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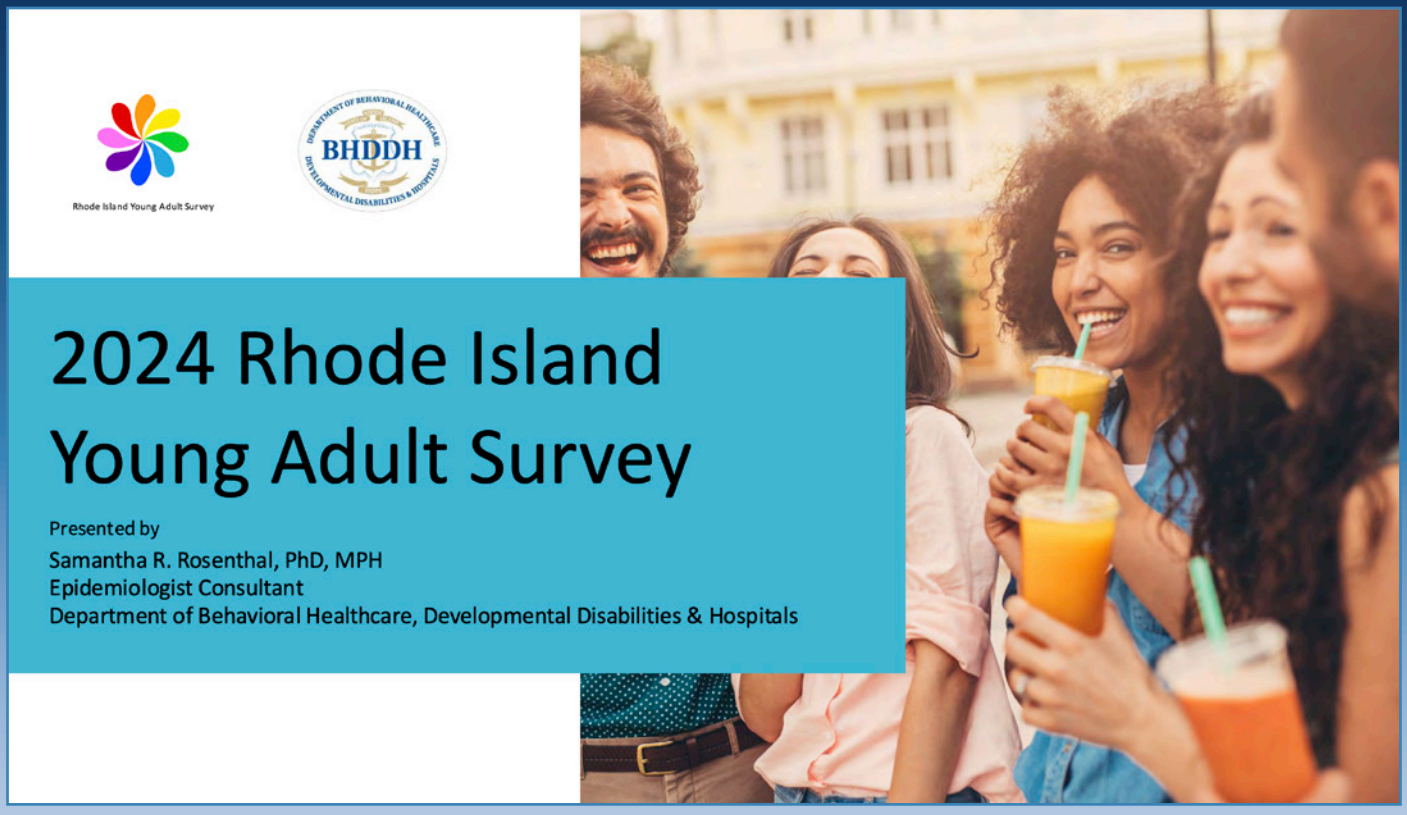

SPECIAL SECTION

2024 RHODE ISLAND YOUNG ADULT SURVEY

GUEST EDITOR: SAMANTHA R. ROSENTHAL, PhD, MPH

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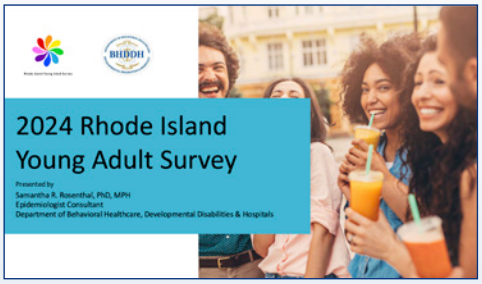

The cover photo is a slide from a presentation given on April 9th, 2025 of Gov. Dan McKee's Overdose Task Force. The full presentation can be found here: https://preventoverdoseri.org/wp-content/uploads/2025/04/GTF-2025-04-09.pdf

Young Adult Male Health and Restrictive Masculinity Norms

SAMANTHA R. ROSENTHAL, PhD, MPH

INTRODUCTION

Young adult health has been highlighted as a public health concern since before the COVID-19 pandemic, as rates of depressive episodes and suicide ideation doubled over the previous decade.[1] Since 2020, young adults in the United States (U.S.) have faced further mental health challenges. In 2022, over one-third (36.2%) of young adults aged 18–25 experienced mental illness, the highest among all age groups, and 11.6% faced serious mental illness.[2] This vulnerable life stage has been characterized by identity exploration and shifting relationships; today it is likewise encumbered by digital dependence and sociopolitical turmoil, which appear to have contributed to declining mental health.[3] The April 2023 special issue of the *Rhode Island Medical Journal* (RIMJ) spotlighted this crisis.[4] Since then, concern has mounted about young adult male health, including increased social isolation, reluctance to seek help for health, and engagement in risky behaviors.

Young adult males today are navigating significant pressures and societal expectations about what it means to "be a man." The most rigid of these expectations are referred to as restrictive masculinity norms (RMNs), which emphasize emotional toughness, self-reliance, dominance, antifeminity, aggression, and risk-taking. Though often celebrated culturally, these norms affect young adult male health, discouraging emotional expression and help-seeking, and encouraging risk behaviors as ways to cope.[5] These norms impact more than just men – they shape the broader culture for all young adults, often reinforcing unrealistic expectations that can hinder emotional well-being for people of all genders. This special issue of RIMJ focuses on the behaviors and health risks of young adult males and the role of RMNs in young adult health. This includes examinations of restrictive masculinity and depression; insomnia and pornography addiction; RMNs and past year checkup; traumatic brain injury and gambling problems; RMNs and eating disorder risk in females; as well as exposure to gun violence in youth and subsequent mental health and substance use disorder outcomes.

The articles in this special issue utilized data from the 2024 Rhode Island Young Adult Survey (RIYAS). This is a self-report, web-based survey administered every other year starting in 2020. Although representing a convenience sample of young adults residing in Rhode Island for at least part of the year, this is the largest survey of Rhode Island's young adults, surpassing other commonly used surveillance systems, such as the Behavioral Risk Factor Surveillance System (BRFSS) and the National Survey on Drug Use and Health (NSDUH). Recent changes – understood to have been rooted in Executive Orders from the current Administration – have made the BRFSS and NSDUH unavailable or altered, making these common data sources less reliable for Rhode Island young adults and created uncertainty about their future use, underscoring the growing importance of the RIYAS.[6]

Articles in this issue were supported by a partnership between the Rhode Island Department of Behavioral Healthcare, Developmental Disabilities, & Hospitals (BHDDH) and the Johnson & Wales University (JWU) Center for Student Research & Interdisciplinary Collaboration (CSRIC). Buttressed by data sharing from BHDDH, CSRIC faculty and students critically identified novel research questions, analyzed relevant data, and provided the meaningful evidence pertaining to young adult male health and restrictive masculinity norms in this issue.

MENTAL HEALTH

Young adulthood is a critical developmental stage marked by major life transitions and heightened vulnerability to mental health challenges.[7] This age group experiences the highest rates of anxiety and depression,[1] with approximately three-quarters of all mental illnesses emerging by age 25.[8] While young women are more frequently diagnosed with mental health conditions,[9] young men bear a disproportionate burden of severe outcomes – most notably, significantly higher rates of suicide, including a growing incidence of firearm-related suicide.[10] Emerging research suggests that the way mental health symptoms manifest in males may contribute to these disparities. Male depression is often underrecognized because it tends to present differently than it does in females. Instead of sadness or withdrawal, males may express depression through irritability, anger, substance misuse, or risk-taking behaviors.[11] Similarly, males with generalized anxiety disorder are more likely to also struggle with substance misuse, nicotine dependence, or antisocial traits – factors that can complicate diagnosis and delay treatment.[12] Restrictive masculinity norms that

equate emotional vulnerability with weakness can further intensify this mental health burden. Stigma around seeking help can lead males to suffer in silence, going undiagnosed and untreated. As a result, many young adult males carry their mental health struggles alone, sometimes until they reach a crisis point.[5]

RMNs socialize boys from a young age to prioritize independence over emotional intimacy. This early conditioning can leave young males ill-equipped to form meaningful, supportive relationships as they transition into adulthood. As a result, many young males report significantly lower levels of social connectedness,[13] contributing to feelings of loneliness – a well-documented risk factor for depression, anxiety, and suicidal ideation.[14] The depth of this isolation is reflected in recent data: in a study of males aged 18 to 23, two-thirds agreed with the statement, "No one really knows me."[15] A 2021 survey found that 15% of males reported having no close friends – five times higher than in 1990.[16] RMNs perpetuate such disconnection by discouraging emotional vulnerability, devaluing open communication about emotional state, and framing the act of seeking support as weakness. These societal expectations leave many young males emotionally isolated or alienated, without the crucial networks that foster resilience, well-being, and a sense of belonging.[5]

PHYSICAL HEALTH & RISK BEHAVIORS

Many males delay or avoid seeking medical care, even when experiencing symptoms. This can include preventive care, which contributes to higher rates of preventable illness and, ultimately, shorter life expectancy.[17] Such outcomes are concerning, but they do not stem from men's lack of concern for health – rather, they appear to be rooted in RMNs.

RMNs can discourage males from seeking help or prioritizing their well-being, and are linked to increased engagement in risk behaviors, including heavy drinking, drug use, smoking, and physical aggression.[5,18] Such behaviors may be used as coping mechanisms or as ways to prove one's masculinity in environments that value dominance and control. Research suggests that when males feel they do not live up to internalized standards of masculinity, it can heighten feelings of frustration and vulnerability, which are sometimes expressed through harmful behaviors.[19] RMNs are associated with physical injury risk from reckless driving, fighting, and, in some cases, gun violence.[20] Males are also 40% more likely to experience traumatic brain injury compared to females.[21] Moreover, restrictive masculinity ideals around physical appearance can take a toll: the drive to achieve a "masculine" body type has been linked to disordered eating, excessive exercise, and steroid use among males.[22]

RMNs also affect sexual health and behavior. Young adult males with RMNs are more likely to engage in unprotected sex, coerce partners to have sex without a condom, avoid open communication about consent and protection, and perpetrate intimate partner violence.[23] These behaviors may be learned responses to societal expectations of dominance and control, not necessarily reflections of individual values. One area where these pressures may manifest is in the use of pornography. Of note, 17% of young adult cisgender heterosexual males in the 2022 Rhode Island Young Adult Survey met the criteria for pornography addiction, a disorder associated with depression and suicide ideation.[24] Studies indicate that when males are pressured to uphold ideals of dominance and emotion suppression, they are at greater risk for using pornography as a coping mechanism, which in turn can reinforce these same norms.[25]

THE MANOSPHERE

Restrictive masculinity norms are perpetuated through family and peer dynamics, institutional cultures, and media representations across society. Restrictive masculinity beliefs among males seem to result, in part, from poor father-son relationships or living in environments of hypermasculinity.[26,27] Research reveals that young males experience peer pressure to conform to RMNs, including aggression.[28] Male-dominated organizations such as fraternities tend to encourage RMNs and associated ideals through hazing rituals with drug and alcohol use, violence, and sexualization of women.[29,30] Similarly, male competitive sports settings can normalize RMNs as they glorify toughness and hostility.[31] Mass media also plays a role: young males who spend more time watching television, video games, and YouTube are more likely to endorse restrictive masculinity traits such as emotional detachment, dominance, and avoidance of femininity; those with significant exposure to violence in video games have even more pronounced restrictive masculinity trait affinity.[32]

More recently, the *manosphere* – a loosely connected network of online communities and spaces shaping and reinforcing restrictive masculine norms – has emerged. These spaces perpetuate toxic RMNs and espouse misogyny, and they are becoming more extreme over time.[33] Members of these communities are at risk of radicalization and have been linked with an increasing number of violent incidents – both online and off.[34] Given the decentralized nature of the manosphere, it is hard to quantify how many young males are members of the community. However, a 2023 study in the United Kingdom showed that 80% of young males aged 16–17 consumed the content of Andrew Tate, a prominent figure in the manosphere,[35] and 56% of young fathers under age 35 approved of him.[36] Young males frequently exposed to such misogynistic content through the manosphere may begin to adopt and internalize these stereotypes, attitudes, and behavioral norms.

THE WAY FORWARD

Given the significant health challenges facing young adult males – and the pervasive influence of restrictive masculinity norms – it is crucial to implement targeted interventions that not only support the well-being of young males, but also

foster healthier, more inclusive expressions of masculinity that benefit everyone. Tackling RMNs calls for an inclusive, thoughtful approach that appreciates the diverse ways masculinity is experienced. Traits commonly associated with RMNs – such as emotional restraint, dominance, and resistance to vulnerability – can have far-reaching negative effects not just on males, but across all genders, by reinforcing power imbalances, stifling emotional development, and contributing to unhealthy relational dynamics. It is important to recognize that RMNs are not a singular concept; they are influenced by overlapping aspects of identity, including race, socioeconomic status, sexual orientation, and culture. As a result, many males face distinct expectations and challenges shaped by these intersections, and effective strategies must reflect that complexity. Encouraging broader, healthier expressions of masculinity – those that embrace compassion, emotional openness, and genuine connection – can create more supportive, equitable communities. The goal is not to reject masculinity, but to redefine it in ways that enhance well-being and foster inclusion for all.

Strategies to prevent the health harms of RMNs include early education and socialization, community-based interventions, mass media representation, and gender-tailored clinical support. Schools serve as important environments where gender attitudes and behaviors are shaped, establishing norms that persist through young adulthood. Promising strategies for shifting boys' gender attitudes in a relatively short period include small-group participatory programs that encourage critical reflection on power dynamics.[37] Similarly, classrooms can incorporate conversations around identity, self-respect, and emotional intelligence into standard health curricula. A gender transformative framework takes this a step further by engaging the broader school environment – including teaching methods, policies, and classroom culture – to actively question and disrupt traditional gender roles and expectations.[38]

Community-based interventions are also vital in addressing RMNs by meeting individuals where they live, work, and socialize. To be effective, programs should be grounded in local culture and led by trusted community members. Some successful initiatives include The Men's Story Project and The Confess Project, which harness storytelling, peer education, and culturally relevant dialogue to shift RMNs and promote more expansive masculinities.[39,40] These programs provide safe spaces for males of all ages, including young adults, to reflect and share their experience, be vulnerable, and build social support.

Media representation can play an important role in addressing RMNs by offering alternative portrayals of young adult males that go beyond RMNs and traditional stereotypes. The Geena Davis Institute recommends that content creators depict men showing a full range of emotions and engaging in nurturing behaviors to counteract RMNs.[41] Moreover, youth can be equipped with critical media literacy skills to help them recognize and deconstruct stereotypical or limiting gender portrayals in the media and popular culture.[42]

Gender-tailored clinical programming can form part of an effective solution. Programming that presents help-seeking as a demonstration of strength can make seeking care more compatible with many men's sense of identity, increasing their willingness to pursue preventive care and mental health support.[43] Integrating assessments that account for masculine norms into regular screenings and adapting diagnostic tools to better reflect male-specific symptoms can enhance accuracy and engage support earlier, meaning more effective health interventions. Therapeutic approaches designed to resonate with men – such as those that are structured, goal-focused, and action-oriented – have shown success in engaging individuals who might be hesitant to participate in more traditional, talk-based forms of therapy.[44]

Effectively addressing restrictive masculinity norms is not about rejecting masculinity, but rather about broadening its definition to embrace connection, vulnerability, and compassion. This shift requires both cultural and clinical change: increasing awareness of how mental health issues manifest differently in men and creating environments where emotional expression is valorized as a strength rather than a weakness. RMN-associated health challenges should not be viewed as personal shortcomings, but as the result of unrealistic societal expectations that limit how men are allowed to experience and express themselves. Supporting young adult males means making space for authenticity, empathy, and self-care – paving the way for stronger mental health, more fulfilling relationships, and healthier communities overall.

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Associations Between Restrictive Masculinity and Depression Across Sexual and Gender Identities

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ABSTRACT

INTRODUCTION: The current study examined associations between believing in restrictive masculinity norms and depression in a sample of Rhode Island young adults.

METHODS: Data from the 2024 Rhode Island Young Adult Survey (n=1008) was used. Restrictive masculinity was measured using a 12-item questionnaire. Depression symptoms were assessed with the CES-D10. Logistic regression models assessed main effects after stratification by sexual and gender status and adjusting for age, race, ethnicity, and social status.

RESULTS: Overall, 45.5% screened positive for depression. Restrictive masculinity was positively associated with a positive depression screen, but only among cisgender heterosexual males (OR[95%CI]=1.05 [1.01,1.10]).

CONCLUSIONS: Lowering the healthcare burden of depression may require providers to be trained to identify restrictive masculinity norms, particularly among cisgender heterosexual males, and to understand how holding such norms can influence the manifestation of depression symptoms.

KEYWORDS: masculinity; depression; young adults

INTRODUCTION

Restrictive masculinity is characterized by the internalization of rigid traditional masculine norms that dictate male behavior.[1,2] These norms promote emotional suppression, dominance, self-reliance, and avoiding vulnerability, which reinforce gender inequality and shapes how depression symptoms manifest in men. Within this construct, male dominance is promoted in financial, sexual, and societal domains, and strict behavioral expectations are enforced.[1,3-5] Consequently, emotional suppression linked to these norms is idealized and increases psychological distress, reduces help seeking, and increases the risk for untreated depression.[2,6] Conforming to "anti-femininity" ideals – a core component of restrictive masculinity that rejects traits like emotional expressiveness, empathy, and dependence – fosters hostility and suppresses emotional distress, further worsening mental health outcomes.[3,7] Within this framework, these traits are devalued, reinforcing the idea that femininity and masculinity are strictly separate.[8,9] By rejecting femininity, restrictive masculinity not only dictates behavioral expectations for men, but also enforces a system where anything perceived as feminine is stigmatized. This deepens gender inequality and increases psychological distress in men who struggle to meet these narrow expectations.[10,11] Importantly, among cisgender heterosexual men, adherence to restrictive masculinity has been associated with a higher likelihood of depressive symptoms.[4]

Broadly, depression is a prevalent concern among young adults. In Rhode Island; approximately 29.2% of young adults aged 18–25 reported experiencing a mental health condition in 2022,[12] and nationally, depressive symptoms among young adults aged 18–29 were estimated at 21% in 2019, driven by growing societal pressures.[13,14] Large disparities across sexual and gender identities in depression rates have been noted, which may be at least partially explained by social and cultural expectations surrounding gender roles.[8,10] Sexual and gender minorities (SGM) often experience higher rates of depression compared to cisgender heterosexual individuals, and nearly 49% of persons identifying as a sexual minority screened positive for depression, compared to 19.5% of heterosexual individuals.[15] Others have reported that SGM individuals have up to three times the odds of experiencing depressive symptoms compared to cisgender, heterosexual peers.[15,16] SGM populations, generally, face a heightened risk of depression due to discrimination, stigma, and insufficient support systems, and understanding these disparities requires examining how gender norms and social status interact with mental health outcomes.[10,15,16]

Among cisgender heterosexual men, depression is widely underreported due to societal pressures discouraging emotional expression and help-seeking. Nearly 50% of men with depressive symptoms do not seek professional help,[4,7] and restrictive masculinity beliefs strongly correlate with higher depressive symptoms, with men conforming to these norms reporting 25% higher depression scores.[3] Additionally, men adhering to rigid masculine expectations are 2.5 times more likely to experience mental distress.[11] These norms influence how depression manifests, with men often displaying externalizing behaviors like substance abuse, risk-taking, and social withdrawal, perpetuating a cycle where restrictive masculinity both increases vulnerability to depression and prevents treatment-seeking.[2,5]

Across all sexual and gender status (SGS) groups, societal norms shape beliefs in, and impact of, restrictive masculinity, with significant implications for mental health, including differential presentation of depression symptoms. Masculinity norms discourage emotional expression and help-seeking behavior, as men fear being perceived as weak or vulnerable.[4,7] These internalized expectations often lead men to isolate themselves and suppress emotional struggles, further complicating their mental health.[6,17] As a result, depression in cisgender heterosexual males often manifests through externalized behaviors, such as aggression, rather than internalized symptoms like sadness, leading to underdiagnosis and untreated depression.[18] For men who do not identify as heterosexual, societal expectations of masculinity often clash with their sexual identity, increasing isolation and mental health struggles.[17,19] Transgender men face challenges related to masculinity and gender expression, leading to emotional distress as they navigate conflicting gender expectations.[16,20] Similarly, non-binary individuals also encounter societal pressures and discrimination related to gender expectations, leading to social isolation, which contribute to depression.[20]

Existing evidence suggests that restrictive masculinity is a risk factor for depression and shapes the manifestation of depression symptoms. Here, we examine the association of restrictive masculinity and depression across different SGS groups in a sample of Rhode Island young adults. It was hypothesized that belief in restrictive masculinity norms would be associated with depression across all SGS groups.

METHODS

This study used data from the 2024 Rhode Island Young Adult Survey (RIYAS), which was a cross-sectional survey containing mental health and related behaviors administered to young adults in Rhode Island.

Sample

The 2024 RIYAS was implemented by the Rhode Island Department of Behavioral Healthcare, Developmental Disabilities and Hospitals and administered between May and August 2024 to individuals who were 18–25 years old and lived in Rhode Island. Participants were recruited through paid social media ads (e.g., Instagram) and Spotify, which was supplemented by recruitment through flyers and emails to students at local colleges and universities. All responses were collected via self-report, and participants received a $10 electronic gift card upon completion. Here, n = 1,008 surveys were completed, and all are included in the present analysis. Informed consent was provided via electronic affirmation, and the study was approved by the Institutional Review Board at a local university.

Measures

Restrictive masculinity was assessed using a 12-item questionnaire whose factor structure has been previously determined,[21] and items measured perceived roles of men in the household, at work, and in society. Responses were collected on a 5-point Likert scale ranging from *strongly disagree* (coded as 1) to *strongly agree* (coded as 5). Item level responses were aggregated by summation (α = 0.76), and higher scores indicated greater agreement with restrictive masculinity norms.

Depression symptoms were assessed using the 10-item Center of Epidemiologic Studies Depression Scale (CES-D10).[22] Items measured past week symptoms related to the development of depression, and responses were collected on a 4-point Likert scale ranging from *rarely or none of the time* (coded as 0) to *most of the time* (coded as 4). Two items were reverse coded. Item level scores were aggregated by summation (α α = 0.78), and participants with scores ≥10 were classified as screening positive to depression (coded as 1).

Several covariates were also assessed, including age, sexual and gender status (SGS), race/ethnicity, and relative social status. SGS included *cisgender heterosexual male, cisgender heterosexual female,* and *sexual and gender minority,* while race and ethnicity were combined into a single item that included *White, non-Hispanic; Black, non-Hispanic; Hispanic, Asian, non-Hispanic;* and *Other/Multiracial, non-Hispanic*. Relative social status was assessed using the MacArthur Scale of Subjective Social Status.[23]

Analysis

The distributions of continuous variables were examined and deemed normally distributed, and descriptive statistics are reported for all variables. Bivariate two-sample t-tests and chi-square tests were used to identify correlations with depression screening status. Then, due to depression screening status being a dichotomous variable, logistic regression models were used to determine the main effect of restrictive masculinity, after adjustment for all covariates. Because of previously identified differences in restrictive masculinity norms across SGS groups,[21] the analysis was stratified by SGS groups to determine if the relationship between restrictive masculinity and depression screening status was consistent across groups. The analysis was conducted using Stata Version 15 (College Station, TX: StataCorp LLC), and statistical significance was determined using 95% confidence intervals (CIs) at α = 0.05.

RESULTS

In the sample, 20.1% identified as cisgender heterosexual males, and 57.4% identified as White, non-Hispanic (**Table 1**). Mean age was 21.3 years old (SE = 0.07), and mean relative social status was 5.7 (SE = 0.06), which is approximately the mid-point of the scale. Mean restrictive masculinity

Table 1. Descriptive statistics and bivariate correlations (N = 1,008)*

	Overall (%)	Positive Depression Screen n = 458 (45.4%)	Negative Depression Screen n = 550 (54.6%)	*p*
Age [Mean (SE)]	21.3 (0.07)	21.1 (0.10)	21.1 (0.09)	0.859**
Sexual and Gender Status				**<0.001*** **
Cisgender Heterosexual Male	203 (20.1)	54 (11.8)	149 (27.1)	
Cisgender Heterosexual Female	363 (36.0)	142 (31.0)	221 (40.2)	
Sexual and Gender Minority	442 (43.9)	262 (57.2)	180 (32.7)	
Race/Ethnicity				0.693***
White, non-Hispanic	579 (57.4)	271 (59.2)	308 (56.0)	
Black, non-Hispanic	77 (7.6)	34 (7.4)	43 (7.8)	
Hispanic	197 (19.5)	89 (19.4)	108 (19.6)	
Asian, non-Hispanic	86 (8.5)	33 (7.2)	53 (9.6)	
Other/Multiracial, non-Hispanic	69 (6.9)	31 (6.8)	38 (6.9)	
Social Status [Mean (SE)]	5.7 (0.06)	5.27 (0.09)	6.06 (0.07)	0.248**
Restrictive Masculinity [Mean(SE)]	27.3 (0.24)	26.7 (0.36)	27.8 (0.31)	**0.023*** **

*bold indicates statistical significance; **two-sample t-test; ***chi-square test

Table 2. Adjusted odds of screening positive for depression after stratification by sexual and gender status*

	Cisgender Heterosexual Males		Cisgender Heterosexual Females		Sexual and Gender Minorities	
	OR	95% CI	OR	95% CI	OR	95% CI
Age	1.04	0.89, 1.20	1.01	0.092, 1.12	1.00	0.92, 1.09
Race/Ethnicity						
White, non-Hispanic	1.00	ref	1.00	ref	1.00	ref
Black, non-Hispanic	2.06	0.78, 5.45	0.93	0.42, 2.06	0.63	0.26, 1.54
Hispanic	1.13	0.49, 2.58	0.95	0.54, 1.67	0.87	0.52, 1.47
Asian, non-Hispanic	0.49	0.13, 1.83	0.88	0.41, 1.91	1.14	0.52, 2.50
Other/Multiracial, non-Hispanic	2.91	0.70, 12.05	0.60	0.24, 1.53	0.78	0.37, 1.64
Social Status	0.89	0.74, 1.06	**0.81**	**0.70, 0.93**	**0.74**	**0.66, 0.83**
Restrictive Masculinity	**1.05**	**1.01, 1.10**	1.01	0.98, 1.04	1.02	0.99, 1.06

*bold indicates statistical significance

score was 27.3 (SE = 0.24), which is slightly below the scale's mid-point.

In the bivariate analysis, sexual and gender status ($p < 0.001$) and restrictive masculinity score ($p = 0.023$) were correlated with screening positive for depression (**Table 1**). After stratification by sexual and gender status, and adjustment for all variables, restrictive masculinity remained associated with screening positive for depression only among cisgender heterosexual males (OR[95%CI] = 1.05 [1.01, 1.10]) (**Table 2**). Additionally, relative social status, which was not associated with depression status in the bivariate analysis ($p = 0.248$) (**Table 1**), was associated with lower odds of screening positive for depression in the stratified adjusted analysis, although only among cisgender heterosexual females (OR[95%CI] = 0.81 [0.70, 0.93]) and persons who identify as a sexual or gender minority (OR[95%CI] = 0.74 [0.66, 0.83]).

DISCUSSION

The present study shows that higher restrictive masculinity scores were associated with increased odds of screening positive for depression in cisgender heterosexual males, which is consistent with previous research,[2,4,9] although no significant effects were detected in other SGS groups. However, higher social status among persons who identify as a cisgender heterosexual female or any sexual or gender minority was negatively associated with screening positive for depression, which is also consistent with previous literature.[2,4,9]

The relationship between restrictive masculinity norms and depression is particularly pronounced among cisgender heterosexual men.[9] Adherence to self-reliance, emotional suppression, and stoicism is linked to higher depressive symptoms,[24] and societal expectations for men to be tough and emotionally restrained contribute to depression and

create barriers to early intervention.[25] Cultural influences shape how masculine norms contribute to depression, and across cultures, masculinity is often linked to dominance, control, and self-sufficiency, reinforcing the belief that seeking psychological support is a sign of weakness.[24,26] These pressures heighten the risk of depressive symptoms and isolate men by preventing access to essential social or medical support.[9,24]

Restrictive masculinity also significantly delays the recognition and treatment of depression, as men are less likely to acknowledge symptoms that contradict societal ideals of strength and independence.[4] This often leads to delayed help-seeking, reinforcing psychological distress and isolation.[26,27] The stigma around emotional vulnerability further discourages men from engaging in mental health services, contributing to underdiagnosis and undertreatment.[3,7] Individuals who identify as cisgender heterosexual females and SGMs often have greater societal permission to express emotions, which serves as a protective factor.[14] While cisgender heterosexual females and some SGM individuals may recognize or accept restrictive masculine norms, they are also less likely to internalize them as strongly as cisgender heterosexual men.[24] Cisgender heterosexual females in particular often experience less psychological distress related to restrictive masculinity because their gender identity is not as directly tied to fulfilling traditional masculine roles.[8,9] For SGM individuals, while gender identity and minority stress complicate outcomes, a greater willingness to seek support buffers against negative effects.[15]

Additionally, higher socioeconomic status protects against depression for cisgender heterosexual females and SGM populations by increasing access to mental health resources.[16] However, this benefit is not seen in cisgender heterosexual men, as the pressure to conform to masculine ideals often overrides the advantages of high social status.[24] In contrast, men's mental health is more closely tied to meeting societal expectations of masculinity than to financial or professional success.[25]

Implications

Healthcare providers must be trained to recognize and address barriers to care created by restrictive masculinity beliefs through integrated clinical assessments, professional training, and public health initiatives. An important step in addressing masculinity-related barriers to mental health care is improving diagnostic practices. Traditional criteria for depression may overlook how restrictive masculinity influences symptom presentation, as men often exhibit externalizing behaviors like irritability and aggression instead of sadness or withdrawal.[2] This can lead to underdiagnosis and undertreatment. Incorporating masculinity-informed assessments into routine screenings and refining tools to align with male-specific symptoms can improve diagnostic accuracy and ensure timely interventions.[1,26]

Improving diagnostic accuracy requires better education and training to foster gender competency in mental health care. Integrating masculinity-related content into medical curricula can enhance clinicians' ability to recognize and address restrictive masculinity in practice.[26] However, professional training on this topic remains underdeveloped and inconsistently implemented.[1,25] Without proper training, clinicians may struggle to recognize and address the ways in which masculine norms affect men's willingness to disclose mental health concerns or seek treatment. Targeted interventions can counteract restrictive masculinity norms by promoting health-supportive conceptions of masculinity. Reframing help-seeking as a sign of strength can encourage men to seek mental health support in ways that align with their identity.[24] Peer-led support initiatives in male-dominated spaces like workplaces, sports teams, and religious organizations have shown promise in normalizing mental health conversations.[11] These approaches leverage familiar social structures, making support more accessible than traditional therapy models.

Clinical interventions should work within the masculine norms framework to encourage mental health engagement. Male-friendly therapeutic models like goal-oriented and action-based interventions have proven effective in engaging men who might resist traditional therapy.[26,28] Structured, solution-focused approaches can improve treatment adherence, while education on emotional expression can challenge beliefs discouraging vulnerability.[25] Additionally, future research should focus on the development of interventions to break down barriers to care among culturally sensitive individuals and the development of novel screening tools that incorporate the impact of restrictive masculinity norms.

Limitations

The current study uses cross-sectional data and causality cannot be inferred. Data is self-reported and subject to recall and social desirability bias. Indeed, it is likely that both restrictive masculinity norms and depression symptoms are underreported. The sample used is not representative of all young adults in Rhode Island as a non-probability sample technique was used and cisgender heterosexual males are underrepresented. Consequently, generalizability of the results to young adults outside Rhode Island may be limited. Additionally, perceptions of masculinity may vary amongst specific SGM subgroups given the diverse intersectional experiences of sex, orientation, gender identity, and expression within this population.

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Insomnia and Pornography Addiction in Rhode Island Young Adults

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ABSTRACT

OBJECTIVE: The current study examined the association between insomnia and pornography addiction in Rhode Island young adults.

METHODS: Data from the 2024 Rhode Island Young Adult Survey (n=1008) was used. The Problematic Pornography Consumption Scale and Insomnia Severity Scale were used to assess pornography addiction and insomnia symptoms, respectively. Logistic regression models estimated main effects after adjusting for age, sexual/gender status, race, ethnicity, and social status. Interactive effect of sexual/gender status was explored.

RESULTS: Overall, 56.7% of participants viewed pornography and 7.9% screened positive for addiction. Screening positive for insomnia was associated with higher odds of pornography addiction (OR[95%CI]=2.35 [1.35,4.11]), although the effect was limited to cisgender heterosexual males.

CONCLUSIONS: Young adult men with symptoms of insomnia should be screened for pornography addiction. Gender-specific sex education programs and male-based university support groups should be established to lower addiction risk.

KEYWORDS: pornography; insomnia; men; young adults

INTRODUCTION

The prevalence of pornography consumption and addiction is not typically included in nationally representative surveillance studies, and interested stakeholders are required to rely on single surveys or small epidemiological investigations. Yet, the evidence from these smaller sources shows alarming trends. For example, a 2022 survey of Rhode Island (RI) young adults suggested that 54% of young adults aged 18–25 years viewed pornography,[1] and a separate sample of university students in the United States (US) reported that 56.6% consumed pornography in their lifetime.[2] Compared to females (40.9%), pornography use was significantly higher among males (87.6%).[2] Similarly, 83.8% of Polish university students aged 18-26 years old indicated current pornography consumption,[3] and between 2004 and 2016, the proportion of Polish adults who used online pornography rose from 7.7% to 24%.[4] In the Second Australian Study of Health and Relationships (ASHR), 84% of men and 54% of women reported lifetime pornography use, and past year use was 76% and 41% among men and women respectively.[5] Rates were even greater in a nationally representative study of 14–60 year olds in the United States (US), where lifetime pornography use was reported among 94.1% of men and 86.8% of women.[6] Early exposure to pornography may also be common. In the same study, the mean age of first pornography exposure was 13.8 among men and 17.5 among women.[6] Moreover, among 14–18 year olds in the US, lifetime use was 68.4%,[7] and a cross-sectional study of young Australians, 15–29 years old, reported that monthly and daily pornography use rates were 20% and 15%, respectively.[8]

Pornography addiction is not consistently defined and is not yet listed in the Diagnostic and Statistical Manual of Mental Disorders.[9] However, sources define pornography addiction as the persistent consumption of pornographic content accompanied by uninhibited self-control despite efforts to cease use.[10,11] Despite lack of recognition from diagnostic manuals, researchers have identified numerous risk factors associated with pornography addiction. Studies suggest males are 53% more likely to develop pornography addiction compared to females,[12] and males who use the internet are 20% more likely to note past month porn use compared to female internet users.[4,] Similarly, young adults also have a higher likelihood for pornography addiction, as 50% of young adults under 25 report weekly porn consumption.[12] In addition, individuals with alcohol use disorder report a greater average score on the problematic pornography use scale relative to those without alcohol use disorder.[13] Among Rhode Island young adults, 6.2% of individuals displayed signs of pornography addiction, and compared to cisgender females, the odds of pornography addiction were 13.4 times for cisgender males and 3.7 times for sexual or gender minority (SGMs).[1] Internationally, 9.5% of Iranian university students were classified as problematic pornography users.[14] Likewise, 4% of the 76% active male pornography users in the ASHR and 3% of German adult women aged 18–77 years reported pornography addiction.[5,15] Moreover, among Hungarian young adults, 4.4% met the criteria for Pornography-Watching Disorder (PWD), and males were 1.89 times more likely to report PWD compared to females.[12]

In addition to pornography addiction, a significant portion of young adults report insomnia. Incidence of insomnia is estimated to range between 13–30% globally,[16] and a meta-analysis of 13 articles suggested that the odds of chronic insomnia were 1.58 times greater for heterosexual cisgender females compared to males.[17] Similar findings were reported in a study of Norwegian young adult university students, with 34.2% of females and 22.2.% of males meeting the DSM-5 criteria for insomnia.[18] Numerous studies have linked insomnia with poor health outcomes. For example, approximately 24.6% of young adult students aged 18–24 who slept between 0–4 hours daily reported cardiovascular disease compared to 7.1% who slept between 7–8 hours.[19] Reduced immune health is common, and in a 2022 study of young adults, individuals who self-reported impaired wound healing had a higher likelihood of insomnia, with 31.9–45.2% screening positive for insomnia compared to 25.8% in the control group.[20] Additionally, poor sleep has been tied to metabolic disorders, with young adult men who sleep less than seven hours reporting a 1.4 unit increase in mean BMI compared to men who slept seven-nine hours.[21] Moreover, insomnia is a major risk factor for psychological problems in adults.[22] Adults with chronic insomnia have 2.27 times the risk of developing depression,[23] 1.61 times the odds of using non-cannabis drugs,[22] and 1.75 times the hazard of developing alcohol use disorder.[24]

Few studies have suggested a relationship between insomnia and pornography addiction, and those few are largely exclusive to male samples or measure other psychological constructs. Tangentially, studies that consider pornography addiction a form of problematic internet use have consistently linked pornography use to the onset and maintenance of sleep disorders.[25] Literature also suggests that internet pornography addiction may share basic mechanisms with substance addiction and heavy substance use, such as alcohol, among young adults with insomnia, who may be motivated by desires to improve sleep efficiency.[26,27] Further, insomnia is common among individuals attempting to cease substance use and is a contributor to relapse.[28]

Despite prior studies investigating the prevalence of pornography and pornography addiction, there is still limited information on the behavior in young adults, particularly in Rhode Island (RI), and additional investigations are warranted to better understand the association between insomnia and pornography addiction. The current study sought to estimate the prevalence of pornography addiction in RI young adults, examine the association between insomnia and pornography addiction, and investigate whether this association is moderated by sexual/gender status (SGS). It was hypothesized that insomnia would be positively associated with pornography addiction, and that this association would be particularly pronounced among cisgender heterosexual males.

METHODS

The current analysis is a secondary analysis of data from the 2024 Rhode Island Young Adult Survey (RIYAS), which was a cross-sectional survey administered to Rhode Island young adults to assess mental health and related behaviors in that population.

Sample

The RIYAS was developed by the Rhode Island Department of Behavioral Healthcare, Developmental Disabilities & Hospitals and administered between June and September 2024 to 18–25 year olds who lived in Rhode Island for at least part of the year. Participants were recruited through advertising on social media platforms (e.g., Instagram), Spotify, and recruitment was supplemented using flyers and emails to students at local colleges and universities. Responses were collected electronically via the Qualtrics survey platform, and all data was self-reported by participants. Informed consent was completed via affirmation, and participants were compensated with a $10 electronic gift card after survey completion. The study was approved by the university Institutional Review Board, and N = 1,008 participants with complete data are included in the analysis.

Measures

Pornography use was assessed using: *In an average month, how many days do you view porn?* Numeric responses were collected, and any participant indicating any pornography viewing completed the Problematic Pornography Consumption Scale (PPCS-6).[29] Consisting of six items, the PPCS-6 assessed symptoms of addiction (e.g., neglecting leisure activities, tolerance) in the context of pornography viewing over the past six months. Responses were collected on a 7-point Likert scale ranging from *never* (coded as 1) to *all the time* (coded as 7). Responses across items were aggregated via summation ($\alpha = 0.87$). A dichotomous variable was then created to identify participants who screened positive for pornography addiction (i.e., PPCS score ≥20, coded as 1).

Insomnia was measured using the 7-item Insomnia Severity Scale, which measures difficulties with sleep and the impact of sleep problems on quality of life.[30] Responses were collected on 5-point Likert scales, with specific response categories varying across items. For each Likert scale, the least severe response (i.e., *none*, *not at all*, *very satisfied*) was coded as 0, and the most severe response (i.e., *very severe*, *very much*, *very dissatisfied*) was coded as 4. Responses across items were aggregated via summation ($\alpha = 0.89$). A dichotomous variable was created where participants with scores ≥8 were classified as screening positive for insomnia (coded as 1).

Alcohol use disorder, an important risk factor for pornography addiction, was assessed using the 10-item Alcohol Use Disorders Identification Tests (AUDIT).[31,32] Items assess frequency and intensity of alcohol consumption, and severity of alcohol-related consequences. Responses were collected

on 5-point Likert scales, with response options varying across items. Response options were coded from 0 (e.g., *never*, *no*) to 4 (e.g., *daily or almost daily*, *yes during the last year*). Responses were aggregated via summation ($\alpha = 0.83$), and participants with scores ≥ 8 were classified as screening positive for alcohol use disorder (coded as 1).

Several covariates were included as well, including age, sexual/gender status, race, ethnicity, and social status. Race and ethnicity were assessed in a single question and included *White, non-Hispanic; Black, non-Hispanic; Hispanic; Asian, non-Hispanic;* and *Other/Multiracial, non-Hispanic.* SGS categories were *cisgender heterosexual male*, *cisgender heterosexual female*, and *sexual or gender minority*. The MacArthur Scale of Subjective Social Status was used to measure social status.[33]

Analysis

The distributions of continuous variables were examined and deemed normally distributed. Descriptive statistics are reported for all variables, and a logistic regression model was used to assess the main effects after adjusting for alcohol use disorder and the covariates. Interaction effects involving SGS were also tested due to previously identified differences in pornography consumption between SGS groups.[1] Reference groups included not screening positive for pornography addiction, insomnia, or alcohol use disorder; cisgender heterosexual males; and White, non-Hispanic. Stata Version 15 (College Station, TX: StataCorp LLC) was used to conduct the analysis, and statistical significance was determined using 95% confidence intervals (CIs) at $\alpha = 0.05$.

Table 1. Descriptive statistics and bivariate correlations (N = 1,008)*

	Overall (%)	Positive Pornography Addiction Screen n = 80 (7.9%)	Negative Pornography Addiction Screen n = 928 (92.1%)	*p*
Age [Mean (SE)]	21.3 (0.07)	20.6 (0.24)	21.1 (0.07)	**0.045****
Sexual/Gender Status				**0.001*****
Cisgender Heterosexual Male	203 (20.1)	25 (31.3)	178 (19.2)	
Cisgender Heterosexual Female	363 (36.0)	14 (17.5)	349 (37.6)	
Sexual or Gender Minority	442 (43.9)	41 (51.3)	401 (43.2)	
Race/Ethnicity				**0.036*****
White, non-Hispanic	579 (57.4)	35 (43.8)	544 (58.6)	
Black, non-Hispanic	77 (7.6)	11 (13.8)	66 (7.1)	
Hispanic	197 (19.5)	18 (22.5)	179 (19.3)	
Asian, non-Hispanic	86 (8.5)	11 (13.8)	75 (8.1)	
Other/Multiracial, non-Hispanic	69 (6.9)	5 (6.3)	64 (6.9)	
Social Status [Mean (SE)]	5.7 (0.06)	5.5 (0.21)	5.7 (0.06)	0.248**
Alcohol Use Disorder				**<0.001*****
Yes	31 (3.1)	8 (10.0)	23 (2.5)	
No	977 (96.9)	72 (90.0)	905 (97.5)	
Insomnia				**<0.001*****
Yes	167 (16.6)	25 (31.3)	142 (15.3)	
No	841 (83.4)	55 (68.8)	786 (84.7)	

*bold indicates statistical significance; **two-sample t-test; ***chi-square test

RESULTS

Briefly, a plurality of the sample identified as a sexual or gender minority (43.9%), and a majority identified as White, non-Hispanic (57.4%), while mean age was 21.3 years old (SE = 0.07) (**Table 1**). Overall, 56.7% of participants self-reported pornography use and 7.9% screened positive for pornography addiction. Among pornography users, 14.0% screened positive for addiction. Additionally, 16.6% and 3.1% screened positive for insomnia and alcohol use disorder, respectively.

In bivariate analyses, insomnia ($p < 0.001$), alcohol use disorder ($p < 0.001$), and sexual/gender status ($p < 0.001$) were associated with pornography addiction (**Table 1**). In the adjusted analysis, odds of pornography addiction were over two times those in participants who screened positive for insomnia (OR[95%CI] = 2.35 [1.35, 4.11]) and nearly four times those of participants who screened positive for alcohol use disorder (OR[95%CI] = 3.96 [1.59, 9.87]) (**Table 2**). Odds were significantly lower among participants who identified as cisgender heterosexual female (OR[95%CI] = 0.30 [0.15, 0.61]) relative to cisgender heterosexual males, and there was a significant interaction between screening positive for insomnia and sexual/gender status ($p < 0.001$). Specifically, the association between insomnia and pornography addiction was only significant among cisgender heterosexual males (**Figure 1**).

DISCUSSION

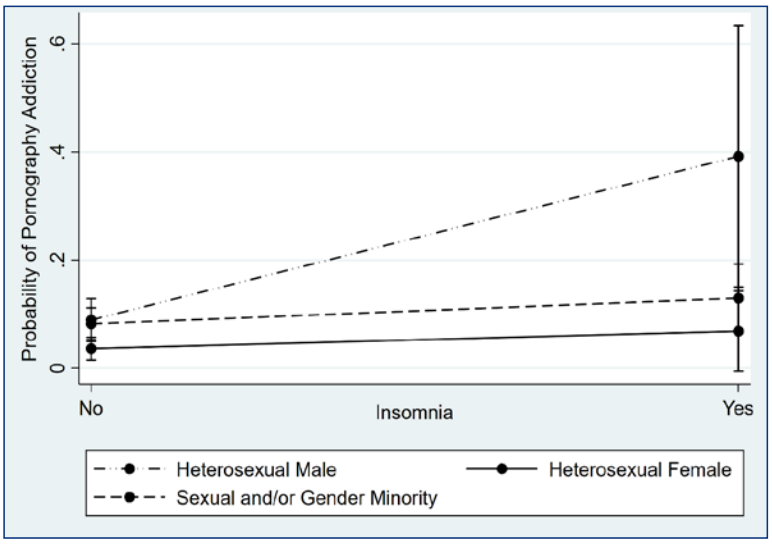
The majority of RIYAS participants regularly viewed pornography, and one in seven pornography users were identified as having a pornography addiction. Individuals who screened positive for insomnia had greater odds of pornography addiction, although the relationship between insomnia and addiction only occurred in young adults who identify

Table 2. Crude and adjusted odds of screening positive for pornography addiction*

	Crude OR	95% CI	Adjusted OR	95% CI
Age	**0.90**	**0.81, 0.99**	0.90	0.81, 1.01
Sexual/Gender Status				
Cisgender Heterosexual Male	1.00	ref	1.00	ref
Cisgender Heterosexual Female	**0.29**	**0.14, 0.56**	**0.30**	**0.15, 0.61**
Sexual or Gender Minority	0.73	0.43, 1.23	0.68	0.39, 1.21
Race/Ethnicity				
White, non-Hispanic	1.00	ref	1.00	ref
Black, non-Hispanic	**2.59**	**1.26, 5.34**	**2.77**	**1.30, 5.93**
Hispanic	1.56	0.86, 2.83	1.44	0.78, 2.67
Asian, non-Hispanic	**2.28**	**1.11, 4.68**	**2.80**	**1.32, 5.95**
Other/Multiracial, non-Hispanic	1.21	0.46, 3.21	1.19	0.44, 3.23
Social Status	0.93	0.82, 1.05	0.94	0.83, 1.07
Alcohol Use Disorder				
Yes	**4.37**	**1.89, 10.12**	**3.96**	**1.59, 9.87**
No	1.00	ref	1.00	ref
Insomnia				
Yes	**2.52**	**1.52, 4.17**	**2.35**	**1.35, 4.11**
No	1.00	ref	1.00	ref

*bold indicates statistical significance

Figure 1. Interaction between insomnia and sexual/gender status on screening positive for pornography addiction ($p < 0.001$)



as cisgender heterosexual males. These findings are somewhat consistent with previous literature, but the moderation by sexual/gender status is novel.

Insomnia may be associated with pornography addiction in young adult cisgender heterosexual males for several reasons. First, fMRI studies suggest that men with problematic pornography use display increased activation in the ventral striatum in response to anticipation of explicit content, provoking a craving-like response that mirrors other behavioral addictions.[34] This effect may be intensified since, compared to women, visual sexual stimuli elicit stronger neural activation, with differences occurring at the cognitive processing stage, enabling powerful physiological and subjective arousal in men.[35] Further, significant sleep deprivation impairs cognitive function in the prefrontal lobes, which are charged with decision-making, and impairment is associated with impulsive tendencies.[36] As men are more likely to engage in risky behaviors in response to sleep loss compared to women, it is possible men experience greater impairment.[37] Consequently, men with insomnia may view pornography as a form of gratification from immediate cravings, developing into consistent viewing given their coupled susceptibility. Second, because insomnia among young adults is often motivated by anxiety or stress related to college or work, men may use pornography as a maladaptive coping strategy for reducing stress.[38] When this stress cannot be readily resolved, men are more likely than women to use avoidance coping strategies as a means of denial or emotional detachment, and because pornography is readily attainable and late-night hours provide greater privacy, young men may seek out pornography for quick avoidance of current stressors.[3,39] In comparison, women tend to employ more emotional coping methods such as positive self-talk, verbal self-expression, and social support, and therefore, may not use pornography in the same manner as men.[39]

Implications

Healthcare providers should consider screening for excessive pornography use and pornography addiction among patients, particularly those exhibiting symptoms of insomnia. The PPCS-6, containing only six items, is a valid and reliable questionnaire that may be an effective screening tool for persons thought to be at risk for pornography addiction.[29] As pornography addiction in cisgender heterosexual males is uniquely affected by insomnia, targeted screening may be warranted. Among males

with a pre-existing insomnia diagnosis, cognitive-behavioral therapy for insomnia (CBT-I) may be used as an effective means of reducing insomnia symptoms, which may subsequently lower the risk of pornography addiction.[40] Acceptance and Commitment Therapy (ACT) is a widely used intervention for problematic pornography use and may be integrated with CBT-I to reduce avoidance coping.[41] Further, mindfulness-based practices, such as mediation or ACT, which have been shown to reduce impulsivity by allowing greater emotional regulation and cognitive control, may decrease the desire to consume pornography due to stronger emotional control.[42]

Sex education programs should be evaluated to emphasize pornographic literacy and greater sexual awareness. Additionally, gender-specific sex education programs or media campaigns that target males and discuss challenges with conforming to perceived societal stereotypes should be considered.[43] Within a university setting, administrators should consider establishing communities that can offer males positive spaces for informative discussions on the significance of pornography, reduction of stigma associated with help-seeking, and alternative methods to alleviate stress and anxiety associated with pornography. These communities should also promote healthier masculinity norms that discourage avoidant coping strategies and encourage the use of mental health services when necessary.[44] Finally, additional research is needed on the role of pornography in young adulthood across all SGS groups to better understand how pornography consumption turns into pornography addiction.

Limitations

There are several study limitations to consider. Since persons identifying as a sexual or gender minority are overrepresented, the sample is unlikely to be representative of all young adults, and generalizability will be limited. The data are cross-sectional, and causality cannot be inferred. Additionally, recall bias is a concern as items as varying time constraints. Social desirability bias is also a concern due to stigma associated with pornography use and substance use, and rates of pornography addiction and alcohol use disorder are likely under-estimated.

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Restrictive Masculinity Norms and Past-Year Checkup Among Young Adult Males and Females

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ABSTRACT

INTRODUCTION: Despite the benefits of regular checkups for early disease detection, many young adults skip routine care, a pattern linked to restrictive masculinity norms that discourage help-seeking.

METHODS: Including males and females from the 2024 Rhode Island Young Adult Survey (n=1,004), we examined the relationship between restrictive masculinity and checkup avoidance using multivariable logistic regression, adjusting for demographics, social status, student, employment, and insurance status.

RESULTS: 29.4% reported no past-year checkup. Each unit increase in the restrictive masculinity scale was associated with 1.05 (95% CI: 1.03–1.07) times the odds of no past-year checkup. Effects were consistent across both sexes.

DISCUSSION: To reduce barriers to annual healthcare, interventions must be gender-sensitive and tailored to individuals who endorse restrictive masculine norms. Education-based strategies can help reframe healthcare as a strength. For males and females, social support, inclusive programming, and strength-based models can increase comfort and motivation to seek care.

KEYWORDS: Restrictive masculinity; young adults; ;annual checkups preventive care

INTRODUCTION

Regular checkups administered by a primary care provider are critical in preventing and detecting disease, as well as improving health behaviors and outcomes. These visits provide patients the opportunity to learn how to improve or maintain their health through lifestyle and behavioral changes, as well as treat chronic conditions through various means.[1] In doing so, overall community health is also improved by lowering the prevalence of disease and its spread.[2] Preventive care is essential to screen for and manage some of the leading health issues for both males and females, such as heart disease, obesity, diabetes, and lung disease.[3] Primary care physicians also monitor patients for health issues that may disproportionately affect one particular sex.[4] For females, this is often focused on the prevention of heart disease, breast cancer, and stroke.[5-7] For males, screening for and treatment of obesity, colorectal cancer, and cardiovascular disease are particularly important.[8-10]

Despite the importance of these visits, one in five adults in the United States (US) has not seen a provider for a routine checkup within the last year.[11] In the US, this issue is particularly prominent among males, who are 24% less likely to have an annual checkup compared to females.[12] They are also less likely to have a regular source of care, such as a primary care provider.[13] When males do seek care, they are more likely to have brief visits focused on acute care, rather than preventive visits, and are less likely to ask questions[14] or get screening for sex-specific issues.[8-10,15] Men are also much less likely to seek mental health services, often waiting until a crisis point, likely contributing to the higher suicide rates in this population.[16] Further, the avoidance of care among men leads to higher rates of preventable illness and early death.[17]

While evidence suggests males are less likely to access healthcare, there is reason to believe that restrictive masculinity norms, rather than being biologically male, is a major driver in whether someone seeks an annual checkup. Restrictive masculinity norms encompass a set of traditional, rigid ideals of what it means to be a man, mainly embodying dominance, self-reliance, and invincibility.[18] While men tend to avoid help-seeking in relation to preventive care, this may be due to viewing help-seeking as a sign of weakness or dependence, in violation of these rigid masculine norms.[19] Research shows male avoidance of healthcare is often following the example of other male family members who avoid healthcare or adhering to the idea that males should not ask for help.[15,20] Similarly, men may avoid checkups due to fear of losing a sense of control or invincibility if a health problem is identified.[21]

While under-researched, restrictive masculinity norms may also lead to neglect of physical and mental health in females.[22] Research shows that females who endorse rigid masculine norms engage in more negative health behaviors, fewer positive ones,[23] and are more likely to avoid healthcare when their self-worth is tied to masculinity.[24] Additionally, there is a significant gap in our understanding of the overall relationship between regular checkups and restrictive masculinity, especially among young adults. To address these

concerns, this study examines whether belief in restrictive masculinity norms is associated with not having a checkup in the past year among Rhode Island young adults, and whether this holds for both males and females.

METHODS

Sample

The Rhode Island Young Adult Survey (RIYAS) was a confidential, self-reported, cross-sectional study conducted by the Rhode Island Department of Behavioral Healthcare, Developmental Disabilities & Hospitals. The 2024 survey was administered online through Qualtrics to collect data on young adults' behavioral health, risk behaviors, and mental and physical health outcomes. Eligible individuals were between the ages of 18 and 25 and resided in Rhode Island for at least part of the year. Recruitment strategies included paid advertisements on Instagram and Spotify, as well as outreach via flyers and emails to students at higher education institutions. To maintain data quality, the survey underwent rigorous internal validation processes. Participants were compensated with a $10 gift card for their participation. A total of 1,008 surveys were completed between June and September 2024. All participants provided electronic informed consent, and the study was approved by the local Institutional Review Board. Those included in this study were individuals who reported their sex assigned at birth as either male or female, removing the small sample of n=4 from the total sample who were intersex.

Measures

The primary outcome of the study is not getting an annual checkup, specifically not having a routine checkup in the past year versus having a routine checkup in the past year. This variable was defined by the survey question, "About how long has it been since you last visited a doctor for a routine checkup?" Those who responded "Within the past year (anytime less than 12 months ago)" were considered to have a routine checkup in the past year. All others responding "Within the past two years (one year but less than two years ago)" or "Within the past five years (two years but less than five years ago)" or "five or more years ago" were considered as not having a routine checkup in the past year.

The main exposure variable in this study is belief in restrictive masculinity norms assessed by the Restrictive Masculinity Scale, a 12-item questionnaire (**Table 1**). Example statements include "Men should be able to freely express their emotions through crying" and "Men should respect a woman's decision if she says no to sex." Participants responded to each statement using a scale from strongly disagree (coded as 0) to strongly agree (coded as 4), with three items being reverse-coded. Total scores ranged from 0 (indicating the least restrictive masculinity norms) to 48 (indicating the most restrictive masculinity norms).[25]

Other covariates measured in the study are those previously identified as potential risk factors for getting a routine checkup.[26-29] These covariates include sex assigned at birth (male/female), gender and sexuality (cisgender heterosexual/sexual and/or gender minority), race/ethnicity (White, Black, Hispanic, Asian, Other/Multiracial), age, social status, student status, employment status, and insurance status. Social status was measured using the MacArthur Scale of Subjective Social Status, where respondents rated their perceived standing in their community from 1 "worst off" to 10 "best off".[30] Student status was based on enrollment in high school or post-secondary education. Employment included part- or full-time work. Insurance status was assessed by asking if respondents had any form of health coverage.

Table 1. Questions from the Restrictive Masculinity Scale [25]

1. Men should provide for the financial needs of the household.
2. Men should care for children and complete household chores, like cooking and cleaning.
3. Men should earn more money than women.
4. Men should work in physical jobs, such as a construction worker, truck driver, or fisherman.
5. Men should be able to freely express their emotions through crying.
6. For men, work should be more important than anything.
7. Men should be strong, tough, and assertive leaders.
8. Men should have the final say in household decisions.
9. Men should control everything in the household.
10. Men should protect family members, especially women and girls.
11. Men should always be the one to initiate sex.
12. Men should respect a woman's decision if they say no to sex.

Statistical Analysis

Descriptive statistics, specifically means and standard errors for continuous variables and frequencies and percentages for categorical variables, were reported for the total sample and by past-year checkup. Bivariable statistics were assessed using two-sample t-tests for continuous variables and chi-square tests for categorical variables by past-year checkup. Multivariable logistic regression for not having a past-year checkup on restrictive masculinity scale was conducted controlling for sex assigned at birth, gender and sexuality, race/ethnicity, age, social status, student status, employment status, and insurance status. Adjusted odds ratios and 95% confidence intervals are reported. Reference categories were male, cisgender heterosexual, White, non-Hispanic, not being a student, not being employed, and having insurance. Fully adjusted models were then stratified by sex assigned at birth. All analyses were conducted at $\alpha = 0.05$ and all analyses were calculated in Stata/SE 15.0.[31]

RESULTS

In a sample of n=1,004 young adults, 29.4% had no past-year checkup. The mean age was 21.1 years (SE: 0.07) with a mean social status of 5.7 (SE: 0.06). The majority were female (72.1%) and cisgender heterosexual (56.4%). Most were White, non-Hispanic (57.3%), students (61.8%), employed (74.4%), and insured (75.5%). The mean restrictive masculinity score was 27.3 (SE: 0.24), with a higher score among those with no past-year checkup (p < 0.001). Mean age was higher among those with no past-year checkup (p < 0.001). Students were less likely to have no past-year checkup (p = 0.003), while those employed were more likely (p = 0.032). In the fully adjusted model, there was 1.05 (95%CI: 1.03, 1.07) times the odds of not having a checkup in the past year with each additional unit of the restrictive masculinity scale; and 1.17 (95%CI: 1.08, 1.26) times the odds with each additional year in age. When models were stratified by sex, the effect of restrictive masculinity score was consistent for each sex with the combined model [males AOR: 1.05 (95%CI: 1.01, 1.09); females AOR: 1.05 (95%CI: 1.02, 1.08)] (**Tables 2,3,4**).

Table 2. Sociodemographics of young adults by past-year checkup

	Total N=1,004 (%)	Past-Year Checkup N=709 (70.6%)	No Past-Year Checkup N=295 (29.4%)	P-value
Restrictive Masculinity [Mean(SE)]	27.3 (0.24)	26.7 (0.27)	28.8 (0.48)	**<0.001**
Sex Assigned at Birth				0.299
Male	280 (27.9)	191 (26.9)	89 (30.2)	
Female	724 (72.1)	518 (73.1)	206 (69.8)	
Gender and Sexuality				0.426
Cisgender Heterosexual	566 (56.4)	394 (55.6)	172 (58.3)	
Sexual and Gender Minority	438 (43.6)	315 (44.4)	123 (41.7)	
Race/Ethnicity				0.520
White, non-Hispanic	575 (57.3)	413 (58.3)	162 (54.9)	
Black, non-Hispanic	77 (7.7)	48 (6.8)	29 (9.8)	
Hispanic	197 (19.6)	139 (19.6)	58 (19.7)	
Asian, non-Hispanic	86 (8.6)	59 (8.3)	27 (9.2)	
Other/Multiracial, non-Hispanic	69 (6.9)	50 (7.1)	19 (6.4)	
Age	21.1 (0.07)	20.9 (0.09)	21.6 (0.12)	**<0.001**
Social Status [Mean(SE)]	5.7 (0.06)	5.7 (0.07)	5.6 (0.10)	0.432
Student				**0.003**
Yes	620 (61.8)	459 (64.7)	161 (54.6)	
No	384 (38.3)	250 (35.3)	134 (45.4)	
Employed				**0.032**
Yes	747 (74.4)	514 (72.5)	233 (79.0)	
No	257 (25.6)	195 (27.5)	62 (21.0)	
Insurance				0.205
Yes	758 (75.5)	543 (76.6)	215 (72.9)	
No	143 (14.2)	92 (13.0)	51 (17.3)	
Don't know/ not sure	103 (10.3)	74 (10.4)	29 (9.8)	

Note: P-values are calculated using two-sample t-tests for continuous variables and chi-square tests for categorical variables

Table 3.

	Adjusted Odds of No Past-Year Checkup	
	AOR	95%CI
Restrictive Masculinity Score	**1.05**	**1.03, 1.07**
Sex Assigned at Birth		
Male	1.00	ref
Female	1.02	0.73, 1.42
Gender and Sexuality		
Cisgender Heterosexual	1.00	ref
Sexual and Gender Minority	1.19	0.88, 1.63
Race/Ethnicity		
White, non-Hisanic	1.00	ref
Black, non-Hispanic	1.43	0.85, 2.40
Hispanic	1.06	0.73, 1.53
Asian, non-Hispanic	1.16	0.70, 1.92
Other/Multiracial, non-Hispanic	1.07	0.60, 1.90
Age	**1.17**	**1.08, 1.26**
Social Status	0.93	0.86, 1.01
Student		
Yes	1.00	0.72, 1.38
No	1.00	ref
Employed		
Yes	1.40	0.99, 1.99
No	1.00	ref
Insurance		
Yes	1.00	ref
No	1.36	0.91, 2.02
Don't know/not sure	1.12	0.69, 1.82

Table 4. Sex-stratified models for adjusted odds of no past-year checkup

Adjusted Odds of No Past-Year Checkup			
Males		Females	
AOR	95%CI	AOR	95%CI
1.05	**1.01, 1.09**	**1.05**	**1.02, 1.08**

NOTE: Models control for sex assigned at birth, gender and sexuality, race/ethnicity, age, social status, student status, employment, insurance status

DISCUSSION

Regardless of sex, believing in more restrictive masculinity norms hinders past-year checkups. The results showed almost an identical effect across males and females, further emphasizing that sex does not moderate this relationship.

Prior research suggests that restrictive masculinity is a significant barrier to healthcare utilization among males. For example, traits celebrated in restrictive masculinity norms, such as emotional control, self-reliance, and stoicism, are associated with avoidance of health services.[14] In adhering to traditional ideals of stoicism and control, men often suppress fear and delay medical attention to preserve a sense of normalcy and self-reliance.[32] Strong belief in these norms can lead to feelings of shame, embarrassment, or fear of being judged when reporting health concerns,[13] further discouraging men from seeking necessary care. Males, and particularly young adults, may also have a sense of invincibility due to these masculinity norms, viewing themselves as less vulnerable to illness and requiring fewer doctor visits.[19]

Research also indicates that restrictive masculine norms significantly hinder men's engagement with sex-specific healthcare, such as prostate cancer screening and treatment, despite being one of the most prevalent malignancies among this population.[32,33] As these norms discourage open communication about sensitive health issues to avoid appearing vulnerable, many men avoid discussing prostate health with physicians or seeking care, even when symptoms are present. Additionally, fear of diagnosis and the potential disruption to daily life may further deter men from seeking timely care.[32] Mental health care is similarly neglected, with fear of stigmatization emerging as a central barrier to help-seeking. Many men forgo psychiatric services to maintain the emotional toughness associated with their masculine identity. This is evident even among populations with elevated mental health risks – such as military veterans – where healthcare utilization remains disproportionately low, reflecting the influence of hyper-masculine cultural norms.[34]

Masculinity norms can be endorsed and adopted by females, even though these norms are directed at men. Individuals who support these restrictive masculine ideals for others may also – whether knowingly or subconsciously – hold themselves to the same standards.[35] In fact, research suggests that masculinity norms, such as strength and assertiveness, are more strongly associated with the psychological well-being of women than femininity norms.[36] A study of adults in the United Kingdom shows that restrictive masculinity norms predicted worse health behaviors for women – which were consistent with findings in men. Overall, this suggests that gender role orientation may be more important than biological sex when considering health behaviors such as getting an annual checkup.[23] Like males, females who conform to restrictive masculinity norms may avoid seeking healthcare, prioritizing mental toughness over self-care.[22] For these women, strength and emotional expression are seen as incompatible, creating a conflict that leads them to avoid mental health services and view seeking help as a source of shame. Females who adopt restrictive masculine norms may compare themselves to men to appear "tough," especially in male-dominated fields like law enforcement or the military. To meet these standards, they often suppress physical and mental health needs.[37] Female veterans who embrace these norms are less likely to seek care, despite high rates of PTSD, anxiety, depression, and other health issues. This pressure to prove capability can lower self-efficacy and harm their overall health.[38,39]

A study with a university sample and a separate adult sample found that females personally endorsing masculine norms such as self-reliance had more barriers to help-seeking, less use of preventative healthcare, and delay of care. This finding indicates that when women internalize masculine ideology – particularly valuing self-reliance and bravery as core aspects of their self-worth – they experience similar negative outcomes as men.[24]

Limitations

This study comes with limitations. It is a convenience sample of young adults in Rhode Island and may not represent the young adult population nor the young adult population in Rhode Island. This study is also subject to recall and social desirability bias – thus people may be hesitant to report they did not access a checkup in the past year. Also, this study is cross-sectional in nature and therefore causality cannot be inferred. Finally, this study only measured beliefs related to restrictive masculine norms, it did not measure conformity to such norms.

Importance of Intervention

Intervention is needed to decrease barriers to healthcare and encourage accessing annual checkups for both males and females. There is a need for gender-sensitive healthcare messaging that is tailored specifically to the needs of those who possess restrictive masculine norms to view seeking healthcare as a strength rather than a weakness. By using an education-based approach, group learning sessions with the focus of familiarizing males on how to access healthcare services while providing reassurance that healthcare is not bound to a specific sex nor gender, may be helpful as a preliminary step.[40] A foundation rooted in social-emotional education can be beneficial as males that inherited restrictive masculine norms may have had inaccurate or incomplete information passed down to them and cannot rationalize the concept of healthcare as being helpful.[40,41] Health programs in male-centered settings may provide a comfortability for males to engage more informally with health screening without the pressure of a typical clinical-style setting. *The Confess Project of America* is an example of this type of initiative using barbershops as a site for accessible mental health services coming from service professionals dually

trained in administering mental health counseling.[42] The environment in which this service takes place has the ability to remove the stigmatization of seeking treatment as the individual is surrounded by those who come from similar backgrounds and even professionals who have once been in their position.[42] For females, increasing social support networks and implementing programs that allow for female input on how to access care may make seeking healthcare more desirable.[43,44] Social support can come in many forms including through social media platforms and in-person group therapy.[44] Frameworks such as Pender's Health Promotion Model can be beneficial in these settings to promote the message of positive health seeking behaviors and to teach individuals how to take control of maintaining their well-being while reframing how they look at the external factors making them avoid healthcare.[44] For both males and females of military status, programs such as the Defender's Edge program help reduce stigma from seeking healthcare services.[45] Increasing support among this community for healthcare utilization is extremely important as some of the highest need for mental health care is among this population.[38,45] The approach that the Defender's Edge program takes is promoting this effort with a strength-based philosophy, making it more appealing to those who find difficulty in diverting from restrictive masculine norms.[45]

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Brain Injury and Problem Gambling Among Rhode Island Young Adults

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ABSTRACT

OBJECTIVES: Problem gambling has a negative impact on an individual's well-being. This study examined the association between having a history of a brain injury and problem gambling among young adults in Rhode Island.

METHODS: N=1,008, 18–25-year-olds participated in the 2024 Rhode Island Young Adult Survey. History of a brain injury and problem gambling were measured. Multivariable logistic regression assessed main effects after controlling for age, race/ethnicity, sexual and gender identity, social status, employment status, and student status.

RESULTS: 16.9% of participants reported a history of a brain injury and 4.3% reported problem gambling. Odds of problem gambling were higher in those who experienced a brain injury (AOR[95%CI]=3.81 [1.93,7.49]), but lower in participants identifying as cisgender heterosexual females and currently employed.

CONCLUSIONS: Young adults who have sustained a brain injury should be screened for problem gambling. Additional research is needed to better understand the underlying mechanisms of this relationship.

KEYWORDS: gambling; problem gambling; brain injury; young adults; Rhode Island

INTRODUCTION

Problem gambling is an emerging public health concern, particularly among young adults. Research indicates that gambling rates among young adults rise significantly between the ages of 17 and 20, and between 9–12% of young people report gambling weekly.[1] As of 2020, 62.3% of young adults in Rhode Island (RI) reported gambling in the last year, and 11.4% reported problem gambling behaviors.[2] Some known demographic risk factors for problem gambling include identifying as male or being younger than 35 years old.[3] Other high-risk young adults include sexual and gender minorities as well as individuals who identify as Black, Indigenous, or a Person of Color (BIPOC).[4]

There are various ways that young adults may engage in gambling activities. Horse racing was first approved by RI voters in 1934[5] and remained the primary mode of gambling until the Rhode Island Lottery was established in 1974.[6] Since then, dog racing, slot machines, table games, charitable gambling, and casino gaming have been legalized in the state.[7] In the 2024 fiscal year, the RI Lottery alone generated 1.6 billion dollars in revenue,[6] while commercial casinos reported a gross gambling revenue of 708 million in 2023.[8]

The legalization of sports betting has also played a significant role in expanding gambling opportunities for this population. In RI, retail sports betting was legalized in 2018, with online sports betting launching the following year.[9] Similarly, the rise of online gambling platforms has made gambling increasingly accessible, allowing individuals to engage in gambling activities regularly from virtually anywhere. A bill was passed in 2023 to legalize additional forms of online gambling in RI for those 21 and older, and later took effect in March 2024.[10] Recently, a bill was introduced into the RI Senate that seeks to end the renewal of the single sports betting vendor contract currently in place, and award at least five approved contracts in an effort to create a more competitive market for sports betting.[11] If passed, this bill will further expand opportunities for sports betting in the state.

Studies reveal that online gambling has seen the largest increase among gambling activities, likely due to the widespread use of the internet during recent years,[1] and plays an important role in problem gambling.[12,13] Further, previous data from Rhode Island suggests that sports betting[4] and gambling via a smartphone app[14] increase the risk of problem gambling among young adults.

The increasing prevalence and accessibility of gambling among young adults is a significant concern as it can lead to various negative consequences. In a 2020 study, researchers reported that moderate to high severity problem gamblers were significantly more likely to have a poor diet, poor general health, low mental wellbeing, low physical activity, and smoke cigarettes compared to non-problem gamblers.[15] Problem gambling can also lead to relationship strain, employment issues, financial strain, and mental health issues such as anxiety, depression, and suicidality.[16,17]

Some research has suggested that experiencing a brain injury is a risk factor for problem gambling. For example, one study reported that individuals who had experienced a traumatic brain injury (TBI), defined by a sudden blow to the head from an external force causing damage to the brain, had higher odds of engaging in problem gambling.[18] Another study reported that those with a prior TBI were more likely

to report problem gambling, trying to win back money they previously lost, and betting beyond their means.[19] Those who have sustained a brain injury may exhibit some of the behavioral characteristics that can present in individuals who have problem gambling, such as aggression, risk-taking, and impulsivity.[18] Brain injury and problem gambling also share similar risk factors, such as age, sex, and impulsivity.[18-20]

While there is some evidence to suggest that history of brain injury is a risk factor for problem gambling, there are significant gaps in our understanding of this relationship, particularly as it relates to young adults living in the United States. Given the variation in laws governing gambling regulations, it is important to examine these topics not only at the national level, but at the state level. As such, this study aims to examine the association between the history of a brain injury and problem gambling among Rhode Island's young adult population.

METHODS

Data

The Rhode Island Young Adult survey is a cross-sectional web-based survey conducted biennially by the Rhode Island Department of Behavioral Healthcare, Developmental Disabilities, & Hospitals (BHDDH). This study utilized data from the 2024 RIYAS collected from June through September 2024. Eligible participants were aged 18–25 and resided in Rhode Island for at least part of the year. Participants were recruited via paid targeted ads on Instagram and Spotify and supplemented with flyers and emails to students at local universities. Those who completed the survey received a $10 electronic giftcard. A total of N=1,008 young adults were recruited, all of whom provided electronic informed consent. This study was approved by the local institutional review board.

Measures

Primary Outcomes: Having experienced a brain injury was assessed with the question *Have you ever experienced a significant head injury, brain injury, or a concussion?* with response options including *No, Yes, more than a year ago,* and *Yes, in the past year*. Responses were dichotomized for analysis.

Primary Exposures: Problem gambling was evaluated using the Brief Biosocial Gambling Screen (BBGS).[21] This three-item tool is used to screen for problem gambling behaviors. Response options included *Yes* or *No*, and responding *Yes* to one or more questions was indicative of problem gambling. Questions included: *During the past 12 months: Have you become restless, irritable, or anxious when trying to stop/cut down on gambling?; Have you tried to keep your family or friends from knowing how much you gambled?*; and *Did you have such financial trouble that you had to get help with living expenses from family, friends, or welfare?* The validity and reliability of this tool have been established and its psychometric properties were retained following the update to the DSM-V.[22] Though not included in this analysis, participants were also asked about the types of gambling activities they engaged in and modalities of gambling used.

Covariates: Several demographic covariates were measured. Social status was measured using the MacArthur Scale of Subjective Social Status,[23] which requires participants to identify their social status relative to other individuals, using a scale from 1 (worst off) to 10 (best off). Race/ethnicity was measured as White non-Hispanic, Black non-Hispanic, Hispanic, Asian non-Hispanic and Other/Multiracial non-Hispanic. Sexual and gender identity was measured as cisgender heterosexual male, cisgender heterosexual female, and sexual and gender minority. Additionally, age, student status, and employment status were measured.

Statistical Analysis

Descriptive statistics were calculated using frequencies and percentages for the entire sample and stratified by problem gambling. Chi-square tests, Fischer's Exact Test, and independent two-sample t-tests were used to test relationship between the independent variable and all other variables. Multivariable logistic regression was used to assess the odds of problem gambling while controlling for all covariates. Statistical significance was determined with a p-value of <0.05 and statistical analyses were conducted using Stata, version 15.[24]

RESULTS

Participants were predominantly White non-Hispanic (57.4%), identified as a sexual and gender minority (43.9%), and students (61.7%) (**Table 1**). The majority worked at least part-time (74.2%) and 16.9% reported ever experiencing a brain injury. Any gambling behavior was reported by 38.6% of participants with, for example, 23.1% purchasing scratch tickets, 12.9% using slot machines at casinos, and 7.1% betting on sports. 4.3% of participants screened positive for problem gambling.

Problem gambling varied significantly by sexual and gender identity ($p<0.001$), employment status ($p=0.035$), and history of brain injury ($p<0.001$). Both cisgender heterosexual males and SGMs were over-represented among problem gamblers ($p<0.001$). While 25.8% of the sample was unemployed, 39.5% of problem gamblers were unemployed ($p=0.035$). Similarly, while 16.9% of the sample had a history of a brain injury, 39.5% of problem gamblers had that history ($p<0.001$) (**Table 1**). Problem gambling did not vary by age, race/ethnicity, social status, or student status.

In multivariable logistic regression, individuals with a history of a brain injury had significantly higher odds of problem gambling (AOR[95%CI]: 3.81 [1.93,7.49]) compared to those without (**Table 2**). Individuals who were

Table 1. Descriptive statistics of the total sample and by problem gambling

	TOTAL N=1,008 (%)	No Problem Gambling N=965 (95.7%)	Problem Gambling N=43 (4.3%)	P-value
Age [Mean (SE)]	21.3 (0.07)	21.1 (0.07)	21.4 (0.33)	0.422
Sexual and Gender Identity				**<0.001***
Cisgender Heterosexual Male	203 (20.1)	187 (19.4)	16 (37.2)	
Cisgender Heterosexual Female	363 (36.0)	359 (37.2)	4 (9.3)	
Sexual and Gender Minority	442 (43.9)	419 (43.4)	23 (53.5)	
Race/Ethnicity				0.196*
White, non-Hispanic	579 (57.4)	560 (58.0)	19 (44.2)	
Black, non-Hispanic	77 (7.6)	73 (7.6)	4 (9.3)	
Hispanic	197 (19.5)	188 (19.5)	9 (20.9)	
Asian, non-Hispanic	86 (8.5)	81 (8.4)	5 (11.6)	
Other/Multiracial, non-Hispanic	69 (6.9)	63 (6.5)	6 (14.0)	
Social Status [Mean (SE)]	5.7 (0.06)	5.7 (0.06)	5.4 (0.38)	0.298
Student Status				0.076
Student	622 (61.7)	601 (62.3)	21 (48.8)	
Non-Student	386 (38.3)	364 (37.7)	22 (51.2)	
Employment Status				**0.035**
Employed	748 (74.2)	722 (74.8)	26 (60.5)	
Unemployed	260 (25.8)	243 (25.2)	17 (39.5)	
History of a Brain Injury				**<0.001**
Yes	170 (16.9)	153 (15.9)	17 (39.5)	
No	838 (83.1)	812 (84.2)	26 (60.5)	

NOTE: P-values for categorical variables were computed using chi-square tests, unless denoted as * for Fisher's Exact test. P-values for continuous variables were computed using independent two-sample t-tests

Table 2. Adjusted odds of problem gambling

	AOR	95%CI
History of a Brain Injury		
Yes	**3.81**	**1.93, 7.49**
No	1.00	ref
Age		
Sexual and Gender Identity		
Cisgender Heterosexual Male	1.00	ref
Cisgender Heterosexual Female	**0.12**	**0.04, 0.38**
Sexual and Gender Minority	0.55	0.26, 1.12
Race/Ethnicity		
White, non-Hispanic	1.00	ref
Black, non-Hispanic	1.84	0.58, 5.89
Hispanic	1.25	0.54, 2.91
Asian, non-Hispanic	2.14	0.74, 6.15
Other/Multiracial, non-Hispanic	2.49	0.92, 6.76
Social Status	0.94	0.79, 1.11
Student Status		
Student	0.67	0.33, 1.40
Non-Student	1.00	ref
Employment Status		
Employed	**0.41**	**0.21, 0.82**
Unemployed	1.00	ref

employed (AOR[95%CI]: 0.41 [0.21,0.82]) and those who identified as cisgender heterosexual female (AOR[95%CI]: 0.12 [0.04,0.38]) had significantly decreased odds of problem gambling compared to those who were unemployed and cisgender heterosexual males, respectively.

DISCUSSION

In this sample of young adults, those with a history of brain injury had higher odds of problem gambling. Additionally, those who were employed had decreased odds relative to those employed, while cisgender heterosexual females had lower odds relative to cisgender heterosexual males.

Our findings suggest that experiencing a brain injury is an independent risk factor for problem gambling. While this aligns with existing research indicating that TBI increases susceptibility to gambling issues among adults, the literature lacks evidence to support these findings among US young adults specifically. For example, a 2019 study of adults in Ontario, Canada reported that individuals who sustained a TBI that resulted in loss of consciousness or a hospital stay had 2.8 times the odds of experiencing moderate to severe gambling problems.[18] A 2019 matched case-control study of 30,652 Canadian adults reported that a diagnosis of TBI independently predicted problem gambling, with an even greater risk among those who have sustained more than one TBI.[19] There is also evidence to suggest damage to specific areas of the brain that control the reward system may play a role.[19,25] Further, common neurobehavioral sequelae of brain injuries have been shown to increase risk of problem gambling, including impaired decision-making,[26] impulsivity,[27,28] disinhibition,[28] depression, anxiety, and emotional lability.[28]

In accordance with current literature, cisgender heterosexual females were significantly less likely to report problem gambling compared to cisgender heterosexual males. For example, a recent meta-analysis found that men had a significantly higher risk for problem gambling compared to women.[3] A 2016 systematic review similarly reported an increased risk among males, though researchers suggested that gender served as a proxy for other associated risk factors rather than having a direct role in the development of problem gambling.[29] Interestingly, the odds of problem gambling

for sexual and gender minority individuals did not significantly differ compared to cisgender heterosexual males. There is a sizeable gap in the literature surrounding problem gambling among sexual and gender minorities, and the existing literature is inconsistent.[30]

Finally, our findings suggest that young adults who are employed have a decreased risk of engaging in problem gambling compared to those who are unemployed. This is generally consistent with current literature, which suggests a higher risk for problem gambling among individuals who are unemployed.[31] Researchers have provided varied explanations for this relationship ranging from using gambling as a means of socialization to using it as an escape from problems.[31] Problem gambling behaviors could also potentially cause absences at work or impair work performance, leading to unemployment.[32] Additionally, those who are unemployed have the most to win from gambling and may use it as an opportunity to supplement their income.[33]

Implications

Given the growing body of evidence suggesting that brain injury is an independent risk factor for problem gambling, a public health response is necessary. It is important that healthcare providers, particularly those in primary care, rehabilitation, and mental health settings, understand the risk of problem gambling among this population.[34] To ensure early identification and prevention of long-term consequences, providers should consider implementing routine gambling screening for patients who have sustained a brain injury.[35] The BBGS, which was used in the current study and consists of only three items, may be effective for such screening programs.[21] Interventions to target problem gambling should also be developed to account for the unique needs of this population.[18] Further research is needed to concretely establish the direction of the relationship and to examine differences in gambling behaviors by mechanism, location, and severity of injury to ensure those at the highest risk are adequately identified.

Limitations

Despite the novel contributions to the literature, this study is not without limitations. The cross-sectional nature of this study limits the ability to determine causality, and the use of self-reported measures makes the study vulnerable to social desirability and recall bias. As a convenience sample was used, this study may not be representative of all young adults in Rhode Island.

CONCLUSION

The persistence of the association between brain injury and problem gambling, even after controlling for other risk factors, highlights the importance of targeted interventions to support individuals who have sustained a brain injury in managing impulsive behaviors and reducing gambling-related harm. Gambling screens should be regularly utilized in healthcare settings for early identification among individuals who have sustained a brain injury.

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Restrictive Masculinity Norms and Eating Disorder Risk in Young Adult Females

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ABSTRACT

OBJECTIVE: This study examined the association between restrictive masculinity norms and eating disorder risk in young adult females.

METHODS: Data from females in the 2024 Rhode Island Young Adult Survey were used (n=724). The SCOFF and the Restrictive Masculinity Scale were used to assess eating disorder risk and restrictive masculinity norms, respectively. A multivariable logistic regression model estimated the main effect after adjusting for age, gender and sexuality, race/ethnicity, social status, student status, and employment status.

RESULTS: In the fully adjusted model, odds of eating disorder risk were 2% higher (OR=1.02, 95%CI: 1.01,1.04) for each additional unit of the restrictive masculinity scale.

CONCLUSIONS: Interventions for females with eating disorders should address rigid masculinity norms by integrating gendered perspectives into screening, therapy, and treatment. Schools and media can further support prevention by promoting gender awareness, media literacy, and diverse body representation.

KEYWORDS: restrictive masculinity; eating disorder; female; young adult

INTRODUCTION

Eating disorders occur most frequently among young females, with approximately 6% of females experiencing an eating disorder at some point in their lives, yet this figure is likely an underestimate.[1,2] Research suggests the highest rates of eating disorder are among females aged 20 to 24 years, as well as those from lower socioeconomic backgrounds, sexual minority groups (especially bisexual men and lesbian women), college students, and the Latinx community.[2,3]

Eating disorders encompass a range of issues, all are characterized by changes in eating behaviors that affect consumption or absorption of nutrients and present with substantial impairments to mental and physical health.[4] These disorders can affect an individual's perception of weight, body shape, and eating habits, and include specific behaviors such as restrictive eating, purging, and difficulties controlling food intake. Commonly recognized disorders include bulimia nervosa, anorexia nervosa, binge-eating disorder, though there are a total of eight separate eating disorders recognized in the current Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR).[4]

Eating disorders can have severe physical consequences, impacting multiple body systems such as the cardiovascular, gastrointestinal, neurological, and endocrine systems.[5] For example, individuals with an eating disorder are at an increased risk for both functional and structural cardiac abnormalities, including irregular heart rhythm, irregular heart rate, hemodynamic changes, and other related issues.[5] They also face a higher likelihood of electrolyte imbalances and potential damage to blood vessels. Many individuals with an eating disorder have reported gastrointestinal symptoms, including abdominal pain, bloating, nausea, and heartburn.[6] Additionally, different eating disorders have been linked to specific neurological complications. For instance, anorexia can disrupt the functional connectivity of the frontal cortex and the amygdala, impairing emotional regulation, while bulimia can lead to a desensitized dopamine reward system.[7] Furthermore, eating disorders can cause hormonal imbalances, particularly reduction in estrogen and testosterone, which can negatively impact menstruation, bone metabolism, and may contribute to infertility.[8]

Current literature suggests that social norms in general, and in relation to body image, contribute to the burden of eating disorder among young females. For example, social media may play a significant role, as studies have reported that appearance and weight-related content exacerbate body image concerns among young females.[9-11] Similarly, restrictive masculinity norms may play a role. Restrictive masculinity norms are rigid, socially enforced expectations about how men should think, feel, and behave. Common aspects of restrictive masculinity include emotional suppression, dominance, aggression, anti-femininity, self-reliance, and physical toughness.[12,13] Those with rigid masculinity norms are at higher risk of mental health disorders while individuals with less rigid norms have lower risk of mental health difficulties due to greater adaptability.[14] Despite this research, no literature to our knowledge has examined the role of restrictive masculinity norms in eating disorder risk among young adult females. Thus, this study aims to examine whether holding more restrictive masculinity norms is associated with greater eating disorder risk among young adult females in Rhode Island.

METHODS

Sample

The Rhode Island Young Adult Survey (RIYAS) was an anonymous, self-reported, cross-sectional survey conducted by the Rhode Island Department of Behavioral Healthcare, Developmental Disabilities & Hospitals. The 2024 survey was administered online using Qualtrics to gather information on young adults' behavioral health, risk behaviors, and mental and physical health outcomes. It targeted individuals aged 18 to 25 who lived in Rhode Island for at least part of the year. Recruitment efforts included paid advertisements on Instagram and Spotify, along with outreach via flyers and emails to students at institutions of higher education. To ensure data integrity, the survey underwent strict internal quality control measures. Participants received a $10 gift card as compensation for their time. A total of 1,008 surveys were completed between June and September 2024. All respondents provided electronic informed consent, and the study received approval from the local Institutional Review Board. This study includes only those young adults who were assigned female at birth (n=724).

Measures

The primary outcome of the study is eating disorder risk, as measured by the SCOFF. The SCOFF is a five-question screening tool used to identify people at risk for eating disorders, including anorexia nervosa, bulimia nervosa, and others, but not diagnose them. Questions address whether a person makes themselves sick because they feel uncomfortably full, worries about a loss of control over how much they eat, has recently lost 14lbs. within a three-month period, believes they are fat while others say they are too thin, or reports that food dominates their life. Each "yes" response accounts for 1 point on the overall score. A total score of 2 or more suggests screening positive for eating disorder risk.[1]

The primary exposure of the study is the Restrictive Masculinity Scale, a 12-item questionnaire that measures restrictive masculinity norms (i.e., "Men should be able to freely express their emotions through crying" and "Men should respect a woman's decision if they say no to sex").[13] Response options for each norm statement ranged from strongly disagree (coded 0) to strongly agree (coded 4), except for 3 items which were reverse coded. Scores could range from 0, the least restrictive masculinity norms score, to 48, the most restrictive masculinity norms score.[13]

Covariates measured in the study are those previously identified as potential risk factors for eating disorder risk.[15] These covariates include gender and sexuality, race/ethnicity, age, social status, student status, and employment status. Gender and sexuality was a binary variable. Young adults whose sex assigned at birth matched their gender identity and identified as heterosexual were categorized as Cisgender Heterosexual, and those whose gender identity differed from their sex assigned at birth or identified as anything other than heterosexual were categorized as Sexual and Gender Minority. Race/ethnicity was categorized as White, non-Hispanic, Black, non-Hispanic, Hispanic, Asian, non-Hispanic, or Other/Multiracial, non-Hispanic. Age was a continuous variable measured in years. Social status was measured by the MacArthur Scale of Subjective Social Status (MSSS), a self-reported measure to assess an individual's perceived social standing within their community. Respondents are asked to place themselves on a ladder based on social status relative to others in their community ranging from 1 "worst off" to 10 "best off".[16] Student status was measured by an affirmative response to the question, "Are you currently enrolled in high school or a post-secondary educational institution, this includes a two- or four-year college, university or technical school?" Employment status was measured by the question, "Are you employed?" Responses of "Yes, part-time" and "Yes, full-time" were considered employed.

Statistical Analysis

All continuous variables were considered normally distributed after examination of their distributions, and descriptive statistics were provided for all variables in the total sample and by eating disorder risk. Means and standard errors were reported for continuous variables, while frequencies and percentages were reported for categorical variables. Bivariable statistics were assessed using two-sample t-tests for continuous variables and chi-square tests for categorical variables by eating disorder risk. Multivariable logistic regression for eating disorder risk on restrictive masculinity scale was conducted controlling for gender and sexuality, race/ethnicity, age, social status, student status, and employment status. Adjusted odds ratios and 95% confidence intervals are reported. Adjusted probabilities of eating disorder risk were plotted across the restrictive masculinity scale controlling for all other variables. Reference categories were cisgender heterosexual, White, non-Hispanic, not being a student, and not being employed. All analyses were conducted at $\alpha = 0.05$ and all analyses were calculated in Stata/SE 15.0.[17]

RESULTS

In a sample of n=724 female young adults, 39.8% screened positive for eating disorder risk. The mean age was 21.1 years old (SE: 0.08). About half (50.1%) were cisgender heterosexual, and a majority were White, non-Hispanic (59.0%). Most females were students (65.5%) and employed (75.3%). The mean restrictive masculinity score was 25.7 (SE: 0.24), with a higher score among females with eating disorder risk (p = 0.044) than those without. Social status was lower among females with eating disorder risk (p = 0.009). In the fully adjusted model, there was 1.02 (95%CI: 1.01, 1.04) times the odds of eating disorder risk with each additional unit in the restrictive masculinity scale; 1.59 (95%CI: 1.19, 2.13) times the odds for sexual and gender minority females; 0.89

(95%CI: 0.82, 0.96) times the odds with each additional unit in social status; 1.38 (95%CI: 1.01, 1.89) times the odds for students; and 1.38 (95%CI: 1.01, 1.90) times the odds for those employed. (**Table 1**)

Table 1. Sociodemographics of young adult females by eating disorder risk

	TOTAL N=724 (%)	No Eating Disorder Risk N=436 (60.2%)	Eating Disorder Risk N=288 (39.8%)	P-value
Restrictive Masculinity [Mean(SE)]	25.7 (0.24)	25.3 (0.31)	26.3 (0.39)	**0.044**
Gender and Sexuality				0.083
Cisgender Heterosexual	363 (50.1)	230 (52.8)	133 (46.2)	
Sexual and Gender Minority	361 (49.9)	206 (47.3)	155 (53.8)	
Race/Ethnicity				0.52
White, non-Hispanic	427 (59.0)	255 (58.5)	172 (59.7)	
Black, non-Hispanic	51 (7.0)	37 (8.5)	14 (4.9)	
Hispanic	135 (18.7)	74 (17.0)	61 (21.2)	
Asian, non-Hispanic	58 (8.0)	32 (7.3)	26 (9.0)	
Other/Multiracial, non-Hispanic	53 (7.3)	38 (8.7)	15 (5.2)	
Age [Mean(SE)]	21.1 (0.08)	21.2 (0.11)	21.1 (0.14)	0.433
Social Status [Mean(SE)]	5.5 (0.07)	5.7 (0.08)	5.3 (0.11)	**0.009**
Student				0.303
Yes	474 (65.5)	279 (64.0)	105 (67.7)	
No	250 (34.5)	157 (36.0)	93 (32.3)	
Employed				0.832
Yes	545 (75.3)	327 (75.0)	218 (75.7)	
No	179 (24.7)	109 (25.0)	70 (24.3)	

Note: P-values are calculated using two-sample t-tests for continuous variables and chi-square tests for categorical variables

DISCUSSION

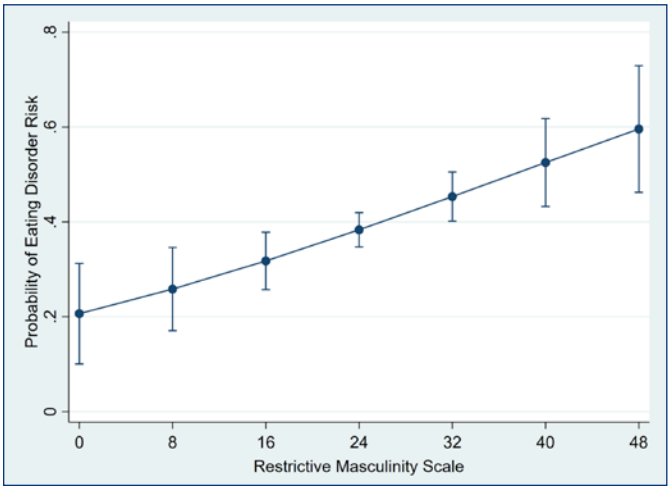
In this sample of females, higher restrictive masculinity scores were associated with eating disorder risk. Identifying as a sexual and/or gender minority, a student, or employed were also identified as risk factors for eating disorder risk in this sample. However, having a perceived higher social status was considered a protective factor. (**Table 2, Figure 1**)

While some literature focuses on the association between restrictive masculinity and eating disorders in cisgender males, no research to our knowledge examines this relationship in cisgender females.[18] Females who believe in more restrictive masculinity norms--rigid, socially enforced expectations about men—may also subscribe to more restrictive femininity norms. These include not only people-pleasing and self-sacrificing, but also appearance-based self-worth, thinness, and unrealistic beauty standards.[19] Internalizing these norms may lead females to more weight loss attempts, behaviors, and disordered eating.[20] This is supported by

Table 2. Adjusted Odds of Eating Disorder Risk among young adult females

	Adjusted Odds of Eating Disorder Risk	
	AOR	95%CI
Restrictive Masculinity	**1.02**	**1.01, 1.04**
Gender and Sexuality		
Cisgender Heterosexual	1.00	ref
Sexual and Gender Minority	**1.59**	**1.19, 2.13**
Race/Ethnicity		
White, non-Hispanic	1.00	ref
Black, non-Hispanic	0.62	0.36, 1.07
Hispanic	1.19	0.85, 1.67
Asian, non-Hispanic	1.22	0.76, 1.97
Other/Multiracial, non-Hispanic	0.78	0.45, 1.36
Age	0.99	0.92, 1.06
Social Status	**0.89**	**0.82, 0.96**
Student		
Yes	**1.38**	**1.01, 1.89**
No	1.00	ref
Employed		
Yes	**1.38**	**1.01, 1.90**
No	1.00	ref

Figure 1. Adjusted Probabilities of Eating Disorder Risk among Females across the Restrictive Masculinity Scale



Note: Adjusted probabilities control for gender and sexuality, race/ethnicity, age, social status, student status, and employment status

the femininity theory of eating disorders which suggests females' conformity to traditional female gender roles is associated with higher levels of eating disorder pathology.[21] Also, consistent with restrictive masculinity norms, men are meant to be dominant financially and sexually.[22] Females who hold more restrictive views of masculinity may therefore view themselves as subordinate or submissive. According to one study, patients with eating disorders reported higher levels of submissive behavior, and the level of that submissive behavior was related to the severity of eating disorder symptoms.[23] This also aligns with femininity theory that traits such as dependence, passivity, and exaggerated need for male approval can lead to the development of eating disorder.[21]

Research also suggests that adhering to rigid gender norms, whether masculine or feminine, can increase eating disorder risk. For example, in one longitudinal study following adolescents (11–18 years) to adulthood (18–26 years), higher levels of femininity traits in females were associated with weight loss attempts and weight loss behaviors.[20] Similarly, research has shown females who displayed higher levels of masculinity traits also displayed higher levels of disordered eating.[24] Adherence to these rigid gender norms, masculine or feminine, can lead to unrealistic appearance expectations, a drive for muscularity and a drive for thinness, respectively, contributing to eating disorders.[25,26] Females conforming to restrictive masculinity may express more control-oriented traits such as perfectionism, which are common among individuals with eating disorders.[27] Other common traits of restrictive masculinity, poor emotional awareness and emotional suppression, are also prevalent among females diagnosed with eating disorders, often contributing to the use of maladaptive eating behaviors as coping mechanisms.[28]

Other risk factors for disordered eating included being a sexual and/or gender minority, being a student, and being employed, and stress may play a role in explaining these relationships. Literature suggests that sexual and gender minorities have higher rates of disordered eating behaviors due to stigma, minority stress, and other social pressures.[29] Similarly, college students have been identified as a high-risk group for eating disorders and researchers have reported an even greater risk among students who face specific stressors, such as food insecurity.[30]

While there is considerably less research examining employment status specifically, previous literature has reported associations between work-related stress and burnout with various forms of disordered eating.[31] Conversely, higher perceived social status protects against disordered eating, while low social rank perception is linked to eating disorder psychopathology.[32] Feelings of inferiority, self-criticism, and appearance-based rankings drive restrictive eating to boost status.[32,33] High social rank perception enhances self-esteem, reducing eating disorder risk, while low self-esteem increases vulnerability.[34,35]

LIMITATIONS

While a novel research question among a high-risk population, this study comes with some limitations. First, this is a cross-sectional study and causality cannot be inferred. Second, while the SCOFF was used as a screening tool for eating disorder risk, it is not a diagnostic test and relies on self-report, leaving room for misclassification by eating disorder risk. Also, the entire survey was self-reported and therefore subject to social desirability and recall bias. Finally, this study is among a convenience sample of young adults in Rhode Island and may not be representative of all young adults.

Implications

Interventions for eating disorders in females should address the influence of rigid masculinity norms. While valid tools like the Eating Attitudes Test identify symptoms, they often overlook the impact of gender norms.[36] Clinicians can enhance treatment by integrating gendered perspectives, screening for masculine norms, and training providers to recognize their role in eating disorder risks.

Gender-sensitive therapy can incorporate discussions on masculinity, perfectionism, and emotional suppression. Cognitive behavioral therapy (CBT) effectively helps individuals recognize and change harmful thoughts and behaviors, including those linked to eating disorders.[37] Framing recovery as a strength-based process fosters empowerment, reduces stigma, and enhances engagement by emphasizing personal strengths and goals. This has been shown to enhance recovery outcomes.[38]

Our results also align with the developmental theory of embodiment, a theory focused on the experiences of females. This theory highlights the importance of freedom to explore and determine one's identity, freedom from objectification, and the development of a positive relationship with one's body.[39] This can be applied in empowerment workshops where a space is provided for young females to explore their identity beyond restrictive norms and develop self-confidence in their self-expression.

Media can also be created to normalize diverse body types by promoting realistic body images. Research has shown that embracing diverse body representation challenges traditional beauty standards and encourages individuals to value their bodies based on functionality rather than appearance which can promote body appreciation.[40]

Lastly, interventions can be applied in the school setting. Schools can integrate discussions on gender norms, self-worth, and emotional well-being into health curricula. Gender transformative education follows this approach by using all aspects of the education system to transform stereotypes, norms, and practices by challenging and rethinking gender norms. Students can also be taught to analyze and challenge gendered portrayals in media.[41,42]

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The Behavioral Health Harms of Youth Exposure to Gun Violence: A Rhode Island Example

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ABSTRACT

BACKGROUND: Youth exposure to gun violence is increasing and we must better understand its impact on mental health and substance use disorders in young adults.

METHODS: The 2024 Rhode Island Young Adult Survey recruited n=1,008 young adults. Multivariable logistic regressions were used for mental illness and substance use disorder outcomes on exposure to gun violence in childhood while controlling for sexual and gender identity, race/ethnicity, age, and social ladder.

RESULTS: Exposure to gun violence in childhood is highly prevalent (24.7%) and associated with higher odds of depression (AOR: 1.59 [95%CI: 1.16, 2.19]), suicide ideation (AOR: 2.13 [95%CI: 1.41, 3.22]), alcohol use disorder (AOR: 2.98 [95%CI: 1.34, 6.54], and cannabis use disorder (AOR: 1.87 [95%CI: 1.22, 2.88], but not anxiety.

CONCLUSION: Efforts to reduce adolescent exposure to gun violence must be comprehensive, addressing all levels from policy and legislation to social and community-based interventions.

KEYWORDS: young adults, gun violence, mental health, behavioral health, substance use

INTRODUCTION

Gun violence, both fatal and nonfatal, has grown significantly over the past two decades,[1,2] and the United States (US) has 10 times more mass shootings than other developed nations.[3] From 2012 to 2022, firearm deaths rose 62.5%,[1] with most due to suicide (56.1%) and homicide (40%).[2] Similar rates were seen in Rhode Island (RI) from 2019 to 2023, with suicides accounting for 61% of firearm deaths and homicides accounting for 36%.[4] During this time, there were also 452 nonfatal firearm-related hospital visits. Of all firearm-related injuries, 62% of deaths and 74% of hospital visits involved people under 35.[5] Firearm mortality among adolescents and young adults now surpasses motor vehicle accidents as their leading cause of death.[6]

Firearm homicides disproportionately affect males – six times more than females.[1] Yet, females are five times more likely to be affected by firearm injuries related to intimate partner violence incidents.[1] In RI, firearm deaths by gender revealed a significant disparity, with males accounting for 85% of deaths[4] and 87% of firearm injuries.[5] Literature on gun violence among sexual and gender minorities (SGMs) is limited, and no data are available for firearm injuries or fatalities for this population in RI. Significant racial and ethnic disparities exist in firearm injuries and deaths. From 2019–2023 in RI, over 71% of nonfatal firearm-related hospital visits involved Hispanic or Black individuals.[5] Hispanic individuals accounted for 20% of firearm deaths and 40% of nonfatal injuries; non-Hispanic Black individuals accounted for 9% and 31%, respectively.[4,5] Additionally, in 2022, Black adolescents had higher rates of firearm-related suicides compared to White adolescents and accounted for half of all firearm-related deaths in the US.[1] Other studies also suggest witnessing gun violence is more prevalent in low-income households and neighborhoods, particularly affecting Black and Latino youth.[7-9] This is further supported by RI data from 2019–2023, which shows that more than 50% of firearm injury-related hospital visits among Hispanic individuals were under age 25, compared to about 35% for non-Hispanic Black individuals, and 29% for non-Hispanic White individuals.[5]

Witnessing gun violence can have significant health implications, especially for children and adolescents. As an adverse childhood experience (ACE), exposure to gun violence is linked to trauma, anxiety, aggression, PTSD, and long-term emotional challenges.[9,10] One study shows that 41% of youth in major US cities have witnessed or heard gun violence,[11] and adolescents exposed to such violence are more likely to show behavioral changes, including future firearm carrying.[10-13] Further, chronic stress from this exposure can disrupt brain development, impair learning, and negatively impact both mental and physical health – paralleling the effects of other ACEs.[9,11]

Despite this harm, few studies report the prevalence of childhood exposure to gun violence, and even fewer have examined the association between childhood exposure to gun violence and behavioral health outcomes in young adulthood. This study aims to (1) estimate the prevalence of childhood exposure to gun violence in a convenience sample of young adults in RI, (2) estimate the prevalence by sexual or gender identity and race/ethnicity, and (3) examine the association between childhood exposure to gun violence and

mental illness (i.e., anxiety, depression, suicide ideation) and substance use disorder (i.e., alcohol use disorder, cannabis use disorder) outcomes in young adulthood.

METHODS

Sample

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 2024 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 survey 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 and Spotify ads, and was supplemented by flyers and emails to students at institutions of higher education. Participants received $10 gift cards as compensation for study participation. A total of N = 1,008 surveys were completed between June and September 2024 and were available for the current analysis. All participants provided electronic informed consent. This study was approved by the local Institutional Review Board.

Measures

Exposure to gun violence in childhood was assessed with a single item: *Have you ever seen or heard gun violence in your neighborhood, community or school?* Response options included *yes, in childhood; yes, in adulthood; no.* All those reporting *yes, in childhood* met the definition for exposure.

The valid and reliable Center of Epidemiologic Studies Depression Scale, 10-item version (CES-D10) was used to assess depression. CES-D10 items measure past week prevalence of symptoms related to depression. Responses were on a 4-point Likert scale ranging from *rarely or none of the time* to *most of the time.* Aggregated scores ≥10 indicated depression.[14] The valid and reliable Generalized Anxiety Disorder 7-item scale (GAD-7) was used to assess anxiety.[15] The GAD-7 items measure past two-week experiences of anxiety symptoms. Responses were collected on a 4-point Likert scale ranging from *not at all* to *nearly every day.* Aggregated scores of ≥10 indicate clinically significant anxiety.[16] Suicide ideation was assessed as an affirmative response to the survey question: *During the past 12 months, did you ever seriously consider attempting suicide?* Alcohol use disorder was assessed by the Alcohol Use Disorders Identification Test (AUDIT) score generated from 10 items.[17] 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.*[18] 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 15 or more were considered alcohol use disorder.[17] Cannabis use disorder was assessed via the Cannabis Use Disorders Identification Test – Revised (CUDIT-R). This valid and reliable assessment includes eight items total: seven about cannabis use with various frequency responses on a 5-point Likert scale, 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.*[19] Scores of 12 or more were considered cannabis use disorder.

Several potential confounders were measured as covariates (i.e., age in years, sexual and/or gender identity, race/ethnicity, and social status).[20-23] A single variable, sexual and/or gender identity, was categorized as heterosexual cisgender female, heterosexual cisgender male, and sexual and/or gender minority. Race/ethnicity was categorized as White non-Hispanic, Black non-Hispanic, Hispanic, Asian non-Hispanic, and Other non-Hispanic. The Other category includes participants identifying as Native American or Alaskan Native, Native Hawaiian or Other Pacific Islander, different identity not listed, or more than one race. The MacArthur Scale of Subjective Social Status, which asks participants to rank themselves relative to others in the community on a scale from 1 (worst off) to 10 (best off), was used to assess social status.[24]

Statistical Analysis

Descriptive statistics such as frequencies and percentages were computed for categorical variables, and means and standard errors were computed for continuous variables among the total sample and among those exposed to gun violence in childhood. Bivariable tests, namely two-sample t-tests for continuous variables and chi-square tests for categorical variables, were conducted. Prevalence of exposure to gun violence in childhood was plotted by race/ethnicity and by sexual and/or gender identity. Multivariable logistic regressions were conducted for each of the five outcomes controlling for all covariates. All statistical tests were assessed at $\alpha = 0.05$. Analyses were completed using STATA/SE 15.0 (StataCorp. 2017. College Station, TX: StataCorp LLC.), and statistical significance was determined using 95% confidence intervals (CI).

RESULTS

The mean age of the sample was 21.1 years old (SE: 0.07). Of the sample, 43.9% identified as a sexual and/or gender minority and 36.0% as cisgender heterosexual female (**Table 1**). Most of the sample identified as White, non-Hispanic (57.4%). Almost 1 in 4 (24.7%) young adults in the sample were exposed to gun violence in childhood. Bivariate results showed sexual and/or gender minorities were more likely to be exposed to gun violence in childhood (p=0.005), as were Hispanic young adults (p<0.001). Those exposed to gun

Table 1. Sociodemographics of the Sample and by Exposure to Gun Violence in Childhood

	Total N (%)	Exposed to Gun Violence in Childhood N=249 (24.7%)	P-value
Sexual and/or Gender Identity			**0.005**
Cisgender Heterosexual Male	203 (20.1)	37 (14.9)	
Cisgender Heterosexual Female	363 (36.0)	82 (32.9)	
Sexual or Gender Minority	442 (43.9)	130 (52.2)	
Race/Ethnicity			**<0.001**
White, non-Hispanic	579 (57.4)	99 (39.8)	
Black, non-Hispanic	77 (7.6)	25 (10.0)	
Hispanic	197 (19.5)	87 (34.9)	
Asian, non-Hispanic	86 (8.5)	20 (8.0)	
Other, non-Hispanic	69 (6.9)	18 (7.2)	
Age [Mean(SE)]	21.1 (0.07)	20.7 (0.14)	**<0.001**
Social Ladder* [Mean(SE)]	5.7 (0.06)	5.3 (0.06)	**<0.001**

*Social ladder refers to where someone would place themselves on a ladder relative to others in their community with 1 being worst off and 10 being best off

**P-values were calculated using chi-square tests for categorical variables and two-sample t-tests for continuous variables

Figure 1. Exposure to gun violence in childhood by race/ethnicity among Rhode Island young adults, 2024

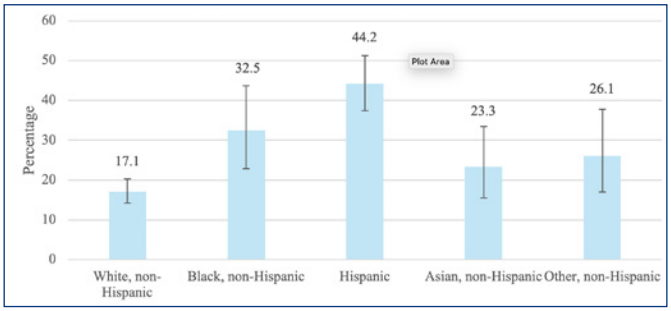
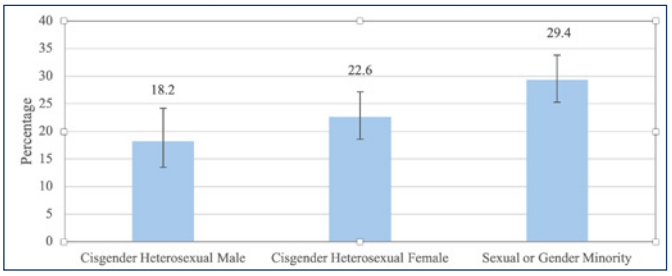


Figure 2. Exposure to gun violence in childhood by sexual and/or gender identity among Rhode Island young adults, 2024



violence in childhood were younger (p<0.001) and lower on the social ladder (p<0.001). Hispanic young adults and sexual and/or gender minorities had the highest prevalence of exposure to gun violence in childhood (44.2% and 29.4%, respectively; (**Figures 1,2**).

Multivariable logistic regressions showed exposure to gun violence in childhood was associated with increased odds of depression (AOR: 1.59 [95%CI: 1.16, 2.19]), suicide ideation (AOR: 2.13 [95%CI: 1.41, 3.22]), alcohol use disorder (AOR: 2.98 [95%CI: 1.34, 6.54], and cannabis use disorder (AOR: 1.87 [95%CI: 1.22, 2.88] (**Table 2**). Exposure to gun violence in childhood was not associated with anxiety.

Table 2. Adjusted Odds of Mental Illness or Substance Use Disorder Associated with Exposure to Gun Violence in Childhood

Outcomes	AOR	95% CI
Anxiety	1.24	(0.90, 1.72)
Depression	**1.59**	**(1.16, 2.19)**
Suicide Ideation	**2.13**	**(1.41, 3.22)**
Alcohol Use Disorder	**2.98**	**(1.34, 6.64)**
Cannabis Use Disorder	**1.87**	**(1.22, 2.88)**

NOTE: Adjusted Odds Ratios were computed by multivariable logistic regressions controlling for sexual and/or gender identity, race/ethnicity, age, and social status.

DISCUSSION

Findings suggest exposure to gun violence in childhood is highly prevalent, particularly among Hispanic and Black young adults, as well as sexual or gender minorities. Findings also suggest that this childhood exposure is associated with poor mental health and substance use disorder in young adulthood. The high prevalence of childhood exposure to gun violence in this study, almost 25%, is consistent with another study that mapped national data on fatal gun violence incidents to the homes and schools of an adolescent cohort. The study found that 21% of adolescents resided or attended school within 500 meters of an incident.[25]

This same study also showed comparable racial/ethnic disparities to the current study. For example, rates of adolescent exposure to fatal gun violence incidents were higher among those who were Black or Hispanic compared to those who were White.[25] These racial and ethnic disparities in childhood exposure to gun violence are long-standing and likely driven by economic inequality and systemic racism. Poverty and employment instability contributes to economic stress which has been shown to increase risk of exposure to gun violence.[26] Systemic racism, through decades of redlining, discriminatory housing policy, and mass incarceration, has created social instability for Hispanic and Black youth, also increasing risk of exposure to gun violence.[27]

The literature on childhood exposure to gun violence among sexual and gender minorities is limited, making these

findings novel and worthy of future research. Yet, a 2024 national sample of young people aged 10–34 years showed that those who do not identify as a man nor a woman had an increased risk of gun victimization relative to women and that sexual minorities had increased risk of gun victimization relative to heterosexuals.[28] Despite the limited literature, these findings are consistent with the known increased risk of violence against sexual and gender minority youth.[29]

Findings herein show childhood exposure to gun violence is associated with poor mental health and substance use disorder in young adulthood. Similar findings are rare in the literature, as most studies focus on firearm possession, firearm injury, and firearm fatality. One study suggests that youth exposure to gun violence is associated with hypertension in adulthood, but behavioral health outcomes were unmeasured.[30] Another nationally representative study of adolescents found that gun possession was associated with poor mental health and increased substance use.[31] Although research on youth exposure to gun violence remains limited, the biological effects of ACEs are well-established.[31-33] Chronic stress from ACEs alters brain structures like the amygdala, hippocampus, and prefrontal cortex, impairing emotion regulation and increasing the risk of depression, substance misuse, and other stress-related disorders.[32] Additionally, ACEs can lead to maladaptive coping, such as self-medicating with substances, and may cause epigenetic changes that heighten vulnerability to poor mental health outcomes.[33,34]

Limitations

This study has several limitations. First, this is a cross-sectional study and causality cannot be determined. Second, this is a self-report study prone to social desirability and recall bias, particularly since the events would have occurred in childhood. Finally, this is a convenience sample of young adults and may not be representative of young adults in general nor in RI.

Implications

Efforts to reduce adolescent exposure to gun violence must be comprehensive, addressing all levels from policy and legislation to social and community-based interventions. Legislative advancements serve as a foundation for the structural changes needed to have widespread impact on gun violence.[35,36] Building community resilience requires engaging local communities in targeted interventions that foster social cohesion, improve access to mental health resources, and address structural inequities from within. Additionally, interdisciplinary collaboration and sustainable funding are critical for systemic change.[37]

One promising approach is the Advanced Peace (AP) model, which focuses on reducing urban violence by addressing individual trauma. Instead of involving law enforcement, AP provides mentorship through outreach workers – often individuals with personal experiences of violence – who act as mentors and violence interrupters.[38] Advocates also recommend using Social Determinants of Health (SDoH) and Social Vulnerability Indices (SVIs) to guide more targeted gun violence interventions. A combined public health and public safety approach, such as the EpiCrim theory, can position communities to reduce gun violence while fostering social cohesion and resilience. Another effective strategy is the Cardiff Model, a multi-agency framework that utilizes data from both health and law enforcement sectors to enhance policing strategies and improve community violence prevention efforts.[35]

Healthcare providers play a crucial role in education, screening, and advocacy for gun violence prevention.[35] Training clinicians in risk-specific interventions and evidence-based practices is essential. Programs like the Violence Intervention Program (VIP) and Cradle to Grave (C2G) exemplify provider-led initiatives: VIP engages individuals in the acute hospital setting, providing long-term care management, psychological follow-up, and coordination with law enforcement and parole services. C2G educates adolescents through a two-hour experience that traces the medical journey of a young gunshot victim, highlighting the consequences of gun violence.[39] Additionally, firearm safety counseling and risk screening tools, such as the SaFETy Score, are critical for identifying high-risk youth.[40] Advocacy for firearm safety education in pediatric settings is also necessary to improve preventive efforts. This evidence-based programming has the potential to become self-sufficient when healthcare providers and community organizations actively engage with existing effective models, such as community health workers and Medicaid reimbursement strategies.[41] By integrating these resources, programs can strengthen sustainability and maximize impact.[35,39-41]

Federal and state level policy changes are not only needed to curb the flow of illegal guns, but to ensure adequate funding, resources, and infrastructure for community organizations and health care providers to implement these evidence-based programs.[6] A federal assault weapons ban should be implemented to reduce mass shooting injuries and fatalities.[42] Universal background checks and permit-to-purchase requirements should be implemented to reduce firearm homicide.[43] Addressing disparities in gun law enforcement and systemic racism should be a research priority. Increasing resources for solving nonfatal shootings and forming stronger community-police partnerships can also enhance violence prevention efforts.[44] To improve youth safety, legislation should focus on strengthening firearm storage laws and closing ownership loopholes to reduce firearm-related injuries.[45] Only through a unified effort where research informs policy, and policy empowers communities, can we drive lasting change and effectively reduce gun violence.

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