

Improving Identification of Suicide Risk Via Routine Screening for Depression and Alcohol Use

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Abstract

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ABSTRACT

Background: Annual rates of suicide have been on the rise for the past two decades in the U.S. In 2017, there were 47,173 confirmed suicide deaths and an estimated 1.4 million suicide attempts. Alcohol use and suicidal ideation are both independently associated with increased risk of suicide attempt. Depression assessment tools that include questions about suicidal ideation can help providers identify patients at risk of suicide attempt in the clinical setting where many seek care in the months prior to an attempt. Using routine self-reported assessment tools for risky patterns of alcohol use may also be useful for optimizing identification of suicide attempt risk. Additionally, understanding more about the patient experience answering questions about suicidal ideation could inform screening and assessment practices during routine care delivery. Therefore, this dissertation studied patients from a large regional healthcare system—Kaiser Permanente Washington—to evaluate whether patterns of patient-reported alcohol use

can be used to identify patients at risk of suicide attempt (Aim 1) whether and how that association varies by report of suicidal ideation (Aim 2), and to understand how patients experience and answer questions about suicidal ideation (Aim 3).

Methods: Aims 1 and 2 used electronic health record data to identify outpatient visits to a mental health provider with documented assessments for unhealthy alcohol use (via Alcohol Use Disorders Identification Test-Consumption or AUDIT-C) and depression symptom severity (via 9-item Patient Health Questionnaire or PHQ-9) in Kaiser Permanente Washington (1/1/2010-6/30/2015). Logistic regression models were fit using generalized estimating equations were fit to conduct visit-level analyses, accounting for correlation between individuals' assessments. Separate models evaluated the association of (1) level of alcohol consumption and (2) frequency of heavy episodic drinking (HED) with suicide attempt within 90 days following each visit. Additional stratified analyses were used to evaluate these associations by self-reported suicidal ideation (PHQ-9 ninth question). Primary models adjusted for age, gender, race/ethnicity and visit year. Aim 3 used criterion sampling to identify primary care patients who had recently completed the PHQ-9 ninth question with whom we conducted semi-structured interviews by phone, which were recorded and transcribed. Directive and conventional content analysis were used to apply knowledge from prior research and elucidate new information from interviews; thematic analysis was used to organize key content.

Results: Aim 1 primary analyses included 60,273 patient visits among 44,106 patients. At the first study period visit, 22% reported nondrinking, and 39%, 35%, and 5% reported low-, moderate-, and high-level drinking, respectively. Further, 65% reported no HED, 22% reported "less than monthly," 7% "monthly," 4% "weekly," and 2% reported "daily/almost daily" HED. Patients reporting high-level alcohol use were 2.59 times (95% CI, 1.80-3.74) more likely to

attempt suicide compared to those reporting low-level use. Patients reporting daily/almost HED were 3.62 times (95% CI, 1.80-3.74) as likely to attempt suicide than those reporting no HED.

Aim 2 primary analyses included 59,705 patient visits among 43,706 patients. At the first study period visit 26% reported having suicidal ideation in the past two weeks. Among these patients, risk of suicide attempt was significantly increased for those reporting high-level (OR 9.77, 95% CI, 6.23-15.34), moderate-level (OR: 4.94, 95% CI 3.49-6.98) and non-drinking (OR 5.86, 95% CI 4.00-8.58), relative to low-level alcohol use. Risk was increased for those reporting HED monthly or more (OR 6.80, 95% CI 4.77-9.72) and less than monthly (OR 5.16, 95% CI, 3.67-7.26) relative to those reporting no HED. Among patients reporting no suicidal ideation, no associations between alcohol use (consumption or HED) and suicide attempt risk were observed. In Aim 3, qualitative analyses revealed: 1) Participants believed being asked about suicidality was contextually appropriate and valuable, 2) Some participants described a mismatch between their lived experience and the PHQ-9 ninth question, 3) Suicidality disclosures involved weighing hope for help against fears of negative consequences, and 4) Provider relationships and acts of listening and caring facilitated discussions about suicidality.

Conclusions: In these studies, we found that while patients believed being asked questions about suicidal ideation was appropriate, some described experiencing stigma and distanced themselves from suicidality. Further, we found that patterns of alcohol use obtained via routine self-reported assessment may help identify patients at higher risk of suicide attempt, but largely only among patients disclosing suicidal ideation. Findings underscored the value of offering alcohol-related care to patients reporting risky alcohol use patterns, especially to those also reporting suicidal ideation. More work is needed to optimize identification of patients at high-risk of suicide attempt who do not report suicidal ideation.

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want to say thank you to my mom and dad for providing valuable educational opportunities when I was young that expanded my horizons and curiosity. Thank you to my brother for his constant presence during the good times and the bad times, but especially for always laughing at my jokes.

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Chapter 1: Introduction

*Maya, Joe, and Matt **

Maya had worked for years at a nonprofit community-based mental health organization. This was important work to her, as she had close family members who had struggled with mental illness. But having fun was also a big priority for Maya. She frequently travelled with friends and family, she played recreational dodgeball, and she loved laughing. The night Maya died she had been in an automobile accident while driving home intoxicated. She was transported to a local emergency room and released with a supply of prescription pain-killers. Her partner was angry with her about the accident and refused to pick her up. Maya's step-daughter later found her in their home in the morning unresponsive after having taken a lethal amount of the prescription painkillers she had been given the previous night.

Joe was well-known in the small community where he had grown up, married, became a father and had grown a successful wine-making operation. He was a lover of his canine companions and welcomed visitors (including canine visitors) to his tasting room. In the months leading up to Joe's death, his father (and business partner) had died following a long illness. The day Joe died he visited friends to talk and share wine, before returning to his rental house alone and continued drinking. He subsequently posted several messages on social media that caused concern among his friends who contacted the local police who later found Joe had died of a self-inflicted gunshot wound.

Matt loved music, outdoor adventures, good food, and spending time with friends. He

*These stories are based on true stories. All the individuals described are friends and/or colleagues of the author and the details described are based on personal interactions and descriptions published in local media reports following the incidents described. Names and other identifiable details have been changed in some cases to protect confidentiality.

particularly loved the company of attractive women and was rarely unaccompanied by a female companion. His life ended late one summer night when a flagger indicated to Matt to stop his car. Only Matt didn't stop his car but continued to slowly drive toward the draw bridge that was partially open for construction. The flagger reported jogging alongside the car yelling to him to stop, but he continued to drive around several construction barriers, through a flashing red and white gate, up the incline of the bridge, over the edge, and into the water below.

In the days and weeks that followed each of these deaths, friends, family and colleagues reflected on the circumstances of the lives of Maya, Joe, and Matt. Many of us tried to reconstruct the final days, hours and moments of these individuals, attempting to understand why their lives had ended and what circumstances would have prevented their deaths.

Suicide Statistics

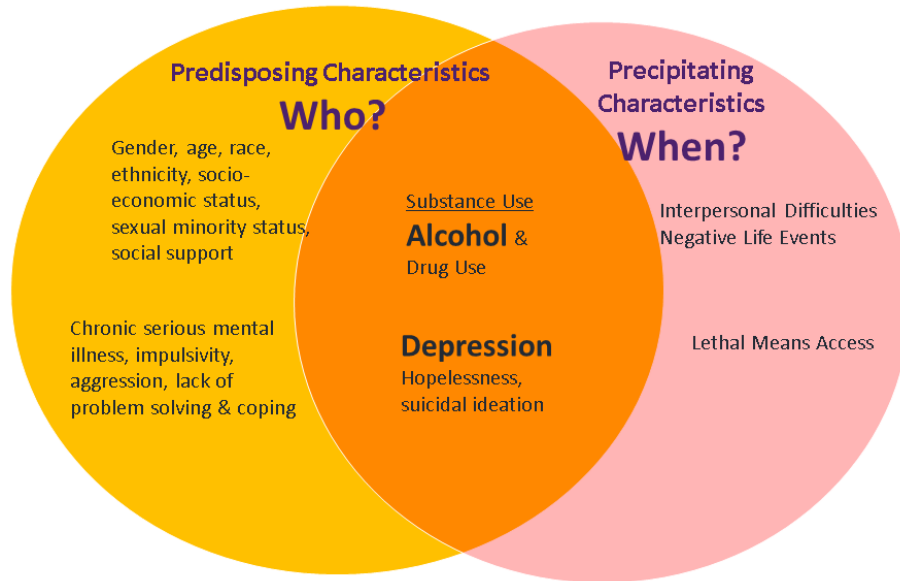
Sadly, stories like these—stories about vital members of our communities who end their own lives, sometimes violently, well before reaching old age—are not uncommon. The effects of suicide on family members, friends, colleagues, and acquaintances following suicide-related death is long-lasting and profound,¹ includes measurable anxiety and depression,² and can result in suicidal thoughts among the bereaved.³ Unfortunately, suicide attempts appear to be on the rise rather than the decline in the U.S.,⁴ In 2017, there were 47,173 confirmed suicide deaths an estimated 1.4 million suicide attempts.⁵ Suicide is the 10th leading cause of death and rates have been on the rise since 1999 in the U.S., for men and women and all age groups under 75 years.⁶ Firearms are the most common method used when individuals die by suicide, followed by suffocation and poisoning.^{5,7}

Risk Factors for Suicide Attempt

There are many important risk factors associated with suicide attempts. Broadly, these fall into two categories: 1) predisposing characteristics used to ascertain “who” is at risk for making a suicide attempt and 2) precipitating characteristics used to ascertain “when” individuals are at risk of suicide attempt (Figure 1). Most suicide attempt research to date has focused on “who” is at risk, specifically demographic and mental health-related characteristics.⁸ Suicide prevention organizations also routinely report rates of suicide death by gender, age, and race/ethnicity.^{5,9} Research on “when” individuals are at risk of suicide is more difficult to study, because it often requires researchers to ascertain intimate details about individuals’ lives that may change over time. These include factors like interpersonal problems (e.g., arguments, breakups/divorce) and negative life events (e.g. death, injury, job-loss).^{10,11} Well-known theoretic models^{12,13} have used anecdotal evidence to describe how these “when” risk factors are associated with suicide attempts. Some researchers have also attempted to empirically confirm these theories using psychological autopsy methods (i.e. interviews with family members/friends of those who died by suicide).^{14,15}

Some risk factors for suicide attempt fall into both the “who” and the “when” categories, including alcohol use and suicidal ideation. For example, alcohol is often used at the time of suicide attempts (both fatal and non-fatal)¹⁶⁻²⁴ and individuals who have an alcohol use disorder [AUD], a chronic condition characterized by loss of control over alcohol intake,²⁵ are also at higher risk of suicide attempt.²⁶⁻³⁰ Similarly, individuals with a history of suicidal ideation are at increased risk of suicide attempt and thoughts about ending one’s life are also present at the time of suicide attempt.³¹⁻³⁵ Moreover, taken together these two risk factors appear to be particularly important as suicidal ideation and AUDs are strongly associated²⁹ and often co-occur.³⁶

Figure 1: Example predisposing (“who”) and precipitating (“when”) risk factors for suicide attempt.



Healthcare Systems & Patient-Reported Alcohol Use & Depressive Symptoms

Research demonstrates that healthcare systems and providers may have a role to play in identifying both “who” and “when” patients are at risk of suicide. About half of those who die by suicide see a healthcare provider in the month prior to their death, and nearly all receive healthcare in the year prior to death.^{37,38} Therefore, new models of care have been developed to support identification of patients at risk of suicide during healthcare encounters, as a first step in suicide prevention interventions designed for this setting.^{39,40} One method of identification is using patient-reported information about depressive symptoms, now often routinely collected to ensure patients in need of care for depression are accurately identified and receive treatment monitoring over time.^{41,42} Depression severity instruments often include questions about suicidal ideation, like the 9-item Patient Health Questionnaire [PHQ-9] which asks patients to report frequency of “thoughts you would be better off dead, or of hurting yourself in some way” in the

past two weeks.⁴³ Researchers have demonstrated this question can identify patients at risk of suicide attempt.⁴⁴⁻⁴⁶

Another method of suicide risk identification may be using patient-reported information about other important risk factors for suicide, like risky patterns of alcohol use. Healthcare organizations are increasing screening patients for unhealthy alcohol use using standard instruments, like the Alcohol Use Identification Disorders Test Consumption [AUDIT-C],^{47,48} to identify and engage patients in alcohol-related care,⁴⁹⁻⁵¹ based on current national recommendations.⁵² It is possible that screening instruments like the AUDIT-C may be able to help identify patients at risk of suicide attempt. Moreover, based on prior research suggesting individuals are more likely to make unplanned suicide attempts while intoxicated,^{53,54} the AUDIT-C may be particularly useful for identifying patients at risk of suicide who do not report suicidal ideation prior to suicide attempt. The AUDIT-C measures frequency of heavy episodic drinking [HED], which usually causes intoxication,^{47,48} therefore it may enable identification of suicide risk among patients who are not be experiencing suicidal ideation at the time of a healthcare visit but subsequently make a suicide attempt while intoxicated. However, it is also possible that alcohol intoxication increases the risk of suicide by intensifying existing suicidal ideation and disinhibiting individuals from acting on their suicidal thoughts.^{11,55}

One caveat to the perceived utility of identifying patients at risk of suicide using brief questionnaires in healthcare settings is that we understand very little about the patient experience answering routine questions about suicidal ideation. Stigma likely impacts how individuals perceive and answer questions like this, as discrimination related to mental illness is well-documented at the patient,⁵⁶ healthcare,^{57,58} and societal levels.⁵⁹ For example disclosures about mental health-related problems, may lead to providers dismissing patients' physical symptoms of

serious illness and delaying treatment, or providers may avoid discussions about patients' disclosures about mental illness for fear of making things worse (i.e. "protective benevolence").⁵⁷ Therefore, patients likely have valid fears of negative experiences associated with disclosing suicidal thoughts to providers.

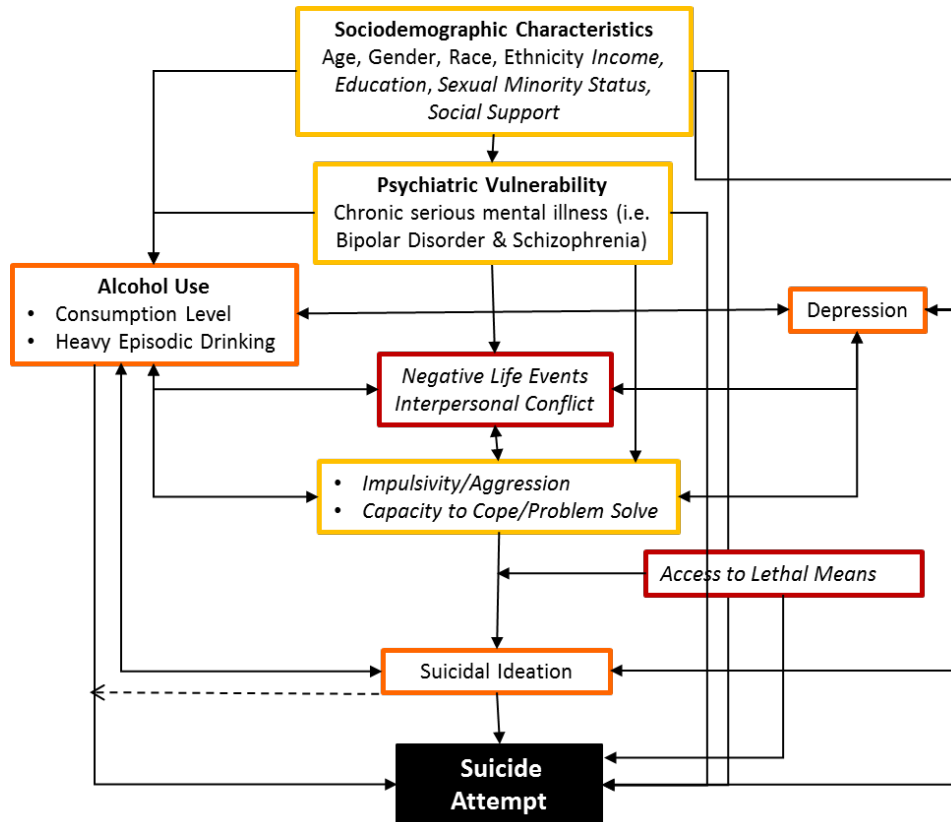
Conceptual Model

To begin the process of addressing the utility of using patient-reported information about patterns of alcohol use and suicidal ideation to help health systems identify, and potentially intervene with, patients at risk of suicide attempt we constructed a conceptual model to guide our evaluation planning (Figure 2). We planned to use statistical methods to evaluate the utility of using the AUDIT-C alone and in combination with the PHQ-9 to identify patients at risk of suicide attempt. Therefore, we thought about how alcohol use and suicide attempt are associated with each other and also about how the other "who" and "when" risk factors are related to alcohol use. For example, in terms of the "who" risk factors (in yellow boxes), we knew that age, gender and race/ethnicity are differentially associated with both suicide attempt⁶⁰ as well as alcohol use.⁶¹ Specifically, research indicates older white males and young Native American males are at the highest risk of dying by suicide, while young white females are most likely to attempt suicide.⁶⁰ Large national surveys have also found that white respondents report the highest prevalence of current alcohol consumption; men report more alcohol consumption and HED than women; and young adults (age 18-25) are at particularly high risk of AUDs.⁶¹

We also planned to focus statistical evaluation on whether suicidal ideation may modify the effect of alcohol use on suicide attempts and used our conceptual model to help us understand how alcohol use could be related to suicide attempt in presence or absence of suicidal ideation.

For example, high-level use and frequent HED, may cause or exacerbate negative life events and interpersonal difficulty (e.g. motor vehicle accidents, arguments with family members), which may in extreme cases result in unplanned (i.e. impulsive) suicide attempts, in the absence of prior suicidal ideation.¹⁰ Alternatively, these high-risk patterns of alcohol use may cause reduced capacity to cope/problem solve and disinhibit individuals from acting on prior suicidal ideation.¹⁰

Figure 2: A conceptual model of the relationship between patterns of alcohol use and suicide attempt



Legend: Yellow boxes indicate “who” risk factors, red boxes indicate “when” risk factors. Italics indicate constructs unavailable for analyses (i.e., not routinely captured in electronic health records).

Specific Aims

Guided by our conceptual model, this dissertation focused on three aims to help understand and optimize information collected in health systems for suicide prevention. The research described in each of the following chapters include the following:

Aim 1 (Chapter 2): We evaluated the associations between patterns of alcohol use and subsequent short-term risk of suicide attempt among adults receiving outpatient healthcare from a mental health provider. Specifically, we tested whether greater alcohol consumption and/or increased HED frequency (both measured via AUDIT-C) were associated with risk of suicide attempt within 90 days of the visits that the AUDIT-C was administered.

Aim 2 (Chapter 3): We evaluated the association between patterns of alcohol use and subsequent short-term risk of suicide attempt among adult patients with and without suicidal ideation. Specifically, we tested whether greater alcohol consumption and/or increased HED frequency identified individuals at higher risk of suicide attempt among patients reporting suicidal ideation (any versus none) at an outpatient visit with a mental health provider.

Aim 3 (Chapter 4): We qualitatively evaluated patient experiences answering standardized questions about suicidality during a routine visit with a primary care provider. Specifically, we conducted and analyzed semi-structured interviews with a sample of primary care patients who had recently answered the PHQ-9 ninth question to understand how patients experience and answer questions about suicidal ideation.

Chapter 2: Short-term Risk of Suicide Attempt Associated with Patterns of Patient-Reported Alcohol Use Determined by Routine Assessment Among Adults Receiving Mental Healthcare

ABSTRACT

Objective: To evaluate the association between patterns of alcohol use routinely assessed during outpatient mental healthcare and short-term risk of suicide attempt.

Methods: Using a longitudinal retrospective-cohort design, electronic health records identified adult outpatient visits to a mental health provider (1/1/2010-6/30/2015) at Kaiser Permanente Washington, with a documented Alcohol Use Disorders Identification Test-Consumption [AUDIT-C]. Suicide attempts within 90 days of AUDIT-C documentation were defined using diagnosis codes (non-fatal) and death certificate cause-of-death. Primary visit-level analyses used generalized estimating equations to account for correlation between multiple AUDIT-Cs for individuals. Separate models, adjusted for patient demographics and visit year, evaluated the association between (1) level of consumption and (2) frequency of heavy episodic drinking (HED) and suicide attempts.

Results: Of 60,247 patient visits, 372 (0.62%) were followed by a suicide attempt within 90 days. Patients reporting high-level alcohol use were 2.6 times (95% CI, 1.80-3.74) more likely to attempt suicide than those reporting low-level use. Patients reporting daily/almost HED were 3.6 times (95% CI, 1.80-3.74) likely to attempt suicide than those reporting no HED.

Conclusions and Relevance: Routine patient-reported information about alcohol may be useful for identifying suicide risk and helping providers address risky patterns of alcohol use as part of suicide-related care.

INTRODUCTION

Alcohol use is an important risk factor for suicide attempt. About a quarter of suicide deaths are directly attributable to alcohol,⁶² which is often used at the time of suicide attempts (both fatal and non-fatal).¹⁶⁻²⁴ Studies have also demonstrated a strong association between alcohol use disorders—the most severe alcohol use—and suicide attempt.²⁶⁻³⁰ This relationship appears to be even stronger among individuals with mental health disorders, particularly those with chronic serious mental illnesses.⁶³⁻⁶⁵ However, prior research on this topic also has limited applicability to suicide prevention in clinical settings because the data were collected retrospectively from coroner reports^{22,66,67} or self-reported from suicide attempt survivors.^{18-20,23,68,69} Such data cannot be used to identify patients at high risk of suicide prior to suicide attempt. Moreover, the majority alcohol use disorders are not recognized in the absence of routine screening,⁷⁰ and many individuals do not seek help for alcohol use disorders due to fear of stigma.^{71,72}

In response to recommendations from the U.S. Preventive Services Task Force [USPSTF]⁵² and initiatives focused on integrating behavioral health in primary care,⁷³ healthcare systems are increasingly implementing population-based screening for unhealthy alcohol use. Screening tools like the Alcohol Use Disorders Identification Test-Consumption [AUDIT-C] assess patterns of alcohol use that may increase risk for adverse outcomes,^{49,51} like average alcohol consumption and heavy episodic drinking [HED].^{48,74} Prior research has found cross-sectional associations between alcohol consumption reported via AUDIT-C and both suicidal thoughts and past attempts among veterans³⁶ and psychiatric⁷⁵ and general adult populations.⁷⁶ It remains unknown, however, whether standardized alcohol screening instruments administered in clinical care, like the AUDIT-C, are useful for prospective identification of patients at higher risk of

suicide attempt, beyond known demographic risk factors.⁶⁰ Healthcare settings may also enable opportunities for suicide prevention, because research demonstrates approximately half of individuals who die by suicide visit their healthcare provider in the month prior to suicide death.^{37,38} This may be particularly relevant to mental health providers who often see a population of patients at higher suicide risk than the general population.^{38,77}

No prior research has examined the short-term risk of suicide attempt associated with risky patterns of alcohol use as measured by routine alcohol assessment in a general population of patients receiving mental healthcare. Therefore, we evaluated the associations between patterns of alcohol use reported via AUDIT-C at an outpatient mental health visit and subsequent risk of suicide attempt within 90 days. Primary analyses, adjusted for demographic risk factors, tested whether greater alcohol consumption and/or increased HED frequency, measured by AUDIT-C, identified individuals at higher risk of suicide attempt. Secondary analysis evaluated this association controlling for other risk factors providers may use during clinical encounters, including depressive symptom severity and documented history of mental health and medical comorbidity.

METHODS

Data Source

The study utilized de-identified data from a prior study,⁷⁸ which included patients from Kaiser Permanente [KP] Washington, a large regional healthcare system serving approximately 700,000 patients. Data sources included the electronic health record (EHR), insurance claims, health system enrollment, and state death certificate files. Data included sociodemographic information, inpatient and outpatient visit diagnosis codes, and summary variables routinely used for research

(e.g. Charlson medical comorbidity index).⁷⁹ The AUDIT-C,^{47,48} which has been used at KP Washington since 2010 and was integrated into a monitoring tool for visits with mental health providers in 2012, was also included. The KP Washington Institutional Review Board did not require human subjects review/approval, because a de-identified dataset was used.

Study Population & Analytic Sample

The analytic sample for the present study included all adult patients who: 1) received care from a KP Washington mental health provider 1/1/2010-6/30/2015, 2) had a documented AUDIT-C at the visit, and 3) were enrolled for at least 90 days after completing the AUDIT-C (i.e., did not disenroll or die from causes other than suicide attempt) (Figure 1). When patients had multiple visits, we further limited to only visits with AUDIT-Cs recorded at least 9 months apart to approximate the past-year timeframe of the AUDIT-C while maximizing the sample. This approach most closely replicates the scenario where individuals are screened for unhealthy alcohol use annually, now common practice in some health systems.^{49,50}

Measures

Two clinically meaningful patterns of alcohol use were derived from the AUDIT-C— 1) *levels of alcohol consumption* and 2) *frequency of HED* (sometimes called “binge drinking”^{80,81} though this term is considered stigmatized). These patterns are associated with many serious health consequences,⁸²⁻⁸⁸ unintentional injury and violence,⁸⁹ and AUD.^{90,91} *Levels of alcohol consumption* included gender-specific AUDIT-C cut-points of the total score (0-12) of the three items: nondrinking: score 0; low-level: score 1-2 or 1-3 (women, men); moderate-level: score 3-7 or 4-7 (women, men), and high-level: score 8-12 (both women and men).⁹² *Frequency of HED* included five levels corresponding to the response options of the third AUDIT-C question, which asks patients to report how often they consume six or more drinks on one occasion, with

response options: “never,” “less than monthly,” “monthly,” “weekly,” and “daily or almost daily.”^{93,94}

Suicide attempts (fatal or non-fatal) were ascertained from state death certificate files (fatal) and from EHR and insurance claim data (non-fatal). Fatal suicide attempts were identified, following common recommendations,^{95,96} as any mortality codes (ICD-10) of self-inflicted injury (X60–X84) or injury/poisoning with undetermined intent (Y10–Y34). Non-fatal suicide attempts were identified using cause of injury codes (ICD-9-CM) indicating intentional self-harm (E950–E958) or undetermined intent (E980–E989), based on prior research, which also demonstrated high and consistent rates of E-code use at KP Washington.⁷⁸

Covariates included demographic characteristics known to be associated with alcohol use and suicide attempt, including age, sex, and race/ethnicity.⁶⁰ Additional covariates were included to evaluate associations among patients with similar severity of depressive symptoms using the Patient Health Questionnaire [PHQ] score category derived from the first eight questions (0-4 minimal or none, 5-9 mild, 10-14 moderate, 15-19 moderately severe, 20-24 severe),^{43,97} and frequency of thoughts about self-harm derived from item 9 of the PHQ-9 (0 “not at all,” 1 “several days,” 2 “more than half the days” to 3 “nearly every day”).^{44,45} Diagnostic codes (ICD-9-CM) in the 0-365 days prior to screening were used to compare patients with similar mental and physical health comorbidity, including for depressive, anxiety, or serious mental illness disorders (bipolar, schizophrenia, other psychosis or personality disorders), suicide attempt and Charlson comorbidity index score.⁷⁹ An *alcohol use disorder* diagnosis indicator in the 0-365 days prior to screening was also used for descriptive purposes but was not considered a potential confounder due to strong correlation with AUDIT-C assessment.⁹⁸

Statistical Analysis

Patient-level statistics (captured at the first visit in study period) were calculated to describe the patient sample and rates of observed suicide attempts, to examine variables for patterns of missing data, and to compare our sample to the overall patient population receiving mental healthcare during the study period. Primary analyses were visit-level and used generalized estimating equations^{99,100} to account for the correlation between multiple AUDIT-Cs for individuals. Separate models were fit to evaluate the association between (1) level of alcohol consumption and (2) frequency of HED and suicide attempt. All models included an indicator for visit year to account for changes in screening practices over time. Models included covariates in blocks using an additive strategy. The primary model adjusted only for demographic risk factors, because all additional covariates added could be caused or exacerbated by alcohol use. Secondarily, the PHQ-8 and PHQ-9 item 9 scores were added to the primary models to evaluate the utility of the AUDIT-C for identifying increased risk of suicide attempt in clinical encounters, which also included assessment of depressive symptoms and suicidal ideation. Finally, indicators for past-year diagnoses of mental health disorders, past-year suicide attempt, and Charlson score were additionally included to evaluate the utility AUDIT-C for identifying increased risk of suicide attempt in clinical encounters with a documented history of mental health and medical comorbidity. Odds ratios were used to approximate relative risk because suicide attempt is rare.¹⁰¹ Low-level drinking (not nondrinking) was used as the reference group in models assessing consumption levels, because the past-year timeframe of the AUDIT-C does not distinguish lifetime abstinence from ceasing drinking due to alcohol-related problems or illness,¹⁰² and prior research has demonstrated a non-linear relationship between levels of alcohol use and mental health¹⁰³ and mortality.^{87,104} In models assessing HED

frequency, report of “never” having a past-year heavy drinking occasion was used as the reference group. In all models, standard errors were calculated using the robust sandwich estimator with an independence working correlation structure. Ninety-five percent confidence intervals and two-sided Wald tests (alpha 0.05) comparing alcohol use categories are presented, in addition to global significance tests of all categories of each measure of alcohol use.

Two sensitivity analyses were conducted to examine the impact of assumptions related to use of repeated visits as the unit of analysis and the timing of AUDIT-C documentation on results. Specifically, we repeated all analyses restricted to the first AUDIT-C recorded for each individual, due to prior research demonstrating how answering questions about drinking may alter subsequent self-reported behavior.¹⁰⁵ Secondly, we used all patient visits with AUDIT-Cs available at least 90 days apart (rather than 9 months apart). All analyses were performed using Stata/MP 15.0.¹⁰⁶

RESULTS

Patient Characteristics

Among all patients in the analytic sample (N=44,106), the majority were women (63.7%), white (77.9%), with a mean age of 43.3 (range 18-90). The majority had a past-year depressive disorder (71.0%) and/or anxiety disorder (58.4%) (Table 1). At the first visit in the study period, 22.1% reported nondrinking, and 38.6%, 34.5%, and 4.8% reported low-, moderate-, and high-level drinking, respectively. Further, 65.1% reported “never” having a heavy drinking episode in the past year, 21.9% reported HED “less than monthly,” 7.1% “monthly,” 4.4% “weekly,” and 1.5% reported “daily/almost daily” HED. Demographic and clinical characteristics among patients in the analytic sample were similar to those in the overall patient population receiving

mental healthcare (Supplement S1).

Patient characteristics differed across levels of alcohol use and frequency of HED (Table 1, Supplement S2, respectively). Patients reporting high-level alcohol use were more likely to be male, younger, to report moderate to severe depressive symptoms, to indicate some frequency of thoughts about self-harm on the PHQ-9 ninth question, and to have past-year diagnoses for depression, suicide attempt and/or alcohol use disorder (Table 1). Similar patterns were seen across HED frequency (Supplement S2).

Of 60,247 patient visits (among 44,106 individuals), 0.62% were followed by a suicide attempt (353 non-fatal, 19 deaths) within 90 days; 0.66%, 0.55%, 0.56%, and 1.53% for those with report of nondrinking, low-level, moderate-level and high-level alcohol consumption, respectively; and 0.54%, 0.64%, 0.79%, 1.02% and 2.06% for those with report of “never,” “less than monthly,” “monthly,” “daily/almost daily” HED frequency, respectively.

Association Between Patterns of Alcohol Use and Risk of Suicide Attempt

In the primary model assessing the association between levels of alcohol consumption and suicide risk adjusted for demographics, risk of suicide attempt was increased for those reporting high-level alcohol use (OR 2.59, 95% CI, 1.80-3.74), relative to those reporting low-level alcohol use, but did not differ for those with moderate-level (OR: 0.95, 95% CI 0.74-1.22) or no alcohol use (OR 1.32, 95% CI 1.00-1.74; Model B, Table 2). Additional adjustment for depressive symptoms and thoughts of self-harm (Model C, Table 2), as well as past-year mental health diagnoses and medical comorbidity (Model D, Table 2), resulted in similar patterns though the magnitude of the association was attenuated. Global tests assessing differential relationships between consumption level categories and suicide attempt were significant for all but the fully adjusted model (Wald tests, Model A: $p < 0.0001$, Primary Model B: $p < 0.0001$,

Model C: $p=0.0075$, Model D: $p=0.0835$).

In the primary model assessing the association between HED frequency and risk of suicide attempt (Model B, Table 2), risk of suicide attempt was increased for those reporting HED “daily/almost daily” (OR 3.62, 95% CI 2.16-6.07) and “weekly” (OR 1.58, 95% CI, 1.02-2.46) relative to those reporting no heavy drinking episodes. No differences in risk were observed for those reporting HED “monthly” (OR 1.16, 95% CI 0.78-1.71) or “less than monthly” (OR 0.98, 95% CI 0.75-1.28) relative to those reporting no HED. Adjustment for depressive symptoms and thoughts of self-harm (Model C, Table 2) attenuated the increased risk for those reporting weekly HED (OR 0.93, 95% CI 0.72-1.19), but risk remained increased for those reporting daily/almost daily HED (Model C, Table 2; OR 2.33, 95% CI 1.38-3.93). Further adjustment for past-year mental health diagnoses and medical comorbidity attenuated all associations (Model D, Table 2). The number of patient visits also decreased with adjustment due to missing PHQ-9 and diagnostic data in Models C and D. Global tests for differential associations between frequency of drinking categories and suicide risk were significant in all but the fully adjusted model (Wald tests Model A: $p<0.0001$, Primary Model B: $p<0.0001$, Model C: $p=0.0236$, Model D: $p=0.4430$).

Results of both sets of sensitivity analyses (Supplements S3 & S4) were similar to main analyses, except that the increased risk of suicide attempt among those reporting “daily/almost daily” HED compared to those reporting “never” remained significant, both in the analysis restricted to the first patient-visit (OR, 1.66; 95% CI, 1.06-3.62) and in the analysis accounting for all patient-visits at least 90 days apart (OR, 1.86; 95% CI, 1.08-3.21).

DISCUSSION

In this large study of adult patients who completed an AUDIT-C during visits with a mental health provider, information about alcohol use documented in the EHR was associated with short-term risk of suicide attempt following AUDIT-C assessment. The findings for high-level alcohol use held even after adjustment for multiple other factors that predict suicide risk. In the primary model (adjusted for demographics), patients reporting high-level alcohol use were 2.6 times more likely to attempt suicide within 90 days than those reporting low-level use. Similarly, patients reporting daily/almost daily HED were 3.6 times more likely to attempt suicide within 90 days than those reporting no HED. These results suggest that assessing and addressing alcohol use as part of routine suicide-related healthcare, particularly to identify patients reporting high-level consumption or heavy episodic use more than monthly, could be a promising suicide prevention strategy.

The present study extends prior research by using a robust longitudinal study design with direct applicability to the clinical setting. Alcohol use information was measured via AUDIT-C prior to and independently from suicide attempt outcomes, instead of using the more commonly used case-control design, which is subject to differential recall bias,¹⁰⁷ because alcohol use data is collected retrospectively after identification of suicide attempt cases and controls.²⁴ Relatedly, defining suicide attempt outcomes using EHR and death certificate data avoided reliance on self-report of suicide attempt, which also introduces recall and social desirability biases.¹⁰⁸ Moreover, these findings have direct applicability to clinical settings where the AUDIT-C is now used routinely, including the Veterans Health Administration,⁴⁹ which cares for a population representing about a quarter of suicide deaths in the United States.^{109,110} Findings of secondary models also suggest the AUDIT-C may be useful in addition to PHQ-9, which is now often used

for routine depression screening and follow-up.⁴²

This study has several limitations. The study sample was defined by patients receiving outpatient mental healthcare; additional research is needed to extend findings to primary care. Relatedly, KP Washington provides comprehensive care for a population of insured patients, so findings should be confirmed in fee-for-service and safety net settings, where information about medical history may be limited and patient populations may differ. Also, the AUDIT-C asks about alcohol use in the year prior, which may not accurately capture current alcohol use, particularly because drinking patterns can vary substantially over time.¹¹¹ Additionally, due to missing PHQ-9 and prior-year diagnostic data results are not strictly comparable across all models. Finally, due to the small number of suicide deaths, we did not examine suicide death separately from suicide attempt or stratify results by important demographic risk factors (e.g., sex, age, race). Future research in larger populations should investigate risk of suicide associated with specific patterns of alcohol use among high-risk demographic subgroups⁶⁰ and consider fatal and non-fatal attempts separately when possible.

Despite these limitations, this is the first study to investigate the utility of using alcohol assessment information documented during routine mental healthcare to identify risk of suicide attempt. Findings support the integration of alcohol-related care into existing suicide prevention interventions, which some argue is often a “missed opportunity” in suicide prevention.¹¹² For example, the Zero Suicide framework, which is designed to systematically identify and assess suicide risk and engage patients in care, does not explicitly address alcohol use.³⁹ Findings of the present study support identification of patients with high-risk alcohol use at the point of mental healthcare and integrating alcohol screening and assessment into suicide prevention. Alcohol screening information could be combined with information on patient-reported suicidal

ideation and/or integrated into more complex risk prediction algorithms being developed to identify and intervene with patients at high risk of suicide.^{78,113} Given the strong associations observed between suicide attempt and patterns of alcohol use identified from routine alcohol screening/assessment, results of the present study also support improved integration of alcohol screening and brief intervention into routine care more broadly. The USPSTF and multiple clinical guidelines recommend routine alcohol screening followed by brief counseling interventions for those who screen positive,^{52,114} but healthcare systems have been slow to adopt these practices and most patients who could benefit never receive alcohol-related care.¹¹⁵⁻¹¹⁷ Finally, media campaigns, which now commonly urge individuals with depression and suicidal thoughts to seek mental healthcare, may also consider promoting help-seeking for changing high-risk patterns of alcohol use, particularly for individuals with depressive symptoms.¹¹⁸

Conclusions

In this large population of adults receiving mental healthcare, high-level alcohol use and heavy episodic drinking more than monthly were associated with significantly increased risk of suicide attempt. Findings suggest alcohol use assessment documented in the EHR is useful for identification of patients at higher risk of suicide attempt and that addressing alcohol use as part of routine suicide-related care, particularly with patients reporting the riskiest patterns of alcohol use, is a promising suicide prevention strategy. Future research should examine the effect of alcohol-related interventions for purposes of suicide prevention.

Figure 1: Adult Outpatient Mental Health Visits with AUDIT-C Documentation and Outcome Data Availability in the Following 90-days During the Study Period

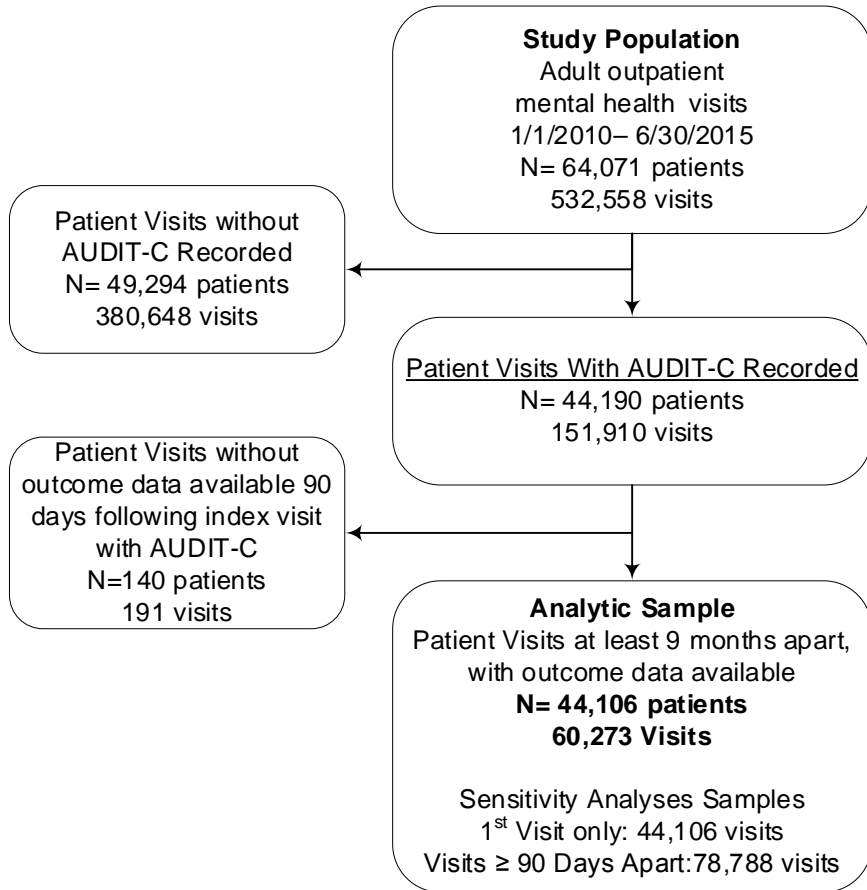


Table 1: Characteristics of Adult Mental Health Patients Assessed for Unhealthy Alcohol Use (N=44106), Across Levels of Reported Alcohol Consumption

	Level of Alcohol Use Based on Alcohol Use Disorder Identification Test Consumption (AUDIT-C) Scores									
	Total Sample N=44106		Nondrinking (Score 0) N=9762		Low-Level Alcohol use (Score 1-2 Women, Score 1-3 Men) N=17038		Medium-Level Alcohol use (Score 3-7 Women, Score 4-7 Men) N=15200		High-Level Alcohol use (Score 8-12) N=2106	
Age (Mean, SD)	43.3	(16.7)	48.0	(18.3)	44.0	(16.1)	40.1	(15.6)	38.8	(14.2)
Male (N, %)	16028	(36.3%)	3358	(34.4%)	6406	(37.6%)	5051	(33.2%)	1213	(57.6%)
Race/Ethnicity (N, %)										
White, non-Hispanic	34367	(77.9%)	7339	(75.2%)	13272	(77.9%)	12134	(79.8%)	1622	(77.0%)
Black, non-Hispanic	1983	(4.5%)	499	(5.1%)	760	(4.5%)	609	(4.0%)	115	(5.5%)
Asian	1965	(4.5%)	591	(6.1%)	766	(4.5%)	548	(3.6%)	60	(2.8%)
Hispanic	1503	(3.4%)	333	(3.4%)	603	(3.5%)	494	(3.3%)	73	(3.5%)
Other	2689	(6.1%)	643	(6.6%)	1025	(6.0%)	880	(5.8%)	141	(6.7%)
Unknown	1599	(3.6%)	357	(3.7%)	612	(3.6%)	535	(3.5%)	95	(4.5%)
*Level of Depressive Symptoms (PHQ-8) (N, %)										
Minimal or None (Score 0-4)	8373	(19.0%)	1841	(18.9%)	3510	(20.6%)	2813	(18.5%)	209	(9.9%)
Mild (Score 5-9)	11075	(25.1%)	2192	(22.5%)	4473	(26.3%)	4008	(26.4%)	402	(19.1%)
Moderate (Score 10-14)	10324	(23.4%)	2188	(22.4%)	3914	(23.0%)	3707	(24.4%)	515	(24.5%)
Moderately Severe (Score 15-19)	8400	(19.0%)	1946	(19.9%)	3044	(17.9%)	2881	(19.0%)	529	(25.1%)
Severe (Score 20-24)	5290	(12.0%)	1366	(14.0%)	1886	(11.1%)	1621	(10.7%)	417	(19.8%)
*Frequency of Self-Harm Thoughts (PHQ-9 Q9) (N, %)										
Not at all (Score 0)	32220	(73.1%)	6930	(71.0%)	12811	(75.2%)	11257	(74.1%)	1222	(58.0%)
Several days (Score 1)	7033	(15.9%)	1543	(15.8%)	2555	15.0%	2436	(16.0%)	499	(23.7%)
More than half (Score 2)	2348	(5.3%)	560	(5.7%)	814	(4.8%)	791	(5.2%)	183	(8.7%)
Nearly every day (Score 3)	1821	(4.1%)	494	(5.1%)	629	(3.7%)	535	(3.5%)	163	(7.7%)
Mental Health Diagnoses, Prior Year (N, %)										
Anxiety disorder	25766	(58.4%)	5876	(60.2%)	9793	(57.5%)	8834	(58.1%)	1263	(60.0%)
Depressive disorder	31294	(71.0%)	6918	(70.9%)	11946	(70.1%)	10785	(71.0%)	1645	(78.1%)
†Serious mental illness diagnosis	6202	(14.1%)	2008	(20.6%)	2353	(13.8%)	1569	(10.3%)	272	(12.9%)
Prior suicide attempt	530	(1.2%)	136	(1.4%)	164	(1.0%)	171	(1.1%)	59	(2.8%)
‡Charlson Score	0.5	(1.2)	0.8	(1.5)	0.5	(1.2)	0.3	(0.8)	0.3	(0.9)
Alcohol Use Disorder Diagnosis	1709	(3.9%)	189	(1.9%)	182	(1.1%)	592	(3.9%)	746	(35.4%)

Time-varying information defined at the time of the first outpatient mental health visit during the study period.

*Recorded via self-report on the PHQ-9 about the prior two weeks during same visit as AUDIT-C; PHQ8 score missing for 644 individuals & PHQ-9 Q9 missing for 684 individuals, so columns for these variable do not total 100% across alcohol consumption categories.

†Diagnosis of bipolar, schizophrenia, other psychosis or personality disorders.

‡Missing for 2467 individuals without ambulatory or inpatient encounters in which to observe comorbidities during 365 days prior to the first visit.

Table 2: Estimated Risk of Suicide Attempt by Reported Level of Alcohol Consumption and Frequency of Heavy Episodic Drinking, within 90 Days of AUDIT-C Assessments at Least 9 Months Apart

	A: *Unadjusted Model			B: Primary Model †Additionally Adjusted for Demographics			C: ‡Additionally Adjusted for Depressive Symptoms and Thoughts of Self-harm			D: Additionally Adjusted for ‡‡Mental Health Diagnoses and Medical Comorbidity		
	N visits=60,273 (44106 patients)			N visits=60,273 (44106 patients)			N visits=59,382 (43537 patients)			N visits=56,731 (41644 patients)		
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
1: Level of Alcohol Consumption**												
Nondrinking	1.25	(0.94-1.65)	0.118	1.32	(1.00-1.74)	0.054	1.12	(0.84-1.49)	0.430	1.02	(0.76-1.37)	0.908
Low-level	<i>ref</i>			<i>ref</i>			<i>ref</i>			<i>Ref</i>		
Moderate-level	1.03	(0.80-1.32)	0.837	0.95	(0.74-1.22)	0.677	0.93	(0.72-1.19)	0.556	0.96	(0.74-1.26)	0.786
High-level	2.87	(2.00-4.12)	<0.001	2.59	(1.80-3.74)	<0.001	1.77	(1.22-2.57)	0.002	1.61	(1.08-2.40)	0.018
2: Frequency of Heavy Episodic Drinking												
Never	<i>ref</i>			<i>ref</i>			<i>ref</i>			<i>ref</i>		
Less Than Monthly	1.20	(0.93-1.55)	0.171	0.98	(0.75-1.28)	0.879	0.94	(0.72-1.23)	0.670	0.98	(0.74-1.30)	0.892
Monthly	1.47	(1.00-2.16)	0.049	1.16	(0.78-1.71)	0.47	1.09	(0.73-1.61)	0.681	1.18	(0.78-1.78)	0.446
Weekly	1.92	(1.25-2.97)	0.003	1.58	(1.02-2.46)	0.042	1.21	(0.78-1.89)	0.392	1.23	(0.77-1.99)	0.389
Daily or Almost Daily	3.88	(2.32-6.49)	<0.001	3.62	(2.16-6.07)	<0.001	2.33	(1.38-3.93)	0.002	1.63	(0.90-2.96)	0.108

OR=odds ratio

*All analyses adjusted for assessment year

†Adjusted for gender, age, race/ethnicity (including unknown category)

‡Additionally adjusted for level of depressive symptoms reported on PHQ-8 score & frequency of thoughts about self-harm measured on PHQ-9 ninth question

‡‡Additionally adjusted for mental health diagnoses recorded in the past year, including depressive disorders, anxiety disorders, serious mental illness (bipolar, schizophrenia, other psychosis or personality disorders), suicide attempt, as well as Charlson comorbidity index score

**AUDIT-C: Nondrinking=score 0; Low-Level= Score 1-2 Women, 1-3 Men; Moderate-Level=Score 3-7 Women, 4-7 Men; High -Level=Score 8-12 Women & Men

Chapter 3: Association between patterns of alcohol use and short-term risk of suicide attempt among patients with and without reported suicidal ideation

ABSTRACT

Objective: To evaluate whether and how the association between patterns of alcohol use and short-term risk of suicide attempt varies among patients with and without reported suicidal ideation.

Methods: Kaiser Permanente Washington electronic health record data were used to identify mental health visits (1/1/2010-6/30/2015) with documented assessments for unhealthy alcohol use (AUDIT-C) and depression severity (PHQ-9). Logistic regression models fit using generalized estimating equations were used to conduct visit-level analyses, accounting for correlation between individuals' assessments. Separate models evaluated the association of (1) level of alcohol consumption and (2) frequency of heavy episodic drinking (HED) with suicide attempt within 90 days following each visit, stratified by self-reported suicidal ideation (PHQ-9 ninth question). Primary models adjusted for age, gender, race/ethnicity and visit year.

Results: Of 59,705 visits (43,706 unique patients), 372 (0.62%) were followed by a suicide attempt within 90 days. Among patients reporting suicidal ideation, risk of suicide attempt was significantly increased for those reporting high-level (OR 9.77, 95% CI, 6.23-15.34), moderate-level (OR: 4.94, 95% CI 3.49-6.98) and non-drinking (OR 5.86, 95% CI 4.00-8.58), relative to low-level alcohol use. Risk was increased for those reporting HED monthly or more (OR 6.80, 95% CI 4.77-9.72) and less than monthly (OR 5.16, 95% CI, 3.67-7.26) relative to those reporting no HED. Among patients reporting no suicidal ideation, no associations were observed.

Conclusions: Findings underscore the value of offering alcohol-related care to patients reporting risky patterns of alcohol use and suicidal ideation. Additional strategies will be needed to identify patients at high-risk of suicide attempt reporting no suicidal ideation.

INTRODUCTION

Alcohol use and suicidal ideation are both associated with increased risk of suicide attempt in different ways. Specifically, both intoxication resulting from heavy drinking and having an alcohol use disorder (AUD) diagnosis are associated with increased risk for both fatal^{22,27,28,30,66} and non-fatal^{16,20,24,26,29} suicide attempts. Suicidal ideation (past-year and lifetime) is also a known risk factor for suicide attempt.³¹⁻³⁵ Moreover, researchers have demonstrated that depression assessment tools that include questions about suicidal ideation, like the 9-item Patient Health Questionnaire [PHQ-9],⁴³ can help providers identify patients at risk of suicide attempt in the clinical setting,⁴⁴⁻⁴⁶ where many seek care in the months prior to attempt.^{37,38}

Alcohol use may be helpful for identifying risk of suicide attempt in the absence of suicidal ideation. In a recent qualitative study conducted among individuals who had survived a recent suicide attempt after reporting no suicidal ideation at a recent healthcare visit on the ninth PHQ-9 question, which asks about frequency of “thoughts that you would be better off dead, or of hurting yourself” in the prior two weeks,⁴³ alcohol use was often described in the context of making an unplanned suicide attempt.⁵³ This suggests identifying alcohol use patterns that increase risk for suicide attempt may help improve suicide risk identification among patients who report no suicidal ideation. However, alcohol use may also strengthen the relationship between suicidal thoughts and attempts by disinhibiting patients from making a suicide attempt.¹¹

The utility of combining information about patterns of alcohol use (rather than AUD diagnoses) and suicidal ideation for purposes of suicide prevention in clinical settings has not been studied. However, health systems are increasingly integrating assessments for unhealthy alcohol use and depression in response to national recommendations,^{41,42,52,114,119} generating opportunities for investigating this issue. For example, many health systems routinely assesses patients for depression (including suicidality) and/or unhealthy alcohol use, using tools like the PHQ-9 and the Alcohol Use Identification Disorders Test Consumption [AUDIT-C].^{47,48} Because the AUDIT-C measures high-level alcohol use and heavy episodic drinking, which usually causes intoxication, it may be particularly useful for identifying patients at high risk of unplanned suicide attempts while intoxicated.

Therefore, among a population of adult patients receiving mental health specialty care, we evaluated whether and how the association between patterns of alcohol use, reported via AUDIT-C, and short-term risk of suicide attempt varied by report of suicidal ideation. Specifically, our primary analysis tested whether greater levels of alcohol consumption and/or increased frequency of heavy episodic drinking identified individuals at higher risk of suicide attempt among patients reporting suicidal ideation (any versus none). Based on increased risk of suicide attempt associated with intoxication,^{16,20,22,24,66} those endorsing high-level use and heavy episodic drinking (at least monthly) were hypothesized to be at greater risk, especially among patients reporting no suicidal ideation.

METHODS

Data Source & Sample

Data sources include electronic health records [EHR], insurance claims, enrollment information

and cause-of-death data from state death certificate files for patients at Kaiser Permanente Washington [KPWA], a large regional healthcare system serving approximately 700,000 patients. The dataset included adult (ages \geq 18) outpatient mental health specialty visits between 1/1/2010 and 6/30/2015. Data included sociodemographic information, inpatient and outpatient visit diagnosis codes and patient-reported measures—specifically, the PHQ-9⁴³ and AUDIT-C.^{47,48} Index visits included outpatient visits with documented AUDIT-C and PHQ-9 assessments on the same visit-day among patients enrolled for the 90-day period following the visit (i.e. did not disenroll or die from causes other than suicide attempt) (Supplement S5). The sample was further limited to patient visits that occurred at least nine months apart, because 1) the AUDIT-C asks individuals to report on their alcohol consumption in the year prior to screening, and 2) this approach approximates the scenario when individuals are assessed for unhealthy alcohol use annually, now common practice in some large health systems, including KPWA.^{49,50} The KPWA IRB approved use of this data for this research evaluation.

Measures

Predictor Measures: Patterns of Alcohol Use. The three-item AUDIT-C questionnaire is a validated screen for unhealthy alcohol use that measures quantity and frequency of average consumption and frequency of heavy episodic drinking (HED) (formerly termed “binge drinking”^{80,81}), resulting in a total score of 0-12, with higher scores reflecting greater alcohol consumption and consequences.¹²⁰ The AUDIT-C was used to assess two clinically meaningful patterns of alcohol use, *level of alcohol consumption* and *frequency of HED*, both of which are associated with many serious health consequences,⁸²⁻⁸⁸ unintentional injury and violence,⁸⁹ and AUD.^{90,91} *Level of alcohol consumption* categories were defined using gender-specific AUDIT-C score thresholds: nondrinking, score 0; low-level, score 1-2 or 1-3 (women, men); moderate-

level, score 3-7 or 4-7 (women, men), and high-level, score 8-12 (both women and men).

Frequency of HED was measured using responses to the third AUDIT-C question, which asks patients to report how often they consume 6 or more drinks on one occasion. Response options include “never,” “less than monthly,” “monthly,” “weekly,” or “daily or almost daily,” and categories were collapsed into three groups to measure risk of suicide attempt associated with HED frequency less than monthly and monthly or more (compared to “never”).

Effect modifier: Suicidal ideation was defined as a binary indicator variable using responses to the ninth PHQ-9 question, which asks about the frequency of thoughts of death or self-harm with response options: “not at all,” “several days,” “more than half,” or “nearly every day.”^{43,121} The last three response options were combined to create a suicidal ideation indicator to evaluate the risk of suicide attempt across patterns of alcohol use stratified by the presence or absence of any suicidal ideation.

Primary Outcome: Suicide attempts (fatal or non-fatal) were ascertained from state death certificate files (fatal) and from EHR and insurance claim data (non-fatal). Fatal suicide attempts were identified, following common recommendations,^{95,96} as any mortality codes (ICD-10) of self-inflicted injury (X60–X84) or injury/poisoning with undetermined intent (Y10–Y34). Non-fatal suicide attempts were identified using cause of injury codes (ICD-9-CM) indicating intentional self-harm (E950–E958) or undetermined intent (E980–E989), based on prior research, which also demonstrated high and consistent rates of E-code use at KPWA.⁷⁸

Other Measures included demographic characteristics known to be associated with alcohol use and suicide attempt, including age, sex, and race/ethnicity,⁶⁰ as well as common comorbidities and mental health conditions that increase risk for suicide.¹²² Demographics were measured as documented in the medical record. Diagnostic codes (ICD-9-CM) within 365 days

prior to the index visit were used to measure mental and physical health comorbidity, specifically anxiety, depressive, or serious mental illness disorders (bipolar, schizophrenia, other psychosis or personality disorders), prior suicide attempts and Charlson comorbidity index score.⁷⁹ We also created an indicator for presence/absence of an AUD diagnosis (within 365 days prior to the index visit) and the PHQ-8 score recorded at the index visit.

Statistical Analysis

Patient-level descriptive statistics were calculated (using the first visit in study period) to describe the sample and rates of observed suicide attempts, to examine missing data patterns, and to compare our sample (i.e. patients with a documented PHQ-9 and AUDIT-C) to the general population of patients who received mental health specialty care from a KPWA provider during the study period (Supplement S6). Logistic regression, fit using generalized estimating equations,¹⁰⁰ was used to conduct visit-level analyses and account for the correlation between multiple assessments for individual patients.^{99,100} Separate models were fit to evaluate the risk of suicide attempt within 90 days of the index visit associated with 1) level of alcohol consumption and 2) HED frequency, among patients with and without reported suicidal ideation (i.e., PHQ-9 ninth question response 0 versus 1-3). Because covariates measuring mental and physical health comorbidities could be on the causal pathway of the interest (i.e., caused or exacerbated by alcohol use), primary models adjusted only for demographics and visit year. All analyses were performed using Stata/MP 15.0.¹⁰⁶ Marginal prevalences of suicide attempts were estimated from the primary model using the covariate distribution (i.e., Stata “margins” command), and presented graphically across categorical measures of alcohol use stratified by suicidal ideation. Secondary models additionally adjusted for indicators of past-year mental health diagnoses (depressive, anxiety, and serious mental illness disorders), past-year suicide attempt and

Charlson score, evaluated the utility of using the AUDIT-C (in combination with suicidal ideation reported on the PHQ-9) for identifying increased risk of suicide attempt, among patients with similar mental health and medical comorbidity (in addition to demographics). The AUD diagnosis indicator and PHQ-8 score were not included in secondary analyses due to strong correlation with alcohol use and suicidal ideation.^{98,121} All models included the binary indicator for any suicidal ideation, reported on the PHQ-9 ninth question, and a multiplicative interaction term between this indicator for suicidal ideation and the predictor of interest (level of alcohol consumption or HED frequency). For models assessing level of alcohol consumption, low-level drinking (rather than non-drinking) was used as the referent group, because the past-year timeframe of the AUDIT-C does not distinguish lifetime abstainers from those who stopped drinking due to alcohol-related problems or illness,¹⁰² and prior research has demonstrated a non-linear relationship between levels of alcohol use and mental health¹⁰³ and mortality.^{87,104} For models assessing HED frequency, reporting “never” HED was used as the referent group. For all models, standard errors were calculated using the robust sandwich estimator,⁹⁹ and odds ratios were used to approximate relative risk because suicide attempt was rare.¹⁰¹ Confidence intervals (alpha 0.05) and p-values associated with two-sided Wald tests¹²³ comparing predictor categories are presented and Wald heterogeneity tests, which tested the interaction between the indicator for suicidal ideation with all alcohol consumption levels.

RESULTS

Patient Characteristics

Among all patients in the analytic sample (N=43,706), the majority were women (63.7%), white (77.9%) and aged 18 to 90 years (mean=43.2) (Table 1). At the first eligible visit in the study

period, 21.9% reported non-drinking, and 38.7%, 34.6%, and 4.8% reported low-, moderate-, and high-level drinking, respectively. Further, 65.0% reported no HED in the past year, 22.0% reported HED less than monthly, and 13.0% reported HED monthly or more. Over half the sample (55.2%) had moderate to severe depressive symptoms (PHQ-8 score ≥ 10) and past-year prevalence of mental health diagnoses was 58.5%, 71.1% and 14.0% for anxiety, depressive and serious mental illnesses, respectively. Among all patients at their first eligible visit, 1.2% had a past-year suicide attempt diagnosis and 3.9% had a past-year AUD diagnosis.

About a quarter of the sample (25.8%, N=11,276) reported suicidal ideation. Patient demographic characteristics were similar across report of suicidal ideation, but patient-reported measures of alcohol use, depressive symptoms and past-year diagnoses differed. Patients reporting some level of suicidal ideation reported more severe depressive symptoms than those with no ideation reported. A higher proportion of patients reporting suicidal ideation also reported high-level alcohol consumption and HED frequency monthly or more than those reporting no suicidal ideation. Prevalence of all past-year diagnoses, including AUD and suicide attempts, were also higher among patients reporting suicidal ideation.

Association Between Patterns of Alcohol Use and Risk of Suicide Attempt by Reported Suicidal Ideation

Of 59,705 patient visits with a documented AUDIT-C and ninth question PHQ-9 response, 372 (62.3 per 10,000) were followed by a suicide attempt (353 nonfatal, 19 deaths) within 90 days, including 241 (163 per 10,000) among patients reporting suicidal ideation and 131 (29 per 10,000) among patients reporting no suicidal ideation. Counts across categorical measures of alcohol use and suicidal ideation are presented in Table 2.

Level of Alcohol Consumption. The marginal prevalences of suicide attempt, estimated from

the primary model adjusted for demographics and visit year, were substantially higher for patients reporting suicidal ideation across all levels of alcohol consumption, particularly for those reporting high-level use (Figure 1). Primary model results (Table 3, Model A1) indicated that among patients reporting suicidal ideation, the risk of suicide attempt was significantly increased for those reporting high-level alcohol use (OR 9.77, 95% CI, 6.23-15.34), moderate-level use (OR: 4.94, 95% CI 3.49-6.98) and non-drinking (OR 5.86, 95% CI 4.00-8.58) relative to low-level alcohol use. However, among patients reporting no suicidal ideation, the risk of suicide was not significantly increased for any level of alcohol use, including high-level (OR 1.80, 95% CI 0.86-3.80), moderate-level (OR 0.82, 95% CI 0.54-1.23), and non-drinking (OR 1.20, 95% CI 0.75-1.89) relative to low-level alcohol use. After further adjustment for past-year mental health and medical comorbidity (Model B1), results were similar to the primary analysis. Specifically, among patients reporting suicidal ideation, the risk of suicide attempt was significantly increased for those reporting high-level alcohol use (OR 6.17, 95% CI, 3.72-9.89), moderate-level use (OR: 3.57, 95% CI 2.47-5.16) and non-drinking (OR 3.89, 95% CI 2.60-5.81) relative to those reporting low-level alcohol use, but among patients reporting no suicidal ideation the risk of suicide was not significantly increased for any level of alcohol use relative to low-level alcohol use. The Wald test for heterogeneity, which tested the interaction between the indicator for suicidal ideation with all alcohol consumption levels, was statistically significant in both primary (A1) and secondary (B1) models ($p < 0.0001$), confirming the relationship between alcohol consumption levels and suicide risk is not the same for those with and without suicidal ideation.

Heavy Episodic Drinking. The marginal prevalences of suicide attempt, estimated from the primary models adjusted for demographics and visit year, were substantially higher for patients

reporting suicidal ideation across all levels of HED frequency and elevated for those reporting HED monthly or more (Figure 2). Primary model results (Table 3, Model A2) also indicated that among patients reporting suicidal ideation the risk of suicide attempt was significantly increased for those reporting HED monthly or more (OR 6.80, 95% CI 4.77-9.72) and less than monthly (OR 5.16, 95% CI, 3.67-7.26) relative to those reporting no HED. However, among patients reporting no suicidal ideation, the risk of suicide attempt was not significantly increased for those reporting any level of HED, including monthly or more (OR 1.12, 95% CI 0.66 – 1.90) and less than monthly (OR 0.75, 95% CI 0.47 – 1.19), relative to those reporting no HED. Results of secondary HED analysis (Model B2) were similar. Among patients reporting suicidal ideation the risk of suicide attempt was significantly increased for those reporting HED monthly or more (OR 4.72, 95% CI 3.21-6.94) or less than monthly (OR 3.74, 95% CI 2.59-5.40) relative to those reporting no HED, but among patients not reporting suicidal ideation risk of suicide attempt was not significantly increased for those reporting any level of HED relative to those reporting no HED. The Wald test of the interaction between the indicator for suicidal ideation with HED was also statistically significant in both primary (A2) and secondary (B2) models ($p < 0.0001$).

DISCUSSION

In this large study of adult patients who completed an AUDIT-C and PHQ-9 during outpatient visits with a mental health provider, information about alcohol use patterns combined with information about suicidal ideation identified increased short-term suicide attempt risk, but only among patients reporting suicidal ideation. Among patients with suicidal ideation, those reporting high-level alcohol use were nearly ten times more likely to attempt suicide than those with low-level alcohol use in primary models. Similarly, among patients with suicidal ideation,

those reporting any frequency of HED were substantially more likely to attempt suicide than those reporting “never” (6.8 and 5.2 times more likely for those reporting HED frequency more than monthly and less than monthly, respectively). These findings were robust to adjustment for other factors known to predict suicide attempt, including mental health and medical comorbidities and prior year suicide attempt. However, patterns of alcohol use reported on the AUDIT-C did not appear to be useful for identifying increased short-term suicide attempt risk among patients not reporting suicidal ideation.

Findings with regard to patients reporting suicidal ideation build on prior research that has demonstrated associations between alcohol use and suicide attempt and death.^{16,18,20,22,23} These findings provide further support for prospective identification of patients with suicidal ideation and risky patterns of alcohol use using standard patient-reported assessments. Combining information from brief standard assessments used for screening and monitoring purposes, like the AUDIT-C and PHQ-9, can facilitate such identification. These results also underscore the value of addressing suicidal ideation and risky patterns of alcohol use together for purposes of suicide prevention.¹¹² For example, providers may counsel patients about patterns of risky alcohol use that appear to increase risk of suicide attempt, by intensifying suicidal ideation,⁵⁵ increasing impulsivity and constricting coping/problem solving.^{124,125} Providers may also recommend treatments for risky alcohol use as part of their care plan for patients identified as being at risk of suicide attempt, including psychosocial interventions¹²⁶ and/or pharmacotherapy.¹²⁷ Relatedly, routinely assessing patients for suicidal thoughts in alcohol treatment settings may be a useful suicide prevention strategy.¹²⁸

Findings with regard to patients reporting no suicidal ideation were contrary to our hypothesis generated from qualitative work.⁵³ Specifically, there were no significant differences

in risk of suicide attempt associated with higher-level alcohol use and more frequent heavy episodic drinking among patients reporting no suicidal ideation. It is unclear what accounts for the lack of association between alcohol use and suicide in patients not reporting suicide attempt. Because both alcohol use and suicide are substantially stigmatized conditions,^{71,129,130} it is possible that these findings relate to social desirability and measurement bias—specifically, some patients may be unwilling to disclose both suicidal ideation and alcohol consumption, and, thus measurement of these factors may be limited in these patients.

Further work is needed to understand the lack of association observed here and improve our ability to identify suicide risk among patients reporting no suicidal ideation. Though the overall suicide attempt rate was much lower among patients reporting no suicidal ideation (29 versus 163 per 10,000 patient visits), suicide attempts in this group still accounted for about a third of the total suicide attempts observed within 90 days of a visit. One promising new approach includes development of predictive algorithms that identify patients at risk of suicide by harnessing large combinations of discrete EHR data elements, such as indicators for different types of healthcare utilization (e.g. in-patient/outpatient, primary care, specialty care), diagnosis codes, and pharmacy records, as well as sociodemographic information.^{78,113} These predictive algorithms may be particularly powerful when health systems have access to comprehensive longitudinal medical records for their patients. However, in situations when health systems provide short-term care to transient populations, other strategies will be needed. One promising strategy could be focusing on improving the screening and risk assessment processes. Patients' fears of disclosing stigmatizing information about suicidality may be alleviated by normalizing disclosures about suicidal thoughts, in combination with providers' expressions of caring and active listening, without panic or raising unnecessary alarm.^{131,132}

Limitations of this study include generalizability, as KPWA cares for a population of patients primarily insured by employer-sponsored health insurance and Medicare; findings should be confirmed in other populations. Future research will be needed to assess the relationship between alcohol use and suicidal ideation and suicide risk in other settings like primary care where many individuals are seen prior to suicide attempt.³⁷ Additionally, the AUDIT-C asks about alcohol use in the year prior to screening, which does not distinguish people with lifetime abstinence from those who may have stopped drinking due to problems with alcohol or other illnesses, thus limiting interpretation of study results for the non-drinking population. Furthermore, non-fatal suicide attempt outcomes were assessed from EHR data and some events may have been missed or misclassified by providers, particularly among patients reporting no suicidal ideation. Finally, due to the small number of suicide deaths, we were not able to examine this outcome separately from suicide attempts or to evaluate findings in specific demographic sub-groups.⁶⁰

Despite these limitations, this is the first study to investigate the utility of combining information about patterns of alcohol use and suicidal ideation for purposes of identifying patients at high-risk of suicide in the clinical setting. These study findings suggest one important future direction for suicide prevention research is integration and evaluation of evidence-based alcohol-related care into standard care for patients reporting suicidal ideation. This may include integration of brief interventions for unhealthy alcohol use and/or alcohol-related treatment (e.g. psychotherapy, pharmacotherapy)^{126,127} into collaborative safety planning interventions with patients at high-risk of suicide,^{133,134} including those in transition to outpatient settings following in-patient psychiatric hospitalizations.¹²⁸ Study findings also suggest additional strategies will be needed to identify patients at high-risk of suicide who do not report suicidal ideation. This may

include identification via suicide risk prediction algorithms deployed in large health systems,^{78,113} or other strategies designed to reduce stigma encourage disclosures about both alcohol use and suicidal ideation.^{131,132}

Conclusions

In this large population of adults receiving outpatient mental health specialty care, moderate to high-level alcohol use and any HED were associated with significant short-term risk of suicide attempt among patients with suicidal ideation. Results from the AUDIT-C were useful for identifying suicide-risk among patients reporting suicidal ideation on the PHQ-9 ninth question and suggest future research should evaluate patient outcomes associated with integrating evidence-based alcohol-related care into standard suicide-related care. Identification of patients at risk of suicide who do not report suicidal ideation will require testing other strategies to improve the suicide risk assessment process in healthcare settings.

Table 1: Patient characteristics and alcohol use measures stratified by indicator of any patient-reported suicidal ideation, at the time of the first outpatient mental health visit within study period.

	Total Sample N=43706		Patient-reported Suicidal Ideation Frequency (‡PHQ9 Q9)			
			None N=32430		Any N=11276	
Age (M, SD)	43.2	16.6	43.9	16.6	41.3	16.5
Male (N, %)	15878	36.3%	11641	35.9%	4237	37.6%
Race (N, %)						
White, non-Hispanic	34050	77.9%	25646	79.0%	8404	74.5%
Black, non-Hispanic	1964	4.5%	1412	4.4%	552	4.9%
Asian	1953	4.5%	1353	4.2%	600	5.3%
Hispanic	1492	3.4%	1048	3.2%	444	3.9%
Other	2666	6.1%	1863	5.7%	803	7.1%
Unknown	1581	3.6%	1108	3.4%	473	4.2%
Alcohol Consumption Level† (N, %)						
Nondrinking	9570	21.9%	6959	21.5%	2611	23.2%
Low-Level	16947	38.7%	12917	39.8%	4030	35.7%
Moderate-Level	15113	34.6%	11327	34.9%	3786	33.6%
High-Level	2076	4.8%	1227	3.8%	849	7.5%
Heavy Episodic Drinking Frequency†† (N, %)						
Never	28419	65.0%	21663	66.8%	6756	59.9%
Less than monthly	9604	22.0%	7001	21.6%	2603	23.1%
Monthly or More	5683	13.0%	3766	11.6%	1917	17.0%
Level of Depressive Symptoms‡‡ (N, %)						
Minimal or None	8424	19.3%	8188	25.3%	236	2.1%
Mild	11124	25.5%	9808	30.3%	1316	11.7%
Moderate	10363	23.7%	7715	23.8%	2648	23.5%
Moderately Severe	8429	19.3%	4702	14.5%	3727	33.1%
Severe	5310	12.2%	1973	6.1%	3337	29.6%
Mental Health Diagnoses, Prior Year (N, %)						
Anxiety Disorder	25602	58.5%	18465	56.9%	7134	63.2%
Depressive Disorder	31068	71.1%	21340	65.8%	9728	86.3%
Serious Mental Illness Diagnosis*	6141	14.1%	4142	12.8%	1999	17.7%
Suicide Attempt	526	1.2%	204	0.6%	322	2.9%
Charlson Score**	0.5	1.2	0.5	1.1	0.5	1.2
Alcohol Use Disorder Diagnosis, prior year (N, %)	1700	3.9%	1091	3.4%	609	5.4%

†AUDIT-C: Nondrinker=score 0; Low-Level= Score 1-2 Women, 1-3 Men; Moderate-Level=Score 3-7 Women, 4-7 Men; High -Level=Score 8-12 Women & Men

††AUDIT-C Question 3: Never=Score 0, Less than monthly=Score 1, Monthly or More=Score 2-4

‡PHQ-9 Question 9 regarding frequency of self-harm thoughts in prior 2 weeks: None=Score 0, Any=Score 1-3 (some of the days to nearly every day)

‡‡PHQ-8: Minimal or None=Score 0, Mild=Score 5-9, Moderately Severe= Score 15-19, Severe=Score 20-24; missing for individuals (N=56) with more than 2 missing values

*Diagnosis of bipolar, schizophrenia, other psychosis or personality disorders

**Missing for individuals (N=2428) with no in-patient or out-patient utilization in prior year

Table 2: Counts of suicide attempts observed within 90-days following the index visits with documented AUDIT-C and PHQ-9 assessments, stratified by binary indicator of patient-reported suicidal ideation

	Total Visit Sample			Patient-Reported Suicidal Ideation Frequency					
	Visits N=59705	Suicide Attempts N=372		<u>None</u>			<u>Any</u>		
		Count	N	%	Count	N	%	Count	N
Alcohol Consumption Level†	Count	N	%	Count	N	%	Count	N	%
Nondrinking	11688	78	0.67%	8494	27	0.32%	3194	51	1.60%
Low-Level	25595	142	0.55%	19870	58	0.29%	5725	84	1.47%
Moderate-Level	19976	114	0.57%	15121	38	0.25%	4855	76	1.57%
High-Level	2446	38	1.55%	1456	8	0.55%	990	30	3.03%
Heavy Episodic Drinking Frequency††	Count	N	%	Count	N	%	Count	N	%
Never	40572	223	0.55%	31339	91	0.29%	9233	132	1.43%
Less than monthly	12343	80	0.65%	9083	23	0.25%	3260	57	1.75%
Monthly or More	6790	69	1.02%	4519	17	0.38%	2271	52	2.29%

†AUDIT-C: Nondrinker=score 0; Low-Level= Score 1-2 Women, 1-3 Men; Moderate-Level=Score 3-7 Women, 4-7 Men; High -Level=Score 8-12 Women & Men

††AUDIT-C Question 3: Never=Score 0, Less than monthly=Score 1, Monthly or More=Score 2-4

‡PHQ-9 Question 9 regarding frequency of self-harm thoughts in prior 2 weeks: None=Score 0, Any=Score 1-3 (some of the days to nearly every day)

Figure 1: Predicted prevalence of suicide attempt by alcohol consumption level for patients with and without suicidal ideation, adjusted for age, sex, race/ethnicity and visit year

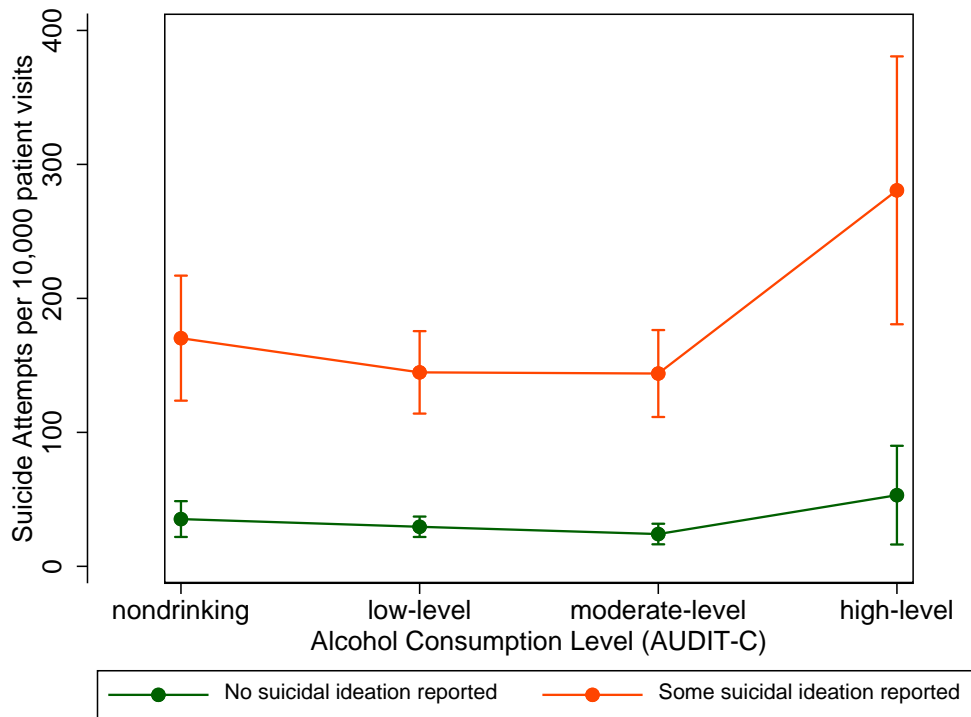


Figure 2: Predicted prevalence of suicide attempt by frequency of heavy episodic drinking [HED] for patients with and without suicidal ideation, adjusted for age, sex, race/ethnicity and visit year

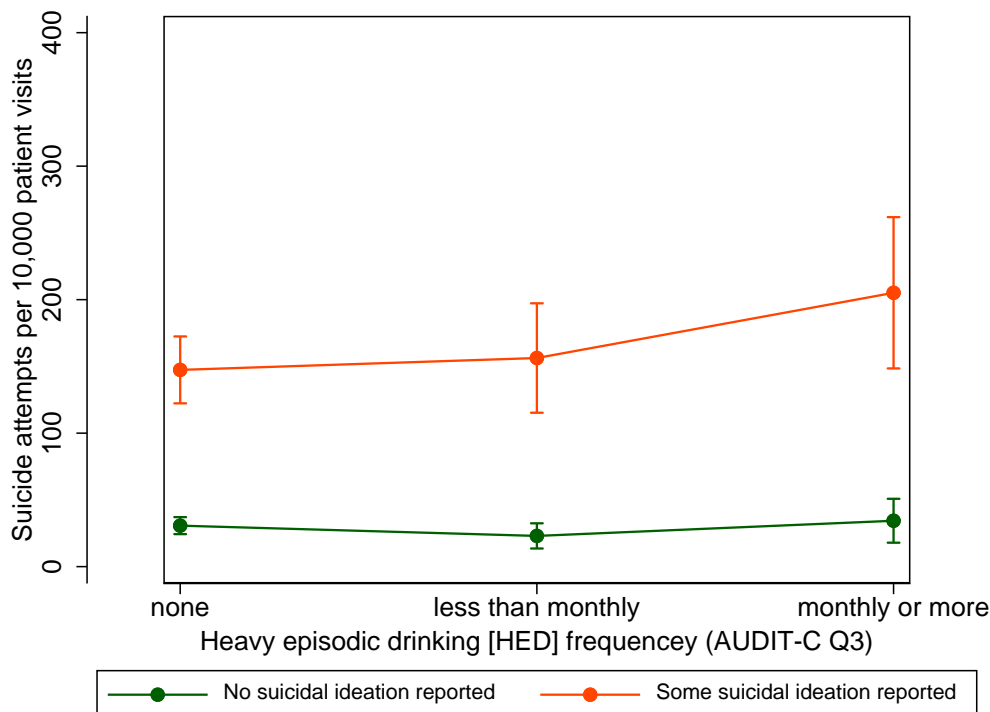


Table 3: Estimated risk of suicide attempt by alcohol consumption level and frequency of heavy episodic drinking stratified by indicator for any patient-reported suicidal ideation, within 90 days of assessment during 59,705 patient visits (N= 43,706 individuals)

	A: Primary Model*						B: Secondary Model**					
	Suicidal Ideation Frequency‡			Suicidal Ideation Frequency‡			Suicidal Ideation Frequency‡			Suicidal Ideation Frequency‡		
	None	Any		None	Any		None	Any		None	Any	
OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value	
1: Alcohol Consumption Level†												
Nondrinking	1.20	(0.75-1.89)	0.447	5.86	(4.00-8.58)	<.001	0.99	(0.62-1.61)	0.995	3.89	(2.60-5.81)	<.001
Low-Level	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
Moderate-Level	0.82	(0.54-1.23)	0.332	4.94	(3.49-6.98)	<.001	0.90	(0.59-1.37)	0.633	3.57	(2.47-5.16)	<.001
High-Level	1.80	(0.86-3.80)	0.120	9.77	(6.23-15.34)	<.001	1.86	(0.88-3.94)	0.106	6.07	(3.72-9.89)	<.001
2: Heavy Episodic Drinking Frequency††												
Never	<i>Ref</i>			<i>Ref</i>			<i>Ref</i>			<i>Ref</i>		
Less than monthly	0.75	(0.47-1.19)	0.221	5.16	(3.67-7.26)	<.001	0.87	(0.54-1.38)	0.546	3.74	(2.59-5.40)	<.001
Monthly or More	1.12	(0.66-1.90)	0.676	6.80	(4.77-9.72)	<.001	1.19	(0.69-2.05)	0.533	4.72	(3.21-6.94)	<.001

*Adjusted for visit year, age, sex, race/ethnicity (including unknown as separate category)

**Additionally adjusted for indicators for past-year diagnosis indicators for depression, anxiety, serious mental illness disorders) and a suicide attempt, and Charlson score, excluding patients (N=2428) with no in-patient or out-patient utilization in prior year

†AUDIT-C: Nondrinker=score 0; Low-Level= Score 1-2 Women, 1-3 Men; Moderate-Level=Score 3-7 Women, 4-7 Men; High -Level=Score 8-12 Women & Men

††AUDIT-C Question 3: Never=Score 0, Less than monthly=Score 1, Monthly or More=Score 2-4

‡PHQ-9 Question 9 regarding frequency of self-harm thoughts in prior 2 weeks: None=Score 0, Any=Score 1-3 (some of the days to nearly every day)

Wald heterogeneity tests for each model, testing interaction between the suicidal ideation indicator and all categories of each measure of alcohol use, were significant p<0.0001

Chapter 4: If You Listen, I Will Talk: The Experience of Being Asked about Suicidality during Routine Primary Care

ABSTRACT

Background: Routine population-based screening for depression is an essential part of evolving healthcare models integrating care for mental health in primary care. Depression instruments often include questions about suicidal thoughts, but how patients experience these questions in primary care is not known and may have implications for accurate identification of patients at risk.

Objectives: To explore the patient experience of routine population-based depression screening/assessment followed, for some, by suicide risk assessment and discussions with providers.

Design: Qualitative, interview-based study.

Participants: Thirty-seven patients from Kaiser Permanente Washington who had recently screened positive for depression on the 2-item Patient Health Questionnaire [PHQ] and completed the full PHQ-9.

Approach: Criterion sampling identified patients who had recently completed the PHQ-9 ninth question which asks about the frequency of thoughts about self-harm. Patients completed semi-structured interviews by phone, which were recorded and transcribed. Directive and conventional content analysis were used to apply knowledge from prior research and elucidate new information from interviews; thematic analysis was used to organize key content overall and across groups based on endorsement of suicide ideation.

Key Results: Four main organizing themes emerged from analyses: 1. Participants believed being asked about suicidality was contextually appropriate and valuable, 2. Some participants

described a mismatch between their lived experience and the PHQ-9 ninth question, 3. Suicidality disclosures involved weighing hope for help against fears of negative consequences, and 4. Provider relationships and acts of listening and caring facilitated discussions about suicidality.

Conclusions: All participants believed being asked questions about suicidal thoughts was appropriate, though some who disclosed suicidal thoughts described experiencing stigma and sometimes distanced themselves from suicidality. Direct communication with trusted providers, who listened and expressed empathy, bolstered comfort with disclosure. Future research should consider strategies for reducing stigma and encouraging fearless disclosure among primary care patients experiencing suicidality.

INTRODUCTION

Behavioral healthcare is being increasingly integrated into primary care settings.⁷³ Population-based screening for depression is an essential part of behavioral health integration and is recommended by experts in primary care settings to ensure patients in need of care are accurately identified.^{41,42} Though the U.S. Preventive Services Task Force has identified insufficient evidence to endorse widespread recommendations for screening for suicide risk, depression screening instruments often include questions about suicidal ideation and these questions have been shown to predict subsequent suicide attempts.⁴⁴⁻⁴⁶ For example, the 9-item Patient Health Questionnaire [PHQ-9] is broadly used to identify patients with depression, and the ninth question asks about frequency of “thoughts you would be better off dead, or of hurting yourself in some way” in the past two weeks.⁴³

It is not currently possible to know when or if patients are suicidal by means other than asking directly. Because nearly half of persons who die by suicide have a primary care visit in the month prior to their death,^{37,38} and studies have identified that endorsement of suicidal thoughts on screening questions have predicted subsequent suicide attempts,⁴⁴⁻⁴⁶ asking patients routine questions about suicidality (suicidal ideation, intent and plans) in primary care settings may be a critical preventive measure.¹³⁵ However, the link between asking patients about suicidality and the ability of providers and health systems to help prevent suicide is unclear. For instance, one study showed one-fourth of suicide attempts occurring within a week of patients completing the PHQ-9 were among patients responding “not at all” to the ninth question.⁴⁵ It is possible that these patients were not experiencing suicidal thoughts at the time of the visit; it is also possible that patients underreport suicidal thoughts or misinterpret the questions.

Previous studies have explored reasons some suicide attempt survivors did not report suicidal ideation prior to attempt⁵³ and Veterans’ experiences of a suicide risk assessment process.¹³² However, additional research is needed to understand how primary care patients experience and answer questions about suicidal ideation in the context of routine depression screening. Therefore, we conducted semi-structured qualitative interviews with a sample of primary care patients who screened positive for depression and were assessed for symptom severity with the PHQ-9. Though all patients screened positive for depression, not all endorsed suicidal ideation; a portion were offered more comprehensive assessment for suicide risk. Thus, we purposively stratified our sampling based on endorsement of suicidal ideation to understand perceptions of primary care patients with varying experiences of depression screening and suicide risk assessment.

METHODS

Study Setting

The study was conducted at Kaiser Permanente [KP] Washington, where primary care patients are given a 7-item self-administered paper questionnaire by a receptionist or medical assistant prior to their visit, including the PHQ-2 for depression,¹³⁶ and questions about substance use^{47,48,51,137} to prompt discussions with providers and guide clinical decision-making. Patients are asked to complete the remaining seven questions of the PHQ-9 when their response to the PHQ-2 is positive (≥ 2 on either question).⁴³ Patients who score 2 “more than half the days” or 3 “nearly every day” on the PHQ-9 ninth question are asked to complete a self-administered paper version of the Columbia Suicide Severity Rating Scale [C-SSRS] (see www.cssrs.columbia.edu).¹³⁸⁻¹⁴⁰ For patients endorsing any past month planning for suicide attempt, staff are prompted to initiate a same-day referral to a primary care social worker or registered nurse for collaborative safety planning.^{133,134,141}

Study Sample

We used electronic medical record [EMR] data to identify eligible patients (N=100) who had screened positive on the PHQ-2 and completed the PHQ-9. We used a purposive sampling distribution defined by specific criteria¹⁴² to recruit demographically diverse patients endorsing across the full PHQ-9 ninth question options of thought about self-harm (N=30 “not at all,” N=20 “several days,” N=20 “more than half the days,” N=30 “nearly every day”) and some who were further assessed by the C-SSRS. We aimed to interview 30-40 participants to maximize thematic saturation. We excluded minors (<18) and anyone currently enrolled in a suicide prevention trial.

Eligible patients received an invitation letter and information sheet describing the study purpose and procedures, how they were selected, and a phone number to opt-out. Interviews

were conducted as soon as possible following screening to help patients accurately recall their experiences.¹⁴³ Participants provided oral consent by phone and received \$50 for participation. All study procedures were approved by the KP Institutional Review Board.

Telephone Interview

Two psychologists (UW, EL) and one health services researcher (JR), all trained in qualitative interview techniques, conducted audio-recorded interviews by telephone. The interview guide (Supplement S7) was designed, mindful of suicide-related stigma, to begin with general questions to help build rapport before probing participants for details about their experiences with questions about suicidal ideation and suicide risk when applicable. Question development considered previous research regarding why providers may choose not to discuss suicide risk with patients¹⁴⁴ and may address suicidal thoughts in unhelpful or harmful ways,^{145,146} as well as patient perspectives on the PHQ-9 questions.¹⁴⁷

Analysis

We summarized the demographic and patient-reported characteristics of participants and compared participants responses to the PHQ-9 ninth question on thoughts of self-harm (also used for sampling). Audio-recordings of interviews were professionally transcribed and uploaded into Atlas.ti¹⁴⁸ for qualitative analysis along with their screening and assessment data from the participants' EMRs. We used a combination of directive content analysis (deductive) to apply knowledge from prior research and conventional (inductive) content analysis,¹⁴⁹ to elucidate new information about the patient experience. Interviews were coded by investigators trained in qualitative methods (JR, SH) using a set of codes developed *a priori* based on the interview guide. Both coders added and refined codes iteratively through independent review, followed by several rounds of comparison and discussion. Once all interviews were coded by at least 1 coder

(10 interviews were coded by both), the coders created an affinity diagram to organize codes into a thematic network,¹⁵⁰ and assessed whether themes differed based on report of thoughts about self-harm. The full investigative team refined themes and agreed on prototypic examples.

RESULTS

Participant Characteristics & Screening Results

Of patients sampled (N=100), 11 refused participation, 12 were unreachable and 37 were interviewed before recruitment ended when thematic saturation was reached. Interviews lasted an average duration of 15.4 minutes (ranging 5-29). Participants included men and women age 20-95 (Table 1). All participants had current depressive symptoms at the time of their visit (mean PHQ-9 Score=17.6, SD 6.4), and those who endorsed having some thoughts about self-harm on the PHQ-9 ninth question (N=28) reported greater symptom severity (PHQ-9 mean score 20.1 versus 9.7, $p<.0001$).

Organizing Themes

Four organizing themes emerged from analysis (see Figure 1): 1. Participants believed being asked about suicidality was contextually appropriate and valuable, 2. Some participants described a mismatch between their lived experience and the PHQ-9 ninth question, 3. Suicidality disclosures involved weighing hope for help against fears of negative consequences, and 4. Provider relationships, and acts of listening and caring facilitated discussions about suicidality.

Theme 1: Participants believed being asked about suicidality was contextually appropriate and valuable

All participants, with and without reported thoughts of self-harm, said depression screening followed by suicidality assessment was appropriate in the context of a primary care visit.

Participants specifically described how the questionnaires provided important information to their doctors: “*Well, I just think that when you go into, especially a new primary care doctor, that they know all of the basic history, and that is part of history for a lot of people (P8).*”

Participants described how questions are a way to get help, as one asserted, “*definitely appropriate, especially in regard to trying to discuss with [providers] options to treat depression (P14).*” Other participants described how the questions were “*good for screening (P2)*” and “*predicting what may happen to my health (P13),*” as well as the necessity to ask because, “*I think it’s the only way they can judge [mental health] (P6).*”

Other participants described how the questions were valuable for self-reflection: “*I feel like it’s also just a good gauge for me as a person... it reminds me, ‘Oh, well, this is something I’ve experienced in the past two weeks (P4).*” However, participants also said self-reflection about suicidality could be difficult, though still important to ask about:

“It’s always difficult, kind of the [questions] of self-harm and suicide, but I think it’s important to ask... You don’t want to have these thoughts. Yet you have them. I don’t like it but the way I answer it is the truth (P37).”

Similarly, another participant described questions about depression and self-harm as “*relevant*” and “*important,*” but found it difficult to share about a topic generally kept private:

“Whenever I fill one of those things out I feel like all of them are uncomfortable, only because it’s making you take a look at yourself and it’s sometimes really hard to be honest with yourself when you have a problem. So, it’s always uncomfortable because it’s letting somebody that you don’t know into probably the deepest secrets you have” (P17).

Theme 2: Some participants described a mismatch between their lived experience and the PHQ-9 ninth question

Some participants, primarily those who reported thoughts of self-harm, felt language in the PHQ-9 ninth question did not fit their experience. Several alluded to a threshold for being “*suicidal*” and one described how their thoughts were more about escaping current problems:

“That question isn’t applicable because I’m not suicidal... my feeling is like running away or wanting to abandon all my problems...there’s people like that out there who feel like that and aren’t quite suicidal, but they are at the edge (P4).”

Another described how the timing of the question affected their answer:

“I was just kind of DONE at the moment... it was hard for me to answer because at the moment I wanted to, you know, say all that but I probably didn’t because that’s not TRULY how I feel (P3).”

Similarly, a participant described thinking about suicide more frequently but was not presently planning to act on those thoughts:

“It wasn’t like, ‘Oh, my God. I want to go out tomorrow and do it.’ But it’s something that I do think about... I don’t feel like I need to go jump off a bridge and hang myself today, but it’s but it’s a catchy one. So, how do I say that (P35)?”

Another described how the intermittent pattern of their suicidal thoughts made it difficult to answer, *“how do you say what you need to say? ...It’s just something that comes out and it goes – I’ve thought about it and forgot about it, type thing (P11).”*

Other participants described how language about suicide does not account for family responsibilities or religious values. One said, *“yes, I would love to disappear, but I also believe in staying around for my children (P9).”* Another described, *“I wasn’t exactly sure how to answer it because I’m a Christian; therefore, I’m not going to kill myself but perhaps I didn’t want to be here and, therefore, you can answer that question several different ways (P21).”*

Theme 3: Suicidality disclosures involved weighing hope for help against fears of negative consequences

Many participants, with and without reported thoughts of self-harm, described a complex relationship between disclosing suicidality in hopes of receiving help, balanced with the fear of stigma, vulnerability and loss of autonomy. Those who expected their provider would use the information like a “stepping-stone” to get them the help they needed described an easier time answering: *“I know I need help somewhere along the line, and it was easier to answer the*

questions so they knew where I was at (P15).” Another described, “I answered it with confidence because I wanted her to help me (P5).” Many participants explained that they perceived their response as a choice, based on a desire for help, or lack thereof: “it just depends on how bad the person wants the help. If they don’t want the help that much, they’re probably not gonna answer the questionnaire (P15).” However, even patients who desired help and planned to disclose their needs had fears about the outcome:

“I was there to seek out help for some reckless behavior on my part... and hopefully seek out some sort of support system for the first time. So, I was not uncomfortable answering those questions honestly. If anything, I was scared about how the response was going to be after the fact (P14).”

Participants described fear of different manifestations of stigma. One described how making the choice to ask for help often means labeling oneself with a stigmatized condition:

“You don’t really want any help because once you go into that system, you are forever – certainly in your own mind, and also in the minds of people that know you’re going there – you’re a person with that kind of problem, a mental health issue, and that is quite a stigma (P2).”

Similarly, patients described fear of judgement from family members, friends or coworkers:

“I don’t know if that was just me, but first thing I’m thinking is, ‘Oh, my God. I don’t want my kids to know. I don’t want my work to know.’... you want them to know some, but not all because it’s kind of a real funky area... I don’t want them to think that I’m losing it or – I’m not too sure what they’ll think (P35).”

One participant described experiencing “shame” and vulnerability during depressive episodes:

“There are still parts where you feel shame and different things. When you’re out of the depression, you don’t feel that way. When you’re in it, you want to protect the way you feel (P37).”

However, some participants who described themselves as “older” with more mental healthcare experiences described how their vulnerability had diminished:

“If I go back many, many years ago, that question would have scared me. But I’ve been answering these for a long time, so they don’t bother me at all anymore (P10).”

Participants also expressed different fears about the loss of autonomy. One referred to the

PHQ-9 ninth question as a “Big Brother” question and the sense that disclosing suicidality may lead to care outside their control, “*especially with mental health patients, you’re not ever sure what is going to be the reaction to what I’m experiencing. Will I have to be taken somewhere or taken care of in a certain way (P4)?*” Another echoed this fear:

“I mean even if I did have those thoughts I don’t think I would say yes to that just because... like I said I don’t know what would happen to me and whether something would happen involuntarily... I guess it’s just what I imagine in movies or something that whether I’d get – not be able to return home to my family (P26).”

Similarly, other participants described fears of, “*being locked up in a white padded room (P35)*” or that “*people in white jumpsuits are gonna jump in and take me out of the room (P4).*” One participant described the experience of being hospitalized and how providers may address this topic to alleviate fear:

“When I was a kid, I went to a therapist. And he basically asked that question, do you wanna be alive? And I couldn’t say yes because I didn’t wanna be. But at the same time, I was not suicidal... and couldn’t say yes to that question. So, they put me in a hospital for three days...if anybody else knows that and they’re afraid of that, just being upfront and saying, ‘Say how you really feel, you won’t necessarily go to a hospital unless you’re actively thinking about hurting yourself (P18).”

His sentiment was repeated by other participants who worried the information they disclosed about suicidal ideation may preclude them from leaving the provider’s office.

Theme 4: Provider relationships, and acts of listening and caring facilitated discussions about suicidality

Many participants, with and without reported thoughts of self-harm, described how trusting relationships they had built with their providers over time, as well as listening and caring, facilitated discussions about suicidality. One participant said, “*My health provider, she can ask anything she wants to. I mean, she has really known me long enough and so has her aid... They’re part of my entire family, which includes my healthcare people (P33).*” Another called

their provider their “rock” and said, “*He’s been through everything with me... I wouldn’t be here today if it hadn’t been for him... And I didn’t have any secrets with Dr. X because he went through so much with me, he didn’t deserve secrets (P10).*” Another described how honesty was implicit in their patient-provider relationship: “*I’ve built up a relationship with my physician...He already knows how I am, so he can probably get a better clue if I’m actually lying to him or if I’m actually telling the truth (P1).*” Participants also described how open and direct communication facilitated honesty and alleviated vulnerability: “*I trusted her to tell her everything that I was going through and what I was feeling. And she felt very candid to tell me, you know, what I needed to do without hurting my feelings (P27).*”

Participants also described how interactions with providers could be improved with specific expressions of listening and caring. Participants described the experience of feeling like the provider was only asking about suicide risk out of obligation, “*I feel like when I was asked the questionnaire, it was like reading off a script and more or less checking boxes rather than I’m afraid for your safety (P17).*” One gave a suggestion about body language, “*Sit down and talk face to face, don’t be standing at the doorway ready to leave (P6).*” Similarly, others described how their visits were “very fast” and not knowing if their provider had looked at their questionnaire due to time limitations. Participants also expressed desire for validation, “*Let’s see what we can do to get this done. We’re on your side. We’re here to help (P25).*” Another participant described expressions of listening and caring were more important than finding an immediate solution to their problems:

“I wish it all could have been done over again with my primary care provider, actually. To be a good listener, when I’m there crying and not knowing what to do, that’s the thing. When somebody’s coming in and they’re vulnerable and they’re depressed and they’re overwhelmed by emotions, I’m sure it can be intimidating... It’s just like compassion. Don’t try to fix it today. Try to first just listen (P37).”

DISCUSSION

To our knowledge, this qualitative study among primary care patients who had recently been asked about their frequency of thoughts about self-harm, using the PHQ-9 ninth question, is the first to investigate the patient experience of being asked about suicidality as part of population-based depression screening and symptom severity assessment. All participants, regardless of their PHQ-9 ninth question response, believed it was appropriate for their healthcare providers to ask about self-harm because it can provide important health information to their providers, and offer valuable self-reflection. However, participants who reported thoughts of self-harm, sometimes felt the PHQ-9 ninth question was difficult to answer because it did not adequately reflect their lived experience. Participants described how questions about suicidal thoughts generate fear of stigma, vulnerability, and/or loss of autonomy. Expressions of listening and caring and direct communication with trusted providers, appeared to bolster participants' comfort with disclosures. Though we did not explicitly assess relationships with providers, these findings support prior research that “protective benevolence” is unhelpful⁵⁷ and providers perceived as focused on building a relationship through genuineness and empathy promoted trust, resulting in more honest disclosure of suicidal thoughts.¹³² Findings from the present study may be useful for primary care practices navigating the benefits and costs of integrating care for depression and suicidality, consistent with current depression screening recommendations.^{41,42}

Participants' descriptions of the mismatch between their lived experiences and the PHQ-9 ninth question were noteworthy. The PHQ-9, designed to measure depression severity, does not explicitly ask about suicidal thoughts; but participants understood that to be the meaning of the question and some described the term “suicide” as being more severe than what they were experiencing, even when they had thoughts about ending their own lives. Participants also

distanced themselves from this term due to family responsibilities or religious beliefs, which is unsurprising given religious norms prohibiting suicide.¹⁵¹ Nonetheless, this experience may reflect a separation between desire and capacity for suicide.¹² Suicide risk assessments, like the C-SSRS, are designed to explicitly distinguish between suicidal thoughts and plans,^{139,140,152} however, the PHQ-9 is often used as indication for suicide risk assessment, so when patients distance themselves from the notion of having suicidal thoughts they may not be offered more comprehensive suicide risk. Future research is needed to identify and evaluate strategies for reducing suicide-related stigma and encouraging fearless disclosure among primary care patients experiencing suicidality.

Participants in this study described weighing desire for help against fears of stigma, vulnerability and loss of autonomy. Recent qualitative findings among suicide attempt survivors suggest this cost-benefit analysis is important when deciding about disclosing suicidality to friends and family members.¹⁵³ Participants described the fear of stigma in different ways, including internalized “shame,” fear of labelling oneself, fear of vulnerability to judgement by friends and family members. These fears are predictable— stigma and discrimination related to mental illness is well-documented at the patient,⁵⁶ healthcare,^{57,58} and societal levels.⁵⁹ Participants also expressed vulnerability regarding potential loss of autonomy and involuntary hospitalization, invoking movie-like descriptions of padded rooms and people in white jumpsuits. While these images may not be an accurate representation of the psychiatric hospitalization experience today, the idea of being locked in an inpatient psychiatric unit causes fear,^{154,155} which is reinforced by descriptions of negative experiences among patients hospitalized for suicidality. Further research is needed to evaluate whether orienting patients about what to expect if they endorse suicidal thoughts may be key to facilitating assessment of

suicide risk and care needs.

This study has several limitations. First, though developed based on a thorough literature review and intended to elicit open-ended unstructured information from participants, the interview guide included several closed-ended questions, which may have encouraged participants to respond in specific ways and/or limited information obtained from participants. Although qualitative research is not intended to be generalizable, several features of the sample indicate a need for additional research in other populations. Specifically, patients were selected from one health system that recently integrated population-based screening for depression and substance use into routine primary care, which may not reflect experiences of patients assessed for suicide risk in other systems using other processes (e.g. provider-administered). Moreover, all participants reported depressive symptoms and most endorsed relatively frequent thoughts of self-harm at their most recent primary care visit. Therefore, although we attempted to capture the full potential range of experiences, findings may not be generalizable to typical primary care populations. It is possible that patients who do not endorse depressive symptoms or fail to respond would have different, potentially less accepting, opinions of questions about suicidal ideation. Finally, the sample was not racially or culturally diverse. Future research is needed within larger broadly representative populations, including less severely affected patients, adolescents and those who choose not to answer screening questionnaires, as well as communities that may culturally define suicide in different ways.¹⁵⁶

CONCLUSIONS

This qualitative study reports patient experiences of being screened for suicidality. Strong trusting relationships with providers alleviated patients' vulnerability disclosing suicidal thoughts. Expressions of caring and active listening, without panic or raising unnecessary alarm,

are perhaps more important than immediate problem-solving, and may bolster patients comfort with disclosing stigmatized information they fear will compromise their autonomy. Findings are relevant to primary care practices considering implementation of procedures supporting routine depression screening followed by suicide risk assessment in accordance with national recommendations. Health systems may consider adding language to self-administered questionnaires that normalize suicidal thoughts and reassure patients their providers will use the information to help them access care they may need.

Table 1: Participant Characteristics & Screening Results

			PHQ-9 Q9 Thoughts of Self-Harm (past 2 weeks)			
	N	%	Score=0		Score=1-3	
	N	%	N	%	N	%
Female	25	68%	7	78%	18	64%
Age Category						
20-35	11	30%	1	11%	10	36%
36-50	11	30%	4	44%	7	25%
51-70	10	27%	0	0%	10	36%
>70	5	14%	4	44%	1	4%
Race/Ethnicity						
White	28	76%	5	76%	23	82%
Black	3	8%	2	22%	1	4%
Asian	2	5%	1	11%	1	4%
Hispanic	2	5%	0	0%	2	7%
Am Indian	1	3%	1	11%	0	0%
Unknown	1	3%	0	0%	1	4%
AUDIT-C Alcohol Use Category						
Non-drinker	13	35%	3	33%	10	36%
Low Risk (women 1-2, men 1-3)	11	30%	3	33%	8	29%
Moderate Risk (women 3-7, men 4-7)	11	30%	3	33%	8	29%
High Risk (women & men \geq 7)	0	0%	0	0%	0	0%
Did not Answer	2	5%	0	0%	2	7%
Illicit Drug Use (any past year)						

Yes	2	5%	0	0%	2	7%
No	33	89%	9	100%	24	86%
Did Not Answer	2	5%	0	0%	2	7%
Marijuana Use (any past year)						
Yes	7	19%	0	0%	2	7%
No	27	73%	9	100%	24	64%
Did Not Answer	3	8%	0	0%	2	11%
PHQ-9 Score (Mean, SD)	17.6	6.4	9.7	4.7	20.1	4.5
PHQ-9 Category						
Mild (5-9)	6	16%	6	22%	0	0%
Moderate (10-14)	4	11%	0	0%	4	14%
Moderately Severe (15-19)	8	22%	3	11%	5	18%
Severe (20-27)	19	51%	0	0%	19	68%
PHQ-9 Q9						
Never (0)	9	24%				
Several Days (1)	8	22%				
More than half the days (2)	11	30%				
Nearly Every Day (3)	9	24%				
†C-SSRS Received						
Score 0	1	7%				
Score 1	5	36%				
Score 2	3	21%				
Score 3	2	14%				
Score 4	1	7%				
Score 5	1	7%				
Score 6	1	7%				
<i>†Routinely administered only to patients who score 2 or 3 on the PHQ-9 ninth question at KP Washington. Score= number of highest question endorsed, indicating greater suicide risk severity.</i>						

Figure 1: Thematic Analysis of the Patient Experience Being Asked about Suicidality in Primary Care Setting



Chapter 5: Conclusion

Summary of Findings

We conducted three studies among patients receiving care at a large health system (Kaiser Permanente Washington) to understand the utility of using routinely collected information on alcohol use for improving identification of suicide risk (alone and in combination with suicidal ideation), and to understand patients' experiences answering routine questions about suicidal ideation. Findings from these studies confirmed that standard assessments for unhealthy alcohol use are useful for identifying suicide risk, particularly in combination with information about suicidal ideation. These results suggest important opportunities health systems have to encourage patient disclosures about suicidal ideation, and areas for further research to improve suicide prevention efforts.

In Chapter 2 (Aim 1), we found that, among adult patients who completed an AUDIT-C during visits with a mental health provider, information about alcohol use documented in the electronic medical record was associated with short-term risk of suicide attempt following AUDIT-C assessment. In the primary model (adjusted for demographics), patients reporting high-level alcohol use were 2.59 times (95% CI, 1.80-3.74) more likely to attempt suicide within 90 days than those reporting low-level use, and patients reporting daily/almost daily HED were 3.62 times (95% CI, 1.80-3.74) as likely to attempt suicide within 90 days than those reporting no HED. In Chapter 3 (Aim 2), we found that information about alcohol use patterns reported on the AUDIT-C combined with information about suicidal ideation reported on the PHQ-9 identified increased short-term suicide attempt risk, but only among patients reporting suicidal ideation. In the primary models, patients reporting suicidal ideation and high-level alcohol use were 9.77 times (95% CI, 6.23-15.34) more likely to attempt suicide than those with low-level alcohol use, and those reporting any HED frequency were substantially more likely to attempt

suicide than those reporting “never;” 5.16 times (95% CI, 3.67-7.26) more likely for those reporting HED frequency more than monthly and OR=6.80 times (95% CI 4.77-9.72) for those reporting less than monthly, respectively. However, contrary to our hypothesis, we found no significant differences in risk of suicide attempt associated with higher-level alcohol use and more frequent heavy episodic drinking among patients reporting no suicidal ideation, suggesting a strong need for further research to understand how to optimally identify patients at risk of suicide who do not report suicidal ideation. Finally, in Chapter 4 (Aim 3), we qualitatively investigated the patient experience of being asked about suicidality as part of population-based depression screening and symptom severity assessment. We learned that our patient participants believed it was appropriate for their healthcare providers to ask about self-harm because it can provide important health information to their providers. Interview participants also described how questions about suicidal thoughts generate fear of stigma, vulnerability, and/or loss of autonomy; but how trusting relationships with providers, as well as expressions of listening and caring bolstered comfort with these disclosures.

These projects advance our understanding of suicide prevention in healthcare systems in several important ways. The research described in Chapters 2 and 3 (Aims 1 and 2) extends findings from prior research, demonstrating associations between alcohol use and suicide attempt,^{16,18,20,22,23} to the clinical setting, where patients reporting risky patterns of alcohol use and suicidal ideation can be identified using standard patient-reported assessments. These projects demonstrate that combining information from brief standard assessments used for screening and monitoring purposes, like the AUDIT-C and PHQ-9, can facilitate such identification and underscore the potential value of addressing risky patterns of alcohol use with patients at risk of suicide attempt.¹¹² The research described in Chapter 3 (Aim 2) also suggests

that further work will be needed to understand the lack of association between patterns of risky alcohol use and suicide attempt among patients reporting no suicidal ideation. It will be important to explore other risk factors for this group, particularly those that increase our ability to identify “when” patients are at risk of suicide attempt. For example, identifying when patients have access to highly lethal means of suicide attempt, like opioids¹⁵⁷ and firearms^{7,158} may be particularly useful for this group. However, the research described in Chapter 4 (Aim 3) also relates to Chapter 3 (Aim 2), because alcohol use and suicidal ideation are highly stigmatized patients likely underreport both, resulting in a lack of ability to identify individuals at high risk of suicide attempt who are fearful of disclosing stigmatizing information. Results in Chapter 4 (Aim 3), extends prior findings from qualitative research among Veterans¹³² and suicide attempt survivors,⁵³ underscoring the importance of trusting relationships with care providers, who listen and express caring and empathy when patients disclose stigmatizing information, they fear may compromise their autonomy.¹⁵⁹

Future Directions

Taken together the three studies in this dissertation portfolio suggest important ways we can enhance safety planning interventions, clinical decision support tools, and care coordination for vulnerable patients at risk of suicide attempt. Specifically, collaborative safety planning interventions,^{133,134} which are an essential element of the Zero Suicide framework, designed to systematically identify and assess suicide risk and engage patients in care,³⁹ could be enhanced by including avoiding risky alcohol use (like HED) as a coping strategy, particularly during times of intense emotional pain; and the personal and professional contact section could be expanded to include individuals to outreach to when patients need help with their alcohol use.

Second, clinical decision support tools in electronic medical record systems could be designed to prompt providers to offer evidence-based treatment options for alcohol use disorders¹²⁶ and emotional distress¹⁶⁰⁻¹⁶² when patients report risky patterns of alcohol use and suicidal thoughts on standard substance use and mental health assessments. Third, workflows and checklists used in urgent care settings¹⁶³ could be tailored to guide care provided to intoxicated patients in emotional distress, for example by reminding providers to avoid prescribing potentially lethal doses of medications, ensuring patients have a support person prior to release, and coordinating alcohol-related follow-up care with patients' primary care providers.

Finally, work in this dissertation suggests it is important to continue learning how we might use patient-reported information about alcohol use and suicidal ideation, in combination with other “who” and “when” risk factors for suicide, to help us provide the right kind of care to the right patients at the right time. For example, future research should consider how best to use information about other risk factors like access to firearms,¹⁵⁸ sexual minority status,¹⁶⁴ and use of lethal prescription medications (opiates/sedatives),^{157,165} in combination with patient-reported depressive symptoms and substance use, to identify patients at high-risk of suicide at the point-of-care. Furthermore, future research should consider how this information could be used in combination to proactively outreach to vulnerable patients and offer support. Support could include decision-making tools about alcohol use¹⁶⁶ and firearms,¹⁶⁷ or it could be a simple caring message^{168,169} to let patients know their healthcare team is paying attention.

What If?

A familiar habit for many of us, particularly researchers, is counterfactual thinking—what does the world where a particular outcome did not occur look like? This is especially true for

those who have been personally affected by suicide, which includes well-known suicide researchers^{13,170} and those of us newer to this field, like myself – I lost my mom to suicide. In that spirit, I will describe a different (counterfactual) ending to the stories of Maya, Joe, and Matt to illustrate how the research studies presented in Chapters 2-4 may help prevent future suicide attempts and deaths.

On the night of Maya's accident, in a counterfactual world, while the medical staff treated her injuries, they would have asked her questions about substance use and the state of her mental health. Maya would have been familiar with some of these questions, having worked for a nonprofit community mental health agency specializing in treatment of substance use disorders. She would have disclosed how she frequently had many drinks on the days she socialized with friends. She also would have disclosed the emotional pain she was experiencing in response to conflict with her partner. Noting Maya's responses to guide development of an appropriate care plan, the emergency room staff may have helped her identify a friend or family member who could be there to for support after they released her from the ER. Further, they would have provided a nonlethal dose of pharmacotherapy for short-term pain management. In addition, they would have contacted Maya's primary care team who would have outreached to her the next day to offer treatment options that could help her reduce/end risky patterns of alcohol use. In the months and years to follow, instead of the hundreds of social media posts about what a great friend, colleague, step-mom, sister, and daughter she had been, her public-facing pages would be filled with photos of friends and new adventures.

Joe would have seen a healthcare provider following the death of his father to help with his insomnia. Joe's provider would have inquired about his emotional state and talked to him about his grief. His provider would have asked if he needed some help reducing his alcohol use,

particularly now while he was experiencing so much emotional pain. His provider would have also offered extra support, including connecting Joe to therapy to help him cope with grief. Joe would have accepted the help, learned new skills and breathing techniques to help when he experienced periods of intense emotional pain. In the years to follow, Joe would continue to use his new coping skills and would also continue to greet many new four-legged friends to his wine-tasting facility.

Matt would have seen a primary care provider to get follow-up care for a hiking injury. He would have received standard questions about depression and suicidal thoughts. He would have been reluctant to answer, but based on prior positive interactions with his provider, he would have trusted his provider would help him get the right kind of care when he disclosed he had thoughts of ending his life. His provider would have listened, expressed empathy, and helped connect him to follow-up care. After his appointment, he would have received a message from his provider's office just to let him know his provider cared about him. On his way home late at night, he would have seen the construction up ahead on the bridge and come to a stop when the flagger indicated. While he was waiting for the indication to go, he would think about how much he liked his new girlfriend and where he might take her on their next hiking trip.

Closing Counterfactual

My mom had a history of depression and several years prior to her death had been hospitalized for suicidal thoughts. My mom and I rarely talked about this experience, but whenever the topic came up she often repeated the sentiment, "I'm never going back there." In the months leading up to her death, she saw multiple providers, including a new primary care provider. I know this because I remember she told me how she made sure to receive a

pneumonia vaccine. As a new grandmother, she wanted to make sure she stayed healthy.

In the counterfactual world, when she saw this new primary care provider she also would have received a depression screener and she would have disclosed her symptoms of depression, including the suicidal thoughts she had been having. Her provider, or a member of her new healthcare team, would have assessed her risk of suicide attempt and listened when she described being fearful of another psychiatric hospitalization. A provider would have also discussed lethal means safety and helped her make a plan to secure her firearms and old medications, at least temporarily until her depressive symptoms improved. Finally, in this counterfactual world, she would have told me about her experience talking to her provider and how much better it had been than the time she was hospitalized. And she would have encouraged me to pursue a career where I could help vulnerable patients, often negatively impacted by discrimination and stigma, receive healthcare that makes them feel cared for and supported living their best life.

This dissertation research will hopefully lead to more situations like these counterfactuals. The research on the associations between patterns of alcohol use and short-term risk of suicide attempt show that the many health systems that routinely screen patients for unhealthy alcohol use have access to valuable data that providers can use to identify patients at increased risk of suicide attempt, like Maya and Joe. Future research will be needed to understand how best to use this information to address risky patterns of alcohol use in the context of emotional distress. The research on the patient experience of answering questions about suicidal ideation can help health systems and providers improve the way we ask questions these questions and react when we identify patients at risk, like Matt and my mom. Future research is needed to inform the best ways to connect these individuals with the right kind of care at the right time to prevent irreversible loss.

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Supplement

Chapter 2 Supplemental Files

Table S1: Characteristics of the Adult Population of Patients Receiving Mental Healthcare Compared to the Analytic Sample

	Patient Population		Analytic Sample	
	N=64071		N=44106	
Age (Mean, SD)	43.4	(17.0)	43.3	(16.7)
Male (N, %)	23281	(36.3%)	16028	(36.3%)
Race/Ethnicity (N, %)				
White, non-Hispanic	47856	(74.7%)	34367	(77.9%)
Black, non-Hispanic	2883	(4.5%)	1983	(4.5%)
Asian	2761	(4.3%)	1965	(4.5%)
Hispanic	2091	(3.3%)	1503	(3.4%)
Other	3759	(5.9%)	2689	(6.1%)
Unknown	4721	(7.4%)	1599	(3.6%)
Diagnoses in Prior Year (N, %)				
Anxiety disorder	34775	(54.3%)	25766	(58.4%)
Depressive disorder	44772	(69.9%)	31294	(71.0%)
†Serious mental illness	8926	(13.9%)	6202	(14.1%)
Alcohol use disorder	2553	(4.0%)	1709	(3.9%)
Prior suicide attempt	709	(1.1%)	530	(1.2%)
‡Charlson Score	0.5	(1.2)	0.5	(1.3)

Time-varying information defined using the first outpatient mental health visit during the study period.

†Diagnosis of bipolar, schizophrenia, other psychosis or personality disorders

‡Missing for 3543 individuals in patient population and 2467 individuals in study population without ambulatory or inpatient encounters in which to observe comorbidities during 365 days prior to first visit.

Table S2: Characteristics of Adult Mental Health Patients Assessed for Unhealthy Alcohol Use (N=44106), Across Reported Frequency of Heavy Episodic Drinking

	Frequency of Heavy Episodic Drinking (AUDIT-C Q3 Score)									
	Never (Score 0) N=28702		Less Than Monthly (Score 1) N=9669		Monthly (Score 2) N=3133		Weekly (Score 3) N=1954		Daily or Almost Daily (Score 4) N=648	
Age (Mean, SD)	47.1	(17.0)	36.4	(13.5)	34.1	(12.5)	36.3	(13.3)	42.8	(14.2)
Male (N, %)	8945	(31.2%)	4010	(41.5%)	1599	(51.0%)	1107	(56.7%)	367	(56.6%)
Race/Ethnicity (N, %)										
White, non-Hispanic	22507	(78.4%)	7454	(77.1%)	2403	(76.7%)	1492	(76.4%)	511	(78.9%)
Black, non-Hispanic	1280	(4.5%)	423	(4.4%)	140	(4.5%)	111	(5.7%)	29	(4.5%)
Asian	1329	(4.6%)	433	(4.5%)	120	(3.8%)	63	(3.2%)	20	(3.1%)
Hispanic	972	(3.4%)	346	(3.6%)	99	(3.2%)	64	(3.3%)	22	(3.4%)
Other	1666	(5.8%)	631	(6.5%)	220	(7.0%)	135	(6.9%)	37	(5.7%)
Unknown	948	(3.3%)	382	(4.0%)	151	(4.8%)	89	(4.6%)	29	(4.5%)
*Level of Depressive Symptoms (PHQ-8) (N, %)										
Minimal or None (Score 0-4)	6024	(21.0%)	1628	(16.8%)	443	(14.1%)	237	(12.1%)	41	(6.3%)
Mild (Score 5-9)	7355	(25.6%)	2366	(24.5%)	801	(25.6%)	442	(22.6%)	111	(17.1%)
Moderate (Score 10-14)	6464	(22.5%)	2406	(24.9%)	818	(26.1%)	485	(24.8%)	151	(23.3%)
Moderately Severe (Score 15-19)	5133	(17.9%)	2000	(20.7%)	643	(20.5%)	460	(23.5%)	164	(25.3%)
Severe (Score 20-24)	3276	(11.4%)	1155	(11.9%)	384	(12.3%)	303	(15.5%)	172	(26.5%)
*Frequency of Self-Harm Thoughts (PHQ-9 Q9) (N, %)										
Not at all (Score 0)	21513	(75.0%)	6965	(72.0%)	2186	(69.8%)	1190	(60.9%)	366	(56.5%)
Several days (Score 1)	4239	(14.8%)	1613	(16.7%)	580	(18.5%)	448	(22.9%)	153	(23.6%)
More than half (Score 2)	1370	(4.8%)	561	(5.8%)	200	(6.4%)	160	(8.2%)	57	(8.8%)
Nearly every day (Score 3)	1101	(3.8%)	411	(4.3%)	123	(3.9%)	123	(6.3%)	63	(9.7%)
Mental health diagnoses, prior year (N, %)										
Anxiety disorder	16811	(58.6%)	5567	(57.6%)	1829	(58.4%)	1147	(58.7%)	412	(63.6%)
Depressive disorder	20240	(70.5%)	6822	(70.6%)	2242	(71.6%)	1467	(75.1%)	523	(80.7%)
†Serious mental illness diagnosis	4433	(15.4%)	1101	(11.4%)	336	(10.7%)	234	(12.0%)	98	(15.1%)
Prior suicide attempt	294	(1.0%)	126	(1.3%)	43	(1.4%)	36	(1.8%)	31	(4.8%)
‡Charlson Score	0.6	(1.3)	0.3	(0.8)	0.2	(0.6)	0.3	(0.8)	0.4	(1.1)
Alcohol Use Disorder Diagnosis	415	(1.4%)	280	(2.9%)	240	(7.7%)	403	(20.6%)	371	(57.3%)

Time-varying information defined using the first outpatient mental health visit during the study period.

*Recorded via self-report on the PHQ-9 about the prior two weeks during same visit as AUDIT-C; PHQ8 score missing for 644 individuals & PHQ-9 Q9 missing for 684 individuals, so columns for these variables do not total 100% across alcohol consumption categories.

†Diagnosis of bipolar, schizophrenia, other psychosis or personality disorders.

‡Missing for 2467 individuals without ambulatory or inpatient encounters in which to observe comorbidities during 365 days prior to first visit.

Table S3: Sensitivity Analysis of the Estimated Risk of Suicide Attempt by Reported Level of Alcohol Consumption and Frequency of Heavy Episodic Drinking, within 90 Days of AUDIT-C Assessment at the First Outpatient Mental Health Visit during the Study Period

	A: *Unadjusted			B: Primary Model †Demographics Adjusted			C: Additionally Adjusted for ‡Depressive Symptoms and Thoughts of Self-harm			D: Additionally Adjusted for ‡‡Mental Health Diagnoses and Medical Comorbidity		
	N visits=44106 (44106 patients)			N visits=44106 (44106 patients)			N visits=43368 (43368 patients)			N visits=40944 (40944 patients)		
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
1: Level of alcohol consumption**												
Nondrinking	1.15	(0.83-1.60)	0.398	1.24	(0.89-1.72)	0.206	1.08	(0.77-1.50)	0.654	0.99	(0.69-1.41)	0.951
Low-level	<i>ref</i>			<i>ref</i>			<i>ref</i>			<i>Ref</i>		
Moderate-level	0.96	(0.71-1.29)	0.774	0.88	(0.65-1.19)	0.422	0.88	(0.65-1.19)	0.403	0.86	(0.62-1.19)	0.359
High-level	3.17	(2.15-4.67)	<0.001	2.82	(1.91-4.18)	<0.001	1.97	(1.32-2.93)	0.001	1.74	(1.13-2.67)	0.011
2: Frequency of heavy episodic drinking												
Never	<i>ref</i>			<i>ref</i>			<i>ref</i>			<i>ref</i>		
Less than monthly	1.15	(0.85-1.56)	0.356	0.93	(0.68-1.27)	0.652	0.90	(0.66-1.23)	0.507	0.89	(0.63-1.24)	0.484
Monthly	1.54	(1.01-2.36)	0.046	1.18	(0.76-1.83)	0.454	1.13	(0.73-1.76)	0.581	1.15	(0.72-1.84)	0.557
Weekly	2.09	(1.32-3.31)	0.002	1.66	(1.04-2.66)	0.033	1.29	(0.80-2.07)	0.291	1.24	(0.74-2.06)	0.410
Daily or Almost Daily	4.84	(2.87-8.15)	<0.001	4.41	(2.61-7.48)	<0.001	2.85	(1.67-4.88)	<0.001	1.96	(1.06-3.62)	0.032

OR=odds ratio

*All analyses adjusted for assessment year

†Adjusted for gender, age, race/ethnicity (including unknown category)

‡Additionally adjusted for level of depressive symptoms reported on PHQ-8 score & frequency of thoughts about self-harm measured on PHQ-9 ninth question

‡‡Additionally adjusted for mental health diagnoses recorded in the past year, including depressive disorders anxiety disorders, serious mental illness (bipolar, schizophrenia, other psychosis or personality disorders), suicide attempt, as well as Charlson comorbidity index score

**AUDIT-C: Nondrinking=score 0; Low-Level= Score 1-2 Women, 1-3 Men; Moderate-Level=Score 3-7 Women, 4-7 Men; High -Level=Score 8-12 Women & Men

Table S4: Sensitivity Analysis of the Estimated Risk of Suicide Attempt by Reported Level of Alcohol Consumption and Frequency of Heavy Episodic Drinking, within 90 Days of AUDIT-C Assessments at Least 90 Days Apart

	A: *Unadjusted			B: Primary Model †Demographics Adjusted			C: Additionally Adjusted for ‡Depressive Symptoms and Thoughts of Self-harm			D: Additionally Adjusted for ‡‡Mental Health Diagnoses and Medical Comorbidity		
	N visits=78788 (44106 patients)			N visits=78788 (44106 patients)			N visits=77729 (43598 patients)			N visits=75078 (41993 patients)		
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
1: Level of Alcohol Consumption**												
Nondrinking	1.22	(0.96-1.54)	0.108	1.27	(1.00-1.61)	0.051	1.06	(0.83-1.35)	0.620	0.95	(0.74-1.22)	0.696
Low-level	<i>ref</i>			<i>ref</i>			<i>ref</i>			<i>Ref</i>		
Moderate-level	0.94	(0.77-1.16)	0.571	0.88	(0.72-1.08)	0.232	0.86	(0.70-1.06)	0.159	0.93	(0.75-1.15)	0.491
High-level	2.79	(2.04-3.83)	<0.001	2.56	(1.86-3.52)	<0.001	1.77	(1.28-2.45)	0.001	1.78	(1.26-2.51)	0.001
2: Frequency of Heavy Episodic Drinking												
Never	<i>ref</i>			<i>ref</i>			<i>ref</i>			<i>ref</i>		
Less Than Monthly	1.20	(0.97-1.49)	0.097	1.01	(0.81-1.26)	0.908	0.99	(0.79-1.23)	0.913	1.03	(0.82-1.31)	0.757
Monthly	1.35	(0.96-1.89)	0.089	1.10	(0.77-1.56)	0.608	1.02	(0.72-1.45)	0.905	1.15	(0.80-1.66)	0.456
Weekly	2.13	(1.48-3.08)	<0.001	1.81	(1.25-2.63)	0.002	1.39	(0.95-2.02)	0.090	1.50	(1.00-2.24)	0.050
Daily or Almost Daily	3.52	(2.18-5.68)	<0.001	3.33	(2.06-5.40)	<0.001	2.30	(1.41-3.76)	0.001	1.86	(1.08-3.21)	0.026

OR=odds ratio

*All analyses adjusted for assessment year

†Adjusted for gender, age, race/ethnicity (including unknown category)

‡Additionally adjusted for level of depressive symptoms reported on PHQ-8 score & frequency of thoughts about self-harm measured on PHQ-9 ninth question

‡‡Additionally adjusted for mental health diagnoses recorded in the past year, including depressive disorders anxiety disorders, serious mental illness (bipolar, schizophrenia, other psychosis or personality disorders), suicide attempt, as well as Charlson comorbidity index score

**AUDIT-C: Nondrinking=score 0; Low-Level= Score 1-2 Women, 1-3 Men; Moderate-Level=Score 3-7 Women, 4-7 Men; High -Level=Score 8-12 Women & Men

Chapter 3 Supplemental Files

Figure S5: Flow diagram analytic sampling: adult patients visits to a mental health provider that included an AUDIT-C and PHQ-9 with and outcome data available 90-days following the AUDIT-C 1/1/2010-6/30/2015

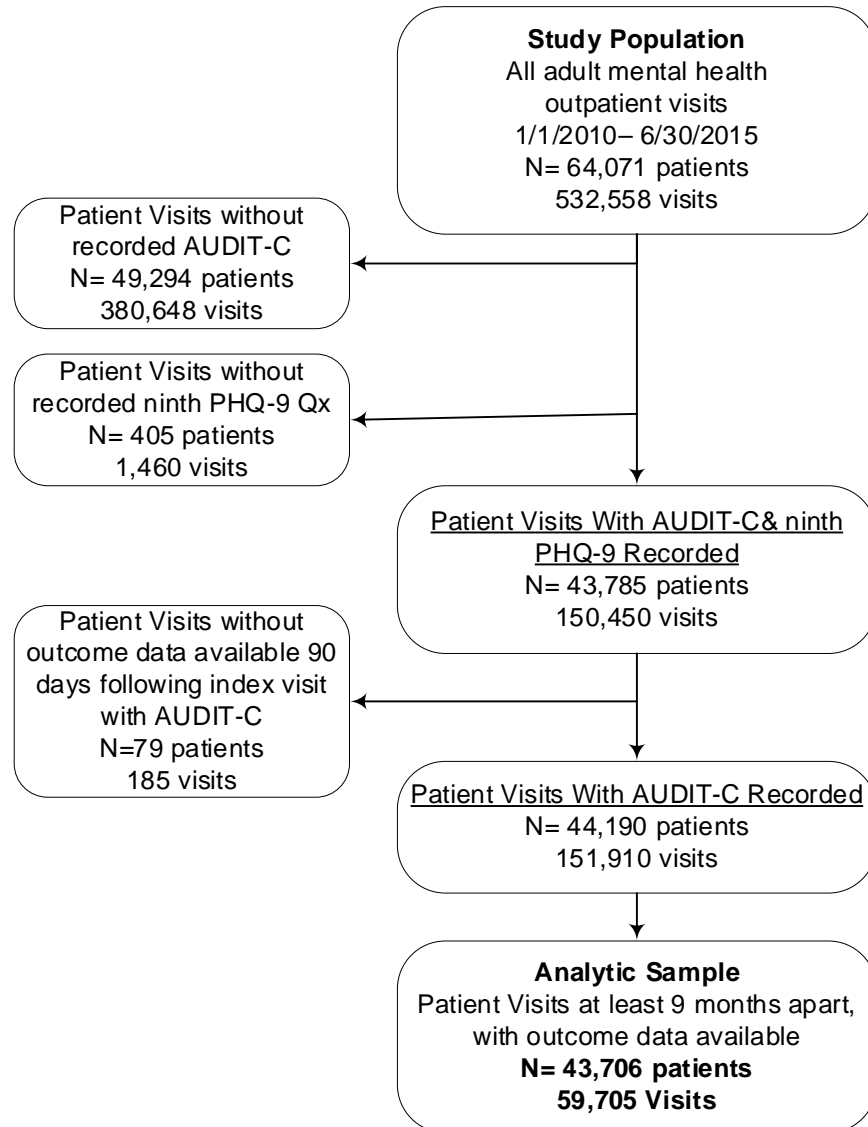


Table S6: Characteristics of Adult Population of Patients Receiving Mental Healthcare Compared to Study Sample Screened, at the time of the first outpatient mental health visit within study period.

	Patient Population		Study Sample	
	N=64071		N=43706	
Age (Mean, SD)	43.4	(17.0)	43.2	(16.6)
Male (N, %)	23281	(36.3%)	15878	(36.3%)
Race/Ethnicity (N, %)				
White, non-Hispanic	47856	(74.7%)	34050	(77.9%)
Black, non-Hispanic	2883	(4.5%)	1964	(4.5%)
Asian	2761	(4.3%)	1953	(4.5%)
Hispanic	2091	(3.3%)	1492	(3.4%)
Other	3759	(5.9%)	2666	(6.1%)
Unknown	4721	(7.4%)	1581	(3.6%)
Diagnoses in Prior Year (N, %)				
Anxiety Disorder	34775	(54.3%)	25602	(58.5%)
Depressive Disorder	44772	(69.9%)	31068	(71.1%)
†Serious Mental Illness	8926	(13.9%)	6141	(14.1%)
Alcohol Use Disorder	2553	(4.0%)	1700	(3.9%)
Prior Suicide Attempt	709	(1.1%)	526	(1.2%)
‡Charlson Score	0.5	(1.2)	0.5	(1.2)

†Diagnosis of bipolar, schizophrenia, other psychosis or personality disorders

‡ Missing for individuals with no in-patient or out-patient utilization in prior year

Chapter 4 Supplemental Files

S7: Interview Guide

Our conversation today will be about your experience in your primary care provider's office filling out the screening questionnaire that asks about depression, thoughts about self-harm, alcohol, marijuana and drug use. We are most interested in your experience answering these questions and less about how you actually answered the questions. Does this make sense?

Do you know the questionnaire I am talking about? Do you mind if I remind you by reading a few of the questions now? [How often did you have a drink containing alcohol in the past year? How often in the past year have you used marijuana? In the last 2 weeks, how often have you been bothered by feeling down, depressed or hopeless?]

1. *How do you think these questions fit in to your healthcare experience? Do you feel like these are appropriate questions for your healthcare provider to ask?*

- *Was it different from answering other kinds of health questionnaires (like about your physical health)?*
- *Were there any questions you were uncomfortable or fearful about answering honestly? Why/why not?*

2. *Did your provider or anyone else talk with you about your answers to these questions?*

- *What was helpful or unhelpful about that conversation?*
- *What kind of conversation with your provider do you think would have been helpful?*
- *Is there anything else that would have been helpful for your provider to do?*

3. *One of the questions asks, "In the last 2 weeks, how often have you been bothered by any of the following problems" this is followed by a list, which includes "Thoughts that you would be better off dead or of hurting yourself in some way? What does that question mean to you?*

- *Do you remember having any discomfort or fears about answering this question honestly? Why or why not?*
- *Did you have a conversation about your answer to this question with your provider?*
- *[If yes] What was helpful or unhelpful about that conversation?*
- *[If no] what kind of conversation with your provider do you think would have been helpful?*
- *Do you have any suggestions about how we could make this an easier question to answer? What would be a better question?*
 - *[If needed] For example, some have suggested it might help if surveys with this question explained thoughts about self-harm are serious but not uncommon for people who have depression or information about how KP providers will work patients having thoughts about self-harm.*

4. *Some patients receive an additional questionnaire specifically about self-harm. This questionnaire asks a series of yes/no questions like, "during the past month have you wished you were dead or wished you could go to sleep and not wake up?" And "During the past month, have you actually had any thoughts of killing yourself?" Do you recall these questions?*

- *If yes, can you tell me more about your experience answering those questions? Did you talk with someone about your answers? What was helpful/or unhelpful about how s/he responded?*
- *Do you think these are appropriate question for your healthcare provider to ask?*

5. Some people are asked about access to a gun. Do you remember this question? [*“Do you have access to guns?” Yes/No*]

- *If yes, can you tell me about your experience answering that question? Did you have a conversation about your answer to this question with your provider?*
 - *[If yes] What was helpful or unhelpful about that conversation?*
 - *[If no] what kind of conversation with your provider do you think would have been helpful?*
- *Do you think this is an appropriate question for your healthcare provider to ask?*

6. *Is there anything else I didn't ask you about that you think is important to tell us?*