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YOUNG ADULT MENTAL HEALTH CRISIS

GUEST EDITOR: SAMANTHA ROSENTHAL, PhD, MPH

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Rhode Island Young Adult Survey Reveals Mental Health Crisis

SAMANTHA R. ROSENTHAL, PhD, MPH
GUEST EDITOR

INTRODUCTION

While young adult mental health involves a broad spectrum of psychosocial and environmental determinants, this special issue of the *Rhode Island Medical Journal* (RIMJ) focuses on timely and specific challenges of this population, including the mental health harms of losing a loved one to COVID-19; the role of racial discrimination in depressive symptoms; the association between brain injury and substance use; the disparities in and mental health consequences of pornography addiction or smartphone addiction, and predictors of suicide ideation among college students.

All articles leveraged data from the novel Rhode Island Young Adult Survey (RIYAS), which was first implemented in 2020. This surveillance system, though a convenience sample of Rhode Island young adults, includes the largest sample of young adults in Rhode Island relative to other commonly utilized surveillance systems to inform programming and planning for young adult health, such as the Behavioral Risk Factor Surveillance System (BRFSS) or the National Survey on Drug Use & Health (NSDUH).

This issue was made possible by a collaboration between the Rhode Island Department of Behavioral Healthcare, Developmental Disabilities, & Hospitals (BHDDH) and the Johnson & Wales University (JWU) Center for Student Research and Interdisciplinary Collaboration. Using data from the new RIYAS, supported by BHDDH, JWU-affiliated faculty and undergraduate students have contributed their research and analytical skills to tell this important, evidence-based story of the current young adult mental health crisis.

CONTEXT: THE VULNERABILITY OF YOUNG ADULthood

Young adulthood is a vulnerable developmental stage of the life course. The individual faces tremendous social and emotional challenges while growing from a dependent minor to, ideally, an autonomous adult. Developmental tasks of young adulthood include forming one's own identity, establishing financial independence, and engaging in intimate relationships. Other milestones include finding employment, enrolling in college or the military, or starting a family. Given evolving societal trends such as economic recession, inflation, rising housing costs, longer periods of education, and marriage postponed or forsworn, young adulthood

has become a more complex and less linear transition.^{1,2}

In addition to burdensome environmental, social, and emotional shifts, young adulthood includes complex developmental changes in neural and hormonal stress-processing systems.³ These changes often accelerate stress-related psychopathology,⁴ and psychosocial stressors during young adulthood are strongly linked to psychopathology.⁵ About 75% of mental health disorders are established by the mid-20s,⁶ and young adulthood tends to have the highest rates of anxiety and depressive symptoms.⁷ A similar vulnerability exists for risky and addictive behaviors during young adulthood.⁸

Substance use behaviors tend to peak in early adulthood,⁹ in part due to brain development. Cognitive underdevelopment, particularly the immaturity of the prefrontal regions of the brain, has been linked to increased sensation-seeking behavior, including the initiation of substance use and shifts to more regular or dependent use.¹⁰ Recent studies suggest the start of college is an important developmental transition in terms of polysubstance use and risky sexual behaviors.^{11,12} Young adults also bear a disproportionate burden of gambling disorder¹³ and are particularly vulnerable to internet-gaming disorder.¹⁴

Even prior to the COVID-19 pandemic, the United States was facing a mental health crisis. Over the decade leading up to the pandemic, prevalence of major depressive episodes and suicidal ideation among young adults aged 18–25 almost doubled.^{7,15} Across the United States, need for mental health care outstrips supply. The Henry J. Kaiser Family Foundation estimates more than 155 million people live in designated mental health care professional shortage areas.¹⁶ Demand for mental health services pre-pandemic already was outpacing workforce capacity on and off college campuses.

While evidence suggests there is an increasing need for behavioral health treatment among young adults and that efficacious treatment exists,¹⁷ there continues to be barriers in the help-seeking process. These include stigma, difficulty recognizing the problem, and a desire to address these problems on one's own.¹⁸ Young adult college students have additional barriers, such as fear of a negative impact on occupational or academic records or a lack of knowledge about available mental health services. Female and sexual or gender minority young adults are particularly likely to report needing but not receiving mental health services.¹⁹

THE COVID-19 PANDEMIC AND YOUNG ADULT MENTAL HEALTH

On top of the usual developmental stressors of young adulthood, the COVID-19 pandemic added new stressors: social isolation, disruptions to in-person schooling and employment, limited access to health and social services, increased food and housing insecurity, as well as sickness, disability and loss of parents and loved ones from the disease. The pandemic, like prior catastrophes, has been linked to unhealthy coping mechanisms such as problematic substance use.²⁰ Evidence gathered over the course of the pandemic supports such links, showing dramatic shifts in mental health and substance use disorders among young adults. A survey from June 2020 showed 13% of adults reported increased substance use due to coronavirus-related stress, while 25% of young adults reported an increase.²¹ From February to May 2020, drug overdose mortality among young adults increased by 59%, disproportionately affecting Black young adults (79% increase) and other people of color.²²

A recent study found that over the 2020–2021 school year more than 60% of college students struggled with at least one mental health disorder,²³ a 50% increase since 2013. During the same school year, the National College Health Assessment estimated that almost 3 in 4 college students across the country experienced moderate to severe psychological distress, and more than 1 in 4 were suicidal.²⁴ Provisional data from 2021 also suggest a significant increase in the national suicide rate, especially for young adults aged 15 to 24 years. In December of 2021, well into the global pandemic, the U.S. Surgeon General issued an advisory on the youth mental health crisis, including young adults.²⁵ Evidence from prior disasters indicate that behavioral health impacts tend to outlast physical health impacts,²⁶ suggesting these elevated rates of substance use disorder and mental illness among young adults are likely to persist.

INHERITING A WORLD OF TURMOIL

The collective trauma of the COVID-19 pandemic affected young adults and exacerbated pre-existing societal crises. As a result of the pandemic, for example, there was an increase in anti-Asian sentiment and xenophobia. In fact, the Federal Bureau of Investigation issued a warning to law enforcement in 2020 of an increase in crimes of anti-Asian bias.²⁷ High-profile cases of police brutality against Black Americans led to the popular participation in the Black Lives Matter movement and widespread protests against racial inequity, as well as continued counter-protests to the movement.²⁸ These incidents of racial discrimination have been shown to lead to traumatic stress and psychopathology.²⁹

As racial tensions intensified, so has anti-LGBTQ sentiment. Despite advancement in LGBTQ rights and marriage equality over the past 30 years, anti-LGBTQ legislation at the state level is increasing significantly. Laws restricting

restroom access and participation in sports teams for transgender youth,³⁰ as well as legislation to limit discussion of sexual orientation and gender identity in schools, have become increasingly common.³¹ The targeting of sexual and gender identities has been linked to poor mental health,³² particularly among the young adult population, among whom almost 1 in 5 identify as a sexual or gender minority.³³

Young adults have also grown up in an era of an unprecedented drug overdose epidemic, perpetual gun violence and mass shootings, and the existential threat of climate change. Having a parent with a substance use disorder and experiencing or witnessing community violence have been linked to depression, anxiety, suicide ideation, and post-traumatic stress disorder.³⁴ Direct and indirect impacts of climate change and associated natural disasters have also been linked to increased anxiety and mental illness.³⁵ Ultimately, young people are transitioning to adulthood in a society experiencing ongoing collective trauma.

THE AGE OF TECHNOLOGY

Young adults have always lived in a world with internet access and smartphones. More than 90% use a smartphone and almost 98% regularly use social media.³⁶ While the digital age has provided easier and more convenient access to information, social connections, and goods and services, the persistent digital connectedness also comes with harm. Excessive smartphone and social media use among young adults has already been linked to poor mental health,^{37–39} although many mechanisms are still being explored. Some mechanisms established in the literature include unfavorable social comparisons, increased exposure to social harm, and social isolation.⁴⁰ Recently, social engagement on smartphones has been linked to the dopamine reward system. Each notification, text, or like contributes to a variable reward schedule – positive stimuli provided at random intervals. This variable sense of reward is often short-lived, and it can lead to an intense anticipatory period awaiting the next positive stimulus, keeping young adults connected to their smartphones, similar to other behaviors with a propensity to become addictive.⁴¹ Constant digital access also exposes young adults to targeted advertisements associated with negative social and health consequences,⁴² such as for substances like alcohol and marijuana, and other potentially addictive engagements like gaming, gambling, and pornography.

And yet, despite these risks to health behaviors and mental health, technology is an important tool in addressing the mental health of young adults. Use of telehealth services for behavioral health among young adults has increased since the COVID-19 pandemic, jumping from 10% in 2019 to 33% in 2020,⁴³ and telehealth services have been shown to increase access to care for disadvantaged groups like racial/ethnic minorities, sexual and gender minorities, and those

with low socioeconomic status.⁴⁴ Young adults have significant interest in behavioral telehealth services, but other digital mental health interventions may also be effective in addressing the current young adult mental health crisis. Evidence from a recent systematic review suggests that computerized cognitive behavioral therapy interventions for young adults have been effective in treating anxiety and depression, particularly those interventions with an in-person component. However, evidence of efficacy for other digital or mHealth (i.e., mobile health) interventions among this age group remain inconclusive.⁴⁵

WHAT'S NEXT FOR YOUNG ADULT MENTAL HEALTH

Despite additional investment in mental health care services, there are simply not enough mental health practitioners to meet the unprecedented need. Increasing the behavioral health care workforce and access to behavioral telehealth for marginalized young adults is an important step. In addition to high quality, culturally tailored, and integrated behavioral health care, young people need environments that cultivate a sense of community and care for their study, work, and living, including minority young adults, whether racial/ethnic minorities, sexual and gender minorities, or those with differing cognitive or physical abilities. This means instilling emotion-regulation skills in young people while addressing other key social determinants of health like economic and social mobility, affordable housing, healthy food access, environments that support healthy sleep habits, neighborhood safety, healthy relationships, and trauma-informed education and health care. More high-quality research on the mental health harms of technology use among youth and young adults is needed, as is examination of effective ways these harms can be mitigated and addressed. Similarly, we need better evidence-based digital or mHealth behavioral health interventions for young adults.

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The Mental Health Consequences of Losing a Loved One to COVID-19

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ABSTRACT

OBJECTIVES: This study examined the association between loss of a loved one to COVID-19 and depression, anxiety and suicide ideation among Rhode Island young adults.

METHODS: The 2022 Rhode Island Young Adult Survey recruited 1,022 young adults aged 18-25 years who lived in Rhode Island. Logistic regression models were used to estimate the odds of depression, anxiety, and suicide ideation due to experiencing a loss due to COVID-19.

RESULTS: The odds of anxiety and suicide ideation were 57% (OR[95% CI] = 1.57 [1.13, 2.18]) and 79% (OR[95% CI] = 1.79 [1.19, 2.70]) greater among participants who lost a close friend or family member due to COVID-19.

CONCLUSIONS: Losing a loved one to COVID-19 increases the risk of anxiety or suicide ideation among young adults in RI. Prevention measures such as screening for mental health symptoms and incorporating mental health awareness into college, university and workplace settings should be instituted.

KEYWORDS: mental health, suicide ideation, COVID-19, loss, depression, young adults

INTRODUCTION

Living through a pandemic creates incredible uncertainty, loss of control and routine, and loss of income, each of which can contribute to or trigger emotional distress such as anxiety or depression.¹ The most recent COVID-19 pandemic has been characterized by these attributes as well as concerns about one's health, economic security,² and loss of a loved one. In particular, losing a loved one to COVID-19 may heighten mental health symptoms, especially for young adults who experience normative developmental transitions that are already associated with mental health symptoms.³

To date, the global death toll associated with COVID-19 is over 6 million documented deaths, with 895,693 deaths occurring in the United States (US) between January 2020 and September 2021.^{4,5} Death rates were higher in US populations of color relative to the non-Hispanic White population, and populations of color died at younger ages than the

non-Hispanic White populations, according to data collected between February 1st and July 22, 2020.⁶ In the US, 95% of COVID-19 deaths occurred in individuals who were over 50 years old.⁷

In Rhode Island (RI), 3,789 deaths due to COVID-19 occurred as of January 2023.⁸ In December 2020 alone, RI had the highest COVID-19 fatality and incidence rates when compared to the rest of the US.⁹ While White individuals had the highest crude death counts when compared to residents of other races, Hispanics/Latinos, African Americans/Blacks and Asians have higher age-adjusted death rates. As with COVID-19 death rates in the US, 95% of COVID-deaths in RI were among individuals over 50 years old.¹⁰

For every COVID-19 death in the US, about nine Americans experience the loss of a close relative or loved one.¹¹ The toll of COVID-19 deaths has led to a rise in adverse mental health consequences among individuals who have lost a loved one to COVID-19. The sudden and unexpected death of a family member or close friend can cause extreme psychological distress (i.e., depression, anxiety, suicide ideation) and require extra emotional support to grieve the unexpected loss.^{12,13} Travel limitations, group gathering restrictions, and required social isolation may have prevented some grieved individuals from seeking and receiving the support needed to adapt to their loss, prolonging the feelings of depression, anxiety, and grief.¹⁴ Bereaved individuals who had lost a loved one to COVID-19 reported guilt, anxiety, and depression due to self-blame for not making greater efforts to visit their loved one during the hospital stay or for not being present during their loved one's death.¹⁵⁻¹⁷ Lack of closure led to feelings of denial and an inability to accept their loss, both of which independently increased the risk of depression, anxiety, or other mental health symptoms.¹⁴ Further, a scoping review of qualitative studies on grief and loss during the COVID-19 pandemic revealed that inconsistencies in or lack of funeral ceremonies further exacerbated an individual's sense of loss immediately post-death, as did contemplating their loss in social isolation, due to COVID-19 restrictions, which increased the risk of suicide ideation.¹⁴

Although evidence suggests that individuals who have lost a loved one due to COVID-19 experience poor mental health, there is very limited information about the prevalence of losing a loved one due to COVID-19, and even less knowledge about the mental health consequences associated with

such a loss among young adults. It is possible that the combination of losing a loved one to COVID-19 during such a formative stage of a young adult's life may increase the risk of experiencing poor mental health among this population. To our knowledge there is no available information about how young adults in RI have been affected by this issue. To address this gap, we used the 2022 RI Young Adult Survey to determine which young adults were most likely to lose a friend or family member to COVID-19, and whether this loss is independently associated with anxiety, depression, and suicide ideation.

METHODS

Sample and Data Collection

The Rhode Island Young Adult Survey (RIYAS) was a self-report, de-identified, cross-sectional survey implemented by the Rhode Island Department of Behavioral Healthcare, Developmental Disabilities & Hospitals. The 2022 RIYAS was a web-based survey that used Qualtrics to collect data regarding young adult behavioral health, risk behaviors, and mental and physical health outcomes. The 2022 RIYAS was administered to young adults, 18 to 25 years old, residing in Rhode Island for at least part of the year. Recruitment included targeted paid Instagram, Twitter, Facebook, and Snapchat ads and was supplemented by recruitment via Reddit, flyers, banners at the Providence Place Mall, and emails to students at an institution of higher education. Participants received \$10 Amazon gift cards as compensation for study participation. A total of $n = 1,022$ surveys were completed between May and August 2022 and were available for the current analysis. All participants provided electronic informed consent. This study was approved by the Johnson & Wales University Institutional Review Board.

Measures

Experiencing a loss due to the COVID-19 pandemic was assessed with a single item: Have you lost a close friend or family member to COVID-19? Response options included no, yes a friend, and yes a family member. The loss of a friend or loss of a family member were combined into an any COVID-19 loss (coded as 0) category.

The Center of Epidemiologic Studies Depression Scale, 10-item version (CES-D10) was used to assess depression.¹⁸ The CES-D10 contains 10 items that measure past week prevalence of symptoms related to the development of depression. Responses were collected on 4-point Likert scales ranging from rarely or none of the time (coded as 0) to most of the time (coded as 3). Aggregated scores ($\alpha = 0.75$) across all items of ≥ 10 indicated depression. Test/re-test reliability and convergent reliability of the CES-D10 has been established.¹⁹ *The Generalized Anxiety Disorder 7-item scale (GAD-7)* was used to assess anxiety. The GAD-7 contains 7 items that measure past two-week experiences

of nervousness, anxiousness, worrying, difficulty relaxing, restlessness, annoyance, irritability, and fear.²⁰ Responses were collected on 4-point Likert scales ranging from not at all (coded as 0) to nearly every day (coded as 3). Aggregated scores ($\alpha = 0.93$) across all items of ≥ 10 indicate clinically significant anxiety.²¹ Reliability and validity of the GAD-7 has been established in adolescent and adult samples.²² *Suicide ideation* was assessed with: During the past 12 months, did you ever seriously consider attempting suicide? The response options were no (coded as 1) and yes (coded as 2).

Several sociodemographic variables (i.e., age, sex, gender, sexual orientation, race/ethnicity, student status, employment status, social status) were assessed to identify disparities between population groups. Sex (male, female, intersex), gender (woman, man, non-binary, two-spirit, different identity not listed), and sexual orientation (heterosexual/straight, homosexual/lesbian or gay, bisexual, don't know, different identity not listed) were collapsed into a single variable – *sexual and gender identity* – that categorized participants as heterosexual cis-female, heterosexual cis-male, and any sexual or gender minority. *Racial and ethnic categories* included African American or Black, Asian, Caucasian or White, Hispanic/Latino, Native American or Alaskan Native, Native Hawaiian or Other Pacific Islander, and different identity not listed. Participants selected all that applied. Because of low sample sizes, participants identifying as Native American or Alaskan Native, Native Hawaiian or Other Pacific Islander, different identity not listed, or more than 1 race were collapsed into a single Other category. *Student and employment status* were combined to classify participants as not a student/employed, student/not employed, student/employed, or not a student/not employed. The MacArthur Scale of *Subjective Social Status*, which asks participants to rank themselves relative to others in the community on a 1 (worst off) to 10 (best off) scale, was used to assess social status.²³

Analysis

The distribution of continuous variables (age, social status) were examined for skew and considered normally distributed. Descriptive statistics are reported for all variables. Disparities in experiencing loss due to the COVID-19 pandemic were identified using multivariable logistic regression models. All sociodemographic variables were specified as the independent variables with loss due to COVID-19 as the dependent. Heterosexual cis-males, White non-Hispanic, and not a student/not employed were the referents. Unadjusted and adjusted logistic regression models were used to estimate the odds of depression, anxiety, and suicide ideation due to experiencing a loss due to COVID-19. Adjusted models controlled for all sociodemographic variables. Analyses were completed using SPSS v28.0 (Armonk, NY: IBM Corp), and statistical significance was determined using 95% confidence intervals (CI).

RESULTS

Mean age of the sample was 21.3 (SD = 2.1), and 44.6% of participants identified as heterosexual cis-female (Table 1). A majority (59.8%) identified as White, non-Hispanic. A majority (55%) were students and employed, and mean social status was 5.0 (SD = 1.7). The prevalence of depression, anxiety, and suicide ideation was 51%, 37.9%, and 14.7%, respectively. Overall, 17.3% of participants lost either a friend or family member due to the COVID-19 pandemic (Figure 1).

There were two sociodemographic disparities noted in the multivariable logistic regression analysis. The odds of losing a friend or family member due to COVID-19 was 56% greater among participants who were Hispanic (OR[95% CI] = 1.56 [1.04, 2.33]) (Figure 2). Conversely, the odds significantly decreased by 11% for every one unit increase in social status (OR[95% CI] = 0.89 [0.81, 0.99]).

In the unadjusted logistic regression analysis, the odds of anxiety and suicide ideation were 57% (OR[95% CI] = 1.57 [1.13, 2.18]) and 79% (OR[95% CI] = 1.79 [1.19, 2.70]) greater among participants who lost a close friend or family member due to COVID-19 (Table 2). The direction and magnitude of these relationships were maintained in the adjusted analysis. There was no association between losing a friend or family member due to COVID-19 and depression.

Table 1. Descriptive statistics of categorical variables (n = 1022)

Variable		n (%)
Sexual and Gender Identity	Heterosexual cis-female	456 (44.6)
	Heterosexual cis-male	132 (12.9)
	Sexual/gender minority	434 (42.5)
Race/ethnicity	Asian	59 (5.8)
	Black/African American	54 (5.3)
	Hispanic	210 (20.5)
	Other/More than 1 race	88 (8.6)
	White	611 (59.8)
Student/employment status	Not a student, not employed	59 (5.8)
	Not a student, employed	244 (23.9)
	Student, not employed	157 (15.4)
	Student, employed	562 (55.0)
Depression	Yes	521 (51.0)
	No	501 (49.0)
Anxiety	Yes	387 (37.9)
	No	635 (62.1)
Suicide ideation	Yes	150 (14.7)
	No	872 (85.3)

Figure 1. [A] Percent of participants who experienced losing a friend, [B] family member, and [C] a friend or family member due to the COVID-19 pandemic

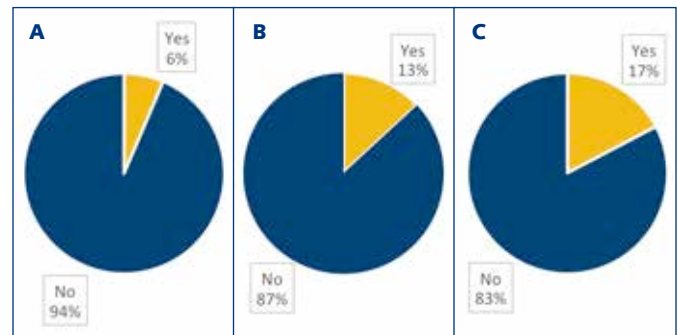


Figure 2. Forest plot of the adjusted odds of losing a friend or family member due to COVID-19 by sociodemographic variables.

*Relative to heterosexual cis-females; †relative to White, non-Hispanic; ‡relative to not a student/not employed.

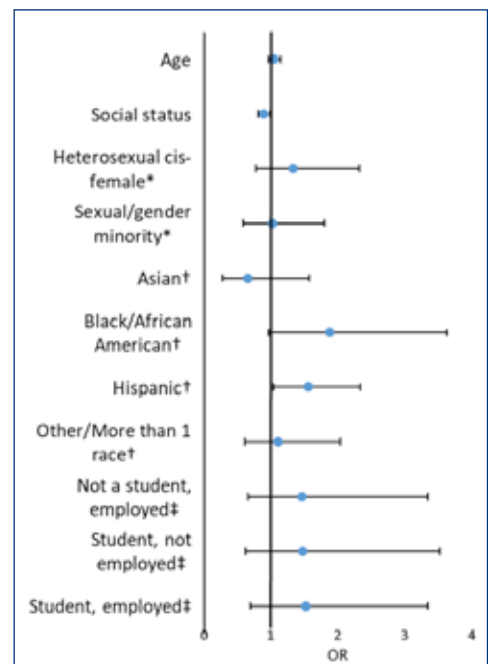


Table 2. Unadjusted and adjusted odds of depression, anxiety, and suicide ideation by loss of a close friend or family member due to COVID-19

		Depression		Anxiety		Suicide Ideation	
Variable		OR	95% CI	OR	95% CI	OR	95% CI
Unadjusted Models							
Loss of a close friend OR family member	Yes	1.17	0.85, 1.62	1.57	1.13, 2.18	1.79	1.19, 2.70
	No	.	.	.	.	.	.
Adjusted Models							
Loss of a close friend OR family member	Yes	1.14	0.80, 1.62	1.65	1.17, 2.33	1.83	1.17, 2.84
	No	.	.	.	.	.	.

DISCUSSION

Nearly 1 in 5 young adults in RI reported having lost someone close to them due to COVID-19 and Hispanic young adults were more likely to lose a loved one to COVID-19, as were those with lower social status. Study results in combination with recent research on loss of a loved one to COVID-19² suggest that while loss to COVID-19 is universal, certain populations may be at a greater risk. National and RI trends alike indicate that populations of color have higher COVID-19 death rates than non-Hispanic White populations suggesting a possible rationale why Hispanic young adults were at a higher risk of experiencing a COVID-19 loss.^{6,10}

Social determinants of health may play a role in this loss disparity. For instance, when looking at percentages of people vaccinated in Rhode Island by race, Hispanic or Latinos are the third highest population for being partially vaccinated at 82%, while also being the lowest population for receiving a booster dose.¹⁰ Further, existing literature shows that Hispanic workers are over-represented in front-line lower status occupations and lower status occupations with high-risk exposures to COVID-19.²⁴ Greater work exposure may contribute to a higher prevalence of COVID-19 and a higher prevalence losing a loved one and/or friend among young adults of low social status and young adult members of the RI Hispanic community.

Experiencing a loss of a loved one due to COVID-19 may increase the odds of anxiety or suicide ideation among young adults in RI. Unexpected death of a loved one is often cited as a traumatic life event that elevates the likelihood of a psychiatric condition.²⁵ Thus, it is not surprising that losing someone close to COVID-19 increased the risk of anxiety and suicide ideation. Our results are consistent with other studies of pandemics. One study of mental health outcomes during the COVID-19 and SARS pandemics suggests that suicide ideation and suicide-related outcomes may be elevated during pandemics because individuals are fearful of infection, worried about others, and social isolation.²⁶ Similarly, in another study of the HIV/AIDS pandemic, the loss of a loved one left bereaved individuals with higher levels of anxiety and other depressive symptoms, which included suicide ideation.²⁷ Lastly, it is plausible that those who lost a loved one to COVID-19 may have had an existing mental health condition, which could increase the risk of suicide ideation, as mental illness increases the risk of suicide ideation.²⁸

Limitations

This convenience sample of young adults in Rhode Island was disproportionately female, with a low-percentage of heterosexual cis-males, individuals identifying as Black/African American and Asian, and a relatively higher percentage of sexual or gender minorities and is not likely representative of the young adult population. The survey used self-reported

questions, which may have led to under-reporting of mental health symptoms, and recall and social desirability bias are a concern. It is possible that those with significant mental health symptoms may not have completed this voluntary web-based survey and therefore prevalence of anxiety, depression and suicide ideation may be underreported. This was also a cross-sectional survey, and causality cannot be assumed. Despite its limitations, this study is among the few studies that examined the mental health of young adults who lost a family member or friend to COVID-19, and it offers insight into the mental health effects of losing a loved one to COVID-19 among young adults in Rhode Island.

Implications

Young adults who have lost someone to COVID-19 could benefit from interventions to manage loss and grief and thereby reduce the likelihood of developing, or exacerbating, depression, anxiety, or suicide ideation. Medical and public health practitioners should specifically consider ways to design interventions that can target Hispanic and low SES populations without increasing stigma or prejudice. Following the recommendation of the National Academic of Pediatrics, all youth 12 years and older should be screened for suicide risk through primary care offices, university and college health centers, and community health centers.²⁹ Primary care offices and community health centers should follow the recommendations of the U.S Prevention Service Task Force National Institute of Mental Health to screen for anxiety in young adults.³⁰ While simple questionnaires such as assessments for anxiety (Generalized Anxiety Disorder-7),²⁰ suicide ideation (Ask Suicide-Screening Questions),³¹ and depression (Patient Health Questionnaire-9)³² are routinely utilized by community health clinics and Federally Qualified Health Centers (FQHCs), patients who have experienced the loss of a friend or family member to COVID-19 may benefit from receiving a referral to mental health services specifically for grief counseling. Specific actions for young adults dealing with grief recommended by the Centers for Disease Control and Prevention (CDC) include connecting with other people to honor your loved one, creating memories that have significance to them and the loved one who died, or joining support groups, hotlines, or seeking spiritual support from faith-based organizations.³³ Given the proportion of young adults in RI who have lost a loved one to COVID-19 and the associated consequences, the RI Department of Health should consider launching a public education campaign to increase awareness of the associated mental health consequences of losing a loved one to COVID-19.³⁴ Likewise, college campuses and workplaces, alike, might want to consider launching similar education campaigns such as incorporating mental health literacy training to promote mental health well-being.³⁵ College campuses should consider initiating grief counseling groups or creative programming that would give young adults an opportunity

to share their experiences of loss.³⁶ Workplaces may consider securing an Employee Assistance Program (EAP) if they do not have such a service for employees.³⁷ Workplaces with EAPs might consider working with their vendor to offer grief counseling groups or special programming for employees who have specifically experienced loss of a loved one due to COVID-19.³⁸

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Brain Injury and Substance Use in Young Adults: The Need for Integrating Care

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ABSTRACT

OBJECTIVES: This study examined sociodemographic disparities in traumatic brain injury (TBI), and the association between TBI and substance misuse among young adults in Rhode Island.

METHODS: Among this sample of N=1,022 from the 2022 Rhode Island Young Adult Survey, multivariable logistic regressions were used to examine both study objectives.

RESULTS: Black, Asian, and Hispanic young adults had 77% (95%CI: 26%, 93%), 79% (95%CI: 32%, 94%), and 58% (95%CI: 31%, 75%) lower odds of brain injury, respectively, compared to White, non-Hispanic young adults. Those having experienced brain injury were more likely to engage in hazardous alcohol use ($p = 0.003$), hazardous marijuana use ($p < 0.001$), and illicit drug use ($p = 0.003$), but not OTC or prescription drug misuse.

CONCLUSIONS: There is a pressing need for integrated, large-scale, multidisciplinary programs with a well-trained workforce to address TBI and substance misuse in various medical settings for behavioral health and emergency care.

KEYWORDS: traumatic brain injury, substance use, young adult, Rhode Island

INTRODUCTION

Traumatic brain injury (TBI) is a major public health concern with approximately a 50% lifetime prevalence globally.¹ TBI is defined as a jolt or a blow to the head which causes an acute disruption to brain function; this can manifest as a period of loss of consciousness, confusion, or posttraumatic amnesia. Long-term health consequences of mild TBI are memory loss, periods of confusion, tinnitus, and loss of consciousness.² Concussions are classified as a traumatic brain injury, regardless of severity.³ Mild TBIs are also associated with an increased risk of depression and anxiety.^{3,4} Severe TBIs have significant long-term health consequences such as coma, emotional problems, seizures, and death. Similarly, severe TBI is associated with an increased risk of depression, anxiety, agitation, anger, aggression, and irritability.⁴ This emotional distress can increase suicide attempts, especially in young adults with TBIs.⁵

In the United States, an estimated 1.7 million people sustain a TBI annually.⁶ In Rhode Island between 2016 and 2020, 14,300 individuals were discharged from the emergency department with a TBI diagnosis, 2,769 were admitted to the hospital, and 653 TBI-associated deaths occurred. Of these, 3,401 individuals aged 15–24 years old were admitted to the emergency department with a TBI diagnosis (23.8%), 163 were admitted to the hospital (5.9%), and 28 had TBI-associated fatalities (4.3%). The most common causes of TBI in Rhode Island young adults (15–24 years) during this time were being struck by an object (28.2%), falls (22.8%), and motor vehicle accidents (22.6%).⁷

Available data show that young adults 18–25 years old are at high risk for TBI, following only elderly adults (75+ years) and young children (<5 years).² TBIs sustained during this developmental stage can have a lasting impact. Global function, cognitive function, and motor function can decrease as a result of TBI.⁸ TBI can also cause behavioral and emotional changes.⁹ Young adults with TBIs often have trouble returning to work or higher education due to executive function and cognitive setbacks.¹⁰

Young adults are also at high risk for substance use. Physiologically, the prefrontal cortex responsible for impulse control is still developing,¹¹ and substance use is typically initiated in the teenage years and young adulthood.¹² Rates of substance use tend to be highest in young adulthood and are generally higher among Rhode Island young adults than across the nation. According to the 2019-2020 National Survey on Drug Use and Health, 41% of Rhode Island young adults binge drank compared to 32% of the national young adult population. Similar disparities were found with marijuana use (36% RI vs. 23% US), illicit drug use (34% RI vs. 24% US), and pain reliever misuse (5% RI vs. 4% US).¹³

The relationship between TBI and substance use is likely bidirectional. Substance use can be a risk factor for TBI in all age groups; however, young adults have an increased risk of long-term morbidity compared to older adults, as their brains are still developing.¹⁴ Studies have shown that those suffering from TBI were likely to be found intoxicated from alcohol upon hospital admission,¹⁵ and a history of problem alcohol use is linked to an increased risk of incurring a TBI.¹⁶ Similarly, among those with poor mental health or substance use disorder (SUD), risk of fatal and non-fatal TBI is increased while individuals are under the influence of

substances. Substance abuse also increases risk of motor vehicle accident, which can result in TBI.¹⁶

Conversely, substance use may result from a TBI.¹⁷⁻¹⁹ Some literature suggests that TBI patients have increased risk for developing alcohol use disorder within a year of injury.¹⁷ Another study shows that being a young adult and suspected substance intoxication at the time of TBI were both independently associated with post-TBI substance use disorder. Furthermore, studies examining TBI outcomes show that individuals who exhibit excessive substance abuse can have lower rates of good neuropsychological outcomes such as memory recall and recognition.^{15,20} TBI-related substance abuse is associated with long-term outcomes such as neurological dysfunction, permanent disability, emotional and financial state,²¹ an increased risk of repeated injury,²² and death.²³

There is limited information on TBIs in young adults and even less research on the relationship between TBI and substance use in young adults. The purpose of this study is to: 1) examine any sociodemographic disparities in TBI, and 2) to understand the relationship between TBI and various types of substance use among young adults in Rhode Island. This study aims to expand the knowledge of young adults with traumatic brain injuries and their relationship to substance use.

METHODS

Sample

A cross-sectional analysis was conducted with data from the web-based Rhode Island Young Adult Survey (RIYAS) from May through August 2022. A full description of RIYAS methodology has been previously published.²⁴ The survey resulted in N = 1,022 young adults aged 18–25 years who lived in Rhode Island for at least part of the year, all of whom are included in this study. This study was approved by the Johnson & Wales University Institutional Review Board.

Measures

The primary exposure of this study is having experienced a brain injury. This was assessed by the question, *have you ever experienced a significant head injury, brain injury, or a concussion?* Response options included *Yes, in the past year*, *Yes, more than a year ago*, and *No*. This measure was dichotomized as those having ever experienced a brain injury or never have experienced a brain injury.

The primary outcomes in this study include hazardous alcohol use, hazardous marijuana use, over the counter (OTC) drug misuse, prescription drug misuse, and any illicit drug use. Hazardous alcohol use was assessed by the Alcohol Use Disorders Identification Test (AUDIT) score generated from 10 items.²⁵ This valid and reliable assessment includes eight items about drinking behaviors with various frequency responses, for example, ranging from *never* to *daily or almost*

daily.²⁶ The final two items had response options *never, yes, but not in the past year, or yes, during the past year*. The assessment was scored according to scoring instructions. Scores of 8 or more were considered hazardous alcohol use. Interitem reliability was $\alpha = 0.82$. Hazardous marijuana use was assessed via the Cannabis Use Disorders Identification Test - Revised (CUDIT-R).²⁷ This valid and reliable assessment includes eight items total: seven about marijuana use behaviors with various frequency responses on a 5-point Likert scale, for example, ranging from *never* to *daily or almost daily* and the final question, *Have you ever thought about cutting down, or stopping, your use of cannabis?* had response options *never, yes, but not in the past 6 months, or yes, during the past 6 months*.²⁸ The assessment was scored according to scoring instructions. Scores of 8 or more indicated hazardous marijuana use. Interitem reliability was $\alpha = 0.82$. OTC drug misuse, prescription drug misuse, and any illicit drug use were all assessed by similar questions: *Have you ever used over-the-counter medication for non-medical reasons?*, *Have you ever used prescription drugs not prescribed to you?*, or *Have you ever used illegal/illicit drugs or club drugs?* Response options *yes, in the past month* or *yes, more than a month ago* were both considered affirmative responses for use, and all variables were dichotomized.

Several covariates that may be associated with brain injury and substance use were included in the study. Covariates included sexual and gender identity (*cisgender heterosexual males, cisgender heterosexual females, sexual and gender minorities*), race/ethnicity (*White non-Hispanic, Black, Asian, Hispanic, Multiracial or something else*), age in years, and social status. Social status was measured using the Macarthur Scale of Subjective Social Status,²⁹ which assessed a participant's perceived social rank relative to other members of the community on a scale of 1, meaning *worst off*, to 10, meaning *best off*.

Statistical Analysis

Descriptive statistics such as frequencies and percentages were computed for all variables among the total sample. Bivariable statistics were used to compare covariates and substance use outcomes by brain injury status (Tables 1, 2). Particularly, two-sample t-tests were used for continuous variables, chi-square tests for categorical variables, and Fisher's exact test was used for categorical variables when a single cell had fewer than 5 observations. A multivariable logistic regression was conducted to calculate adjusted odds of brain injury for all covariates including sexual and gender identity, race/ethnicity, and social status (Table 3). Multivariable logistic regressions were also conducted for each of the five substance use outcomes controlling for all covariates (Table 4). All statistical tests were assessed at $\alpha = 0.05$. All analyses were conducted in Stata/SE 15.0.³⁰

RESULTS

Among this sample of Rhode Island young adults, 16.8% (N=172) reported having ever experienced a brain injury, with N=36 reporting the occurrence within the past year (3.5%). Those having ever experienced a brain injury were more likely to be White, non-Hispanic ($p < 0.001$), and older ($p = 0.028$). However, brain injury status did not vary by sexual and gender identity or race/ethnicity (**Table 1**). Substance use outcomes varied in prevalence with the highest engaging in hazardous marijuana use (18.5%), then hazardous alcohol use (15.7%), prescription drug misuse (12.1%), OTC drug misuse (9.2%), and illicit drug use (9.1%). Those having experienced a brain injury were more likely to engage in hazardous alcohol use ($p = 0.003$), hazardous marijuana use ($p < 0.001$), and illicit drug use ($p = 0.003$). However, brain injury status did not vary by OTC or prescription drug misuse (**Table 2**).

The multivariable model for brain injury showed that Black young adults, Asian young adults, and Hispanic young adults had 77% (95%CI: 26%, 93%), 79% (95%CI: 32%, 94%), and 58% (95%CI: 31%, 75%) lower odds of

Table 2. Substance Use Outcomes of Rhode Island Young Adults by Brain Injury

Substance Use Outcomes	TOTAL N=1022 (%)	Never Experienced a Brain Injury N=850 (83.2%)	Ever Experienced a Brain Injury N=172 (16.8%)	P-value
Hazardous Alcohol Use	160 (15.7)	120 (14.1)	40 (23.3)	0.003
Hazardous Marijuana Use	189 (18.5)	136 (16.0)	53 (30.8)	<0.001
OTC Drug Misuse	94 (9.2)	75 (8.8)	19 (11.1)	0.358
Prescription Drug Misuse	124 (12.1)	98 (11.5)	26 (15.1)	0.189
Illicit Drug Use	93 (9.1)	67 (7.9)	26 (15.1)	0.003

Note: P-values were computed using two-sample t-tests for continuous variables, chi-square tests for categorical variables, and Fisher's Exact tests for categorical variables with cell sizes < 5

Table 1. Characteristics of Rhode Island Young Adults by Brain Injury

	TOTAL N=1022 (%)	Never Experienced a Brain Injury N=850 (83.2%)	Ever Experienced a Brain Injury N=172 (16.8%)	P-value
Sexual and Gender Identity				0.069
Cisgender Heterosexual Males	133 (13.0)	107 (12.6)	26 (15.1)	
Cisgender Heterosexual Females	456 (44.6)	393 (46.2)	63 (36.6)	
Sexual and Gender Minorities	433 (42.4)	350 (41.2)	83 (48.3)	
Race/Ethnicity				<0.001
White, non-Hispanic	611 (59.8)	482 (56.7)	129 (75.0)	
Black	54 (5.3)	51 (6.0)	3 (1.7)	
Asian	59 (5.8)	56 (6.6)	3 (1.7)	
Hispanic	210 (20.6)	190 (22.4)	20 (11.6)	
Multiracial or Something Else	88 (8.6)	71 (8.4)	17 (9.9)	
Social Status [mean (SE)]	4.99 (0.05)	5.00 (0.06)	4.98 (0.13)	0.860
Age [mean (SE)]	21.32 (0.07)	21.25 (0.07)	21.63 (0.15)	0.028

Note: P-values were computed using two-sample t-tests for continuous variables, chi-square tests for categorical variables, and Fisher's Exact tests for categorical variables with cell sizes < 5

Table 3. Adjusted Odds of Brain Injury among Rhode Island Young Adults, N=1,022

	Adjusted Odds Ratio	95% CI
Sexual and Gender Identity		
Cisgender Heterosexual Males	1.00 ref	
Cisgender Heterosexual Females	0.66	0.39, 1.10
Sexual and Gender Minorities	0.93	0.56, 1.55
Race/Ethnicity		
White, non-Hispanic	1.00 ref	
Black	0.23	0.07, 0.74
Asian	0.21	0.06, 0.68
Hispanic	0.42	0.25, 0.69
Multiracial or Something Else	0.90	0.51, 1.59
Social Status	1.00	0.90, 1.10
Age	1.08	0.99, 1.17

Note: Adjusted odds ratios were calculated using multivariable logistic regression

Table 4. Adjusted Associations Between Brain Injury and Substance Use Outcomes among Rhode Island Young Adults, N=1,022

	Adjusted Odds Ratio	95% CI
Hazardous Alcohol Use	1.72	1.14, 2.60
Hazardous Marijuana Use	2.26	1.53, 3.34
OTC Drug Misuse	1.29	0.74, 2.21
Prescription Drug Misuse	1.33	0.82, 2.15
Illicit Drug Use	1.89	1.14, 3.15

Note: Adjusted odds ratios for each substance use outcome were calculated using multivariable logistic regressions controlling for sexual and gender identity, race/ethnicity, social status, and age.

brain injury, respectively, compared to White, non-Hispanic young adults while controlling for sexual and gender identity, social status, and age. There were no other significant associations with brain injury in the multivariable model (Table 3).

Multivariable logistic regressions for substance use outcomes showed that brain injury increased the odds of hazardous alcohol use by 72% (95%CI: 14%, 160%), hazardous marijuana use by 126% (95%CI: 53%, 234%), and illicit drug use by 89% (95%CI: 14%, 215%), controlling for all covariates. Brain injury was not significantly associated with OTC or prescription drug misuse (Table 4).

DISCUSSION

The current study suggests that older and White young adults were more likely to experience TBI. White young adults have greater access to information and health care services for TBIs, thus allowing for higher reporting of these experiences.³¹ Literature suggests that the overall rate of TBI varies by race among young adults. Black youth have been less likely to visit the emergency department for suspected TBI than White youth.³² One study found that Black Americans were more likely to acquire a TBI through violence compared to White Americans.³³

In this study, TBI in young adults was associated with hazardous alcohol use, hazardous marijuana use, and illicit drug use, but not with OTC and prescription drug misuse. The literature shows that being a young adult and suspected substance intoxication at the time of TBI was associated with post-TBI substance use disorder.³⁴ Multiple studies have shown that TBI survivors were more likely to experience alcohol misuse post-injury which was associated with an increased risk for future TBIs.^{6,35-37} Substance abuse can also be a causal factor in TBIs via falls, crashes, or assaults.³⁸ A study at various Level 1 trauma centers throughout the US showed young adults were most likely to test positive for substance use via urine toxicology screening while being assessed for a suspected TBI.³⁹ Adolescents with a history of TBI had greater rates of binge drinking, hazardous drinking, consuming illegal drugs, cannabis (aOR=2.4), and drug problems (aOR=2.1) compared to those who were never injured.⁴⁰

Limitations

While this study offers a novel examination into the association between TBI and substance use among young adults in Rhode Island, it is not without limitations. First, this is a cross-sectional study design and causality cannot be inferred. Specifically, it is not clear whether self-reported TBIs occurred before or after the assessed substance use outcomes – this is always hard to tease out given the plausible bidirectional relationship.^{1,14,41} This is also a convenience sample, and is skewed female and sexual/gender minority, likely not representative of the young adult population and

may underestimate the prevalence of TBI, as many studies suggest males have higher rates.² This underestimate of concussions may be underestimates of sports- or physical-activity-related concussions associated with low representation of males in the sample. However, prior literature suggests that sports-related concussions are significantly associated with substance use across various substances, and therefore are unlikely to bias the findings herein.⁴² Finally, given the self-report nature of the survey, it is likely minor concussions may be under-reported due to lack of awareness, and substance misuse may also be under-reported due to social desirability bias.

Implications

Since TBI and substance use disorders tend to overlap and exacerbate one another, screening, treatment, and referrals should be integrated across the continuum of care. Patients with co-morbid TBI and SUD may require adapted communication due to neurological deficits, some expected noncompliance due to executive function challenges, compensatory strategies for other cognitive challenges, and additional long-term community support.⁴ For these integrated programs to be successful, patient engagement and empowerment must be incorporated into person-centered care.¹ This highlights the pressing need for behavioral health providers to be better trained and equipped to identify TBIs and address neurologic impairments across treatment modalities.

Adapting to a patient's needs as they relate to TBI can improve patient engagement and treatment benefits; however, a TBI must first be identified.⁴³ Studies suggest TBI assessment can help delineate between mental health and neurologic symptoms, leading to better mental health referrals and improved clinical care decisions.^{39,44} While evidence-based short screening tools are available to administer during behavioral health sessions, TBIs are still underrecognized by providers.⁴³ Failure to detect TBI in SUD patients often results in misdiagnosis or inappropriate treatment and rehabilitation plans.¹⁶ Greater uptake of evidence-based TBI screening is needed.

Screenings for mental health and substance use disorders in the triage and emergency departments should also be introduced. Studies suggest that standardized data collection and review of mental health and substance use histories during initial TBI hospital presentations can aid in identifying patients at risk for developing mental illness or substance use disorder.⁴⁵ Unfortunately, this screening is not standard across medical facilities and the intervention and follow-up of substance use disorder in TBI patients is low.³⁹

CONCLUSION

While small-scale, single-program initiatives exist, there is a need for larger-scale, multidisciplinary programs to address TBI and SUD in various medical settings for behavioral

health and emergency care.¹ Increased workforce capacity with appropriate training, knowledge, and resources is needed for integrated behavioral healthcare to better address the short- and long-term needs of young adults with TBI and SUD.

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The Mental Health Burden of Racial Discrimination in Young Adults in Rhode Island

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ABSTRACT

OBJECTIVES: This study examined the association between racial discrimination and depressive symptoms among Rhode Island young adults.

METHODS: The 2022 Rhode Island Young Adult Survey recruited 1,022 young adults aged 18-25 years who lived in Rhode Island for at least part of the year. Multivariable logistic regression for depressive symptoms controlled for sexual and gender identity, race/ethnicity, social status, age, employment, and student status.

RESULTS: 23.6% of young adults reported experiencing racial discrimination in childhood and/or adulthood. Odds of depressive symptoms increased for experiences of childhood racial discrimination (+70%; 95%CI: 14%, 155%) and any racial discrimination (+56%; 95%CI: 6%, 130%), but not for racial discrimination in adulthood (+38%; 95%CI: -8%, 108%).

CONCLUSIONS: Experiences of racial discrimination increase odds of depressive symptoms among young adults. Prevention measures such as universal screening for childhood adversity, incorporating antiracism education into all institutional settings, and continued nondiscrimination policy and enforcement should be employed.

KEYWORDS: discrimination, racism, mental health, depression, young adults

INTRODUCTION

In 2019, young adults aged 18–29 in the United States exhibited a depressive symptom rate of 21%, and experienced greater increases in these symptoms from the years 2017–2020 compared to any other adult age group.^{1,2} This increasing prevalence is due mostly to the disruptions to life stemming from the COVID-19 pandemic, causing psychological, emotional, and physical harm.³ In Rhode Island, 43.2% of young adults experienced depressive symptoms in 2020, more than double the national estimate of major depressive episode.^{4,5} In addition, 11.7% of Rhode Island young adults had serious thoughts of suicide during 2017–2019, where the risk of death by suicide in racial and ethnic minority populations is highest under the age of 30.^{6,7} Of

the Rhode Island young adult population, sexual and gender minorities (SGMs) suffered a disproportionate burden of depressive symptoms (68% of those who are not heterosexual, 59% who identify as neither male nor female) compared to males and females and those who identify as heterosexual (36%, 45%, and 34%, respectively).⁴

A potential risk factor for mental illness in young adults is the experience of racial discrimination. Racial discrimination typically involves injurious, negative, unfair, or hostile treatment because of behavioral manifestations of prejudice.⁸ The Black Lives Matter movement, coupled with the COVID-19 pandemic, marked 2020 as the crux of heightened racial tensions in the United States.^{9,10} The spread of COVID-19 in the United States (US) was accompanied by an increase in discrimination and racism against Asian Americans, where 31% reported that they had experienced racial slurs and insults since the pandemic began.¹¹ The use of the term “Chinese virus” by prominent politicians, including former president Donald Trump, increased xenophobia, and anti-Asian sentiment.¹² Concurrently, the Black Lives Matter movement made strides in advancing policies and practices to protect minority groups, and it also gave rise to multiple counter-movements and negative stances that generated hostile social environments toward Black people.¹³

Prior research suggests that experiencing prejudice and discrimination puts one at higher odds of experiencing depressive symptoms, and this is true for multiple racial and ethnic groups.^{14,15} For example, a scoping review reported that 81% of published studies found a clear positive association between experiencing discrimination and depressive symptoms in African Americans, and general poor mental health, depression, and anxiety were associated with experiencing racism in Aboriginal populations.^{16,17} Similar findings have been reported in individuals who identify as transgender and experiencing discrimination-related stressors was associated with suicide ideation in young adults who identify with the larger LGBT population.¹⁸

To our knowledge, no study has examined rates of racial discrimination and depressive symptoms in Rhode Island young adults, nor have they analyzed the association between racial discrimination in childhood or adulthood and depressive symptoms in this population. Therefore, the present study aims to examine the prevalence of racial discrimination among Rhode Island young adults and its

association with depressive symptoms. We hypothesize that experiencing racial discrimination increases the odds of depressive symptoms, and more so when experienced in childhood than adulthood.

METHODS

Sample

The 2022 Rhode Island Young Adult Survey (RIYAS) is a web-based, cross-sectional survey administered from May through August 2022. A full description of RIYAS methodology is in (whatever the citation is).¹⁹ The survey resulted in $N = 1,022$ young adults aged 18-25 years who lived in Rhode Island for at least part of the year, all of whom are eligible and included in this study. This study was approved by the Johnson & Wales University Institutional Review Board.

Measures

The primary outcome of the study was depressive symptoms. Depressive symptoms were measured using the Center for Epidemiological Study Short Depression Scale (CES-D10). The CES-D10 contains 10 items regarding past week experiences of symptoms related to the development of depression ($\alpha = 0.83$). For example, items include *I felt hopeful about the future*, and *I felt lonely*. The response options ranged from were rarely or none of the time, which was coded as 0, to all of the time, coded as 3. Reverse scoring was implemented for two of the items. Total continuous depressive symptom scores could range from 0 to 30 with higher scores suggesting greater severity of symptoms. Consistent with the literature, a cut-off of 10 or higher was indicative of having depressive symptoms. The CES-D10 has shown strong test-retest reliability and convergent validity in youth and adult populations.²⁰ In this sample, the inter-item correlation according to Cronbach's alpha was $\alpha = 0.85$.

The primary exposures in this study were racial discrimination in childhood, racial discrimination in adulthood, or experiencing any racial discrimination. These exposures were defined by responses to a single survey question, *were you treated badly or unfairly because of your race or ethnicity?* Response options included *Yes, in childhood*, *Yes, in adulthood*, or *No, never*. Those responding *Yes, in childhood* or *Yes, in adulthood* were considered to have experienced racial discrimination in childhood and racial discrimination in adulthood, respectively. Experiencing any racial discrimination was defined by either childhood or adulthood experiences.

Other potential confounders and covariates considered in the analysis include sexual and gender identity (cisgender heterosexual males, cisgender heterosexual females, sexual and gender minorities), race/ethnicity (White non-Hispanic, Black, Asian, Hispanic, Multiracial or something else), social status, age in years, employment (None, Part-Time, Full-Time), and student status. Social status was measured

using the MacArthur Scale of Subjective Social Status (Adler et al, 2000), which assessed a participant's perceived social rank relative to other members of the community on a scale of 1, meaning worst off, to 10, meaning best off.²¹

Statistical Analysis

Descriptive statistics, namely frequencies and percentages, were calculated to describe the total sample by all variables, as well as by all primary exposure variable: racial discrimination in childhood, racial discrimination in adulthood, and experiencing any racial discrimination. Frequency and prevalence of the primary racial discrimination exposure variables were described by racial/ethnic group in the total sample. Bivariable statistics such as chi-square tests for categorical variables and t-tests for continuous variables were applied to assess differences in depressive symptoms and all other covariates by each exposure variable. Crude odds ratios were computed using bivariable logistic regressions for the relationships between each of the primary exposures and depressive symptoms. Multivariable logistic regressions of depressive symptoms were conducted for each of the primary exposures separately while controlling for sexual and gender identity, race/ethnicity, social status, age, employment, and student status. All statistical tests were assessed at $\alpha = 0.05$. All analyses were conducted in Stata/SE 15.0.²²

RESULTS

This sample of Rhode Island young adults was predominantly White non-Hispanic (59.8%), cisgender heterosexual female (44.6%), comprised of students (70.4%), and part-time employees (45.8%). Depressive symptoms were highly prevalent with 51.0% ($N = 521$) meeting the definition (Table 1).

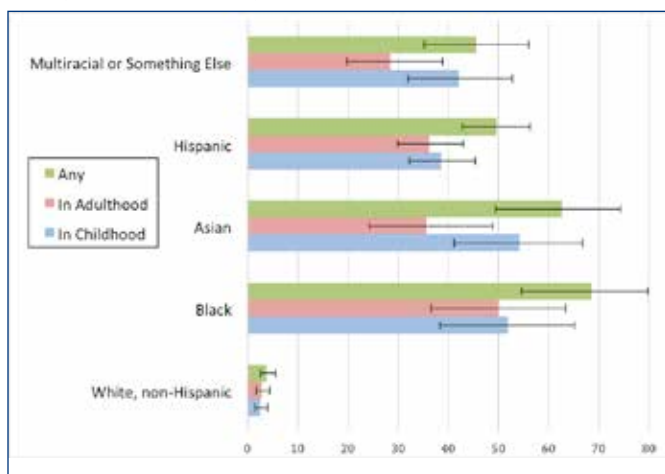
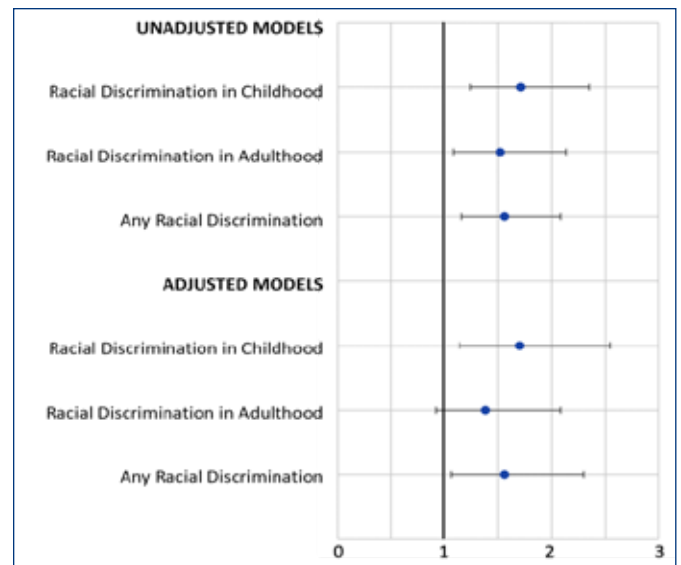
Racial discrimination in adulthood was less prevalent with 18.9% reporting experiences in childhood, 16.2% reporting experiences in adulthood, and 23.6% reporting an experience at all. There was variation in racial discrimination overall, in childhood, and in adulthood by race/ethnicity. Particularly, 68.5% of Black young adults reported racial discrimination, Asian young adults 62.7%, Hispanic young adults 49.5%, Multiracial or other race 45.5%, and White non-Hispanic young adults with only 3.8% (Figure 1).

Any racial discrimination, racial discrimination in childhood, and discrimination in adulthood all varied significantly by race/ethnicity ($p < 0.001$), social status ($p \leq 0.01$), and depressive symptoms ($p \leq 0.015$). Racial discrimination in childhood was also significantly different by sexual and gender identity ($p = 0.013$) and employment status ($p = 0.033$). Similarly, experiences of any racial discrimination were different by employment status ($p = 0.032$). Racial discrimination in adulthood did not vary by sexual and gender identity ($p = 0.326$) nor employment status ($p = 0.383$; Table 1). From crude logistic regression models, odds of depressive symptoms increased for each primary exposure: racial

Table 1. Sociodemographic Characteristics of Rhode Island Young Adults by Any Race Discrimination, in Childhood, or Adulthood

	TOTAL N=1022 (%)	Racial Discrimination in Childhood N = 193 (18.9%)	p-value	Racial Discrimination in Adulthood N = 166 (16.2%)	p-value	Any Racial Discrimination N = 241 (23.6%)	p-value
Sexual and Gender Identity			0.013		0.326		0.117
Cisgender Heterosexual Males	133 (13.0)	20 (10.4)		19 (11.5)		28 (11.6)	
Cisgender Heterosexual Females	456 (44.6)	73 (37.8)		68 (41.0)		97 (40.3)	
Sexual and Gender Minorities	433 (42.4)	100 (51.8)		79 (47.6)		116 (48.1)	
Race/Ethnicity			<0.001		<0.001		<0.001
White, non-Hispanic	611 (59.8)	15 (7.8)		17 (10.2)		23 (9.5)	
Black	54 (5.3)	28 (14.5)		27 (16.3)		37 (15.4)	
Asian	59 (5.8)	32 (16.6)		21 (12.7)		37 (15.4)	
Hispanic	210 (20.6)	81 (42.0)		76 (45.8)		104 (43.2)	
Multiracial or Something Else	88 (8.6)	37 (19.2)		25 (15.1)		40 (16.6)	
Social Status [mean (SE)]	6.00 (0.05)	5.71 (0.13)	0.010	5.54 (0.15)	<0.001	5.65 (0.11)	<0.001
Age [mean (SE)]	21.32 (0.07)	21.16	0.237	21.3 (0.15)	0.925	21.21 (0.13)	0.378
Employment			0.033		0.383		0.032
No	216 (21.1)	53 (27.5)		40 (24.1)		65 (27.0)	
Yes, Part-Time	468 (45.8)	87 (45.1)		78 (47.0)		106 (44.0)	
Yes, Full-Time	338 (33.1)	53 (27.5)		48 (28.9)		70 (29.1)	
Student			0.206		0.550		0.298
No	303 (29.7)	50 (25.9)		46 (27.7)		65 (27.0)	
Yes	719 (70.4)	143 (74.1)		120 (72.3)		176 (73.0)	
Depressive Symptoms			0.001		0.015		0.003
No	501 (49.0)	74 (38.3)		67 (40.4)		98 (40.7)	
Yes	521 (51.0)	119 (61.7)		99 (59.6)		143 (59.3)	

NOTE: Bivariable tests conducted were chi-square for categorical variables and t-tests for continuous variables

Figure 1. Prevalence (%) of Racial Discrimination by Race/Ethnicity among Rhode Island Young Adults**Figure 2.** Odds of Depressive Symptoms among Rhode Island Young Adults

NOTE: AORs control for sexual and gender identity, race/ethnicity, social status, age, employment, and student status

discrimination in childhood by 71% (95%CI: 24%, 135%), in adulthood by 52% (95%CI: 8%, 113%), or at all by 56% (95%CI: 16%, 108%). Findings from the multivariable logistic regressions were consistent with crude results for childhood racial discrimination (70%; 95%CI: 14%, 155%) and any racial discrimination (56%; 95%CI: 6%, 130%), but the association with racial discrimination in adulthood (38%; 95%CI: -8%, 108%) was no longer significant (**Figure 2**).

DISCUSSION

This study aimed to explore and highlight the disproportionate prevalence of racial discrimination among young adults in Rhode Island as well as examine the relationship between racial discrimination and depressive symptoms. More than 1 in 5 Rhode Island young adults reported experiencing racial discrimination, with Black and Asian young adults reporting the highest prevalence. Yet, all young adult persons of color reported much higher rates of racial discrimination compared to White non-Hispanic young adults. Interestingly, Asian young adults had the highest prevalence of racial discrimination in childhood, while Black young adults reported the highest prevalence in adulthood. A nationally-representative sample of US adults from 2016 suggests a prevalence of 44% for lifetime race discrimination experiences, with people of color reporting much higher rates (63%), including high rates for the Asian population (57%) – consistent with our study findings. The lower overall rate of race discrimination in our study was likely due to having a younger sample, and having a White, non-Hispanic population much less likely to report racial discrimination than in the national study (4% versus 30%, respectively).²³

Our study findings also suggest experiences of racial discrimination are associated with depressive symptoms – consistent with current knowledge and confirming our hypothesis.^{14,15} The physiological effects of discrimination are extensive, a few of which being anxiety, cardiovascular irregularities, heightened inflammation, depressive symptoms (as supported by the current study), and even shortened telomere length leading to early aging.²⁴ Research suggests that people of color experience stress and/or trauma from individual, institutional, and cultural experiences of racism. This concept is supported by the Race-Based Traumatic Stress Injury Model. This model suggests that experiences of racism result in emotional injury or traumatic stress, much like symptomatic responses from post-traumatic stress. The extent of this emotional injury is dependent upon the individual facing racism, the extent and severity of the experience, their perception of the experience, and their ability to cope. Race-based traumatic stress injury can lead to symptoms of psychopathology and can be particularly harmful to children who tend to lack the necessary coping strategies.^{24,25}

This study found that those who experienced racial discrimination during childhood may have even higher odds of

depressive symptoms than those who experienced discrimination in adulthood – also consistent with our hypothesis. Those who experience adversity during childhood are at an increased risk for abnormal variations in brain development that can result in physical, psychological, and behavioral consequences.^{26,27} This can be explained through biological embedding, whereby early life stress creates pro-inflammatory tendencies at the cellular level, hypervigilant responses to challenge, and decreased sensitivity to inhibitory signaling, all of which can be carried into adulthood.²⁸ Increases in inflammation due to adverse childhood experiences can serve as a pathway to depression later in life.²⁹ Adults are less vulnerable to the effects of adversity because the brain's neural networks are well established and unlikely to become altered as significantly as a child's brain when experiencing stress.³⁰

Limitations

Despite its novelty, this study has some limitations. First, self-reported racial discrimination is a subjective metric, and each person's perception of discrimination, whether structural, institutional, or individual, may vary. Also, the measures of racial discrimination were lifetime experience, but did not account for severity or frequency, which likely has a dose-response relationship with poor mental health which could not be examined in this study.³¹ Second, this is a cross-sectional study and a causal relationship between discrimination and depressive symptoms cannot be inferred. Finally, despite using a valid and reliable assessment for depressive symptoms, individuals meeting the definition cannot be assumed to meet the threshold for diagnosis.

Implications

Racism is a significant social determinant of health and an adverse childhood experience. To improve health equity for all, it is imperative that society comes together to combat it.³² In order to prevent racism, changes must be made at all social-ecological levels including public policy, institutional, community, and individual. Racism prevention can likely never be absolute; therefore, we must implement measures by which the plausible causal pathway from experiences of racial discrimination, particularly in childhood, to depressive symptoms can be disrupted. Interventions on the public policy level should encourage positive youth engagement. This can be accomplished by creating strong relationships and dialogue between practitioners, policy makers, and youth to fostering stronger and healthier communities.³³⁻³⁵ Increased awareness and ratification of the United Nations Convention on the Rights of the Child (UNCRC), the “gold standard” for children's rights, will help ensure that every child has the right to protection from violence, an education that enables them to fulfill their potential, a healthy relationship with their parents, and the ability to express their opinions. While the United States signed the

UNCRC, it remains the only United Nations member state to have not ratified it. Children should be informed, through their teachers, parents, doctors, or other adult figures, that they have a right to advocate for themselves against racial discrimination by reporting these experiences directly to the UNCRC, and systems should be in place to make this process more accessible.³⁶

Implementing antiracism education into all institutional settings by hiring educators and workplace administrators with equity-based abilities, or the ability to identify, respond to, and remedy inequities in their subtlest forms, can help sustain environments less prone to race discrimination.³⁷ Efforts at the clinical level should include training in culturally competent care, universal screening for childhood adversity and racism-related social determinants of health, as well as the early application of trauma-informed mental healthcare.³⁸⁻⁴⁰ Community-level interventions should include peer and authority engagement when witnessing or experiencing racial discrimination. Programs meant to promote bystander responses to discrimination, such as "Speak Out Against Racism" (SOAR), should be applied in schools and community-based initiatives to educate on appropriate response strategies to witnessing racism.^{41,42} Evidence-based practices should be implemented at the individual level to improve the individual trauma response, such as interventions to cultivate social connectedness and self-compassion, mindfulness, and resiliency.⁴³⁻⁴⁵

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Pornography: A Concealed Behavior with Serious Consequences

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ABSTRACT

OBJECTIVES: The purpose of the current study was to estimate prevalence of pornography use and addiction in Rhode Island young adults, identify sociodemographic disparities, and determine if use and addiction were associated with mental illness.

METHODS: Data from n=1022 participants of the Rhode Island Young Adult Survey were used. Pornography use and addiction, depression, anxiety, and suicide ideation were assessed. Multivariable logistic regressions controlled for age, social status, sex, gender, sexual orientation, and race/ethnicity.

RESULTS: 54% indicated pornography use; 6.2% met the criteria for addiction. Odds of pornography use were 5 times higher (95%CI=3.18,7.71), and addiction 13.4 times higher (95%CI=5.71,31.4) among heterosexual cis-males. Pornography addiction was associated with increased odds of depression (OR=1.92, 95%CI=1.04,3.49) and suicide ideation (OR=2.34, 95%CI=1.24,4.43).

CONCLUSIONS: Pornography use is highly prevalent, and addiction may be associated with mental illness. New screenings, media literacy training, and developing new therapeutic interventions should be considered.

KEYWORDS: pornography, addiction, depression, suicide, young adults

Religion (NSYR) studies, respectively.¹ Rates among women were 38% and 33%, respectively.¹ Further, 47% of men in the NFSS studies viewed pornography more than once a month, compared to 14% of men in the NSYR study.¹ In a sample of college students, 73% reported seeing online pornography before the age of 18, and the prevalence of lifetime pornography use was 57% in a separate sample of U.S. college students.^{2,3} Data from 1,565 male Italian high school seniors suggested that 22% considered pornography part of their routine schedule.⁴

Data on the prevalence of pornography addiction is scarce, potentially because pornography addiction has yet to be accepted by the American Psychiatric Association (APA) as a diagnosis and has not been listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5).⁵ Among a sample of 1,056 adults in the United States (US) who viewed some pornography within the past year, 11% of men and 3% of women self-reported pornography addiction.⁶ Among approximately 9,000 US adults who had used the internet to access sex-related content, 8% reported problems consistent with a behavioral disorder, while 50.7% of US college students with recent pornography use displayed symptoms of problematic or addictive use.^{3,7} There is ongoing discussion on whether the development and maintenance of the disorder is similar to other behavioral addictions, such as gambling or gaming, or if it is a distinct disease, specifically because those addicted have a lack of ability in controlling their thoughts, fantasies and viewing of pornography despite its negative consequences.⁵

INTRODUCTION

Epidemiology

Pornography use and pornography addiction are not routinely measured in surveillance studies, and prevalence estimates are derived from either single surveys or small epidemiological investigations. For example, 54% of men, 18–39 years old, self-reported past year pornography use in the 2008-2014 General Social Survey, which was twice the rate as women (27%).¹ In the 2014 Relationships in American (RIA) survey, 69% of men and 40% of women reported past year pornography use.¹ Past week use was 46% and 16%, respectively.¹ Among 18–23 year old men, past year use was 68% and 66% in the 2012 New Family Structures Study (NFSS) and 2008 National Study of Youth and

Risk Factors

There are individual, social, and structural risk factors for pornography use and addiction. Demographically, men are more likely to visit pornographic websites than women.⁸ Socially, women have reported decreased pornography use because of greater parental supervision of online behaviors, which prevented them from staying on the internet for long periods of time and limited their chances of visiting pornographic websites.⁸ Structurally, online pornography use is enhanced by the “Triple A factors.”⁹ Consisting of accessibility, affordability, and anonymity, these three factors are strongly correlated to problematic online pornography use (POPU).⁹ The anonymous nature of online communications and website viewing allows pornography to be viewed

without being connected to identifying information.⁹ Online pornography is low cost, and often free, which increases the proportion of the population that can access such material, and the nature of digital media allows pornography content to be easily accessed on demand to any individual with an internet connection.⁹

Pornography and Mental Health

Research suggests that individuals who view pornography may become fixated on thoughts associated with pornographic content, which diminishes their ability to form interpersonal relationships and causes them to withdraw from social settings.¹⁰ Despite this, there are few studies that have explored the relationship between pornography use or addiction and mental health. Among US college students, depression, anxiety, and stress scores were highest among participants with recent pornography use, and the relationship was consistent among men and women.³ Pornography use has been previously associated with psychosomatic symptoms of mental illness, such as headache, stomach-ache, nervousness, irritation, stress, and trouble sleeping.¹¹ Pornography use may influence the development of depression symptoms in some adolescents.¹¹ Anxiety symptoms, including feeling of irritation and agitation, may occur when pornographic material cannot be accessed as well as due to sleep deprivation caused by the continuous watching of pornography.³ Finally, problematic pornography use was associated with depression, anxiety, post-traumatic stress disorder, and insomnia, but not suicide ideation, in US veterans.¹²

Current Study

There is limited information on the use of pornography and prevalence of pornography addiction. There is also limited information on the mental health effects of pornography use. In response, the current study sought to a) estimate the prevalence of pornography use and addiction; b) identify sociodemographic disparities in pornography use and addiction; and c) identify associations between pornography use or addiction and mental illness in a sample of US young adults. It was hypothesized that pornography use and addiction would be higher among men, and that pornography use and addiction would be positively associated with depression, anxiety, and suicide ideation.

METHODS

Sample

A cross-sectional analysis was conducted using data from the 2022 Rhode Island Young Adult Survey (RIYAS). A full description of RIYAS methodology was previously published.¹³ Briefly, $n = 1022$ young adults, 18–25 years old, who lived in Rhode Island for at least part of the year, were recruited to complete a web-based survey from May through August 2022.

Measures

Pornography use was assessed by asking how many days in an average month participants viewed pornography. Because of a zero-heavy, positively skewed distribution, responses were dichotomized into those who did not view pornography in an average month and those who viewed pornography 1 or more times in an average month. Pornography addiction was assessed using the Problematic Pornography Consumption Scale (PPCS-6).¹⁴ The PPCS-6 contains 6 items, with each measure based on one component of the 6-component addiction model (i.e., salience, tolerance, mood modification, relapse, withdrawal, conflict measures).¹⁵ Responses were collected on 7-point Likert scales ranging from never (coded as 1) to all the time (coded as 7).¹⁴ Responses were aggregated across items through summation ($\alpha = 0.87$, range = 6–42). Pornography addiction was defined as having an aggregate score ≥ 20 on the PPCS-6. Previous research suggests that the PPCS-6 has a sensitivity of 84.2% and specificity of 90.1% in population-based samples.¹⁴

Depression was assessed using the Center of Epidemiologic Studies Depression Scale, 10-item version (CES-D10), which contains 10 items with responses collected on 4-point Likert scales ranging from rarely or none of the time (coded as 0) to most of the time (coded as 3).^{16,17} Responses were aggregated across items by summation ($\alpha = 0.75$), and scores ≥ 10 indicated depression.¹⁷ Anxiety was measured using the Generalized Anxiety Disorder 7-item scale (GAD-7).¹⁸ Responses were collected on 4-point Likert scales ranging from not at all (coded as 0) to nearly every day (coded as 3) and aggregated by summation ($\alpha = 0.93$).¹⁸ Scores of ≥ 10 indicate clinically significant anxiety.¹⁸ Suicide ideation was measured using a single item: During the past 12 months, did you ever seriously consider attempting suicide? with response options of no and yes.

Sociodemographic variables included age, social status, sex, gender, sexual orientation, race/ethnicity, student status, and employment status. Social status was measured using the MacArthur Scale of Subjective Social Status, which asks participants to rank themselves relative to others in the community on a scale from worst off (coded as 1) to best off (coded as 10).¹⁹ Sex, gender, and sexual orientation were collapsed into heterosexual cis-female, heterosexual cis-male, and any sexual or gender minority (SGM). Race/ethnicity categories included Asian, Black/African American, Hispanic, White, and Other or more than 1 race. Student and employment status were collapsed to categorize participants as not a student/employed, student/not employed, student/employed, and not a student/not employed.

Analysis

Descriptive statistics for key variables were computed. The analysis then proceeded in two steps. First, multivariable logistic regression models were specified to determine if any of the sociodemographic variables were associated

with pornography use and pornography addiction. Age and social status were included as normally distributed continuous variables. For the categorical variables, heterosexual cis-females, White, and not a student/not employed participants were the reference groups. Second, unadjusted and adjusted logistic regression models were specified to determine if pornography use and pornography addiction were associated with depression, anxiety, and suicide ideation. Adjusted models controlled for age, social status, sex/gender status, race/ethnicity, and student/employment status. The analysis was conducted with SPSS v28.0 (Armonk, NY: IBM Corp), and statistical significance was determined using 95% confidence intervals (CI).

RESULTS

Demographic and mental health characteristics of the sample have been previously described.¹³ Briefly, mean age was 21.3 years old (SD = 2.1); approximately 45% of the sample were heterosexual cis-females, with 43% identifying as a SGM; and the sample was predominantly White, non-Hispanic (59.8%) (Figure 1). A majority of participants (55%) were current students who were also actively employed, and mean social status was 5.0 (SD = 1.7). A majority (51.0%) self-reported depression, with approximately 38% and 15% reporting anxiety and suicide ideation, respectively. Among the full sample, 54% of participants indicated pornography use, and 6.2% met the criteria for pornography addiction (Figure 2). The prevalence of pornography use and addiction are depicted in Figures 3 and 4, respectively.

In multivariable analysis, there were several sociodemographic predictors of pornography use. The odds of pornography use for heterosexual cis-males were approximately 5 times (OR[95%CI] = 4.95 [3.18, 7.71]) and for SGMs 2.7 times (OR[95%CI] = 2.67 [2.02, 3.54]) those of heterosexual cis-females (Figure 2). Odds of pornography use increased with each one-year increase in age (OR[95%CI] = 1.14 [1.06, 1.22]). Odds of pornography use were also 93% higher among persons identifying as Asian (OR[95%CI] = 1.93 [1.07, 3.49]) and 72% higher among persons identifying as Other or more than 1 race (OR[95%CI] = 1.72 [1.05, 2.82]) relative to those identifying as White, non-Hispanic. (Figure 5)

The odds of pornography addiction for heterosexual cis-males were approximately 13.4 times (OR[95%CI] = 13.4 [5.71, 31.4]) and for SGMs 3.7 times (OR[95%CI] = 3.67 [1.64, 8.22]) those of heterosexual cis-females (Figure 3). No other disparities in addiction were noted. (Figure 6)

In the unadjusted analysis, odds of depression (OR[95%CI] = 1.36 [1.07, 1.74]) and suicide ideation (OR[95%CI] = 1.68 [1.17, 2.41]) were increased among participants with average monthly pornography use (Table 1). However, these relationships were not maintained after adjustment for sociodemographic variables. Conversely, pornography addiction remained significantly associated with depression and

Figure 1. Participant sociodemographic characteristics

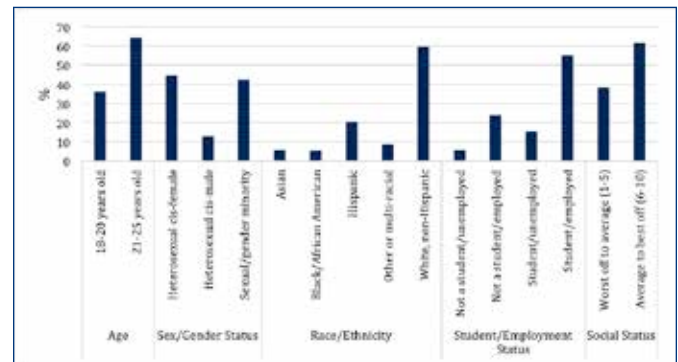


Figure 2. Prevalence of [A] pornography use and [B] pornography addiction

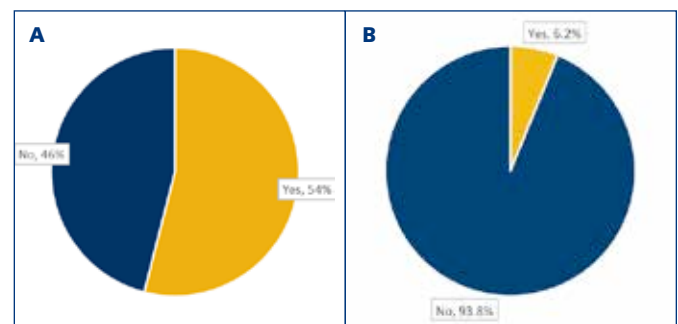


Figure 3. The prevalence of pornography use by sociodemographic characteristics

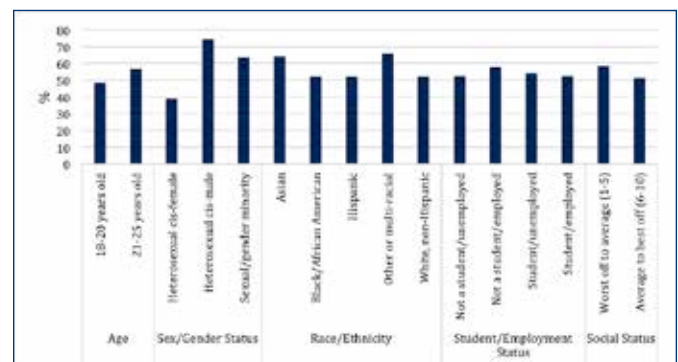


Figure 4. The prevalence of pornography addiction by sociodemographic characteristics

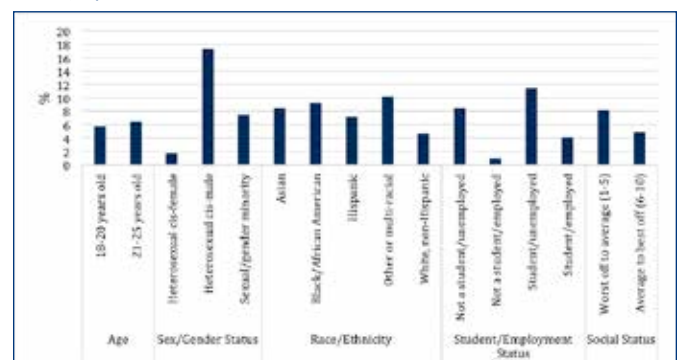
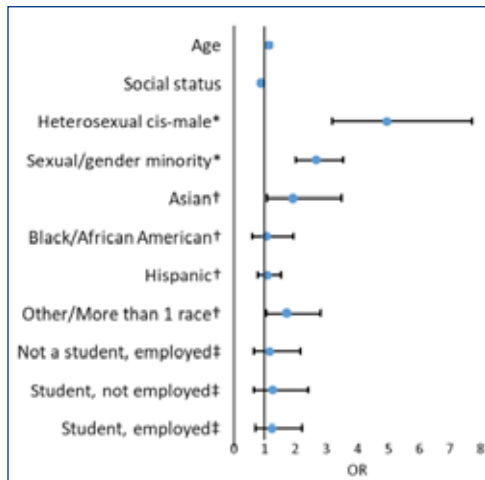
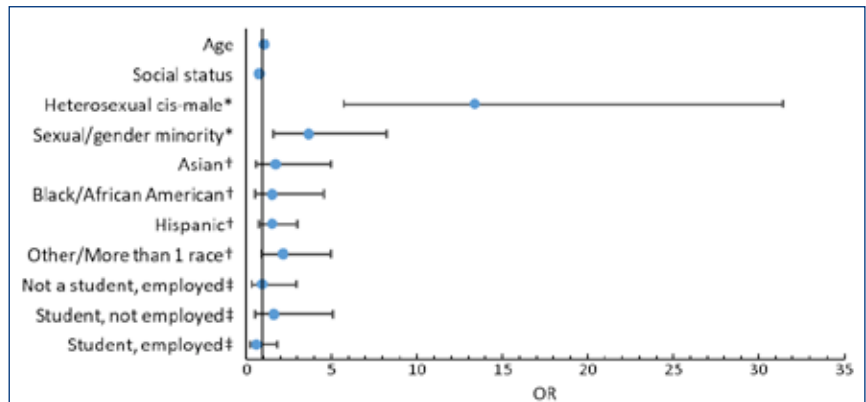


Figure 5. Forest plot of the adjusted odds of pornography use by sociodemographic variables



*Relative to heterosexual cis-females; †relative to White, non-Hispanic; ‡ relative to not a student/not employed.

Figure 6. Forest plot of the adjusted odds of pornography addiction by sociodemographic variables



*Relative to heterosexual cis-females; †relative to White, non-Hispanic; ‡ relative to not a student/not employed.

Table 1. Unadjusted and adjusted odds of depression, anxiety, and suicide ideation by pornography use and pornography addiction status*

		Depression		Anxiety		Suicide Ideation	
Variable		OR	95% CI	OR	95% CI	OR	95% CI
Unadjusted Models							
Pornography Use	Yes	1.36	1.07, 1.74	1.27	0.98, 1.63	1.68	1.17, 2.41
	No	.	.	.	.	.	.
Pornography Addiction	Yes	2.34	1.35, 4.07	1.24	0.75, 2.09	2.97	1.69, 5.20
	No	.	.	.	.	.	.
Adjusted Models							
Pornography Use	Yes	1.12	0.85, 1.47	1.16	0.88, 1.54	1.37	0.92, 2.02
	No	.	.	.	.	.	.
Pornography Addiction	Yes	1.92	1.04, 3.49	1.20	0.68, 2.12	2.34	1.24, 4.43
	No	.	.	.	.	.	.

*Bold indicates statistical significance

suicide, but not anxiety, after adjustment for the covariates. For those with pornography addiction, odds of depression (OR[95%CI] = 1.92 [1.04, 3.49]) and suicide (OR[95%CI] = 2.34 [1.24, 4.43]) were approximately 2 times those of their unaddicted counterparts.

DISCUSSION

Approximately half of Rhode Island's young adults in this sample viewed pornography and 1 in 16 met the criteria for pornography addiction. Use and addiction were particularly high among heterosexual cis-males and individuals who identify as a sexual or gender minority (SGM). Pornography use may also be higher in individuals identifying as Asian,

more than 1 race, or Other. Of particular concern, pornography addiction was associated with depression and suicide ideation.

The current findings are consistent with, and add to, previous research. The overall rate of pornography use described here is similar to that previously reported for compulsive internet pornography use (56.6%), and the prevalence of pornography addiction in a nationally represented sample was 11% and 3% among men and women respectively.⁶ Together, the findings suggest a consistent pattern of high pornography use but lower levels of pornography addiction.⁶ Furthermore, others have reported the link between pornography and poor mental health outcomes, including increased suicide ideation.³

Young adult men may view pornography as a confidential method of accessing sex-related information, whether for information regarding the act of sex itself, for sexual curiosity, or to satisfy sexual urges.^{8,20,21} These behaviors often start in adolescence, and the increased rates reported here among men are likely a continuation of behaviors that started in an earlier developmental period.^{20,21} Conversely, individuals identifying as SGM may see pornography and pornographic websites as a safe space to explore and confirm their sexual identities and understand new sexual activities that fit their identities.²² The confidential nature of the internet provides SGM individuals with a layer of psychological privacy and physical protection that actively engaging in sexual intercourse cannot.

The increased use of pornography, but not addiction, among some racial identities is an interesting result and there is limited relevant literature explaining this

association. For individuals identifying as Asian, the topic of sex may be a cultural taboo, and pornography use may be illegal in home countries, which suggests pornography may be used for either education purposes or as a purposefully defiant behavior.^{23,24} Additionally, Asian Americans, particularly Asian American males, may have higher rates of problematic internet use, which has been reported as a risk factor for pornography use.²⁵

The link between pornography addiction and poor mental health is alarming, and more research is needed on this connection. Because pornography is part of the entertainment industry, it is often changed to fit and capture the most interest and is unlikely to depict realistic or healthy sexual behaviors.²⁰ Consequently, excessive pornography use may lead to irrational perspectives on sex and relationships.²⁰ When the relationships and behaviors depicted in pornography are not realized in real-world dating environments, men may be more likely to experience insecure attachments, fear of being single, loneliness, and depressive symptoms.²⁶

Implications

The internet is a resource for sexual health information, and clinicians should actively discuss where young adult patients are receiving sexual health information, the role of pornography, and reliable sources of sexual health information.²⁰ Providers should consider screening for pornography addiction and other psychological constructs that are associated with pornography addiction, such as impulsivity, sexual obsession, and lack of self control.²⁷ Screening efforts should target young adult men and individuals who identify as SGM. For individuals with pornography addiction, therapeutic interventions, including mindfulness practices and self-compassion techniques, can assist with changing patient mindsets and reducing illness severity.⁵

Prior to reaching young adulthood, parents should discuss media literacy with their children to ensure greater awareness of media messages and greater critical thinking skills when coming across material that encourages unhealthy behaviors.²⁰ Community-based workshops, which build trust and create safe spaces for participants, can provide effective forums for discussions around sex, sexual health, relationship building, and pornography.

Limitations

There are several limitations. The data are cross-sectional and causality cannot be inferred. A convenience sample was used, and participants may not be representative of all young adults. For example, the percent of heterosexual cis-males was disproportionately low. Rates of pornography use, addiction, and other mental health measures are likely underreported because of social desirability bias and the stigma surrounding these topics. Data were self-reported, and recall bias is also a concern.

CONCLUSIONS

Pornography use and addiction are prevalent in Rhode Island's young adult population, particularly young men, and pornography addiction may be associated with depression and suicide ideation. Targeted screening programs should be considered.

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Smartphone Addiction and Mental Illness In Rhode Island Young Adults

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ABSTRACT

BACKGROUND: Smartphone addiction is a rising problem in the United States. The current study estimated the prevalence of smartphone addiction in Rhode Island young adults and its associations with mental illness.

METHODS: The 2022 Rhode Island Young Adult Survey measured smartphone addiction, depression, anxiety, and suicide ideation. Covariates included age, sex/gender minority status, race/ethnicity, and social status.

RESULTS: The prevalence of smartphone addiction was 34%. Odds of experiencing depression (OR[95%CI]=2.69 [2.05,3.52]), anxiety (OR[95%CI]=2.06 [1.58,2.69]), and suicide ideation (OR[95%CI]=1.55 [1.08,2.20]) were greater in participants with smartphone addiction. The relationship between smartphone addiction and depression was strongest in heterosexual cis-males (OR[95%CI] = 8.45 [3.53, 20.3]).

DISCUSSION: Smartphone addiction is prevalent among Rhode Island's young adults and may be associated with depression, anxiety, and suicide ideation. Heterosexual cis-males may be particularly vulnerable. Screening programs and interventions to reduce smartphone use for all young adults, and particularly young men, should be considered.

KEYWORDS: young adults, Rhode Island, smartphone addiction, mental health

INTRODUCTION

Smartphone addiction is a rising problem in the United States (US) as 96 percent of young people own a smartphone,¹ and up to 85% of U.S. adults spend 20 hours or more a week on a digital device.² Between 2015 and 2021, the prevalence of smartphone addiction significantly increased, and overall, approximately 25% of smartphone users may meet the clinical definition of addiction, with the prevalence consistent across countries.³

Several risk factors for smartphone addiction that focus on how and when users use their smartphones have been identified. Smartphone addiction often correlates with the amount of time spent per day on a smartphone as well as the time of day a smartphone is used.⁴ There also may be a threshold

effect where smartphone screen time only exerts an effect on mental health after approximately 5 hours of use.⁵ Furthermore, consistent routine smartphone usage, addictive behaviors, weekend use, and usage in social settings are all risk factors for smartphone addiction.⁶ Fewer studies have reported on non-behavioral risk factors of smartphone addiction, such as socioeconomic or demographic variables. Identifying as female is a commonly reported risk factor, although other studies have reported higher smartphone addiction scores in males and still others report no differences.⁷ Similarly, some studies in adolescents have reported higher rates in older adolescents, while others report higher rates in younger individuals. Mixed findings have also been reported for family income and addiction status.

Smartphone addiction has been strongly linked with negative mental health effects, including increased risk of anxiety, depression, stress, and attention deficit hyperactivity disorder.^{3,6,8-10} These results have been consistent in studies of university students, young adults, and adolescents.^{9,11-12} For example, a study of college students reported that participants who had a smartphone addiction were almost a third more likely than non-addicted participants to have a serious mental illness,¹³ and others have linked smartphone screen time with experiencing co-morbid mental illness.¹⁴

Current Study

The rate of smartphone addiction among Rhode Island's young adults is currently unknown, and existing literature is mixed on whether addiction rates vary by sociodemographic variables. Moreover, the association between smartphone addiction and mental health on young adults in the state has not been explored. Using a sample of young adults that lived in Rhode Island, the current study a) estimated the prevalence of smartphone addiction; b) assessed sociodemographic disparities in smartphone addiction; and c) identified associations between smartphone addiction and depression, anxiety, and suicide ideation. Based on previous literature, it was hypothesized that at least one quarter of participants would meet the definition of smartphone addiction; smartphone addiction would be most prevalent in females and older young adults; and smartphone addiction would be positively associated with experiencing depression, anxiety, and suicide ideation.

METHODS

Sample and Data

Data were obtained from the 2022 Rhode Island Young Adult Survey (RIYAS). The 2022 RIYAS was a cross-sectional survey of young adults ($n = 1,022$) who lived in Rhode Island for at least part of the year. Full details of RIYAS sampling and data collection methodology are published elsewhere.¹⁵

Measures

Smartphone addiction was measured using the Smartphone Addiction Scale – Short Version (SAS-SV).¹⁶ The SAS-SV had a sensitivity of 87% and a specificity of 89% in a sample of adolescents. The SAS-SV contains 10 items that assess the addiction process within the context of smartphone use. Example items include *I cannot stand not having my smartphone* and *I use my smartphone longer than I had intended* (Table 1). Responses are captured on 6-point Likert scales ranging from *strongly disagree* (coded as 1) to *strongly agree* (coded as 6). Responses were aggregated by summation across items ($\alpha = 0.86$). Smartphone addiction was defined as scores ≥ 33 for women and ≥ 31 for men. Since SAS-SV scores are only validated for men and women, one person was excluded from the analysis because they indicated their sex at birth was *intersex*, and the final sample size for this analysis was $n = 1,021$.

The dependent variables included depression, anxiety, and suicide ideation. Depression was measured using the Center of Epidemiologic Studies Depression Scale, 10-item version (CES-D10), which has strong test/re-test and convergent reliability.^{17,18} A 4-point Likert scale, ranging from *rarely or none of the time* (coded as 0) to *most of the time* (coded as 3) was used for all 10 items. Responses were aggregated ($\alpha = 0.75$), and scores ≥ 10 indicated depression. Anxiety was

measured using the Generalized Anxiety Disorder 7-item scale (GAD-7).¹⁹ A 4-point Likert scale ranging from *not at all* (coded as 0) to *nearly every day* (coded as 3) was used for all 7 items. Responses were aggregated ($\alpha = 0.93$), and scores ≥ 10 indicated clinically significant anxiety. The single question: *During the past 12 months, did you ever seriously consider attempting suicide?*, with response options *no* and *yes* was used to assess suicide ideation.

Sociodemographic variables included age, sex, gender, sexual orientation, race/ethnicity, student status, employment status, and social status. Sex, gender, and sexual orientation were combined to categorize participants as *cis-heterosexual female*, *cis-heterosexual male*, or *any sexual or gender minority*. Race/ethnicity included *Asian*, *Black/African American*, *Hispanic*, *White*, and *all others* (including *Native American/Alaskan Native*, *Hawaiian* and *other Pacific Islander*, and more than 1 race). Student and employment status were combined to categorize participants as *not a student/employed*, *student/not employed*, *student/employed*, or *not a student/not employed*. Social status was measured using the MacArthur Scale of Subjective Social Status in which respondents report how their social status compares to their peers on a scale from 1 (worst off) through 10 (best off).²⁰

Analysis

Age and social status were considered normally distributed continuous variables. All others were considered categorical variables. The analysis was conducted in two stages. First, demographic and socioeconomic disparities in smartphone addiction were assessed using a series of univariable logistic regression models. Each sociodemographic variable measured was specified as an independent variable in separate unique models with smartphone addiction as the dependent variable. For the categorical variables, heterosexual cis-males, White, not a student/not employed, and not addicted to smartphones were the referents. Second, the association of smartphone addiction with depression, anxiety, and suicide ideation was assessed using multivariable logistic regression models. Both unadjusted and adjusted models were specified. Adjusted models controlled for all measured sociodemographic variables. In a *post-hoc* analysis, Wald χ^2 tests were used to determine if sexual and gender identity moderated the association of smartphone addiction with depression, anxiety, or suicide ideation. If significant, the adjusted analysis was repeated after stratification by SGM status. Analyses were conducted using SPSS v28.0 (Armonk, NY: IBM Corp), and 95% confidence intervals (CI) and p-values ≤ 0.05 were used to determine statistical significance.

RESULTS

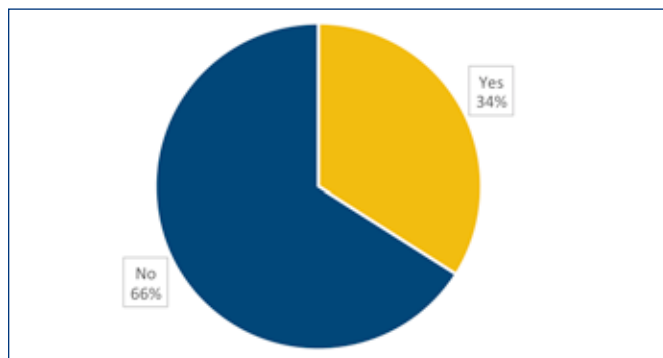
Mean age was 21.3 years old ($SD = 2.1$), and the sample disproportionately identified as a sexual/gender minority (42.4%) (Table 2). A majority identified as White (59.7%).

Table 1. Elements of the Smartphone Addiction Scale – Short Version (SAS-SV)¹⁶

Based on your current situation, to what extent do you agree with the following statements?
I have missed planned work due to my smartphone use.
I have a hard time concentrating in class, while doing assignments, or while working due to my smartphone use.
I feel pain in my wrist or at the back of my neck while using my smartphone.
I cannot stand not having my smartphone.
I feel impatient or fretful when I am not holding my smartphone.
I always have my smartphone on mind even when I am not using it.
I will never give up using my smartphone even when my daily life is already greatly affected by it.
I am constantly checking my smartphone so as to not miss conversation between people on social media.
I use my smartphone longer than I had intended.
The people around me tell me that I use my smartphone too much.

Table 2. Descriptive statistics of categorical variables (n = 1021)

Variable		n (%)
Sexual/gender identity	Heterosexual cis-female	456 (44.7)
	Heterosexual cis-male	132 (12.9)
	Sexual/gender minority	433 (42.4)
Race/ethnicity	Asian	59 (5.8)
	Black/African American	54 (5.3)
	Hispanic	210 (20.6)
	Other/More than 1 race	88 (8.6)
	White	610 (59.7)
Student/employment status	Not a student, not employed	59 (5.8)
	Not a student, employed	244 (23.9)
	Student, not employed	157 (15.4)
	Student, employed	561 (54.9)
Depression	Yes	521 (51.0)
	No	500 (49.0)
Anxiety	Yes	387 (37.9)
	No	634 (62.1)
Suicide ideation	Yes	150 (14.7)
	No	871 (85.3)

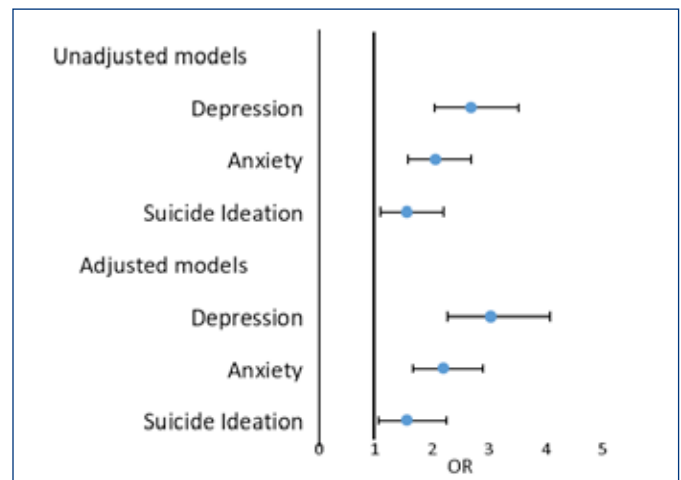
Figure 1. Prevalence of smartphone addiction (n = 1021)

Mean social status was 5.0 (SD = 1.7), and a majority were both students and employed (54.9%). Approximately half (51.0%) the sample met the criteria for depression; more than one-third (37.9%) met the criteria for anxiety; and 14.7% seriously considered suicide in the past year. In all, 34% of participants met the criteria for smartphone addiction (**Figure 1**). Interestingly, there were no statistically significant demographic or socioeconomic disparities to note in the series of univariable logistic regression models (**Table 3**)

In the unadjusted analysis, smartphone addiction was significantly associated with the odds of experiencing depression (OR[95%CI] = 2.69 [2.05, 3.52]), anxiety (OR[95%CI] = 2.06 [1.58, 2.69]), and suicide ideation (OR[95%CI] = 1.55 [1.08, 2.20]) (**Figure 2**). The odds of experiencing depression, anxiety, and suicide ideation were approximately 2.7 times,

Table 3. Univariable logistic regression models showing odds of smartphone addiction by sociodemographic variables.

Variable		OR	95% CI
Age		0.96	0.90, 1.02
Social status		0.98	0.91, 1.06
Sexual/gender identity	Heterosexual cis-female	0.99	0.66, 1.49
	Sexual/gender minority	1.08	0.72, 1.63
	Heterosexual cis-male	.	.
Race/ethnicity	Asian	1.70	0.99, 2.92
	Black/African American	0.93	0.51, 1.69
	Hispanic	1.01	0.72, 1.41
	Other/More than 1 race	1.10	0.69, 1.76
Student/employment status	Not a student, employed	0.95	0.53, 1.71
	Student, not employed	1.04	0.56, 1.93
	Student, employed	0.78	0.44, 1.35
	Not a student, not employed	.	.

Figure 2. Unadjusted and adjusted odds of experiencing depression, anxiety, and suicide ideation among persons with smartphone addiction. Models adjusted for age, sex, gender, sexual orientation, race/ethnicity, student status, employment status, and social status

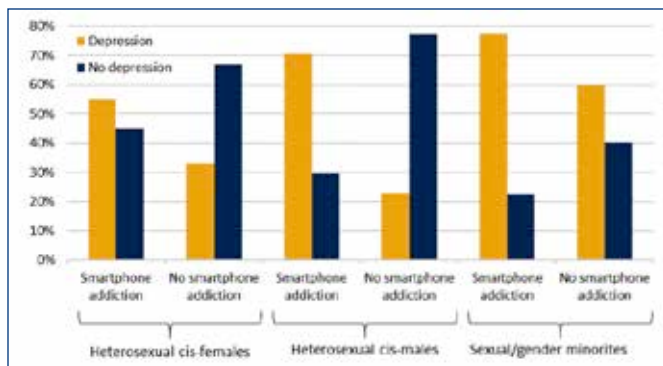
2 times, and 55% greater, respectively, among persons with smartphone addiction. The direction and strength of these relationships were maintained in the adjusted analysis.

The *post-hoc* analysis suggests that sexual and gender identity significantly moderated the relationship between smartphone addiction and depression (Wald $\chi^2_{(2)} = 6.083$, $p = 0.048$), but not anxiety (Wald $\chi^2_{(2)} = 1.529$, $p = 0.465$) or suicide ideation (Wald $\chi^2_{(2)} = 0.113$, $p = 0.945$). After stratification by sexual and gender identity, the strength of the relationship appeared to be strongest among heterosexual cis-males (**Table 4**; **Figure 3**). Among these participants,

Table 4. Adjusted odds of depression by smartphone addiction, stratified by SGM status

Variable		AOR	95% CI
Cis-gender heterosexual females			
Smartphone addiction	Yes	2.59	1.70, 3.95
	No	.	.
Cis-gender heterosexual males			
Smartphone addiction	Yes	8.45	3.53, 20.3
	No	.	.
Sexual/gender minorities			
Smartphone addiction	Yes	2.85	1.76, 4.62
	No	.	.

NOTE: Adjusted models controlled for age, social status, sexual/gender identity, race/ethnicity, and student/employment status.

Figure 3. Prevalence of depression stratified by smartphone addiction and SGM status

the odds of experiencing depression was approximately 8.5 times greater among persons with smartphone addiction (OR[95%CI] = 8.45 [3.53, 20.3]).

DISCUSSION

The results suggest that smartphone addiction is common among Rhode Island's young adults, and the burden of disease is shared equally across young adult sub-groups. Moreover, smartphone addiction may be associated with depression, anxiety, and suicide ideation. Interestingly, the relationship between smartphone addiction and depression may be strongest among heterosexual cis-males, although the association remains significant in heterosexual cis-females and sexual or gender minorities.

Smartphone Addictions and Mental Health

The prevalence of smartphone addiction in the current sample is similar to that reported in other samples of U.S. college students,¹¹ and smartphone addiction's relationships with depression and anxiety have been previously reported.^{12,21} However, the increased odds of suicide ideation in U.S.

young adults with smartphone addiction is a novel finding. A cross-sectional study of Korean adolescents also found a relationship between smartphone addiction and an increased risk of suicide ideation and suicide attempts, although the study participants were considerably younger.²² Suicidality was also associated with smartphone addiction in smaller studies of Malaysian and Egyptian university students,^{23,24} which suggests the impact of smartphone addiction on mental health may be universal and not culturally dependent.

Smartphone addiction may be associated with poor mental health through several plausible mechanisms. First, smartphone addiction is often characterized by extensive smartphone use that disrupts normal sleep patterns. A meta-analysis of 41 studies suggested smartphone addiction was strongly associated with poorer sleep quality,¹² and in a cross-sectional survey of young adults in the United Kingdom, approximately 69% of participants with smartphone addiction reported poor sleep quality.²⁵ Consistent poor sleep quality and sleep irregularities are symptoms of clinical depression and anxiety, and predictive of later diagnoses.²⁶

Second, smartphone addiction may increase exposure to harmful or hateful digital content. Cyberbullying victimization was previously identified as a mediator between smartphone addiction and depression and between digital screen time and suicide ideation.^{27,28} Exposure to hate speech, violence, cyberbullying, sexual content, and profanity has also been associated with suicide ideation and self-harm in adolescents, and synergistic effects have been reported whereby exposure to multiple forms of negative digital content increases the risk of self-harm exponentially.²⁹ While explicitly harmful content is one plausible pathway, another potential pathway has been proposed: increased time on mobile social media increases upward social comparisons and the evocation of jealousy, leaving young adults feeling inferior to their peers and/or role models, leading to depressive symptoms.³⁰ More mobile screen time, teamed with low self-esteem, has also been shown to increase risk of depression.^{30,31}

Finally, because of the cross-sectional nature of the data, it is possible that participants with depression, anxiety, or suicide ideation are more likely to be addicted to their smartphones, and use of online connections as a form of digital social support to relieve symptoms of mental illness has been reported.³² Social media, in particular, provides an opportunity for those with a mental illness to seek support through both public and anonymous methods, and these virtual forms of social support may be as effective as physical forms of social support.³³

Smartphone Addiction in Young Adult Men

The stronger than expected relationship between smartphone addiction and depression among heterosexual cis-males was unexpected and may be a novel finding. We speculate the current finding may have occurred because

there are fewer social risk factors for depression among heterosexual cis-males, relative to the other sexual/gender groups, which allows smartphone addiction to explain a much larger proportion of the variance in depression among this population group. Moreover, heterosexual cis-males are more likely to engage in socially isolating smartphone use such as gaming, gambling, and pornography compared to their female counterparts.³⁴ Prior research indicates that males who participate in mobile gaming are more likely to suffer from reduced self-esteem and other negative mental health impacts attributable to internet gaming disorders.³⁵ Additionally, heterosexual cis-males have 2.3 times the risk of being problem gamblers,³⁶ which is another socially isolating activity when occurring on a smartphone.³⁷ Compulsive internet pornography use has also been linked to social impairment and poor mental health and is much more prevalent among heterosexual cis-males.^{38,39}

Implications

Smartphone use is widespread among young adults, with no evidence of predicted decline over time. The findings should serve as a call to action for both the mental health and technology industries. Mental health clinicians who treat young adults with mental illness should discuss the known risks of smartphone addiction with their patients. Previous research recommends taking a harm reduction approach to smartphone use by suggesting a decrease total amount of time spent on smartphone apps and other social media sites.⁴⁰ In addition to reducing screen time, individuals can participate in more “non-screen time” activities that may include physical activity or meeting friends in person.⁴¹

The technology industry plays a major role in smartphone addiction and can also play a role in delivering psychological interventions for young adults who suffer from mental health disorders. Mobile apps, referred to as “mHealth applications,” now provide a variety of health-related needs, and dozens of apps focus on major and mild neurocognitive disorders, personality disorders, anxiety disorders, bipolar and related disorders.⁴² Mental health app development allows young adults to access psychological care when and where they need it without disrupting daily routines.⁴³ mHealth apps to address smartphone addiction and mental health should be made accessible to young adults; reducing accessibility barriers includes reduced subscription fees along with shorter treatment modules.⁴⁴

Simple screen time monitoring and notifications for excessive use are likely ineffective in reducing smartphone addiction.⁴⁵ Public health interventions developed for smartphone addiction need to be focused on the type of app category the user is most likely to use, and app development can include features such as content warnings, access to accountability partners or communities, or a reward system for progress with reducing use of specific apps over time.⁴⁶

Limitations

This study is not without its limitations. This was a cross-sectional study and causality cannot be determined. Furthermore, the sample was a convenience sample and limited to young adults in Rhode Island. The sample may not be representative of all young adults, which limits the generalizability of the findings. Specifically, the sample underrepresents cis-heterosexual males, which may result in overestimated prevalence rates and greater uncertainty in identifying effects in this sub-group. The data collected through this survey is based on self-report, resulting in potential recall and social desirability biases. Finally, information about anxiety and depressive disorders were collected through validated screening instruments and not through clinical diagnostic evaluations.

CONCLUSIONS

Smartphone addiction is prevalent among young adults and may be associated with depression, anxiety, and suicide ideation. Screening and interventions integrated into clinical care and smartphone apps are needed, with particular attention to socially isolating apps that young men are more likely to use.

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Risk Factors for Suicide Ideation Among Rhode Island College Students

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ABSTRACT

OBJECTIVES: This study aimed to identify individual and relational risk factors for suicide ideation among students enrolled in 2- and 4-year colleges.

METHODS: A cross-sectional analysis was conducted using N=685 college students from the 2022 Rhode Island Young Adult Survey.

RESULTS: 13.7% (N = 94) reported suicide ideation, 7.6% (N = 52) reported making a suicide plan, and 3.2% (N = 22) reported at least one suicide attempt. Sexual and gender minorities had 300% (95%CI: 47%, 987%) increased odds relative to cisgender heterosexual males, students living on campus had 56% (95%CI: 79%, 10%) lower odds compared to those living off campus with a parent, and students with insomnia had 156% (57%, 320%) increased odds of suicide ideation.

CONCLUSIONS: Interventions to 1) cultivate identity-affirming communities for sexual and gender minority students, 2) create a sense of belonging for students living off campus, and 3) improve sleep health are needed.

KEYWORDS: suicide ideation, college students, sleep, housing, LGBTQ

INTRODUCTION

Emerging adulthood, the transition from childhood to adulthood, typically ranging from ages 18 to 25 years, is a developmentally vulnerable stage for college students marked by a new level of independence, freedom, development of personal skills, financial responsibility, social-skills development, pressure to perform academically, and often an introduction to intimate relationships.¹ The imminent stress coming with entering college is prevalent, with 38.8% of male college students and 48.2% of female college students reporting having “more than average stress” within the first 12 months of enrolling. In 2019, United States (US) college students considered the following to be “traumatic or difficult to handle:” academics (42.5% of males, 54.6% of females), intimate relationships (28.2% of males, 33.6% of females), social relationships (23.4% of males, 33.3% of females), financial problems (29.5% of males, 39.6% of females), and sleep difficulties (29.7% of males, 37.0% of females).²

Due to this excess stress,³ a substantial portion of college students experience suicide ideation. Suicide is the second leading cause of death among US college students and the second leading cause of death for Rhode Islanders ages 15 to 34 years.^{4,5} In 2019, the National College Health Assessment (NCHA) reported that within the last 12 months 7.5% of male college students and 8.6% of female college students had seriously considered suicide, with 1.1% and 1.4% reporting at least one suicide attempt,² respectively. Of concern, few college students are willing to seek mental health treatment.⁶

There are several risk factors for suicide ideation in college students, with major depressive disorder (MDD) and insomnia being significant contributors.⁶ For example, the odds of being classified with suicide risk as a freshman college student were approximately 6.5 times and 2.7 times greater for college students with elevated depressive symptoms and sleep problems, respectively.⁷ Others have identified socio-demographic risk factors for suicide in college students. Elevated rates of suicide ideation have been identified in bisexual college students, even when compared to lesbian or gay students, and the experience of persons who are transgender is similar.³ Additionally, students who identify with a racial or ethnic minority may have higher rates of suicide ideation or suicide attempts relative to White, non-Hispanic students.³

Despite prior studies investigating key risk factors for suicide ideation among college students, no study to our knowledge focuses specifically on students at both 2- and 4-year colleges in Rhode Island. Given the many known risk factors for suicide ideation, this study aims to identify key individual and relational risk factors for suicide ideation among a sample of Rhode Island college students to inform future prevention programming on college campuses.

METHODS

Sample

A cross-sectional analysis was conducted with data collected from the Rhode Island Young Adult Survey (RIYAS) from May through August 2022. A full description of RIYAS methodology is published elsewhere.⁸ The survey resulted in N = 1,022 young adults aged 18–25 years who lived in Rhode Island for at least part of the year. This study was limited to college students, particularly those identifying as

freshman, sophomore, junior, or senior undergraduates, as well as graduate students. This yielded an analytic sample of $N = 685$. This study was approved by the Johnson & Wales University Institutional Review Board.

Measures

The primary outcome of this study was suicide ideation. Suicide ideation was defined by an affirmative response to the survey question, *During the past 12 months, did you ever seriously consider attempting suicide?* Follow-up questions for those responding *Yes* included measures of having a suicide plan (*During the past 12 months, did you make a plan about how you would attempt suicide?*) and attempting suicide (*During the past 12 months, how many times did you actually attempt suicide?*).

Both individual and relational characteristics were considered as potential explanatory variables. Individual characteristics included school year (*freshman undergraduate, sophomore undergraduate, junior undergraduate, senior undergraduate, graduate*), race/ethnicity (*White non-Hispanic, Black, Asian, Hispanic, Multiracial or something else*), social status, age in years, employment status (*none, part-time, full-time*), sexual and gender identity (*heterosexual cisgender male, heterosexual cisgender female, sexual and gender minorities*), insomnia, student status (*full-time, part-time*), and first-generation college status. Social status was measured using the MacArthur Scale of Subjective Social Status,⁹ which assessed a participant's perceived social rank relative to other members of the community on a scale of 1, meaning *worst off*, to 10, meaning *best off*.

While these sociodemographic characteristics are often considered risk factors for suicide ideation and mental health,¹⁰ first-generation college status was included, based on its known association with poor mental health of college students,¹¹ and insomnia due to its known association with suicide ideation since the COVID-19 pandemic.¹² First-generation college status was determined by an affirmative response to the question, *Are you a first-generation college student, meaning you are the first person in your immediate family to attend college?* Insomnia was measured via the Insomnia Severity Index (ISI), a 7-item self-report questionnaire of insomnia symptoms with 5-point Likert-scale responses ranging from *none* to *very severe*. Total summary insomnia symptom scores potentially ranged from 0 to 28, with higher scores reflecting greater severity of insomnia symptoms. In accordance with scoring instructions, summary scores of 15 or above indicated either moderate or severe clinical insomnia. The ISI is a valid and reliable instrument and holds excellent internal consistency with a Cronbach alpha of about 0.90.¹³ In this sample, the interitem correlation according to Cronbach's alpha was $\alpha = 0.89$.

Relational characteristics included living arrangement, participation in Greek life, and social support. Living arrangement was measured by responses *off-campus housing with a*

parent, off-campus housing without a parent, or on-campus housing to the question, *what is your current living situation?* Participation in Greek life was assessed by affirmative response to the question, *Are you a member of Greek life, such as a fraternity or sorority?* Social support was dichotomized in response to the question, *How often do you get the social and emotional support you need?* as those responding *always/usually/sometimes* versus *rarely/never*.

Statistical Analysis

Descriptive statistics such as frequencies and percentages were computed for all variables among the college student sample ($N = 685$). Overall frequency and percentage of suicide ideation, suicide plans, and suicide attempts were calculated. Bivariable statistics were used to compare individual and relational characteristics by suicide ideation (**Tables 1 & 2**). Particularly, two-sample t-tests were used for continuous variables, chi-square tests for categorical variables, and Fisher's exact tests were used for categorical variables when a single cell had 5 or fewer observations. A multivariable logistic regression was conducted to calculate adjusted odds of suicide ideation for all explanatory variables. All statistical tests were assessed at $\alpha = 0.05$. All analyses were conducted in Stata/SE 15.0.¹⁴

RESULTS

Among this sample of college students aged 18 to 25 years in Rhode Island, 13.7% ($N = 94$) reported suicide ideation, 7.6% ($N = 52$) reported making a suicide plan, and 3.2% ($N = 22$) reported at least one suicide attempt. Students in the total sample were primarily undergraduates (85.3%), a small majority White non-Hispanic (53.2%), mean age around 21 years old, majority part-time employed (55.6%), and a small portion cisgender heterosexual male (11.8%). The minority of students were part-time (17%) and first-generation college (35.1%). Insomnia was highly prevalent (46.8%).

Bivariable analyses showed suicide ideation varied by social status ($p < 0.001$), sexual and gender identity ($p < 0.001$), insomnia ($p < 0.001$), and social support ($p = 0.006$; **Tables 1 & 2**). In the fully adjusted model, sexual and gender minorities had 300% [95%CI: 47%, 987%] increased odds of suicide ideation relative to cisgender heterosexual males, students living on campus had 56% [95%CI: 79%, 10%] lower odds of suicide ideation compared to those living off campus with a parent, and students with insomnia had 156% (57%, 320%) increased odds of suicide ideation relative to those without insomnia (**Figure 1**). The difference between bivariable and multivariable results were likely because social status and social support are correlated ($p < 0.001$). Post-hoc analyses, however, confirmed that with or without one or both variables in the multivariable model, living on campus was significantly protective against suicide ideation, and these other variables were not.

Table 1. Individual characteristics by suicide ideation among Rhode Island college students

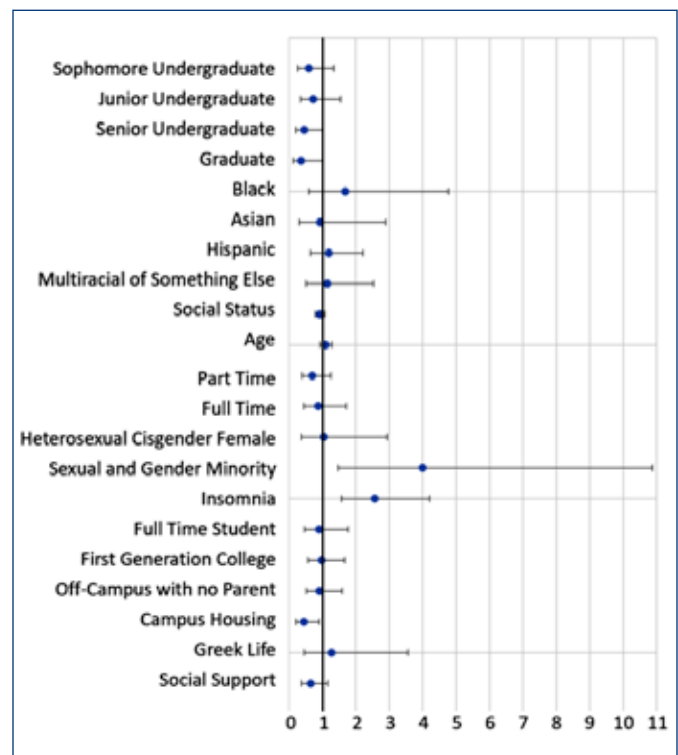
	Total Sample		Suicide Ideation		P-values
	N = 685	100%	N = 94	14%	
School Year					0.238
Freshman Undergraduate	120	17.5	24	25.5	
Sophomore Undergraduate	96	14	113	13.8	
Junior Undergraduate	168	24.5	23	24.5	
Senior Undergraduate	200	29.2	23	24.5	
Graduate	101	14.7	11	11.7	
Race/Ethnicity					0.648
White, non-Hispanic	397	58	50	53.2	
Black	36	5.3	6	6.4	
Asian	41	6	4	4.3	
Hispanic	152	22.2	24	25.5	
Multiracial or Something Else	59	8.6	10	10.6	
Social Status [mean (SE)]	6.08	0.06	5.24	0.16	<0.001
Age [mean (SE)]	20.8	0.07	21.1	0.18	0.171
Employment					0.078
No	145	21.2	27	28.7	
Part-Time	381	55.6	43	45.7	
Full-Time	159	23.2	24	25.5	
Sexual and Gender Identity					<0.001
Heterosexual Cisgender Male	81	11.8	5	5.3	
Heterosexual Cisgender Female	313	45.7	23	24.5	
Sexual and Gender Minority	291	42.5	66	70.2	
Insomnia					<0.001
No	514	75	50	53.2	
Yes	171	25	44	46.8	
Student Status					0.211
Part-Time	89	13	16	17	
Full-Time	596	87	78	83	
First Generation College					0.886
No	449	65.6	61	64.9	
Yes	236	34.5	33	35.1	

Note: P-values were computed using two-sample t-tests for continuous variables, chi-square tests for categorical variables, and Fisher's Exact tests for categorical variables with cell sizes ≤ 5

Table 2. Relational characteristics by suicide ideation among Rhode Island college students

	Total Sample		Suicide Ideation		P-values
	N = 685	100%	N = 94	14%	
Living Arrangement					0.189
Off Campus with Parent	334	48.8	49	52.1	
Off Campus with no Parent	208	30.4	32	34	
Campus Housing	143	20.9	13	13.8	
Greek Life					0.523
No	645	94.2	89	94.7	
Yes	40	5.8	5	5.3	
Social Support					0.006
No	127	18.5	27	28.7	
Yes	558	81.5	67	71.3	

Note: P-values were computed using two-sample t-tests for continuous variables, chi-square tests for categorical variables, and Fisher's Exact tests for categorical variables with cell sizes ≤ 5

Figure 1. Adjusted odds of suicide ideation among Rhode Island college students

Note: Referents for categorical variables in multivariable logistic regression were freshman undergraduate, White non-Hispanic, no employment, heterosexual cisgender males, no insomnia, part-time student, not a first-generation college student, living off campus with a parent, not in Greek life, and no social support

DISCUSSION

This study aimed to identify individual and relational risk factors for suicide ideation among students enrolled in 2- and 4-year colleges in Rhode Island. Individual characteristics independently associated with suicide ideation in this sample included identifying as a sexual and/or gender minority and experiencing insomnia. The only relational characteristic independently associated with suicide ideation in this population was living on campus, which was protective. While bivariate results suggested higher social status and social support were less common among students with suicide ideation, these did not remain independent protective factors for suicide ideation in multivariable models. These bivariate associations are consistent with other literature showing that those with lower socioeconomic status and those with more social support are less likely to report suicide ideation.⁹

Sexual and Gender Minorities

Our results show, as well as previous studies,¹⁵ that sexual and gender minority college students have an increased risk for suicide ideation, which may be explained by the Minority Stress Theory.¹⁶ Minority Stress Theory suggests that suicide ideation is greater in minority subgroups, including sexual and gender minorities, due to the constant and consistent exposure to stress, shame, and rejection from society.¹⁷ Here, multiple studies of young adults and/or college students have documented that transgender or gender non-conforming individuals, as well as sexual minorities, have increased rates of trauma, depression,¹⁸ and suicide ideation, which is consistent with this theory.¹⁹

Sleep Problems

Our results suggest that insomnia or sleep problems may be associated with suicide ideation, and this finding is supported by other studies. Around 60% of all US college students suffer from poor sleep quality, and 7.7% meet the criteria for an insomnia disorder. A systematic review of research in university students concluded that insomnia and nightmares were associated with elevated suicide risk as well as suicidal thoughts and behaviors within the college student population.²⁰ Furthermore, a cross-sectional research study suggested that 82.7% of individuals with elevated suicide risk also had sleep problems, and 31.3% individuals with sleep problems also had elevated suicide risk.^{7, 21} The relationship between sleep problems and poor mental health among college students is likely bidirectional – with sleep problems as both a cause and effect of poor mental health, since poor sleep quality can negatively impact a student's education, work ethic, daytime routine, and chronotype changes.²² Consequently, the possibility of a positive feedback loop may exist that is difficult for students to eliminate without external support.

Living in Campus Housing

A novel finding was that living on campus, relative to off campus, was independently associated with a lower risk of suicide ideation. Living in campus housing may be a proxy for having a stronger sense of belonging or community as a college student, which may provide a protective effect against suicide ideation.²³ Others have reported that a lower sense of belonging was significantly associated with greater severity of depression, hopelessness, suicidal ideation, and history of prior suicide attempt(s),²⁴ and feeling a stronger connection to a college campus was positively associated with help-seeking for suicide ideation. The association between campus connection help-seeking may be stronger among students who have a strong sense of togetherness with peers or a supportive group of friends.²³

Recommendations and Implications

Colleges are not merely educational settings, but an environment in which adolescents transition into adulthood. Therefore, colleges must create an environment and sense of community that helps young people thrive and supports well-being, which can be accomplished in several ways. First, colleges should support programming and outreach that facilitates greater inclusion of students who identify as sexual and gender minorities while also continuing to promote the acceptance of proper pronoun identification to increase social comfortability of all students.²⁵ Generally, continued work is needed at Rhode Island colleges to minimize existing barriers with mental health services, support/create community-driven and community-based interventions, and increase suicide ideation knowledge while reducing its stigma.²⁶ College health-service programs should also refer sexual and gender minority students who seek help to professionals that support SGM-affirmative mental health practices.²⁷

Second, colleges should consider integrating sleep-health interventions into campus health services and health education campaigns since sleep education can increase sleep knowledge and improve some sleep behaviors.²⁸ Colleges can also consider minimizing 8 a.m. classes, decreasing late-night assignment deadlines, creating safe areas where commuters or residential students can nap, enforcing dormitory quiet hours, and requiring all staff to be educated on the importance of sleep.²⁹

Finally, colleges should create programs that support the mental health of off-campus students, which can include outreach of mental health services and initiatives to create more social/community connectedness. Colleges should emphasize incorporating off-campus students in conversations on mental health, ensure that campus-wide mental health campaigns effectively reach off-campus students, and create systems to support off-campus student on an as-needed basis.³⁰

Limitations

The current study has some limitations. First, the sample is under-represented in heterosexual cis-males. Given higher rates of poor mental health among females and sexual and gender minorities,³¹ the study likely has an elevated rate of suicide ideation above and beyond the general population. This is also a convenience sample of young adult college students and therefore generalizability to the US college student population is limited. The self-reported nature of this study may also allow for social desirability bias, so suicide ideation may be under-reported. Finally, this is a cross-sectional study and temporality cannot be confirmed. Specifically, we cannot determine whether insomnia preceded or resulted from suicide ideation.

CONCLUSIONS

This study of Rhode Island young adult college students found sexual and gender minorities and students with insomnia were more likely to have suicidal ideation, but those living on campus were protected. Colleges must be safe and inclusive community environments that help students thrive. Interventions to cultivate identity-affirming communities for sexual and gender minority students and a sense of belonging for students living off campus are needed. Programming to improve sleep health should also be incorporated.

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Syncope and Methemoglobinemia Preceded by Amyl Nitrite ‘Popper’ Inhalation

KATHERINE BARRY, MD’23; KRISTINA E. MCATEER, MD

ABSTRACT

INTRODUCTION: Methemoglobinemia represents an uncommon but potentially serious cause of presentation to the emergency department, resulting in hypoxemia and even death. The symptoms and clinical findings in this condition can be nonspecific and therefore methemoglobinemia can be easily missed if the clinician is not familiar with it. This report presents a case caused by recreational drug use which has rarely been documented previously.

CASE REPORT: A 23-year-old male with a history of asthma presents to the emergency department for an episode of syncope after inhalation of amyl nitrite “poppers”. He had normal vitals other than tachycardia but was found to have nailbed and perioral cyanosis, a classic but uncommon presentation that is demonstrated in the included clinical image. He was found to have methemoglobinemia caused by his use of amyl nitrite and received supportive care but did not require methylene blue.

CONCLUSION: Emergency physicians should familiarize themselves with the classic physical exam findings in methemoglobinemia in order to identify and treat this condition promptly. While this patient had a good outcome with only supportive care and observation, his presentation and the etiology of his condition offer an important teaching point. The possibility of methemoglobinemia after recreational “popper” use should be considered when working up a patient who presents with cyanosis and hypoxemia.

KEYWORDS: methemoglobin, amyl nitrite, inhalants, case report

INTRODUCTION

Methemoglobinemia refers to the condition where the iron in hemoglobin is oxidized, impairing its ability to carry oxygen and carbon dioxide.¹ It is uncommon but potentially life threatening as it causes hypoxemia, and therefore it is important for emergency physicians to be confident in diagnosing this condition. Unfortunately, patients with methemoglobinemia can present with nonspecific symptoms and

have unusual pulse oximeter and blood gas findings, and there are a wide variety of causes which makes focused history-taking difficult. Environmental triggers include oxidizing agents such as nitrites, but genetic and dietary causes are also possible.

Recreational drugs have been implicated in methemoglobinemia, as well. Inhaled nitrites or “poppers” are a class of recreational drugs that cause vasodilation, producing a sensation of warmth and lightheadedness. They are sometimes used by men who have sex with men to facilitate anal intercourse due to their effects on the anal sphincter.² Since they are nitrites, they can have oxidizing effects on hemoglobin and cause methemoglobinemia. This report describes a case of methemoglobinemia that occurred after inhalation of amyl nitrite, a rare but serious complication of recreational “popper” use.

The cyanotic appearance of the patient’s nailbeds on physical exam is documented in the clinical image, which is a classically reported finding that is rarely observed in practice. While the patient ultimately required only supportive care, learning about his clinical course will offer the emergency clinician a framework for diagnosing and managing this condition.

CASE REPORT

A 23-year-old male with a past medical history of asthma and depression presented to the emergency department for an episode of syncope followed by cyanosis of his fingernails. He reported that he had been “huffing poppers” earlier, which he and his partner do regularly for sexual enhancement. He had used three of them. Soon afterwards, he got in the shower, but felt lightheaded and transiently lost consciousness. He denied striking his head or sustaining any traumatic injuries. His partner reported that he quickly regained consciousness and behaved normally within seconds. He denied shortness of breath, palpitations, or chest pain. He would not have come to the hospital, but he noted that his fingernails were blue, and he became concerned.

On arrival, the patient appeared pale but was alert and in no acute distress. His vital signs were notable for tachycardia but were otherwise within normal limits. On examination, he was found to have blue nail beds and perioral cyanosis but had no evidence of trauma and no other significant findings

Figure 1. Nail bed cyanosis on presentation to the ED

(**Figure 1**). His EKG showed sinus tachycardia with normal intervals and no ischemic changes. The patient's medications included duloxetine and albuterol as needed and he was a non-smoker.

Laboratory studies, including a CBC, CMP, lactate, troponin, carboxyhemoglobin, ethanol, acetaminophen, salicylates, and urine drug screen were normal. A venous blood gas demonstrated a pH of 7.36 and pCO₂ of 47 mmHg (normal), but his pO₂ and O₂ saturation were low at <30 mmHg and 41%, respectively. His methemoglobin level on arrival was 25.6% (normal range 0–1.8%), confirming a diagnosis of methemoglobinemia. His cyanosis was attributed to his use of inhaled amyl nitrite. The etiology of his syncope was felt to be vasovagal due to the combined vasodilatory effects of amyl nitrite and the hot shower.

Because of the short half-life of both amyl nitrite and methemoglobin (both about one hour), poison control recommended foregoing treatment for the methemoglobinemia as the patient did not require supplemental oxygen and was minimally symptomatic. He was admitted to the internal medicine service and was monitored and treated with IV fluids. At 2 hours from arrival his methemoglobin level was 13.4%, which continued to downtrend to 2.5% at 6 hours and 1.7% at 12 hours. The next morning his cyanosis had resolved and his vital signs were within normal limits, so he was discharged home.

DISCUSSION

Methemoglobinemia can be due to a variety of causes including genetic or dietary but is commonly caused by exposure to an oxidizing chemical.¹ The most common categories of causative agents in the National Poison Data System include benzocaine, phenazopyridine, dapsone, and nitrites. **Table 1** summarizes common triggers.³ Mild cases of methemoglobinemia can present with cyanosis, dyspnea, headache, and anxiety, while higher levels of methemoglobin can lead to arrhythmias, acidosis, seizures, and coma. Pulse oximetry

Table 1. Common triggers of methemoglobinemia.⁴

Anesthetics	Benzocaine
	Prilocaine
Analgesics/anti-pyretics	Phenacetin
Antibiotics/anti-infectives	Trimethoprim
	Ciprofloxacin
	Dapsone
	Sulfonamides
	Primaquine
	Nitrofurantoin
	Chloroquine
Antiemetics	Metoclopramide
Psych/neurologic drugs	Phenelzine
	Phenobarbital
Cardiac drugs	Nitroglycerine
	Isosorbide dinitrate
	Nitroprusside
Environmental/occupational	Naphthalene
	Acetanilide
	Amyl nitrate
	Aniline
	Chlorate

may show slightly reduced oxygen saturations, but at moderate to severe levels of methemoglobinemia will frequently over-estimate oxygen saturation. Co-oximetry is an accurate method of measuring levels of methemoglobin, and lab tests can determine the concentration of methemoglobin in the blood.¹ Interestingly, the patient in this case had a low pO₂ on presentation, an unexpected finding in this condition as methemoglobin is unable to transport and release O₂ effectively but does not affect the amount of oxygen in the blood. Typically, the pO₂ would be normal or even elevated in a patient with this condition.

Treatment for methemoglobinemia should begin with supportive care, including intravenous fluids and oxygen supplementation. Glucose supplementation may also be indicated, as endogenous reducing enzymes must have adequate glucose available. This is also important for the production of NADPH in the case of methylene blue administration. Methylene blue is the treatment that can be used to reduce methemoglobin levels, but should be used with caution in patients with G6PD deficiency, pregnant patients, those on serotonergic medications and those with renal failure.⁵ Treatment thresholds differ between providers and are primarily based on symptoms, as some patients can have severe symptoms at only moderate levels of methemoglobin in the

blood.⁶ Poison control or a toxicologist should be involved in the treatment plan when possible. Methylene blue should be administered if blood levels of methemoglobin are 20–30%, but should not be withheld in cases where symptoms are significant and blood levels are lower or unavailable.⁷

Nitrites are a known cause of methemoglobinemia, but it is rare for this condition to be caused by recreational inhalation of nitrites. Upon review of the literature, 10 cases of methemoglobinemia from inhalation of isobutyl (amyl) or butyl nitrite have been described between 1979–2022. Patients ranged in age from 21 to 62 years old, with most in their third or fourth decade of life. Most reported exam findings of cyanosis and hypoxemia, and the majority of these patients received treatment with methylene blue. Almost all of these patients made a full recovery within 24–36 hours of arrival to the emergency department.^{8–17}

CONCLUSION

This case of a young man who presented to the ED after amyl nitrite inhalation with syncope and cyanosis provides an example of how a patient can present with methemoglobinemia. The history of “popper” use contributing to his condition is rare and has not been frequently documented in the literature. Emergency clinicians can learn from this unusual case and refine their history-taking in a patient who presents with hypoxemia and cyanosis and should keep methemoglobinemia on their differential when evaluating a patient with these symptoms and a history of recreational drug use.

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A Case of Culture-Negative Endocarditis Due to *Bartonella henselae* and Cat Scratch Disease

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ABSTRACT

This report describes the case of a 73-year-old female with a history of a prosthetic mitral valve and breast cancer who presented with fever and confusion. Brain imaging revealed multiple ischemic infarcts, and abdominal imaging demonstrated splenic infarcts. Workup with transesophageal echocardiogram revealed a vegetation on the aortic valve, but several blood cultures had no bacterial growth. Further history revealed a recent exposure to a stray cat, and the patient was found to have positive antibodies for *Bartonella henselae*, the organism implicated in cat scratch disease. She was treated with the appropriate course of antibiotics, and she made a full recovery to her baseline functional status. This report emphasizes the importance of a comprehensive patient history and a broad differential diagnosis.

KEYWORDS: endocarditis, cat scratch disease, prosthetic valve

BACKGROUND

Infective endocarditis (IE) is defined as a microbial infection that causes inflammation within the endocardium of the heart. Severity varies by causative agent, valvular anatomy or pathology, and pathological presentation of the untreated disease. The characteristic lesion, a vegetation, is composed of a collection of platelets, fibrin, microorganisms, and inflammatory cells.¹ If the causative agent cannot be determined after three independent attempts to grow it in blood culture, it is termed “blood-culture negative”.² Blood culture negative endocarditis is estimated to make up anywhere between 2.5–70% of all endocarditis cases depending on the country.³ Difficulty in its detection contributes to the wide variability of incidence. Risk factors for this class of endocarditis include exposure to zoonotic sources such as cats, sheep, goats, as well as an underlying valvular heart disease or implanted cardiac devices such as pacemakers.^{4–6} Confirmation requires both a high degree of clinical suspicion based on presentation and advanced microbiological diagnostic tools due to its ability to elude standard culture methods.^{3,7,8}

While endocarditis can arise from various bacterial and viral sources, a relatively rare cause is *Bartonella henselae*. *B. henselae* is part of the *Bartonella* genus of Gram-negative bacilli that can cause a range of human complications including bacteremia, angiomatosis, myocarditis, and endocarditis.² Here we report a case of cat scratch disease due to *Bartonella henselae* that caused vegetations on a native aortic valve. This case adds to the growing body of literature regarding a rare causative agent and improve awareness of the management of culture-negative endocarditis.

CASE REPORT

A 73-year-old female with a history of hypertension, mitral regurgitation status post prosthetic mitral valve on warfarin, vasculitis on steroids, and breast cancer post-excision and radiotherapy presented to the emergency room with acute onset confusion and a three-day history of fever. She denied any chest pain, shortness of breath, palpitations, cough, nausea, vomiting, abdominal pain, lightheadedness, dizziness, or syncope. Of note, she was recently hospitalized for a lower extremity purpuric rash and acute kidney injury. A kidney biopsy had revealed IgA deposits consistent with IgA nephropathy versus Henoch-Schönlein purpura, and she was discharged on a steroid taper, which she was currently still completing.

Her temperature on admission to the hospital was 101.7°F (38.7°C) and she was tachycardic with a heart rate of 115 beats per minute. Physical exam revealed that she was oriented to herself but not to place or time. The rest of her neurologic exam was normal. Her mucous membranes were dry. Auscultation of the heart revealed tachycardia with a regular rhythm, and a mid-systolic click. Her abdomen was soft, nontender, and nondistended, without evidence of hepatosplenomegaly. Inspection of the lower extremities revealed a palpable purpuric rash bilaterally.

International normalized ratio (INR) was 2.4, below the goal INR of 2.5–3.5 for patients with prosthetic mitral valves. Troponin was elevated at 1.831 and trended down. Electrocardiogram showed sinus tachycardia with a rate of 107, without evidence of AV block or ischemia. Computed tomography angiography (CTA) of the abdomen, and pelvis revealed mild splenomegaly and peripheral hypoattenuating regions

Figure 1. CT angiogram of the abdomen and pelvis reveals mild splenomegaly and peripheral hypoattenuating regions in the spleen consistent with splenic infarcts.



Figure 2. MRI brain demonstrates multiple punctate ischemic infarctions in the [A] left insula, [B] left cerebellum, and [C] right parieto-occipital lobe.

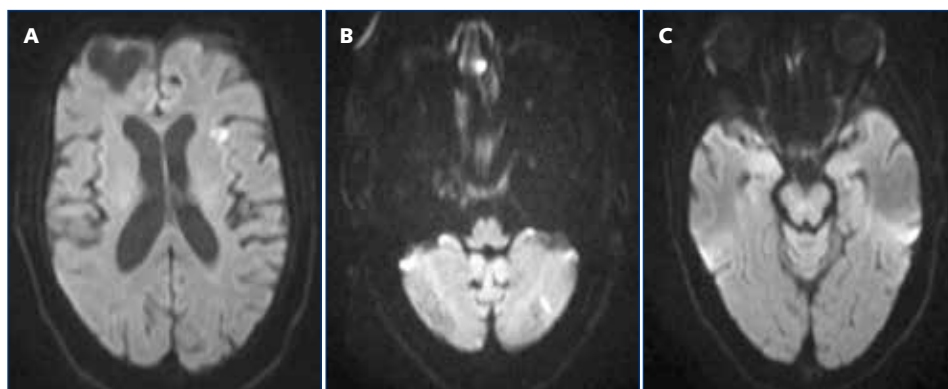


Figure 3. TEE reveals a 6-millimeter vegetation on the ventricular side of the aortic valve.



in the spleen consistent with splenic infarcts (**Figure 1**). Magnetic resonance imaging (MRI) of the brain showed multiple punctate ischemic infarctions in the left insula, left cerebellum, and right parieto-occipital lobe, with no evidence of metastasis (**Figure 2**).

Transthoracic echocardiogram revealed no evidence of endocarditis. Transesophageal echocardiogram (TEE) revealed a 6-millimeter vegetation on the ventricular side of the aortic valve (**Figure 3**). There was a trace to mild aortic insufficiency. However, five sets of blood cultures, including cultures drawn prior to antibiotic administration, revealed no growth.

Infectious disease specialists were consulted for further evaluation. Further history revealed recent exposure to a stray cat in which she pet the cat on multiple occasions in the several weeks before presentation. *Coxiella burnetii* serology, *Bartonella* PCR and serologies, and fungal blood cultures were sent. Antibodies were positive for *Bartonella Henselae*, with an IgG titer of 1:1024, which was strongly suggestive of *Bartonella* as the etiology for culture negative infective endocarditis.

CLINICAL WORKUP

Initially, the differential diagnosis for fever and confusion in this woman with breast cancer and a prosthetic mitral valve was broad. Brain infarcts and splenic infarcts were concerning for thromboembolism, especially given the presence of a prosthetic valve and possible hypercoagulable state of malignancy. Infective endocarditis was another possibility, although the source was not immediately

evident. Prosthetic valve endocarditis from bacterial species including *Enterococcus*, *Staphylococcus*, and *Streptococcus* tend to be common culprits. Marantic endocarditis was also possible, given her history of vasculitis and malignancy. Brain metastasis was on the differential for confusion. Other possible diagnoses included brain abscess, meningitis, and encephalitis.

While hospitalized, the patient had a repeat brain CT after her brain MRI which showed intraparenchymal hemorrhage. She was transferred to the intensive care unit where her warfarin was held, and heparin was started. Intravenous heparin was started due to her prosthetic mitral valve. She then developed a right frontal hemorrhage seen on a subsequent CT. Heparin drip was discontinued until repeat MRI and neurological exams were stable, and then resumed in 48 hours. The patient was discharged from the hospital once

neurologically stable and therapeutic on warfarin. She was initially treated with broad-spectrum antibiotics, vancomycin and piperacillin-tazobactam. These were discontinued when *Bartonella henselae* antibodies returned positive and culture-negative endocarditis was established. She was then started on ceftriaxone, doxycycline, and rifampin with plans for a four-week treatment course. Aminoglycosides were avoided in view of her recent renal dysfunction due to vasculitis. Cardiothoracic surgery was consulted, but surgery was not indicated due to the absence of significant valvular abnormalities. She did not complete the ceftriaxone course due to concerns for an allergic reaction; however, the rifampin and doxycycline courses were completed, and the patient remained off antibiotics without signs of further infection or complications at 2 months. She received physical rehabilitation services at home, and she returned to her baseline functional status in about 2 months.

DISCUSSION

Culture-negative induced endocarditis is typically caused by fastidious organisms such as *Bartonella* spp. and other zoonotic agents and fungi and accounts for around 10% of all IE.^{9–11} Some reports estimate the *Bartonella* spp. accounts for 2–28% of culture-negative endocarditis depending on geographical region.^{2,8,9} Especially in the cases driven by *Bartonella* spp., underlying valvular and congenital heart disease appear to be significant risk factors as highlighted in several recent case reports.^{12–15}

Among patients with reported *Bartonella* endocarditis, some reports estimate that cat exposure such as owning a cat (or being in regular contact with strays) can result in a seroprevalence of between 28.9–40% depending on the country where the studies were conducted.^{10,16,17} These patients usually present with constitutional non-specific symptoms such as fever, fatigue, weakness, and weight loss. In many cases, they will have evidence of a murmur on cardiac auscultation, but in some cases, the key findings of endocarditis, including elevated white blood cell count (WBC) and erythrocyte sedimentation rate (ESR), may be lacking.¹⁸ In addition, some studies have shown that when compared to native valvular disease, prosthetic valve disease leads to a more aggressive disease course with rapid deterioration in hemodynamics, valvular perforation, and eventual heart failure.^{13,19} Adding to the sequelae, patients may also develop an immune-complex glomerulonephritis as reported in several studies^{20–22} including the patient presented in this report.

CONCLUSION

While several *Bartonella* spp. have been described to cause infective endocarditis, in patients with epidemiological exposure to cats and underlying valvular disease or

prosthetic valves, *B. henselae* should be considered high on the differential diagnosis. Patients with clinical and echocardiographic evidence of endocarditis that have negative blood cultures after 72 hours should be suspicious of *Bartonella* endocarditis or any of the slow-growing bacteria such as the HACEK bacteria group. Patients with subacute constitutional symptoms, with murmurs on auscultation, and immune-complex glomerulonephritis should also raise clinical suspicion of a *Bartonella* induced endocarditis. Clinical suspicion of culture-negative endocarditis followed by confirmatory tests such as ELISA and PCR can prevent the rapid decline of these patients and need for operative repairs by interceding with rapid antimicrobial treatment courses. Vigilance and obtaining a comprehensive patient history are key in maximizing favorable outcomes.

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Klinefelter's Syndrome with Tremors, Ataxia and Parkinsonism

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ABSTRACT

Klinefelter's syndrome (KS) is the most common cause of hypogonadism in men. Essential tremor (ET) and parkinsonism have been reported in KS, but ataxia, which has been commonly reported with other causes of hypogonadism, is very rare in KS. Orthostatic tremor has not been reported. We present a case with multiple movement disorders, including gait ataxia, essential-type tremor, rest tremor, orthostatic tremor and parkinsonism.

KEYWORDS: Klinefelter's syndrome, ataxia, orthostatic tremor

INTRODUCTION

Klinefelter's syndrome (KS) is the most common cause of primary hypogonadism in males, but is also associated with several neurological disorders, including behavior problems, intellectual disability, seizures, and movement disorders. It is due to supernumerary X chromosomes, of which 47 XXY is the most common. Movement disorders are rare but have been well documented, most commonly essential tremor (ET).¹ Parkinsonism and ataxia have been reported rarely.² Ataxia has been reported more frequently with causes of hypogonadism other than KS,³ but never in association with parkinsonism. No case of orthostatic tremor has been reported in association with KS and other movement disorders. Here we report a KS patient with all of these disorders.

CASE REPORT

A 49-year-old man was initially evaluated in the movement disorders clinic in 2016. He had been diagnosed as a child with XXY Klinefelter's syndrome, with hypogonadism. Subsequently, intellectual disability was recognized, followed by schizoaffective disorder, depressive type, and generalized anxiety disorder. He also developed type 2 diabetes mellitus. According to his family, the patient had action tremors of the hands for many years, affecting his ability to write and eat without spilling. About two years prior to the first movement disorders evaluation, his hand tremors had increased and leg tremors developed, which occurred only with standing. Family history included a paternal uncle



[Click to view video](https://vimeo.com/786310675)

[1:29] <https://vimeo.com/786310675>

Neurological examination of the patient showing postural hand tremors, orthostatic tremors, wide-based ataxic gait, bradykinesia on finger tapping and heel tapping, facial hypomimia.

with Parkinson's disease (PD) but no one else with tremors, PD or other neurological problems.

On initial evaluation in 2016, the patient was taking risperidone 2 mg daily, aripiprazole 30 mg daily, quetiapine 300 mg daily, escitalopram 10 mg daily, and clonazepam 0.5 mg daily. He had 3 types of tremors: mild resting tremors of the hands which were thought to be secondary to antipsychotics, postural and action hand tremors, and orthostatic tremor. He also had mild parkinsonism which also was thought to be secondary to the antipsychotic medications. He was tapered off the previous antipsychotics including quetiapine, and treated with clozapine, which does not cause parkinsonism, but parkinsonism persisted. Carbidopa-Levodopa 25–100 1 tab TID was tried with no benefit and discontinued. His parkinsonism symptoms continued to get worse and he also developed gait ataxia.

On examination in 2021, while taking clozapine 150 mg daily, trihexyphenidyl 4mg daily, escitalopram 10mg daily, propranolol 60mg daily, insulin, atorvastatin, linagliptin, desmopressin, allopurinol, iron, budesonide/formoterol inhaler, his stride length was reduced. There was a flat foot strike, wide base, slow and unsteady gait, and posture was stooped.

Brain MRI showed mild ventriculomegaly, unchanged from 2009. The Dopamine Transporter Scan (DaT), which is a nuclear imaging measure of midbrain dopamine secreting cells thereby assessing pre-synaptic dopaminergic function, was normal.

In 9/2022, gait and tremors were worse (see Video). He had normal heel-to-shin testing, but mild ataxia on heel tapping. He needed to use his arms to push off the armrests of his chair to stand. There was tremor of legs on standing, which disappeared with walking. He had a wide base, with a very short stride. He was very unsteady and could barely move each leg, despite being supported (see Video). His behavior and cognition had not changed in many years despite withdrawal of all antipsychotic medications.

DISCUSSION

KS is the most common sex chromosome disorders in humans. It is thought that the majority of the affected men are not identified, presumably being phenotypically normal. Cognitive and behavioral problems are common and neurological problems are not rare among those identified, particularly epilepsy and essential type tremor. Parkinsonism has been reported with normal and abnormal DaT scan² in KS patients, implicating pre-synaptic dopamine deficiency in some KS patients, but unexplained parkinsonism in others. Ataxia is very uncommon in KS, although it is the most common neurological problem in other forms of hypogonadism.³ Our patient has rest tremor, postural tremor and orthostatic tremor (which has not been reported previously) as well as ataxia. There is no report of this combination of neurological findings. Although this patient had been treated with neuroleptic medications, they had been discontinued 60 months prior to the attached video. Parkinsonism had worsened during this time, indicating that this was no longer a neuroleptic side effect.

There are only a few reports on the neuropathology of KS patients, none of which describe patients with parkinsonism, tremors, ataxia or schizophrenic-type psychiatric problems.⁴ In one of the reports, focal cerebral and cerebellar megalencephaly with broad gyri, cytoarchitecturally abnormal cortex and thickened cerebral vessels were described. Most of the other studies reported non-specific changes such as neuronal loss, demyelination, gliosis, or pituitary abnormalities. There are also reports of bilateral megalencephaly with polymicrogyria and cortical dysplasia.⁴ The brain MRI of our patient showed none of these abnormalities. These pathology reports may explain cognitive impairment and seizures but not the movement abnormalities of our patient. We have no explanation for the abnormalities in our patient, the localization of the pathology, or why these progressive changes should have begun when they did. It is possible that this patient may have another neurological condition co-existing with KS.

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Maternal and Neonatal Outcomes Before and During the COVID-19 Pandemic

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ABSTRACT

OBJECTIVE: The COVID-19 pandemic brought about many social, psychological, and economic changes. We sought to compare pregnancy and birth outcomes immediately preceding the COVID-19 lockdown to those 12 months later.

STUDY DESIGN: This was a retrospective cohort study of people giving birth at a large-volume tertiary medical center in Rhode Island. We compared those who gave birth in February 2020 to those in February 2021.

RESULTS: Fewer people delivered in 2021 than 2020 (562 vs. 655). There was a non-significant decrease in the number of primary cesarean deliveries from 2020 to 2021. Insurance status modified this effect as there was a significant decrease in the number of patients with private insurance undergoing primary cesarean (63.6 vs 36.4%, $p=0.004$). Neonatal complications significantly decreased (55.4% vs 47.4%, $p=0.006$).

CONCLUSION: There were differences in sociodemographic characteristics and outcomes of birthing people between 2020 and 2021. The socioeconomic and healthcare landscape caused by COVID-19 altered statewide birthing patterns.

KEYWORDS: coronavirus, COVID-19, adverse perinatal outcomes, maternal, neonatal

INTRODUCTION

The ongoing global pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) brought about many social, psychological, and economic changes. The lockdown measures that were instituted across the United States in March of 2020 impacted employment rates, healthcare access, and social support structures.^{1,2} In particular, there is concerning evidence that suggests that the social disturbances of the pandemic widened existing racial and socioeconomic disparities in pregnancy and birthing outcomes.³⁻⁵ Studies have shown that women who are Black or Hispanic, living in neighborhoods with high deprivation, or experiencing job loss had a higher prevalence of COVID-19 infections;

women living in neighborhoods with high unemployment rates were more than twice as likely to contract COVID-19 during the early pandemic.^{3,4} These discrepancies in infection rates could translate to birth outcomes as COVID-19 infection during pregnancy is associated with increased rates of stillbirth, preterm birth, and preeclampsia. Pregnant women are also three times more likely to require ICU level care because of COVID-19 infection compared to non-pregnant women.⁵

During lockdown, women disproportionately experienced more job loss than men,⁶ which put financial strain on many families and affected their family planning. In one study, 34% of participants reported delaying plans to have a child or reducing the number of children they were expected to have because of the pandemic and a 2020 report predicted 300,000 to 500,000 fewer births in the year following.^{7,8} However, it is not known how these changes may have translated to local birthing characteristics and outcomes.

Additionally, the pandemic and the implementation of new public health measures also disrupted access to health care. One study reported that 33% of participants had to cancel or delay reproductive health appointments and barriers to receiving care were greater among Hispanic and Black patients compared to White patients.⁸ The increased challenges in accessing health care also led to an estimated 12 million women who were unable to access family planning services.⁹ These barriers will likely impact who is giving birth during the pandemic and change the risk profiles of pregnant patients.¹⁰

The pandemic also greatly altered the birthing experience in hospitals. In the early pandemic, many hospitals incorporated stringent visitor restrictions, in some cases not allowing any labor support.¹¹ Furthermore, in a prior study, half of birthing parents and newborns had a postpartum stay of just one night following vaginal delivery post-implementation of COVID-19 protocols as compared to only one-quarter of birthing parents and newborns in the pre-implementation group, which may have impacted their comfort in neonatal care after discharge.¹¹ With the added stress of the pandemic, there has also been a notable increase in peripartum anxiety and depression,^{12,13} both of which are associated with preterm births and lower rates of breastfeeding.¹⁴

However, despite the many recognized impacts of the COVID-19 pandemic, much remains unknown. We aimed

to study differences in pregnancy and birth characteristics in Rhode Island between a pre-pandemic cohort and a cohort who gave birth 12 months after COVID-19 public health measures were implemented in the US. We hypothesized that the pandemic increased barriers and disparities in accessing reproductive services and obstetric care, resulting in changes in birth characteristics and birthing outcomes.

METHODS

This study was a retrospective cohort study involving all individuals who gave birth at ≥ 20 weeks gestation at Women & Infants Hospital in Providence, Rhode Island during the months of February 2020 and February 2021. Women & Infants Hospital is a tertiary medical center, performing over 8,000 deliveries per year, which represents over 85% of Rhode Island births. A detailed review of patient demographics, pregnancy and delivery characteristics, and neonatal outcomes were performed by trained research personnel, and 5% of charts were doubly abstracted to ensure quality control.

For this analysis, we compared those delivering immediately prior to the pandemic (February 2020) to those delivering approximately one year after the pandemic started (February 2021 with conception during lockdown in 2020). Our primary outcome of interest was mode of delivery (cesarean, spontaneous vaginal, or operative vaginal delivery). The secondary outcome was composite neonatal morbidity which included Neonatal Intensive Care Unit (NICU) admission, fetal or neonatal death (at delivery admission), APGAR score of < 7 at 5 minutes of life, hypoglycemia (blood glucose of < 40 mg/dL at any point), or hyperbilirubinemia (as documented on hospital discharge diagnoses).

STATISTICAL ANALYSES

We calculated descriptive statistics for our demographic variables by delivery year and estimated p-values using a 2-sample test for equality of proportions (z-test) with continuity correction for count values and the Welch 2-sample t-test for mean values. We similarly calculated descriptive statistics by delivery year for our outcomes of interest. We used bivariate logistic regression to report odds ratios for our main findings as determined by the descriptive statistics.

RESULTS

There was a total of 655 births in February 2020 and 562 in February 2021. Overall, demographic characteristics were similar between those delivering in 2020 compared with 2021, except that the proportion of people with private insurance decreased from 2020 to 2021 (56.5 vs 50.4%, p -value=0.04) (Table 1). There were no significant differences in mean maternal age, race and ethnicity, and number

Table 1. Demographic characteristics among birthing parents who delivered in February 2020 and February 2021

Demographics	2020	2021	P-value
Total	655	562	
Maternal age, years (mean, SD)	30.49 (5.8)	30.87 (5.9)	0.26
Advanced Maternal Age	189 (28.9)	165 (29.4)	0.90
Nulliparous	198 (30.2)	164 (29.2)	0.77
Race			
American Indian/Alaska Native	26 (4.0)	15 (2.7)	0.27
Asian	31 (4.7)	24 (4.3)	0.80
Black/African American	69 (10.5)	70 (12.5)	0.34
Native Hawaiian/Pacific Islander	8 (1.2)	2 (0.4)	N/A
White	417 (63.7)	348 (61.9)	0.57
Other	37 (5.7)	42 (7.5)	0.24
Unknown	67 (10.2)	61 (10.9)	N/A
Ethnicity			
Hispanic	192 (29.3)	157 (27.9)	0.64
Non-Hispanic	450 (68.7)	403 (71.7)	0.28
Unknown	13 (2.0)	2 (0.004)	N/A
Primary Language English	568 (86.7)	487 (86.7)	0.52
Insurance status			
Private	370 (56.5)	283 (50.4)	0.04
Public	279 (42.6)	275 (48.9)	0.04
Other	6 (0.9)	4 (0.7)	N/A

Columns are N (%) unless otherwise noted

of primary English speakers between those giving birth in 2020 versus 2021.

For mode of delivery, the number of primary cesarean deliveries decreased non-significantly from 2020 to 2021 (20.2 vs 16.0%, p -value=0.08) (Table 2). This effect was modified by insurance status: the odds of primary cesarean among those with public insurance was unchanged (odds ratio [OR] 1.10, 95% confidence interval [CI] 0.71–1.69), whereas the odds of primary cesarean among those with private insurance was lower in 2021 compared with 2020 (OR 0.54, 95% CI 0.36–0.82) (Table 3). Other pregnancy and delivery characteristics were similar across the two periods, including rates of gestational diabetes, hypertensive disorders of pregnancy, postpartum hemorrhage, patients undergoing Trial of Labor After Cesarean (TOLAC), and multifetal gestation.

In terms of neonatal outcomes, there was a significantly higher number of neonatal complications in 2020 compared with 2021 (55.4 vs 47.4%, p =0.006). This difference was primarily driven by a decreased incidence of hyperbilirubinemia in 2021 (35.6 vs 24.0%, p <0.001) (Table 4). There was no statistically significant change in the rates of hypoglycemia and other complications between the two years. Additionally, the rates of NICU admissions, low birth weight (< 2500 g),

Table 2. Pregnancy and delivery characteristics among birthing parents who delivered in February 2020 and February 2021.

Characteristic	2020	2021	P-value
Total	655	562	
Labor Onset			
Spontaneous	313 (47.8)	262 (46.6)	0.78
Induction of labor	241 (36.8)	208 (37.0)	1.00
Scheduled cesarean	100 (15.3)	92 (16.4)	0.64
Mode of Delivery			
Spontaneous vaginal delivery (SVD)	398 (60.8)	359 (63.9)	0.31
Vacuum-assisted vaginal delivery (VAVD)	26 (4.0)	14 (2.5)	0.20
Forceps-assisted vaginal delivery (FAVD)	10 (1.5)	13 (2.3)	0.42
Primary cesarean	132 (20.2)	90 (16.0)	0.08
Repeat cesarean	89 (13.6)	86 (15.3)	0.43
Trial of Labor After Cesarean (TOLAC)†	26 (24.1)	36 (32.1)	0.24
Gestational diabetes	55 (8.4)	59 (10.5)	0.24
Hypertensive disorder of pregnancy*	84 (12.8)	71 (12.6)	1.00
Postpartum hemorrhage	27 (4.1)	32 (5.7)	0.25
Multifetal Gestation			
Twins	15 (2.3)	9 (1.6)	0.51
Triplets	1 (0.2)	0	N/A

Columns are N (%) unless otherwise noted

*Hypertensive disorders of pregnancy included gestational hypertension, pre-eclampsia, eclampsia

†Calculated only among patients who had a cesarean

congenital anomalies, neonatal readmission, APGAR scores, and preterm birth were comparable between 2020 and 2021.

DISCUSSION

In this study comparing maternal, neonatal, and birth characteristics before versus during the COVID-19 pandemic, we found an overall decrease in the number of births between 2020 and 2021, which was largely driven by a reduction in patients with private insurance giving birth. Privately insured patients also underwent fewer cesarean deliveries and there was an overall decrease in the rate of neonatal complications in 2021.

This is consistent with previous predictions that the birth rate would drop during the first year of the COVID-19 pandemic.^{7,10} This decrease is likely multifactorial; the potential impact of close confinement during lockdown on increasing birth rate appeared to be outweighed by the stress and uncertainty caused by social and financial insecurities and the unknown progression of the pandemic.¹⁵ The drop in

Table 3. Odds ratio of primary cesarean delivery among nulliparous birthing parents delivering in February 2021 vs 2020 with private insurance and public insurance.

Odds Ratios	OR (95% CI)
Among people with private insurance, primary cesarean birth	0.54 (0.36, 0.82)
Among people with public insurance, primary cesarean birth	1.10 (0.71, 1.69)

Table 4. Neonatal characteristics among birthing parents who delivered in February 2020 and February 2021.

Neonatal Outcomes	2020	2021	P-value
Total	663	566	
Sex			
Male	333 (50.2)	286 (50.5)	0.96
Female	330 (49.8)	280 (49.5)	0.96
Preterm birth <37 weeks	68 (10.3)	66 (11.7)	0.49
Low birth weight <2500g	59 (8.9)	58 (10.3)	0.48
5 min APGAR (mean, SD)	8.76 (0.8)	8.78 (0.8)	0.69
Neonatal Complications, total	367 (55.4)	268 (47.4)	0.006
Hyperbilirubinemia	236 (35.6)	136 (24.0)	<0.001
Hypoglycemia	30 (4.5)	23 (4.1)	0.80
Other	101 (15.2)	109 (19.3)	N/A
NICU Admission	101 (15.2)	79 (14.0)	0.58
Readmission within 30 days	16 (2.4)	11 (1.9)	0.72

Columns are N (%) unless otherwise noted

patients with private insurance giving birth in 2021 with a similar number of patients with public insurance giving birth between the two years may be reflective of patients with lower socioeconomic status experiencing greater barriers to accessing birth control and family planning services during the pandemic, which has been found in other studies.^{8,16} However, we did not detect differences by race and ethnicity that have been previously described. Additionally, with higher unemployment rates after the start of the pandemic, there may have been a shift from employer-sponsored health insurance to public coverage.²

We observed a non-significant decrease in the rate of primary cesarean births between the two time periods, that appears to be driven by a decreased rate of patients with private insurance undergoing primary cesarean delivery. This is consistent with a study of nulliparous patients delivering at full term in Rhode Island that reported a decrease in elective cesareans during the beginning of the pandemic in April 2020.¹⁷ However, it is in contrast with other studies that found increased rates of cesarean births during the

pandemic.^{18,19} These changes in cesarean delivery rates may signify differences in who is getting pregnant and pre-pregnancy risk profiles, with higher-risk patients being more likely to postpone birth given the social uncertainty associated with the pandemic. While we did not detect differences in pre-gestational complication profiles, including pre-gestational diabetes and hypertension, there may have been other medical comorbidities or characteristics we were unable to capture.

Our data also show a significant reduction in neonatal complications from 2020 to 2021, which was primarily driven by a decrease in hyperbilirubinemia. Contrary to other studies, we did not observe a significant difference in preterm births or rates of labor induction between 2020 and 2021, which might have otherwise explained this difference.^{5,20-22} Similar to the findings above, this could represent that a population with fewer medical comorbidities achieved pregnancy during the pandemic, although we were not able to detect those differences.

STRENGTHS AND LIMITATIONS

This study has a number of important strengths and weaknesses. This study was completed at a large, diverse, tertiary medical center where >85% of the state births occur, generating a state-representative sample. We completed a comprehensive chart review for all patients birthing during the months included with stringent internal auditing protocols to increase validity of abstracted results. However, this analysis was not without limitations. We only collected data from two timepoints before/during the pandemic. It may have been more informative to have collected additional timepoints to establish longer-term patterns in care and outcomes. We also only collected data from a single site, so the results may be locally but not more widely representative of the experiences and outcomes in other locations. While our medical center experienced a decrease in total births, we cannot know if this was a result of a decreased birth rate or fewer people deciding to come to this site to give birth. We also did not have detailed data available on receipt of reproductive infertility treatments, which likely had an impact on the profile of birthing people across the two time periods and was a service that was not consistently accessible during the early pandemic.

CONCLUSIONS

Our data show that in the state of Rhode Island, there were fewer births among people with private insurance in 2021 compared to 2020 while patients with public insurance had a similar birth rate before and during the pandemic. We also found a significant reduction in neonatal complications in 2021, with no change in preterm birth rates, induction of labor rates, or medical comorbidity profiles. These shifts suggest that the societal and economic changes brought on by the COVID-19 pandemic altered birthing demographics by

possibly affecting access to family planning services, health care, and private insurance. Further research is needed to explore the long-term impact of the COVID-19 pandemic on access to comprehensive reproductive health care and birthing outcomes.

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Hospital Courses Differ Amongst Hip Fracture Patients With or Without Coronavirus-19 Positive Status Upon Admission

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ABSTRACT

INTRODUCTION: The purpose of this study was to compare the hospital course and disposition of COVID-19 positive versus negative patients following an operatively managed hip fracture.

MATERIALS AND METHODS: This retrospective cohort study evaluated patients presenting to a university medical center with a hip fracture who underwent surgical management between February 1, 2020 and April 1, 2021. COVID-19 diagnosis was obtained using PCR testing. Hospital length of stay, disposition, readmission, and mortality were compared between patients with and without COVID-19.

RESULTS: 399 total patients were identified who met inclusion criteria, with 14 patients who were COVID-positive (3.1%). There was a 6.1 day increase in length of hospital stay for COVID-19 positive patients compared to those who were COVID negative ($p = 0.002$), without significant changes in disposition, readmission rates, or mortality.

CONCLUSIONS: A positive COVID-19 test at the time of admission can significantly increase hospital admission duration.

LEVEL OF EVIDENCE: III, Retrospective Cohort Study

KEYWORDS: COVID-19 outcomes, hip fractures, geriatric orthopedic surgery

INTRODUCTION

The Coronavirus disease 2019 (COVID-19) pandemic has had a profound impact on global healthcare systems, with effects felt from the local to the international level. As of January 2022, the World Health Organization has reported a cumulative total of over 346,000,000 confirmed cases and 5,584,000 confirmed deaths secondary to COVID-19 since the start of the pandemic.¹ First identified in Wuhan City, China in late 2019, the SARS-CoV-2 pathogen is capable of producing massive bilateral interstitial pneumonia with both acute and long-term cardiopulmonary and systemic sequelae.² Risk factors for developing severe COVID-19 symptoms have been extensively studied and include advanced age (>70 years old), obesity, underlying cardiovascular and

respiratory disease, and immunocompromising conditions.³ The risk of severe symptoms, rapid rates of transmission, and emergence of unique variants have placed substantial strain on hospital systems and societal institutions alike, pushing previously well-prepared hospitals to capacity and triggering lockdowns and increased restrictions from international governments.⁴⁻⁶

The impact of government lockdowns placed to reduce the spread of COVID-19 and mitigate overtaking of challenged healthcare systems will remain the subject of ongoing investigation for the foreseeable future. Extensive global lockdowns demonstrated high efficacy in containing COVID-19 transmission, with limitation of social functions and communal gatherings removing many paths of disease spread.^{7,8} Secondary effects of these lockdowns may prove more or less significant than expected, and include unforeseen economic, psychologic, and social impacts.⁷ In the realm of orthopedics, such restrictions had unexpected yet unsurprising effects on patient injury patterns. Pediatric fractures were observed to decrease 2.5-fold during the pandemic, due largely to closure of playgrounds and cessation of organized sports.⁹ Motor vehicle accidents and related trauma decreased significantly worldwide, trends likewise observed for homicide and suicide.¹⁰⁻¹² Lockdown initiatives, which decrease both social activities and social support, have been posited as either increasing or decreasing rates of fragility fractures, with different epidemiological studies reaching both conclusions.^{13,14} Regardless, fragility fractures of the hip continue to occur in the general population, with the potential for COVID-19 to influence patient care once such an injury occurs.

Patient care following a hip fracture during the COVID-19 pandemic can be impacted by the presence of the disease in the individual patient, as well as the current state of the hospital system as a result of surging cases. Redirection of healthcare facility resources, such as beds and nursing staff, from orthopedic to urgent medical care was common in heavily challenged hospitals, with the CDC classifying musculoskeletal injuries as “less likely risk” for patient mortality if care is deferred compared to immediately life-threatening conditions.¹⁵ This classification, in conjunction with limited resources, has the potential to both delay patient treatment and expedite important postoperative care and rehabilitation.¹⁶ Likewise, risk factors for fragility fractures, such as

advanced age, smoking, and immunosuppression, are also risk factors for COVID-19 complications, suggesting that the overlapping patient population of COVID-19-positive fragility fracture patients may require more extensive care during their hospitalization, and may be at increased risk for short-term complications.^{17,18}

The persistence of COVID-19 has had a considerable impact on both the development and management of hip fractures. At present, there is limited research examining management and outcomes of hip fractures in patients actively testing positive for COVID-19 at the time of injury. The present study seeks to examine the hospital course and disposition of all reported cases of hip fractures within a primary state healthcare system during a during the first year of the COVID-19 pandemic. We hypothesize that a positive COVID-19 diagnosis at the time of injury will result in increased hospital length of stay as well as readmission and mortality rates.

METHODS

This is a retrospective cohort study of all patients presenting to one of two university medical centers with a hip fracture who subsequently underwent surgical management between February 1, 2020 and April 1, 2021. All patients were grouped into two cohorts based on a lab confirmed positive or negative COVID-19 diagnosis using COVID-19 reverse transcription polymerase chain reaction (RT-PCR) testing. This study was started following Institutional Review Board approval [board reference number 221010].

Establishing the Cohorts

The cohort described was gathered using Current Procedural Terminology (CPT) codes for hip fracture repair (27130, 27125, 27235, 27236, 27244, 27245). To be included in the COVID-19 positive cohort, surgery had to occur during the patient's stay in which they received a lab-confirmed positive COVID-19 diagnosis using RT-PCR testing. A total of 399 patients presented with a hip fracture and subsequently underwent surgery. Of these, 15 patients were included in the COVID-19 positive cohort, while 384 patients with a lab-confirmed negative COVID-19 diagnosis were included in the COVID-19 negative cohort. Laboratory testing for COVID-19 was performed prior to surgical intervention.

Fracture types were identified as intertrochanteric, subtrochanteric, femoral neck fractures (including displaced and valgus-impacted) and basicervical femoral neck fractures. Basicervical, intertrochanteric, and subtrochanteric femur fractures are typically treated with cephalomedullary nailing at our institutions, while femoral neck fractures are treated with hemiarthroplasty, total hip arthroplasty, or closed versus open reduction and internal fixation, depending on surgeon preference and fracture pattern. Data from this study included that of 19 different attending surgeons.

Data included

For each patient, data regarding their demographic characteristics, past medical history, hip fracture procedure, and subsequent hospital stay were extracted via chart review. The primary outcomes were hospital length of stay, intensive care unit (ICU) admissions, blood transfusion requirements, discharge disposition, hospital readmission at 30 days and 90 days, and mortality. Each patient's past medical history was used to calculate their respective Charlson Comorbidity Index (CCI) that would be used, along with other specific diagnoses, to control for comorbidities when analyzing potential differences in the variables of interest between the two cohorts.

Statistics and Analyses

Patient demographics and surgical characteristics were analyzed for each cohort. **Table 1** shows the patient characteristics for each cohort, including CCI and rates of cardiovascular disease (CVD), cerebrovascular accident/transient ischemic attack (CVA/TIA), dementia, chronic obstructive pulmonary disease (COPD), connective tissue disease, liver disease, diabetes mellitus, chronic kidney disease (CKD), and cancer. An initial model comparing hospital courses between the two cohorts was done using chi-square and t-tests to assess for differences in categorical and continuous variables, respectively. Multivariate logistic regression was used to generate a second model to analyze for potential differences in hospital stay between the two cohorts, while controlling for patient demographics, anesthesia used during the procedure, individual comorbidities, and CCI.

A p-value < 0.05 was considered statistically significant. All analyses were performed using Stata (Version 15.1, StataCorp, Durham, NC, USA).

RESULTS

A total of 399 patients underwent surgical repair of a hip fracture in two university associated medical centers from February 1st, 2020 to April 1st, 2021. The study cohorts comprised of 15 laboratory-confirmed COVID-19-positive patients (3.8%) and 384 laboratory-confirmed COVID-19-negative patients (96.2%), with demographic findings and a comparison of the two cohorts located in **Table 1**. Aside from a diagnosis of COVID-19, there were no significant differences in sex, age, anesthesia type, surgery type, tobacco use, and comorbidities (including CCI) between the two cohorts. Patients in the COVID-19 positive cohort were more likely to have basicervical fractures rather than other types of femoral neck fractures; rates of peritrochanteric fractures were similar between the two cohorts (**Table 1**). The types of surgeries performed were similar between the two groups.

Bivariate analysis of hospital stay between the cohorts demonstrated a statistically significant 6.1 day increase in length of hospital stay in the COVID-19 positive cohort

Table 1. Characteristic Comparison between Cohorts

Variable	COVID-19 Negative (n = 384)	COVID-19 Positive (n = 15)	p-value
Sex, female (%)	255 (66.4)	10 (66.7)	0.696
Age, mean +/- SD	79.2 +/- 13.7	75.8 +/- 16.85	0.363
Fracture Type			
Basicervical	7 (1.8)	2 (14.3)	0.015
Femoral Neck	183 (47.7)	4 (28.6)	
Intertrochanteric	172 (44.5)	7 (50.0)	
Subtrochanteric	21 (5.5)	1 (7.1)	
Surgery Performed			
Cephalomedullary Nail	190 (49.5)	10 (71.4)	0.355
Hemiarthroplasty	137 (35.7)	2 (14.3)	
Total Hip Arthroplasty	20 (5.2)	1 (7.1)	
Other	37 (9.6)	1 (7.1)	
Anesthesia Type, (%)			
General	204 (53.1)	5 (35.7)	0.256
Spinal	163 (42.7)	7 (50.0)	
MAC	16 (4.2)	2 (14.3)	
Smoker (%)	306 (79.7)	9 (64.3)	0.164
Comorbidities			
CCI, mean +/- SD	5.2 +/- 2.2	5.1 +/- 2.8	0.959
CVD, (%)	195 (50.8)	7 (50.0)	0.954
CVA/TIA, (%)	72 (18.8)	5 (35.7)	0.114
Dementia, (%)	48 (12.5)	12 (28.6)	0.080
COPD, (%)	43 (11.1)	1 (7.1)	0.635
Connective Tissue Disease, (%)	10 (2.6)	0 (0)	0.541
Liver Disease, (%)	7 (1.8)	0 (0)	0.61
Diabetes Mellitus, (%)	64 (16.7)	5 (35.7)	0.064
CKD, (%)	26 (6.8)	2 (14.3)	0.28
Cancer, (%)	86 (22.4)	2 (14.3)	0.473

Note: MAC, monitored anesthesia care; CCI, Charlson Comorbidity Index; CVD, cardiovascular disease; CVA/TIA, cerebrovascular accident, transient ischemic attack; COPD, chronic obstructive pulmonary disease; CKD, chronic kidney disease; "Other" includes dynamic hip screw, closed reduction percutaneous pinning, and open reduction internal fixation; Bold represents statistical significance, $p < 0.05$

compared to the COVID-19 negative cohort ($p = 0.002$). There were no significant differences in blood transfusion requirements, ICU admissions, discharge disposition, rates of hospital readmission at 30 and 90 days, or all-cause mortality between the two cohorts (**Table 2**).

In a multivariate logistic regression model controlling for age, sex, fracture morphology, surgery type, and comorbidities, hospital length of stay remained the only significant difference between the two cohorts (**Table 3**). COVID-19 positive patients were over 25 times more likely to experience a greater than 10-day hospital stay following hip fracture

Table 2. Hospital Course Comparison between Cohorts

Variable	COVID-19 Negative (n = 384)	COVID-19 Positive (n = 15)	p-value
Length of Stay, mean +/- SD	6.6 +/- 7.3	12.7 +/- 8.8	0.002
Required Transfusion, (%)	86 (17.7)	3 (21.4)	0.932
Intensive Care Unit Admission (%)	5 (1.3)	0 (0.0)	0.787
Discharge Disposition, (%)			
Skilled Nursing Facility	249 (64.8)	9 (64.3)	0.119
Acute Rehabilitation	35 (9.1)	0 (0)	
Home	89 (23.2)	5 (35.7)	
Hospice	11 (2.9)	0 (0)	
Readmitted within 30 days, (%)	67 (17.7)	4 (28.6)	0.286
Readmitted within 90 days, (%)	106 (27.6)	6 (42.9)	0.213
Mortality	16 (4.2)	1 (7.1)	0.589

Note: SD, standard deviation; Bold represents statistical significance, $p < 0.05$

Table 3. Multivariate Analysis of COVID-19 Status Effect on Hospital Course

Variable	Odds Ratio	95% CI	p-value
Length of Stay Greater than 10 Days	25.6	6.37–102.89	<0.001
Required Transfusion	0.92	0.23–3.77	0.913
Discharge Disposition			
Skilled Nursing Facility	1.20	0.33–4.30	0.780
Home	1.90	0.50–7.23	0.347
Readmitted within 30 days, (%)	1.89	0.53–6.68	0.323
Readmitted within 90 days, (%)	2.56	0.80–8.22	0.115
Mortality	2.53	0.24–27.07	0.442

Note: CI, confidence interval; Bold represents statistical significance, $p < 0.05$

repair compared to their COVID-19 negative counterparts (odds ratio (OR) 25.6, 95% confidence interval, 6.37–102.89). Akin to the bivariate analysis, there was no significant difference in the transfusion requirements, discharge disposition, rates of hospital readmission at 30 and 90 days, or all-cause mortality between the two cohorts (**Table 3**).

DISCUSSION

The present study examines cases of hip fractures occurring in the state of Rhode Island during statewide COVID-19 regulations, with the purpose of comparing demographic and hospital course data of patients diagnosed with COVID-19 at the time of injury versus those testing negative for the virus. In the examined patient population, no significant differences were observed in patient sex, age, tobacco use, type of surgery, and medical comorbidities, as well as anesthesia used during surgery. Length of stay was significantly increased in

patients testing positive for COVID-19, but there were no other observed associations between outcome variables and COVID-19 status. This investigation is unique in its examination of hip fractures in COVID-19 positive patients specifically and how these patients compare to others managed during the same period of healthcare strain and systemic change. The relatively small size of Rhode Island and predominant volume of patients within the state seen by the studied academic hospital network makes Rhode Island an optimal region for examining COVID-19-related health data.¹⁹

Studies examining fragility hip fractures in the context of COVID-19 have primarily focused on impacts to patient care secondary to hospital and healthcare system changes from COVID-19, regardless of individual patient disease status. Numerous investigations have sought to elucidate changes to the epidemiology of hip fractures brought on by society-level COVID-19 changes. In the United Kingdom, Arafa et al observed an increase in the number of patients admitted for hip fractures during a period of national lockdown, in contrast to findings by Italian researchers in Maniscalco et al and other UK researchers in Malik-Tabassum et al, both of whom saw relative decreases in case volume.^{13,14,20} Arafa et al attributed the observed increase in cases to potentially decreased daily support of these patients by self-isolating caregivers, while limited time outside of the home was proposed as a means by which falls and consequent hip fractures were reduced during lockdowns.

Given the substantial variability in symptom severity associated with COVID-19, a wide range of average hospital length of stay in COVID-19 positive patients has been reported. A 2020 systematic review by Rees et al found reported median length of stay in patients admitted for COVID-19 to range between less than a week to almost 2 months, with a mean of 5 days in hospitals outside of China.²¹ There is likewise variability in reported length of stay following surgeries during this time, with few studies differentiating between COVID-19-positive and negative patients. Dick et al reported no changes in general post-operative length of stay following emergency general surgery during COVID-19.²² A study of fragility hip fractures amongst a cohort of Israeli patients during COVID-19 found that these patients, not stratified by COVID-19 status, had significantly shorter lengths of stay compared to similar data from 2017 and 2018 (7.2 ± 3.3 versus 8.9 ± 4.9 days).²³ This difference could be attributed to an increased effort to mobilize patients from the hospital, due in some combination to resource demand and fear of hospital-acquired infection. Similarly, Walters et al found a shorter mean length of stay across all patients managed for hip fractures in a major London hospital during the a 13-week peak of COVID-19 cases when compared to pre-COVID-19 data (11.6 vs. 19.6 days).²⁴ Length of stay amongst hip fracture patients was stratified by COVID-19 status by Arafa et al, who observed significantly longer hospital stays in COVID-19-positive patients compared to

both negative patients and pre-COVID-19 patient cohorts.¹³ The results of the present study support these findings, suggesting that COVID-19-positive postoperative patients require significantly longer periods of hospitalization than their negative-testing counterparts. Another possible reason for the prolonged lengths of stay of COVID-19 positive hip fracture patients may be due in part to the large portion of postoperative hip fracture patients that require placement in short to long-term care facilities at discharge. It is possible that policies put in place by the Department of Health or individual skilled nursing or long-term care facilities to prevent the spread of COVID-19 precluded the acceptance of COVID-19 positive patients, requiring them to remain in the hospital when they would have otherwise been discharged to such a facility.

Regardless of COVID-19, hip fractures are a major cause of morbidity and mortality in elderly patients worldwide, with an estimated fatality rate ranging from 15% to 30% in community-dwelling patients, and up to 55% amongst those in long-term care facilities.²⁵ Combine this risk with those inherent to COVID-19, which has been demonstrated in the literature to increase postoperative complication rates for major surgeries, and the potential for adverse outcomes in these patients is substantial.^{26,27} Furthermore, there is significant overlap in the risk factors for both hip fractures and severe COVID-19 symptoms warranting hospitalization.^{17,18} The present study identified no significant difference in the transfusion requirements, discharge disposition, rates of hospital readmission at 30 and 90 days, or all-cause, in-hospital mortality between hip fracture patients with or without diagnosed COVID-19. In contrast, Arafa et al found a significantly higher rate of 30-day mortality in COVID-19-positive patients (36.8%) versus COVID-19-negative and pre-COVID-19 patients (11.5%, 11.7%).¹³ All 7 COVID-19-positive patient deaths in this study were due to COVID pneumonia, and postoperative falls was the only postoperative complication observed to be higher in the COVID-19-positive cohort. A 2020 meta-analysis of 16 case series and retrospective cohort studies by Wang et al examining early mortality following hip fractures found that those with concomitant COVID-19 infections had an overall pooled mortality rate in the early postoperative period of 32.6%, with a 5.66 relative risk of postoperative mortality in COVID-19-positive versus negative patients.²⁸ Severity of COVID-19 symptoms is likely associated with risk of early postoperative mortality, with one case series reporting a mortality rate of 10% in a group of 10 positive patients, albeit with nearly all patients demonstrating little to no COVID-19 symptoms.²⁹ Konda et al observed a postoperative mortality rate of 12.5% in asymptomatic COVID-19-positive hip fracture patients versus a 30% mortality rate in symptomatic patients, further underscoring the significance of patient symptoms when assessing post-operative management risks.³⁰

Patient COVID-19 status must undoubtedly be taken into consideration when evaluating a hip fracture, particularly in the context of postoperative planning. Suspected or confirmed COVID-19 necessitates adherence to strict contact precautions and personal protective equipment by all providers, and general surgical planning should best minimize exposures and predominantly focus on the most conservative approach, particularly one that lessens risk of reoperation.³¹ COVID-19 has generated increased focus on conservative orthopedic management of fractures given the amplified attention towards resource management, though the necessity for surgery on a femur fracture limits the application of this approach.³² Regarding postoperative management, COVID-19 should be considered an important factor when considering length of stay, with the potential for patients regardless of demographics to warrant increased medical attention. Standardized assessment scores can be modified for COVID-19, such as the Score for Trauma Triage in the Geriatric and Middle-Aged (STTGMA), which was modified by Konda et al to stratify risk in COVID-19-positive hip fracture patients, and provide valuable information for clinical decision making. As our collective understanding of COVID-19 continues to evolve, so too should our understanding of its role in postoperative outcomes.

There exist potential limitations to the present study inherent to its retrospective, single-system nature. The rapidly changing landscape of healthcare in the context of the global COVID-19 pandemic suggests that practices and patient management have the potential to vary greatly, both between hospital systems and even within a singular system depending on the current state of the pandemic. For example, the prolonged lengths of stay of COVID-positive patients may be directly related to SNF issues, such as losses in staffing and bed availability, causing providers to be unable to transfer patients to SNF even when medically cleared for discharge. Though the data was taken from the largest state healthcare system and two different facilities, it represents only a singular system in a single state, with a relatively low number of COVID-19 positive patients captured. Moreover, COVID-19 severity drastically ranges, and we were unable to assess for COVID-19-related illness severity. Unfortunately, we were unable to account for clinical and radiographic outcomes of our patients due to limitations within the data; this limitation also applies to mortality as we were only able to capture in-hospital mortality for our two cohorts. Importantly, we were also unable to capture patients who had not undergone operative intervention for their hip fracture; given some surgeons were treating COVID-19 positive individuals nonoperatively for their hip fractures, our study cannot account for these patients who may have been more systemically ill and at higher risk for complicated hospital courses. Additionally, advances in vaccine availability and the emergence of COVID-19 variants can impact the effects of the virus on patients and will necessitate frequent updates and expansion of research into COVID-19-related outcomes.

CONCLUSION

COVID-19 remains a significant variable to consider when developing treatment algorithms and individual treatment plans concerning hip fracture management, particularly in regards to patient length of stay. A positive COVID-19 test at the time of admission can significantly increase time spent in the hospital, though no increase in complications or mortality was observed in these patients. The ongoing global prevalence of COVID-19 and sustained rates of hip fracture necessitate continued research into the relationship of these conditions, and highlights new opportunities for improving the quality of patient care.

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Preliminary findings from the Rhode Island Harm Reduction Surveillance System: January 2021–December 2022

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In 2020, Rhode Island (RI) had the 12th highest death rate of drug-involved overdoses in the United States.¹ To better understand the overdose epidemic, the Rhode Island Department of Health (RIDOH) partnered with The Miriam Hospital in 2020 to survey people who use illicit drugs in RI through the RI Harm Reduction Surveillance System (HRSS). This article summarizes findings from the HRSS, which can be used to inform prevention and outreach activities to better address RI's overdose epidemic.

METHODS

The HRSS is operated by RIDOH in partnership with The Miriam Hospital and was developed in collaboration with various RI harm reduction (HR) organizations, including Parent Support Network, Project Weber Renew, AIDS Care Ocean State, and Community Care Alliance. The HRSS collects information on demographics, substance use behaviors, access to health services and treatment, experience with overdose, and HR behaviors. Additionally, questions are periodically evaluated, added, or removed to aid in RIDOH's effort to address the overdose epidemic.

The HRSS was launched in January 2021 and is ongoing. Data used in this analysis were collected between January 1, 2021, and December 31, 2022. To be eligible, individuals had to be a current RI resident, aged 18 or older, able to provide verbal consent, and self-reported use of illicit drugs or unprescribed medications in the past 30 days (excluding individuals who only reported marijuana use). Survey administration occurred over the phone or in-person. Participants were recruited through targeted canvassing at local needle exchange and HR outreach programs, encampments, bars, college campuses, and other overdose hotspots throughout the state. Individuals who consented to the anonymous survey were compensated \$25 cash upon completion. Survey data were collected through the Research Electronic Data Capture (REDCap) tool. This work is considered public health surveillance and was reviewed and deemed exempt by the RIDOH Institutional Review Board.

Data cleaning was performed in SAS [Version 9.4] and analysis took place in Stata 17. Summary descriptive statistics were generated for variables of interest.

RESULTS

A total of 393 people completed the survey between January 1, 2021 and December 31, 2022. Most participants identified as male (62.1%), non-Hispanic White (41.2%), age 25–44 years (57.5%), and experiencing housing instability (69.5%) (Table 1). Most reported having Medicaid (78.3%) and few were uninsured (4.3%).

Table 1. Demographic characteristics of respondents in the Rhode Island Harm Reduction Surveillance System, 1/1/2021–12/31/2022 (n=393)

	N (%)
Age (years)	
18–24	19 (4.8%)
25–34	111 (28.2%)
35–44	115 (29.3%)
45–54	91 (23.2%)
55–64	47 (12.0%)
65+	10 (2.5%)
Gender identity^a	
Female	141 (33.8%)
Male	244 (61.9%)
Non-binary, other ^b	8 (2.0%)
Race/ethnicity	
Non-Hispanic Black	73 (18.6%)
Non-Hispanic White	162 (41.2%)
Hispanic (any race)	96 (24.4%)
Other ^c	62 (15.8%)
Housing status	
Housing instable	273 (69.5%)
Housing stable	120 (30.5%)
Insurance	
Medicaid	329 (78.3%)
Medicare	34 (8.1%)
Other ^d	39 (9.3%)
None	18 (4.3%)

^a Transgender people were grouped with their identified binary identity measure.

^b Non-binary, other gender includes other, non-binary, or preferred not to answer.

^c Other race/ethnicity includes American Indian/Alaska Native, Asian, Pacific Islander, or other.

^d Other insurance includes Rite Care, Veterans Affairs, Indian Health Services, State Sponsored, or other option.

Table 2. Non-prescribed drug use among respondents in the Rhode Island Harm Reduction Surveillance System, 1/1/2021–12/31/2022 (n=393)

	N	%
Alcohol use		
4–7 times/week	53	13.6%
1–3 times/week	166	42.6%
2 or less per month	108	27.7%
None in the past 12 months	99	25.4%
Non-prescribed drug		
Marijuana	271	69.0%
Cocaine	173	44.0%
Crack	280	71.2%
Methamphetamine	106	27.0%
Benzodiazepines	105	26.7%
Stimulants	51	13.0%
Heroin/fentanyl	161	41.0%
Opioid pain medications	72	18.3%
Gabapentin	53	13.5%
Polysubstance use	347	88.3%
Have naloxone		
Yes	303	77.1%
No	90	22.9%

Overall, crack cocaine (71.2%), marijuana (69.0%), cocaine (44.0%), and heroin/fentanyl (41.0%) were the most frequently reported drugs used in the past 30 days (Table 2). Polysubstance use in the last 30 days was reported by 88.3% of respondents. Comparing all reported routes of substance administration, 90.1% of respondents reported smoking, 52.4% oral use, 46.3% nasal use, and 31.8% used intravenously. Approximately 77% of respondents reported having naloxone, and among the 168 individuals who reported using naloxone in the last 12 months, and at least 540 overdoses were reversed. Overall, 32.5% of respondents reported personally experiencing an overdose during the past 12 months (Table 3). Of respondents who reported using a substance that unexpectedly contained fentanyl (56.7%), the most reported contaminated substance was crack cocaine (25.7%). Of the 67.4% who witnessed an overdose during the past 12 months, when asked about the most recent overdose they observed, 59.2% reported that someone called 911.

Most respondents reported engaging in some type of substance use treatment over the past 12 months (58.0%), with 41.7% reporting use of medication, 18.6% using detox, and 18.8% reporting a hospitalization related to substance use treatment. Additionally, 46.5% of respondents reported being interested in treatment/recovery supports.

When asked about HR behaviors, 8.2% of individuals reported always using fentanyl tests strips, 38.8% of

Table 3. Overdose experience among respondents in the Rhode Island Harm Reduction Surveillance System, 1/1/2021–12/31/2022 (n=393)

	N	%
Witnessed an overdose in the past 12 months?		
Yes	265	67.4%
No	128	32.6%
What happened after overdose		
Someone (not EMT/police) gave naloxone	187	47.6%
Someone called 911	154	59.2%
Police administered naloxone	20	8.5%
EMT administered naloxone	86	35.5%
Someone gave rescue breaths	95	37.0%
Someone administered chest compression	103	39.8%
Ambulance arrived	122	48.8%
Someone took them to hospital	7	3.3%
Person came to on their own	9	3.8%
Person died	16	7.6%
Left area	21	5.7%
In the past 12 months, how many times have you used naloxone to reverse an overdose?		
No times	90	34.9%
1 time	37	14.3%
2 times	31	12.0%
3 times	24	9.3%
4 times	11	4.3%
5 or more times	65	25.2%
Overdosed in the past 12 months?		
Yes	126	32.5%
No	262	67.5%
Unexpected fentanyl past 12 months		
Yes	223	56.7%
No	170	43.3%
Substance used believed to be contaminated with fentanyl		
Crack	101	25.7%
Cocaine	36	9.2%
Benzodiazepines/tranquilizers	34	8.7%
Marijuana	32	8.1%
Heroin	28	7.1%
Methamphetamine	20	6.2%
Opioid pain medication non-prescribed	25	6.4%
Stimulants	5	1.3%

individuals reported always using with others, and 23.2% reported always starting with a low dose (Table 4). Among those who used with others, 18.6% reported taking turns. When asked about openness to using a HR center, 61.7% of individuals were likely or very likely.

Table 4. Harm reduction behaviors among respondents in the Rhode Island Harm Reduction Surveillance System, 1/1/2021-12/31/2022 (n=393)

	N	%
Use fentanyl test strip		
Always	32	8.2%
Most/sometimes	92	23.6%
Never	266	68.2%
Use with other people		
Always	150	38.8%
Most/sometimes	196	50.7%
Never	41	10.6%
If using with others, how often take turns?		
Always	64	18.6%
Most/sometimes	145	42.2%
Never	135	39.2%
Start with low dose		
Always	89	23.2%
Most/sometimes	119	31.1%
Never	175	45.7%
How often: share needles?		
Always	<5	1.7%
Most/sometimes	24	20.7%
Never	90	77.6%
How often: share a pipe?		
Always	32	10.4%
Most/sometimes	142	46.0%
Never	135	44.7%
How often: share works?		
Always	13	11.1%
Most/sometimes	38	32.5%
Never	66	56.4%
How likely to use harm reduction center		
Very likely	144	40.2%
Likely	77	21.5%
Neutral/don't know	22	6.2%
Unlikely	32	8.9%
Very unlikely	83	23.2%

Note: Measures with counts less than five observations are reported as <5

DISCUSSION

Data from the HRSS show that among marginalized, non-prescribed substance users in RI, many individuals have witnessed (67.4%) or personally experienced (32.5%) an overdose in the past 12 months. This is concerning as many individuals (22.9%) report not having naloxone, and 40.8% reported that 911 was not called during their most recent overdose experience. Encouragingly, among this

relatively small sample, participants reported reversing over 540 overdoses in the prior 12 months. These data highlight the continued need for naloxone distribution to individuals at high risk of observing an overdose, given the high proportion of overdose events that are not attended by a medical professional and the high utilization of naloxone by peers to reverse an overdose. These data also demonstrate that RIDOH's non-fatal overdose surveillance systems are likely not capturing a large portion of overdoses due to lack of interaction with the healthcare system. This aligns with prior data that roughly 50% of overdose events are not attended by a medical professional.²

Despite the high percentage of individuals who experienced or witnessed an overdose, HR practices in this population remained underutilized. Additionally, polysubstance use, which increases the risk of overdose,³ was common in respondents. Education on risks associated with polysubstance use and the benefits of utilizing HR methods is needed.

Fentanyl contamination of non-opioid substances was highly reported by participants, with the most frequently contaminated substance being crack cocaine. This is of high concern as stimulant users are often unprepared to respond to an overdose and would need minimal exposure to experience an overdose given the lack of tolerance.⁴ While fentanyl test strips could help prevent these unintentional exposures, this HR approach is underutilized among participants. Overall, the most commonly reported drugs with unexpected fentanyl were not opioids, aligning with data collected by testRI, which tests donated samples of drugs from individuals in RI which has found fentanyl contamination in methamphetamines, crack cocaine, and pressed pills,⁵ suggesting additional public health messaging and outreach is needed to help people who use non-opioid drugs understand the risk of fentanyl contamination in the drug supply and ways to reduce their risk of overdose.

While many individuals were interested in treatment, access to health insurance does not appear to be a barrier for respondents. In addition to having health insurance, most respondents reported receiving a prescribed medication in the last 30 days, demonstrating their regular interaction with the healthcare system. This stresses the need for healthcare professionals to ask about substance use, provide information on HR techniques and treatment/recovery support when appropriate, and work to make treatment more accessible for those who are interested.

The largest limitation of this data is that it was collected through convenience sampling and heavily recruited from high-risk populations; therefore, results are not representative of drug use behaviors among all Rhode Islanders. As the survey is interviewer administered, data could be impacted by social desirability bias and/or recall bias. More research is needed to understand associations between demographic characteristics (such as race, age, sex) and substance use and HR behaviors.

With overdose fatalities increasing in RI since late 2019,⁶ it has become important to better target prevention and outreach efforts. The findings from this descriptive analysis can help inform prevention, program, and policy efforts to promote HR practices and prevent fatal overdoses in RI.

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**VITAL STATISTICS**

UTPALA BANDY, MD, MPH

DIRECTOR, RHODE ISLAND DEPARTMENT OF HEALTH

COMPILED BY ROSEANN GIORGIANNI, DEPUTY STATE REGISTRAR

PUBLIC HEALTH

Rhode Island Monthly Vital Statistics Report

Provisional Occurrence Data from the Division of Vital Records

VITAL EVENTS	REPORTING PERIOD		
	AUGUST 2022	12 MONTHS ENDING WITH AUGUST 2022	
	Number	Number	Rates
Live Births	1,013	11,281	10.6*
Deaths	863	11,372	10.7*
Infant Deaths	6	43	3.8#
Neonatal Deaths	4	33	2.9#
Marriages	793	6,794	56.4*
Divorces	261	2,683	2.5*

* Rates per 1,000 estimated population

Rates per 1,000 live births

Underlying Cause of Death Category	REPORTING PERIOD			
	FEBRUARY 2022	12 MONTHS ENDING WITH FEBRUARY 2022		
	Number (a)	Number (a)	Rates (b)	YPLL (c)
Diseases of the Heart	201	2,425	221.0	3,504.0
Malignant Neoplasms	173	2,214	201.8	4,040.0
Cerebrovascular Disease	46	494	45.0	475.0
Injuries (Accident/Suicide/Homicide)	87	1,099	100.1	16,161.5
COPD	36	440	40.1	440.0

(a) Cause of death statistics were derived from the underlying cause of death reported by physicians on death certificates.

(b) Rates per 100,000 estimated population of 1,097,379 for 2020 (www.census.gov)

(c) Years of Potential Life Lost (YPLL).

NOTE: Totals represent vital events, which occurred in Rhode Island for the reporting periods listed above.

Monthly provisional totals should be analyzed with caution because the numbers may be small and subject to seasonal variation.



Adventures

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Reining in the Behemoth: Corporate Medicine and the Individual Physician

WILLIAM BINDER, MD, FACEP

Last week I received sign-out from a colleague I have worked with over the past eight years. I do not know him well, but I have listened to his lectures, chatted with him at social events, and worked alongside him in the emergency department (ED). He is occasionally irreverent, but in the ED, we all have at least a trace of gallows humor. He is bright, funny, and I have always respected his commitment to patient care. As I received his patients, I told him I heard a rumor he was leaving our department. Rather than the usual one-liner and deflecting joke, his expression changed. With shoulders hunched over, he told me his soul had been crushed. His metrics were not good, he was too slow, and he had begun to doubt himself. He questioned whether he could practice clinical medicine. I looked at his list of patients, and reviewed his evaluations after he left. Perfect. No flaws. Thoughtful. What had happened to this buoyant, energetic physician?

This was not an isolated incident. One month ago, I received a note from a friend explaining why he had left emergency medicine. He wrote:

I remember one night, the entire Emergency Department felt like it was drowning. The overflow area – a parking lot of patients arriving by ambulance mixed with intoxicated or psychotic (or both) patients – was packed. Several fights had broken out. Nursing was desperate to get patients who could safely leave out the door, and asked me to evaluate a patient in the overflow area for discharge. The patient had been waiting so long to be seen that his buzz had faded. The patient – linear, goal-directed, sober, and non-suicidal – was discharged. A few days later, my former director (truly, a wonderful man) told me the family complained about my care. At my best, I would've called that family before letting him go – just to make sure he had a safe place to go. And I couldn't. I had too many patients to see.

If the system itself wasn't beating me down, sometimes it felt like others working within the system were. Although rare, the disrespect encountered by other physicians was incredibly demoralizing. If I called the PCP to arrange a follow-up – if I got a call back – I was annoying. If I didn't call the PCP to arrange follow-up – I was an irresponsible doctor...In the end, it was too much.

The Exodus

The flight from medicine is not unique to my colleagues. One report estimated that over 100,000 physicians had left the work force in 2021.¹ At first glance, I thought this was an exaggeration, but a remarkable number of my colleagues left medicine or shifted practice environments between 2021–2022. During the past year the literature examining the “great resignation” in health care has exploded. A recent Google search about post-pandemic physician retirement returned greater than one million results. Most of the “reports” are based on poor methodology, and the amplified impact of social media undoubtedly creates a pile-on effect. However, some of the research is of high quality. Shanafelt et al have studied occupational burnout longitudinally. His group noted that emotional exhaustion and depersonalization scores were significantly higher in 2021 than in 2020, 2017, 2014, and 2011.² Over 62% of physicians had at least one manifestation of burnout in 2021 compared to 38% in 2020, and satisfaction with work-life integration declined.² There are numerous reasons behind a physician's emotional depletion and dissatisfaction noted in Shanafelt's study. Workload, the lack of effective treatments early on in the pandemic, short-staffed health systems, as well as the divisiveness and politicization of vaccination – issues out of physician control – have all lead to emotional exhaustion.^{2,3,4}

Corporatization

Yet, there may be more to the story. Over the past 30 years, the practice of medicine has been transformed. American hospitals have evolved from local, community board-operated individual hospitals to large systems with central corporate governance. U.S. health-care costs have risen from \$721 billion in 1990 to \$4.2 trillion in 2021, and account for almost 20% of the GDP. The Centers for Medicare and Medicaid Services (CMS) projects national health-care expenditures will reach \$6.2 trillion in 2028.⁵

Physician practices have evolved rapidly, as well. In 2012, 60% of practices in the U.S. were physician-owned, and less than 6% of physicians were direct hospital employees.⁶ Times have changed. Within one decade hospital systems now dominate the industry. Almost 75% of physicians are employed by hospitals, health systems, and other corporate

entities which frequently span many communities and multiple states, and hospital systems control over 80% of U.S. inpatient hospital beds.^{6,7,8} The early promise of the corporate health/physician bargain was alluring – physicians would be allowed to practice medicine without the administrative red tape and financial stressors of practice management.⁹ Unfortunately, this promise went unrealized. Physicians spend almost two hours on administrative tasks and electronic health records for every hour of patient care.¹⁰ Additionally, a new player has entered the health-care equation. Private equity groups have targeted health care and physician practices because, at \$4 trillion, to paraphrase Willie Sutton, that is where the money is.¹¹ While data is murky, many of these groups generate profits through decreased labor costs (stagnant salaries and lean staff employment).⁷

The government has been complicit in this radical transformation. Medicare physician payments, often used as a benchmark for private insurers, have not kept pace with inflation and the consumer price index, effectively falling 26% between 2001–2023.¹² It is no coincidence that burn-out and emotional exhaustion have accompanied the shifting focus of health care from individual practitioner to employed physician. Combined with the burden imposed by a prohibitively expensive and serpentine regulatory environment replete with unintended consequences, physicians have traded away personal autonomy – the cornerstone of physician well-being – for an increasingly fragile sense of financial security.¹³

Academic medicine faces both economic and political challenges, as well. While some enterprises are physician-led, as systems enlarge differences in perspectives and incentives between rank-and-file physicians and their leadership are often divergent.^{6,8} The financial and personal peril associated with quarterly metrics, which are often beyond the control of an individual, are frequently substitutes for quality indicators in corporate academia. They contribute to year-end performance evaluations, which are tied to salary growth. However, metrics such as patient satisfaction, which use questionable survey instruments, may be inversely related to physician performance.¹⁴ Other metrics are often system-driven and invalid measures of physician efficiency. Some metrics are collected for “informational” means, giving physicians a sense that “Big Brother” is omnipresent and continually calculating. Additionally, both academic and community practices often use relative value units (RVUs) for remuneration, despite documented flaws, and in some centers, salaries are at risk.¹⁵

Unionization

The evolution of U.S. medicine into a corporate behemoth has not been fully appreciated by our profession. CVS’ purchase of Oak Street Health for \$10 billion (it is, of course, ironic that physicians cannot own pharmacies in RI) and Amazon’s purchase of One Medical are some examples of a rapidly changing landscape. In a recent editorial in *JAMA*, Richman and Schulman ask what happens to the medical profession and medical practice when physicians are no longer independent. They suggest that physician employment by corporate hospital systems pose a challenge to professionalism and the medical community, both of which act as a counterweight to market incentives. They suggest that corporatization could diminish physician’s long-standing devotion to patient welfare.⁶

While there is no simple answer, the authors present a compelling argument that collective bargaining through unionization might be an antidote to the increasingly toxic milieu facing physicians.^{6,8} Physician unions have only had a small penetrance in U.S. health care and only about 6% of practicing physicians are union members.⁸ In contrast, over 50% of physicians in the UK belong to unions. However, the trend in the U.S. is rising. Residents at Stanford, the University of Southern California, and the University of Vermont have had successful organizing drives. A recent commentary in the *Wall Street Journal* reported that residents at Mass General Brigham are attempting to unionize in an effort to reclaim their professional autonomy and identity, and the National Labor Relations Board has received petitions to initiate the unionization process in several physician groups.^{8,9}

I have mixed emotions about such a prescription – it certainly is not what I imagined during my training. However, change is the one constant in our profession. Younger physicians do not know any way other than corporate medicine, and perhaps it is an acceptable future for recent graduates. Mid-career and older physicians sense the imbalance, but many have adapted or are resigned to the change. On a personal level, I feel powerless trying to support my friends and colleagues who have succumbed to the hardened path carved by corporate health care. I sympathize with my fellow physicians who, to paraphrase Arlo Guthrie (I am a Boomer, after all), feel as if they have been “injected, inspected, neglected and dejected.”¹⁶ The differential diagnosis for their malaise is relatively narrow, but it does appear that physicians have an additional management option at their disposal. ❖

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[**Author's Note:** The following was published as a complete ms. in the *J Irrep Res*, April 2022. This version was condensed, to allow four of the most important letters to the editor in response to be published.]

Recall of Past Lives and Risk of Parkinson's Disease in California: PD-like Illness in Past Life Increases Risk in Current Life

FRIEDMAN JH, FLUMMOX MR, FLOUNDER KK

INTRODUCTION

Several authorities¹⁻⁴ have called attention to the decreased recollection of past lives reported in people with Parkinson's disease (PWPD). This has been particularly true in PWPD who live in California, where past lives recollection appears to be more common than in other parts of the United States. In a groundbreaking report, Onionpot et al reported that in a survey of people in a shopping mall in Beehive, CA, 43% of 308 people reported having recall for at least one life, and of these 43% the average number of lives was 2.3.

Since that study, attempts to develop a validated scale for assessing past lives have been made,^{4,5} but none with sufficient support until the recent validation of the Past Lives Recollection Questionnaire (PLRQ), and the reduced version, the PLRQ43, which has been used in a number of research reports.

METHODS

Consecutive patients seen in the Surfside Clinic in Beach Sands University Hospital movement disorders clinic who were diagnosed with PD based on the Movement Disorder Society (MDS) criteria by movement disorders neurologists between 3/31/19 and 3/30/20, were offered the chance to volunteer. 87% gave written informed consent in a protocol approved by a central IRB and completed the PLRQ43. Age, gender, age at diagnosis, presence of psychotic symptoms, level of education, medications, Unified Parkinson's Disease Rating Scale (UPDRS) scores are available as supplemental files by contacting the PLPDA. Access to data will be supplied to any established investigator who knows the password.

RESULTS

3,247 patients were seen in the clinic between 3/31/19 and 3/30/20, of whom 702 had idiopathic PD. 653 agreed to participate, 352 men (mean age 74.6) and 301 women (mean age 76.1). Controls were chosen from the database of all adults without a neurologic disorder of the same gender and within 5 years of age of a PD subject, arranged alphabetically, using the winning lottery numbers, divided into 3-digit intervals, of the daily United Lottery Reports System for California. 850 controls were identified, of whom 725 agreed to participate. The ratio of 352:301 was maintained to avoid gender

bias. 62 men and 49 women with PD endorsed having past lives, with the mean number being 1.8 past lives. The control population endorsed a past life in 150 men and 145 women, with the mean number of lives being 3.1. Chi Square testing with Fishing Modification applications found $p < .01$ for the men and $p < .0001$ for the women. Of the PD patients with recalled lives, 50% stated that in the past life they also suffered from PD or similar illnesses, whereas none of the controls did, $p < .00001$.

CONCLUSION

People with PD in southern California endorsed having had at least one previous life, significantly less than non-neurologically affected age, gender and socio-economically matched controls. This may indicate that recalling a past life is an inverse risk factor for the development of PD, or a specific neuropathological deficit, possibly located in the cortico-nigral-pallidal-cortical-putamenal-dentato-cortico-nigral circuit, but those with past lives recall had a significantly increased risk of their past life having had a PD-like disorder, lending credence to recent theoretical advances in the understanding of Lamarckian evolution.

Disclosures

References: Available on request

Funding: Study funded by the Past Lives Institute of California

Conflicts of interest: JHF: none;

MRF: consultant: 23 and me and beyond;

KKF: honoraria: Neurological implications of past lives and lies; Flounder Press; 2022

RESPONSE: LETTERS TO THE EDITOR

**Re: Friedman, Flummox and Flounder:
Past lives as a risk factor for Parkinson's disease**

I found the report by Friedman et al on past lives in people with Parkinson's disease (PWPD) to be another example of "scientific rationalism" trying to undermine the proven scientific truth of recalled past lives. The PLPDQ43 is notorious for failing to adequately assess the presence of a past lives' history. We know that 76% of all people born between

1940 and 1980 had at least one past life. The files from Friedman et al show that 90% of their PD subjects and their controls fell into this epoch, hence many more people had past lives than they recorded. (We believe that younger people are less likely to have had past lives than older ones, since there are more people alive now than had ever lived before, and the laws of past lives holds that they cannot be in the history of more than one living person at the same time). We therefore believe that the deduction that past lives were less common in people with PD is fallacious. The correct deduction is that recall for past lives is affected or that the PLDQ43 is not reliable. We request that the Journal recall the Friedman article suggesting that past lives is an inverse risk factor for the development of Parkinson's disease.

—**Agnes Cannabis, MD**

We found Friedman et al's report of past lives in PD to be compelling, and will be very important when we analyze our own data, which is prospective. In the Santa Barbara prospective holistic study, begun in 1963, we've been following 45,987 people for health outcomes. Among a large number of standardized assessment instruments, we administered a past lives questionnaire every 5 years. Unlike the PLPDQ43, a self-administered questionnaire, we interviewed all participants, and recorded details such as when each of the past lives occurred, what the names of their past soul-containing bodies were, where they lived and several other demographic details that could be used for documentary purposes. We found that 78% of entrants reported at least one past life, far more than Friedman et al, perhaps explained by survey techniques. We also found, interestingly, that people who moved to southern California after age 25 were far less likely to recall past lives than those who were born here and did not move away. The positive association with cannabis and LSD use was only at the $p=.05$ level, hence possibly spurious. We suspect that sun exposure enhances recall of past lives and should be considered in further review of Friedman et al's data, if available.

—**Jimmie Uranus, FRMC, PRDL**

The focus on past lives in the article by Friedman et al ignores the possibility of alien abductions as playing a role. In our study from the Santa Monica Parkinson's disease and marijuana clinic, not yet published, we found that most PD patients from southern California had alien abduction experiences, and far more when compared to those from New England, which has made us suspect that alien abductions increase the risk of developing PD, and, most interesting, also increased the likelihood of remembering past lives. We don't yet know if this is unique to southern California, or might represent a window into one possible etiology of PD. We hypothesize that the warm weather favors alien presence in our region compared to New England, hence the increased prevalence of abductions.

—**Adolph Pickle, MD**

As a scientist with a long interest in past lives, I insist on drawing attention to a number of publications¹⁻¹²³ (see www.PastLivesSpectrum) that have helped inform those sufficiently interested in the topic that they actually know something about it before they continue the longstanding misinformation campaign of the pseudo-science community and pursue avenues of research wearing blinders. It has been established beyond argument that many (current) people have had past lives as non-human species, although they frequently never knew what species they were, only that they were furry, or had claws, ate plants or animals, etc. This specious report by the "three Fs" (F for failure) uses a well debunked evaluation tool validated only for selectively blinded readers. A very different set of results would likely have been found had a truly valid assessment tool been used.

—**Andrew Wilking, MD, PD, RD, FAPLA**

[Editor's Note: This has been validated as an April Fools' Day commentary!]

'Doctoring Words' book event to feature Drs. Iannucci, Fine

MARY KORR
RIMJ MANAGING EDITOR

BRISTOL – **EDWARD IANNUCCILLI, MD**, and **MICHAEL FINE, MD**, will share thoughts on their inspirational and, at times, unexpected journeys into authorship and offer tips on how aspirational writers can get started, at a book event to be held at Mount Hope Farm in Bristol on Thursday, April 20th, from 6 to 8 p.m. **DANTE BELLINI, Jr.**, former advertising exec and

creator of the PBS documentary, *Ken Burns: Here & There*, will moderate the discussion.

Dr. Iannucci, a retired gastroenterologist, Rhode Island Heritage Hall of Fame inductee, recipient of numerous professional honors, and currently a columnist for *GoLocalProv*, will speak about his latest book, *A Whole Bunch of 500 Word Stories*, terse and humorous reflections on growing up in Rhode Island – from pinball machines to the polio epidemic and so much more.

Dr. Fine, a family medicine practitioner, health strategist for Central Falls, and former director of the Rhode Island Department of Health, (2011–2015), will discuss his recently published book, *On Medicine as Colonialism*. Triggered by the Pandemic, it presents a reframing of the health care system in the United States, with a focus on how to replace the current health care marketplace with a system “that is for people and not for profit,” as he said in a recent book discussion.

In advance of the April event, RIMJ posed a few questions, below, to the speakers on their writing patterns and influences.

RIMJ: Can you briefly tell RIMJ readership what you will be discussing from your experiences in health care at the event?

DR. IANNUCCILLI: My experiences of observation and conversation in my day-to-day work as a physician helped me realize how capturing a moment, a conversation, and being able to describe them with the written word, are critical.

DR. FINE: Doctoring teaches us to listen to what is said and left unsaid from the people who are our patients. That skill and habit helps me listen out for the inner lives of everyone I meet. Those voices are what show up when I go to write a story. And that habit, in listening to the inner lives of others, is a necessary

process in a democracy. When we can see the inner lives of others, we start thinking they are mostly like us, and that's the way we start being one people again.

RIMJ: Every writer has a pattern, usually, that takes them from inspiration to perspiration to publication. What is your writing modus?

DR. IANNUCCILLI: I look around and listen. I read the best writers, and then I read some more. From those experiences come hundreds of ideas. I carry a notebook with me wherever I go, being sure not to miss an idea. And I have a notebook on my bedstand for writing those middle-of-the-night revelations. I write, and then I write it again, and again, until I am comfortable, which almost never happens.

DR. FINE: I write every day from 8 a.m. to at least 1 p.m., six days a week. And finish at least one short story a month.

[Read some of his stories here: <https://www.michaelfinemd.com/news-and-events>]

RIMJ: Who are your favorite authors or whose work influenced you the most as a writer?

DR. IANNUCCILLI: Ernest Hemingway and David McCullough.

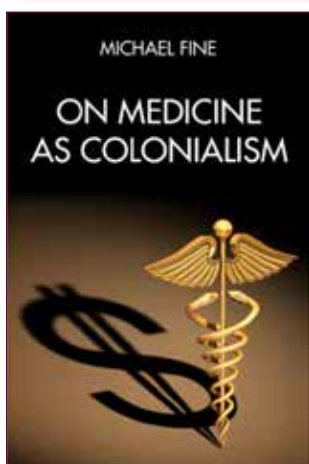
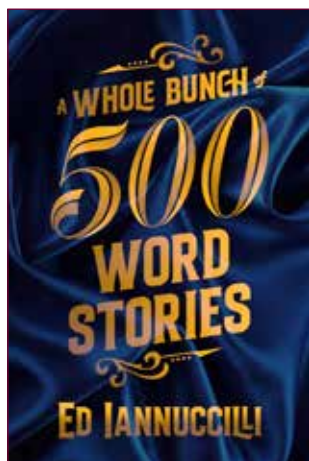
DR. FINE: William Carlos Williams, Allen Ginsberg, Tolstoy, IB Singer, IL Peretz, Dos- toyevsky, Robert Creeley, Chekhov, Wendell Berry, Charles Chestnutt, Edward P. Jones, with a bit of Heming- way in the mix. Lots of Old Testament, aka *Torah* and *Tanach*.

RIMJ: What is your favorite quote or words to live by?

DR. IANNUCCILLI: From poet Mary Oliver...“Tell me, what is it you plan to do with your one wild and precious life?”

DR. FINE: Pirkei Avot, 1:14: He (Rabbi Hillel) used to say: “If I am not for me, who will be for me? And when I am for myself alone, what am I? And if not now, then when?”

For reservations and more information on the Mount Hope Farm evening, visit: <https://www.mounthopefarm.org/upcoming-events/doctoring-words>



Edward Iannucci, MD



Michael Fine, MD



Dante Bellini, Jr.



Working for You: RIMS advocacy activities

March 6, Monday

RIMS Board meeting: **Thomas Bledsoe, MD**, President

Protect our Health Care Policy Group:
Stacy Paterno, staff

March 7, Tuesday

RIMS Physician Health Committee (PHC):
Herb Rakatansky, MD, Chair

Raising Rhode Island Kick Off: staff

March 8, Wednesday

Rhode Island Department of Health
(RIDOH) Board of Medical Licensure and
Discipline (BMLD): Stacy Paterno, staff

Governor's Overdose Intervention and
Prevention Task Force: **Sarah Fessler, MD**,
Past President

House Corporation Committee:
Hearing on H 5495 related to improving
prior authorization processes, **Thomas
Bledsoe, MD**, President and **Peter
Hollmann, MD**, Past President

March 9, Thursday

AMA Addressing Physician Burnout
Webinar: Stacy Paterno, staff

March 13, Monday

Behavioral Health Career Ladder Advisory
Workgroup: Stacy Paterno, staff

March 14, Tuesday

CMS Region 1 Medical Societies Meeting:
Stacy Paterno, staff

March 15, Wednesday

Rhode Island Workers' Compensation
Board Meeting: Stacy Paterno, staff

Senate Leadership Meeting: **Michael
Migliori, MD**, Chair Public Laws;
Heather Smith, MD, Incoming President;
and **Elizabeth Lange, MD**, Immediate
Past President

Primary Care Physician Advisory
Committee: **Elizabeth Lange, MD**,
Immediate Past President

Opioid Settlement Advisory Committee:
staff

March 16, Thursday

Health & Human Services Workforce
Data Collection Workgroup: staff

RIDOH Leadership Quarterly Meeting:
Thomas Bledsoe, MD, President; and
Heather Smith, MD, Incoming President

Health Information Technology Steering
Committee: Stacy Paterno, staff

March 20, Monday

Protect our Health Care Policy Group:
Stacy Paterno, staff

RIMS Public Laws Committee Meeting:
Michael Migliori, MD, Chair

March 21, Tuesday

Rhode Island Foundation Long-term
Health Planning Strategy and Advocacy
Sub-committee: Stacy Paterno, staff
National Government Services Key
Stakeholder Meeting: Stacy Paterno, staff

March 23, Thursday

Senate Health & Human Services
Committee: Hearing on H 5495 related to
improving prior authorization processes,
Thomas Bledsoe, MD, President; **Peter
Hollmann, MD**, Past President; **Michael
Migliori, MD**, Chair Public Laws

March 28, Tuesday

Direct Care Career Ladders Advisory
Workgroup: Stacy Paterno, staff

March 30, Thursday

RIMS Climate Change and Health
Committee: **Katelyn Moretti, MD**,
Co-Chair; **Alison Hayward, MD**, Co-Chair

RIMS Membership Committee:
Roberto Ortiz, MD, Chair



RIMS gratefully acknowledges the practices who participate in our discounted Group Membership Program



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THE BRIDGE TO SELF-RELIANCE

Orthopaedic Associates, Inc.



Ortho Rhode Island



Wood River
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NRMP® Match Day results: record-breaking 2023 Main Residency Match®

The National Resident Matching Program® (NRMP®) celebrated the landmark milestone that is “Match Day” for the 2023 Main Residency Match with residency applicants, training programs, medical schools, and the medical education community. In the largest Match in NRMP’s 70-year history, there was a record number 42,952 applicants who certified a rank order list (“active applicants”) and 40,375 certified positions.

“The 2023 Main Residency Match proved once again to be a highly successful Match with outstanding results for participants. We were excited to see the record number of primary care positions offered in this year’s Match and how the number of positions has consistently increased over the past five years, and most importantly, the fill rate for primary care has remained steady,” says NRMP President and CEO **DONNA L. LAMB, DHSC, MBA, BSN.**

RESULTS

Application numbers

- There were 48,156 total applicants registered in the 2023 Main Residency Match, an increase of 481 applicants over last year. This rise in applicants was driven primarily by the increase of 707 more non-U.S. citizen IMG applicants and 153 more U.S. Osteopathic (DO) seniors over last year.
- Surprising this year was the decrease in the number of U.S. MD seniors registered for the Match, a decrease of 236 registered applicants over last year. The number of U.S. MD seniors certifying a rank order list also declined, from 19,902 seniors last year to 19,748 seniors this year.
- There were 42,952 applicants who certified a rank order list in the 2023 Main Residency Match, which is the highest number on record and an



Benjamin Gallo Marin on Match Day at the Alpert Medical School was thrilled to find out he matched in dermatology at Stanford.
[COURTESY OF BENJAMIN GALLO MARIN]

NRMP® Match Day Rhode Island Results

RHODE ISLAND	Pos.	Applicant Type								% MD		% Tot
		No. Filled	MD Sr	MD Gr	DO Sr	DO Gr	US IMG	IMG	Oth			
Anesthesiology (PGY-2)	16	16	13	2	0	0	0	1	0	81.3	100	
Anesthesiology (Physician)	4	4	0	4	0	0	0	0	0	0.0	100	
Dermatology (PGY-2)	4	4	4	0	0	0	0	0	0	100	100	
Emergency Medicine (PGY-1)	22	22	13	1	5	0	3	0	0	59.1	100	
Family Medicine (PGY-1)	16	16	13	0	2	0	1	0	0	81.3	100	
Internal Medicine (PGY-1)	94	88	50	1	16	1	4	16	0	53.2	93.6	
Internal Medicine/Pediatrics (PGY-1)	4	4	3	0	0	0	1	0	0	75.0	100	
Interventional Radiology (Integrated) (PGY-2)	2	2	1	0	1	0	0	0	0	50.0	100	
Neurological Surgery (PGY-1)	2	2	2	0	0	0	0	0	0	100	100	
Neurology (PGY-2)	6	6	5	0	0	0	0	1	0	83.3	100	
Obstetrics and Gynecology (PGY-1)	8	8	8	0	0	0	0	0	0	100	100	

Key: Pos.= of positions filled in the match; No. Filled=No. of positions filled; MD Sr=U.S. allopathic seniors; MD Gr=prior U.S. allopathic graduates; DO Sr=U.S. osteopathic seniors; DO Gr=prior U.S. osteopathic graduates; US IMG=U.S. citizen graduates of international medical schools; IMG=non-U.S. citizen graduates of international medical schools; Oth=5th Pathway and Canadian medical schools graduates; % Sr=percent of positions filled by U.S. seniors; % Tot = percent of positions filled.

increase of 403 applicants over last year. Of the total number of applicants who certified a rank order list, 34,822 of those matched to a first-year position (PGY-1 position) at a rate of 81.1 percent, an increase of 1.0 percentage point over last year.

- In the 2023 Main Residency Match, there were 1,239 couples participating. Of these couples, 1,095 had both partners match and 114 had one partner match to residency training programs for a match rate of 93.0 percent.

Program and Position Participation

- The 2023 Main Residency Match had the largest number of certified positions in history with 40,375, an increase of 1,170 positions and 3.0 percentage points more than the 2022 Main Residency Match and an increase of 14.8 percent over the last five years.
- Of all positions offered, 37,690 filled for a rate of 93.3 percent, which is less

than a one percentage point decline from 2022. Of the 37,425 PGY-1 positions offered, which includes preliminary and transitional year positions (one year of training), 34,822 filled for a rate of 93.0 percent. The fill rate for categorical positions (positions that provide the full training required for specialty board certification) was 97.5 percent. There were 6,270 total certified programs, which was an increase of 183 programs from 2022. Out of the total certified programs, 5,431 filled at a rate of 86.6 percent, a decrease of 1.6 percentage points over last year.

- Specialties with 30 positions or more that filled all available positions in the 2023 Main Residency Match were Orthopedic Surgery, Plastic Surgery (Integrated), Radiology – Diagnostic, and Thoracic Surgery.
- Emergency Medicine placed 3,010 positions in the 2023 Match and had 554 positions remain unfilled, an increase of 335 more unfilled positions than last year. The number of unfilled positions, driven in part by the decreased number of U.S. MD and U.S. DO seniors who submitted ranks for the specialty, could reflect changing applicant interests or projections about workforce opportunities post residency.

Number of Primary Care Positions Hit an All-Time High

- In the face of a serious and growing shortage of primary care physicians across the U.S., there was a record number of primary care positions offered in the 2023 Main Residency Match. There were 571 more primary care positions than 2022, an increase of 3.2 percent over last year and an increase of 17.0 percent over the last five years. Primary care positions also filled at a rate of 94.2 percent, which remained steady from last year.

Specialty Highlights and Competitiveness

- The specialties with increases in the number of positions filled by U.S. MD seniors of more than ten percent and ten positions in the last five years (2019 – 2023) were Anesthesiology, Child Neurology, Interventional Radiology, Neurology, Pathology, Physical Medicine & Rehabilitation, Plastic Surgery (Integrated), Psychiatry, Radiology-Diagnostic, Transitional Year, and Vascular Surgery.
- The specialties with increases in the number of positions filled by U.S. DO seniors of more than ten percent and ten positions in the last five years (2019–2023) were Child Neurology, Emergency Medicine, Family Medicine, Internal Medicine, Medicine-Pediatrics, Medicine-Primary, Neurology, Obstetrics & Gynecology, Orthopedic Surgery, Otolaryngology, Pathology, Pediatrics, Physical Medicine & Rehabilitation, Psychiatry, Surgery, Surgery-Preliminary, and Transitional Year. While this may indicate a trend, this may also represent the maturation of the Single Accreditation System and the single Match.
- The specialties with 30 positions or more that filled with the highest percentage of U.S. MD and DO seniors were Plastic Surgery (Integrated) (92.3 percent), Internal Medicine – Pediatrics (90.5 percent), Obstetrics & Gynecology (90.1 percent), and Orthopedic Surgery (90.0 percent).
- The specialties with 30 positions or more that filled with the highest percentage of U.S. citizen IMGs and non-U.S. citizen IMGs were Internal Medicine (41.3 percent), Pathology – Anatomic and Clinical (40.9 percent), Medicine – Primary (33.3 percent), and Family Medicine (30.0 percent).

Supplemental Offer and Acceptance Program® (SOAP®)

- Applicants who did not match to a residency position participated in the NRMP's Match Week Supplemental Offer and Acceptance Program (SOAP to try to obtain an unfilled position. This year, 2,685 positions were unfilled after the matching algorithm was processed, 423 more positions and an increase of 18.7 percent over last year. Of those unfilled positions, 2,658 were placed in SOAP, 396 more positions and an increase of 17.5 percent over last year. SOAP results will be available in the 2023 *Main Residency Match Results and Data Book*, which is published in the Spring. ❖

New \$1M planning grant to expand mental health & substance use care in RI

WASHINGTON, DC – In an effort to expand access to mental health and substance use services, U.S. Senators **JACK REED** and **SHELDON WHITEHOUSE** and Congressmen **DAVID CICILLINE** and **SETH MAGAZINER** announced that Rhode Island is one of fifteen states that will receive a \$1 million, one-year planning grant to be considered among the final ten states that will be chosen in 2024 to participate in the Certified Community Behavioral Health Clinic (CCBHC) Medicaid demonstration program.

This new federal award, administered by the U.S. Department of Health and Human Services' (HHS) Substance Abuse and Mental Health Services Administration (SAMHSA), will help enhance access to comprehensive mental health and substance use care. The competitive grant award positions the state to work with behavioral health providers and further develop plans to invest in CCBHCs.

CCBHCs are specially designated mental health clinics that must meet rigorous federal standards, such as serving anyone who needs care regardless of their ability to pay, providing 24/7 crisis services, and delivering developmentally appropriate care to children and youth.

The CCBHC model provides integrated mental health, substance use disorder, behavioral health, and medical care as well as 24/7 access to crisis intervention services. Certified Community Behavioral Health Clinics aim to swiftly treat any patient in need of care, regardless of diagnosis or insurance status.

The purpose of the CCBHC planning grants is to support states in their development of proposals to participate in a

time-limited CCBHC Demonstration program. States develop and implement certification systems for CCBHCs, establish prospective payment systems (PPS) for Medicaid reimbursable services, and prepare applications to participate in the CCBHC Demonstration program. CCBHCs are designed to ensure access to coordinated comprehensive behavioral health care. CCBHCs are required to serve anyone who requests care for mental health or substance use, regardless of their ability to pay, place of residence, or age – including developmentally appropriate care for children and youth. The award also places Rhode Island in contention for additional federal dollars that would help cover the cost of the transition to CCBHCs.

Rhode Island and the other fourteen states will use the funding to compete for ten CCBHC “demonstration program” awards. CCBHCs receive Medicaid reimbursements that are based on the approved actual cost of services that the clinics provide, and clinics in states that participate in the demonstration program will receive Medicaid reimbursements at higher rates, helping to reduce the costs borne by those states.

In addition to Rhode Island, the other fourteen states selected are: Alabama, Delaware, Georgia, Iowa, Kansas, Maine, Mississippi, Montana, New Hampshire, New Mexico, North Carolina, Ohio, Vermont, and West Virginia.

In the United States, only 45 percent of adults with any mental health condition and 10 percent of adults with any substance use disorder received treatment in 2019, according to SAMHSA. ❖

Gateway Healthcare receives \$796K to increase RI children's, teens' access to intensive home-based trauma therapy

PAWTUCKET – Gateway Healthcare announced that it has received a two-year \$796,757 National Child Traumatic Stress Initiative grant from the Substance Abuse and Mental Health Services Administration (SAMHSA) to implement a project called, “Scaling Up Access to Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) for Children in Rhode Island.”

The intent of the new project, which will focus on providing care for children and their families who are Black, indigenous and people of color (BIPOC), is to increase the number of children in Rhode Island who have access to a specific

evidence-based trauma treatment, or TF-CBT, by increasing the number of trained providers.

“Gateway is a known local provider of trauma services for children and families in need. This newest community effort is particularly exciting because we will be training more providers in a well-researched trauma treatment model,” said psychologist **DEIDRE DONALDSON, PhD, ABPP**, project manager for the grant award. “Our goal is to provide Rhode Island children, and particularly those who are BIPOC, with better access to effective trauma treatment.”

The work will focus on ages 5–18 who

have experienced significant trauma and are exhibiting symptoms such as anxiety, depression, self-harm, disruptions in eating and sleeping, physical ailments and/or co-occurring mental and substance use disorders.

In addition to providing evidence-based trauma treatment and services to children in RI, project strategies and interventions include growing the trauma resources in RI by bringing together organizations that support specific target populations and expanding the number of clinicians in the state with both child expertise and training in TF-CBT by no less than 65 over a two-year period. ❖

House OKs Edwards bill renewing state's commitment to harm reduction pilot program to combat overdose deaths

STATE HOUSE – The House of Representatives passed legislation introduced by Majority Floor Manager **JOHN G. EDWARDS** (D-Dist. 70, Tiverton) that would extend a two-year pilot program to prevent drug overdoses through the establishment of harm reduction centers, which are a community-based resource for health screening, disease prevention and recovery assistance where persons may safely consume pre-obtained substances.

In addition to adding another two years to the program, the bill (2023-H 5044) would also permit the smoking of pre-obtained substances within a harm reduction center. It would still require the approval of the city or town council of any municipality where the center would operate.

With passage of the original law in 2021, Rhode Island became the first state in the union to sanction the operation of harm reduction centers by authorizing a pilot program. Several nations have allowed supervised injection sites for years.

“Not only do harm reduction centers severely mitigate the chance of overdose, they are a gateway to treatment and rehabilitation of people with substance abuse disorder,” said Representative Edwards. “This program, which has seen so much success over the globe, is just getting started in Rhode Island. These locations will be under the supervision of trained medical staff who can direct addicts toward substance use disorder treatment. It’s a way to tackle this epidemic while saving lives in the process.”

Project Weber/RENEW is partnering with CODAC Behavioral Healthcare to open a clinic on Huntington Avenue in Providence where people can use drugs under the supervision

of a trained and experienced staff who will guide users toward recovery and support services.

Studies of supervised injection facilities in other countries have demonstrated that they reduce overdose deaths and transmission rates for infectious disease, and increase the number of individuals who seek addiction treatment, without increasing drug trafficking or crime in the areas where they are located, according to the American Medical Association.

“Since we enacted this law, the opioid crisis has only gotten worse,” said Representative Edwards. “We went from 384 overdose fatalities that year to 435 the following year, according to the state medical examiner. What we’ve been doing isn’t working; the crisis has touched every family in the state. This program will save the lives of hundreds of Rhode Islanders.”

Representative Edwards has long been in the vanguard of legislation addressing the opioid crisis, and was selected as a 2019 Opioid Policy Fellow for the National Conference of State Legislatures. That same year, he sponsored a state law to improve hospital discharge planning to better help patients with drug and mental health emergencies with recovery.

In 2021, the General Assembly enacted a law he introduced to exclude the possession of buprenorphine from those controlled substances that can result in criminal penalties. Buprenorphine is a prescription drug used to treat opioid use disorder.

The bill now moves to the Senate, where similar legislation (2023-S 0026) has been introduced by Sen. Joshua Miller (D-Dist. 28, Cranston, Providence), chairman of the Senate Committee on Health and Human Services. ❖

Appointments



Roger D. Mitty, MD, named President, COO at CNEMG

WARWICK – Care New England Health System has announced the appointment of **ROGER D. MITTY, MD, MBA**, as President and Chief Operating Officer of Care New England Medical Group (CNEMG).

Dr. Mitty comes to CNEMG from Steward Medical Group in Dallas, Texas, where he worked his way through the ranks from Vice President of Primary Care and Medical Specialties to his most recent appointment as Chief Physician Executive. He has also been a member of the Board of Trustees of Steward Medical Group since 2009.

Dr. Mitty has also held leadership roles at Steward's St. Elizabeth's Medical Center in Boston, Massachusetts, where he served as interim hospital president from 2014 to 2015; Chief of the Division of Gastroenterology from 2005 to 2014; and Chairman of the Department of Medicine from 2015 to 2017. An Associate Clinical Professor of Medicine at Tufts University School of Medicine, Dr. Mitty's areas of clinical, teaching, and research concentration included biliary endoscopy and esophageal disorders.

He earned his BA from Wesleyan University in Middletown, Connecticut, and his MD from New York University's School of Medicine. He completed his Residency in Internal Medicine at Mount Sinai Hospital in New York City, and his Gastroenterology Fellowship at Boston University. In 2016, Dr. Mitty earned his MBA from the University of Massachusetts Isenberg School of Business. ❖



Michael J. Barry, MD



Michael Silverstein, MD

U.S. Preventive Services Task Force Announces Chair, Vice Chair

Dr. Michael Barry named as chair; Dr. Michael Silverstein returns as vice chair

WASHINGTON, D.C. – The U.S. Preventive Services Task Force (Task Force) announced today the appointments of **MICHAEL J. BARRY, MD**, as chair and **MICHAEL SILVERSTEIN, MD, MPH**, as vice chair.

Dr. Barry is the director of the Informed Medical Decisions Program in the Health Decision Sciences Center at Massachusetts General Hospital. He is also a professor of medicine at Harvard Medical School and a primary care clinician at Massachusetts General Hospital.

Dr. Silverstein, who served as a member of the Task Force from January 2016 through December 2020, will now return as vice chair. He is the George Hazard Crooker University professor of health services, policy, and practice at the Brown University School of Public Health and the director of Brown University's Hassenfeld Child Health Innovation Institute, which is charged with eliminating health inequities in pregnancy and childhood for Rhode Island families.

The Task Force is an independent, volunteer panel of national experts in prevention and evidence-based medicine that works to improve the health of people nationwide by making evidence-based recommendations about clinical preventive services such as screenings, counseling services, and preventive medications. ❖

Recognition

Kent awarded advanced total hip and knee replacement certification from joint commission

WARWICK – Kent Hospital has earned The Joint Commission's Gold Seal of Approval® for Advanced Total Hip and Knee Replacement Certification by demonstrating continuous compliance with its performance standards.

The certification, offered in collaboration with the American Academy of Orthopaedic Surgeons, focuses on the pre-surgical orthopedic consultation to the intraoperative, hospitalization, or ambulatory surgical center admission, rehabilitation activities, and a follow-up visit with the orthopedic surgeon.

Kent Hospital underwent a rigorous, onsite review on January 10th and 11th, 2023. During the visit, the Joint Commission physician reviewer evaluated compliance with related certification standards including delivering and facilitating evidence-based clinical care, supporting self-management and patient-centered care. Joint Commission standards are developed in consultation with healthcare experts and providers, measurement experts, and patients. The reviewer also conducted onsite observations and interviews. ❖

Help your Patients Keep their Medicaid Coverage

Medicaid members will need to renew their eligibility with the State of Rhode Island to keep their health insurance.

You can help now by reminding your Medicaid patients to update their account information with their current address and phone number. Medicaid members can update their information by:

- Logging into their HealthSource RI account: <https://healthyrhode.ri.gov/>
- Calling HealthSource RI at 1-855-840-4774 (TTY 711)

Thank you from all of us at Neighborhood for your commitment and partnership in ensuring Rhode Island families keep their health care coverage!



Neighborhood
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www.nhpri.org 1-800-459-6019 (TTY 711)

Neighborhood members can scan the QR code to update their address through our new e-form or visit www.nhpri.org



Obituaries



MICHAEL IRA NISSENSOHN, MD, 68, of Providence died unexpectedly on March 5, 2023. He was born in Brooklyn February 4, 1955, the son of Sydel and the late George Nissensohn.

He was a graduate of Brooklyn College and received his medical degree from the State University of New York Health Science Center at Brooklyn College of

Medicine in 1979. He was board-certified in both internal medicine and gastroenterology.

He practiced medicine in Rhode Island for 44 years and had long associations with Rhode Island Hospital, Roger Williams Hospital and as a teacher at the Brown University medical school.

"Dr. Mike," as he was more commonly known, treated thousands of patients and was beloved for his care and wonderful bedside manner.

He was a pilot, avid traveler and an obsessive golfer at courses throughout Rhode Island.

He is survived by his mother, Sydel Nissensohn; his two children, Emily (Jordan Chase), and Jordan, and his granddaughter, Talia. He also leaves behind sister Bea and brother Lee of New York.

He'll be missed by all and would want nothing more than for family, friends and patients to continue his legacy of extraordinary care. Contributions may be made in his memory to Lustgarten Pancreatic Cancer Foundation (lustgarten.org) or a charity of your choice.

A private funeral service was held March 8, 2023 in Brooklyn, NY. ♦



FRANCIS L. SCARPACI, MD, 89, of Cumberland, died March 23, 2023 at home surrounded by his loving family. He was the beloved husband of the late Audrey (Dugas) Scarpaci, and the beloved companion of the late Jean Frank.



Dr. Scarpaci was a general surgeon, serving as a surgical resident at Rhode Island Hospital from 1961–1966, as staff surgeon at Woonsocket Hospital from 1966–1989, and as chief of surgery at Woonsocket Hospital from 1989 until his retirement in 1993.

He was a graduate of Boston College and the Georgetown University School of Medicine. He was a veteran of the United States Air Force.

He is survived by three daughters, Joan Lada of Nokomis, FL, Carol Howe of Lincoln, and Nancy Scarpaci of Cumberland; two sons, Michael F. Scarpaci of North Providence, and Peter A. Scarpaci of Portland, ME; one sister, Anne Lourenco of Cumberland; twelve grandchildren; and four great grandchildren. He was the brother of the late Richard Scarpaci.

Contributions in his memory to HopeHealth Hospice & Palliative Care, 1085 North Main Street, Providence, RI 02904 or to Andre House, PO Box 2014, Phoenix, AZ 85001-2014 would be appreciated. For guest book, please visit www.bellowsfuneralchapel.com. ♦