# Gaming Alone Together: The Role of Loneliness and Social Anxiety in Adolescent Video Gaming Behaviors

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**Results:** Results: About a third of high school students reported "not good" mental health or feeling hopeless in the last 12 months. About one in five considered attempting suicide (21.0%) or had a plan for suicide (16.6%). One in ten youth reported attempting suicide (11.6%). Nearly half (44.6%) of teens lived in a state with below median supportive SLP. Sexual minority and other/questioning youth had three- to five-fold higher odds compared to heterosexual youth of poor past month mental health (OR=4.51-4.52) and past year sad/hopelessness (OR=3.85-4.28), considering suicide (OR=4.16-5.62), making a suicide plan (OR=4.10-4.94) or attempting suicide (OR=3.54-4.23). States with higher SLP were protective against individual-level reports of poor past month mental health (OR=0.85) or feeling sad or hopeless in the past year (OR=0.86). Sexual minority youth who lived in states with more supportive SLP had lower odds of both considering suicide (OR=0.83) and attempting suicide (OR=0.72) as compared to sexual minority youth who lived in states with less supportive policy. Better SLP also reduced the odds of suicide attempt among questioning/other youth (OR=0.71).

**Conclusions:** Supportive and affirming state-level LBGTQ+ policies have important protective effects for sexual minority youth, as well as more broadly for youth regardless of sexual orientation. These data underscore the importance of advocacy efforts for positive state-level policies as a method of primary prevention.

**Sources of Support:** None

## 3.

### COMPREHENSIVE SEXUAL EDUCATION AS A PRIMARY SEXUAL HEALTH PROMOTION STRATEGY AMONG ADOLESCENTS AND YOUNG ADULTS IN THE UNITED STATES – DATA FROM A NATIONALLY REPRESENTATIVE SURVEY

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**Purpose:** WHO health equity principles affirm the fundamental right of adolescent and young adult (AYA) access to medically accurate, developmentally appropriate, and comprehensive school-based sex education (CSE) to make informed choices about their sexual and reproductive health. However, the construct of CSE remains poorly operationalized, with little empirical evidence linking it to specific SRH outcomes. Using nationally representative data from AYA aged 14 – 26 years in the United States, our objectives were to: 1) structurally validate a multidimensional model of CSE; 2) examine the association between CSE and sexual and relational well-being outcomes.

**Methods:** Data were a subsample of adolescent (14-17 years; N=1011) and young adult (18-26 years; N=427) participants from the 2022 National Survey of Sexual Health and Behavior (NSSHB) – a nationally representative study assessing sexual and reproductive health (SRH) in the United States. We developed a conceptual model to map each of 19 different survey-assessed (5-point: not at all covered to very well covered) sex-ed-topics onto one of four CSE subdimensions – general prevention (e.g., abstinence, condoms/contraception, consent, STI testing/risk reduction), identity support (e.g., finding LGBQIA+ support, general info on identities/expressions, sexual orientation), safety and pleasure (e.g., types of sex with same/different gender partners, sexual-enjoyment, pornography) and healthy relationships (e.g., dating-violence, assault/harassment, qualities of good relationships, sexting). We used weighted multi-level random effects (adjusting estimates for clustering of AYA within states) generalized structural equation modeling (Stata, 19.0; all models controlled for age, race/ethnicity and gender/sexual identity) to evaluate the measurement relationship of the dimensions to a latent CSE construct (Objective 1) and to examine the predictive structural associations between CSE and sexual and relational well-being outcomes (Objective 2), including: relationship and sexual satisfaction (both 5-pt: not at all to extremely), recency of last sex, participant and/or partner intoxication at last sex (both: 3-point not at all – very), sexual pleasure, sexual arousal and emotional intimacy of last sexual event (all 5-point: not at all to very), chosen behaviors at last event (all no/yes: affectionate [kissing/cuddling], manual genital [vaginal/anal fingering, breast touching], any oral [given or received], penile-vaginal, penile-anal), orgasm at last event (no/yes), condom/contraceptive use at last event (all no/yes: male condom, any hormonal or any unreliable]). All outcomes were evaluated separately.

**Results:** All four content areas (B=0.75-0.93; all p<.001) were significant indicators of CSE; this structure fit better than models with fewer indicators. Better CSE was associated with higher relationship and sexual satisfaction (OR=1.30-1.31), lower odds of AYA or partner intoxication during last sex (OR=0.98-0.99), greater sexual pleasure (OR=1.03), greater arousal (OR=1.04) and greater emotional intimacy (OR=1.39) during last sex. CSE was positively associated with affectionate, manual genital and oral sex (OR=1.14-1.38) and reporting have an orgasm at last sex (OR=1.39). Higher CSE predicted higher odds of male condom use (OR=1.06) at last sex.

**Conclusions:** Data provide strong support for delivery of sexual education that addresses multiple sexual health topics and takes a positive, affirming, inclusive approach to human sexuality. CSE improves sexual health by both preventing risk behavior and by promoting healthy relationships and satisfying sexual experiences.

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## 4.

### GAMING ALONE TOGETHER: THE ROLE OF LONELINESS AND SOCIAL ANXIETY IN ADOLESCENT VIDEO GAMING BEHAVIORS

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**Purpose:** Online social video games provide valuable socialization opportunities for adolescents, particularly those experiencing loneliness and social anxiety. However, the extent to which social gaming and in-game interactions contribute to difficulties in disengaging from gaming remains unclear. This study aims to 1) explore correlations between loneliness, social anxiety, and various gaming behaviors, including the frequency of solo and social play, play partner selection, and in-game interactions; and 2) examine their associations with symptoms of problematic gaming, characterized as excessive, uncontrollable gaming that can result in social and/or emotional problems.

**Methods:** We conducted a survey involving 1,468 U.S. adolescents aged 13-17 (M = 14.99, SD = 1.42), assessing loneliness, social anxiety, gaming behaviors such as the frequency of solo and social play, play partner selection (strangers vs. known figures), in-game real-time communication, and problematic gaming symptoms like preoccupation with gaming, conflicts with others over gaming time, and displacement of other activities (e.g., school, work, and sleep). Descriptive and correlation analyses were conducted, followed by Confirmatory Factor Analysis (CFA) and Structural Equation Modeling

(SEM) to investigate these relationships, incorporating demographics as covariates. Bootstrapping with 10,000 samples explored potential mediation roles of gaming behaviors.

**Results:** The sample comprised 47.3% females, 46.7% males, and 3% non-binary individuals, with a diverse racial composition (41.3% White). CFA confirmed construct validity (CFI= .96, TLI= .95, RMSEA = .04, SRMR = .04). SEM indicated a good fit (CFI = .96, TLI = .91, RMSEA = .06, SRMR = .04) and explained significant variability in problematic gaming symptoms (46%) and various gaming behaviors (2.4% to 17.1%).

Loneliness significantly predicted increased social play with both strangers ($\beta$ = .16, p < .001) and known figures ($\beta$ = .14, p < .001), and more in-game communication with strangers ($\beta$ =.31, p < .001) and known figures ($\beta$ =.12, p <.001). Social gaming with strangers ($\beta$ = .07, p < .001) and communicating with them ($\beta$ = .26, p < .001) were positively associated with problematic gaming symptoms. Notably, frequent real-time communication with strangers significantly intensified the relationship between gaming with them and problematic gaming symptoms ($\beta$ = .05, p < .05). Mediation analysis confirmed significant pathways from loneliness to problematic gaming through social play and in-game communication with strangers.

Social anxiety correlated significantly only with solo play ($\beta$ = .17, p < .001). Boys reported higher engagement in social gaming ($\beta$stranger= -.24, p < .001; $\beta$known figure = -.17, p < .001), in-gaming communication ($\beta$stranger= -.27, p < .001; $\beta$known figure = -.10, p < .001), and more pronounced problematic gaming symptoms ($\beta$ = -.17, p < .001), compared to girls.

**Conclusions:** Among adolescents who play video games, loneliness was associated with problematic gaming symptoms, mediated by social gaming and in-game communication with strangers. Online gaming may serve as a coping mechanism for adolescents with unsatisfactory in-person social relationships. With growing clinical awareness of problematic gaming, treatment strategies should move beyond reducing or eliminating gaming time to address underlying social struggles that may drive adolescents toward these behaviors.

**5.**

## PROXIMAL ASSOCIATIONS BETWEEN ALCOHOL USE BEHAVIORS AND EEG SLEEP CHARACTERISTICS IN YOUNG ADULTS WHO BINGE DRINK

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**Purpose:** Alcohol use disorder (AUD) is characterized by sleep disturbances, but differentiating the effects of acute alcohol exposure, withdrawal, and chronic consumption remains unsolved. This study examines proximate alcohol consumption effects on sleep electroencephalography (EEG) in heavy drinking young adults.

**Methods:** Young adults (21-30 years, N=88) who binge drinking weekly completed two nine-day ecological momentary assessment (EMA) protocols assessing drinking events followed by overnight in-lab polysomnography (PSG) after a negative alcohol breath test. EEG sleep analyses included sleep-wake staging and power spectral analysis. Linear mixed effect modeling examined the effects of drink number during the EMA period on measures of sleep continuity, architecture, and spectral power, adjusting for covariates.

**Results:** Participants reported an average of 17.5+/-1.0 drinks over 3.0+/-0.1 drinking days in each 9-day EMA period. Unexpectedly, higher drink counts were associated with lower time spent awake after sleep onset (WASO, log-transformed, BSTD=-0.19, p=0.03) and improved sleep efficiency (inverse log-transformed, BSTD=0.18, p=0.03) without changes in sleep onset latency (SOL, BSTD=-0.05, p=0.51). More drinks also correlated with higher number of REM periods (log-transformed, BSTD=0.19, p=0.02), less REM fragmentation (BSTD=-0.23, p=0.004) and decreased REM onset latency (log-transformed, BSTD=-0.20, p=0.02). Finally, more drinks were associated with decreased alpha power (8-12 Hz, log-transformed, BSTD =-0.1, p=0.03) but not with other aspects of sleep architecture or spectral power (p>0.05).

**Conclusions:** Contrary to predictions, greater proximal drink consumption was associated with better sleep by multiple parameters, including decreased time awake after sleep onset (WASO), improved sleep efficiency (SE), less REM fragmentation, and decreased alpha spectral power. Preliminary analyses suggests that these sleep improvements may largely be driven by participants assigned female at birth, suggesting biological sex differences. Overall, this pattern of effects may be due to the baseline drinking pattern, age-related resilience, or differential effects across the night. Future analyses will assess for these possibilities and others, including polysubstance use and stress levels.

# PLATFORM RESEARCH PRESENTATIONS II: ADDRESSING ADOLESCENT HEALTH: EXPLORING EFFECTIVE STRATEGIES AND INTERVENTIONS

**6.**

## FACILITATORS OF GENDER-AFFIRMING MEDICAL CARE FOR TRANSGENDER AND NONBINARY ADOLESCENTS

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**Purpose:** Most research with transgender and nonbinary (TNB) adolescents has been conducted in clinics that provide gender-affirming medical care (GAMC), which systematically excludes those who experience barriers to receiving this care. The purpose of this study was to (1) better understand demographic variation in access to GAMC and (2) identify potential facilitators of GAMC among TNB adolescents who want but are not currently receiving this care.

**Methods:** An electronic survey was designed to understand TNB adolescents' experiences seeking GAMC. Potential participants were identified using electronic health record (EHR) data from a tertiary pediatric healthcare system if they were (1) aged 13-17 years, (2) had documented pronouns or gender identity that differed from their sex assigned at birth listed in the EHR, and (3) had at least one completed encounter within the health system from October 2020—December 2022. Chi-square and adjusted Wald tests compared use and/or desire for gender-affirming medications (i.e., already receiving GAMC, not receiving GAMC and do not want it, not receiving GAMC