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Extracurricular screen time among Idaho youth: Prevalence and association with psychological distress

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ABSTRACT

Objectives: To measure the daily hour prevalence of informal computer and video games use among Idaho youth, and to examine the association between usage hours and selected psychological variables, including feelings of hopelessness, suicidal ideation, and past suicide attempts.

Methods: Data analyses was performed on responses obtained via anonymous questionnaires from a sample of school children ages 12-18 (n=1,678) who completed the 2011 CDC Youth Risk Behavior Survey at randomly selected schools in Idaho.

Results: Analysis showed that males were more likely to report three or more hours of screen time per day, while a higher percentage of females than males reported experiencing psychological distress. Females engaging in three or more hours of daily screen time were more likely than boys to have in the past 12 months engaged in intentional self-harm behaviors, reported suicidal ideation or feelings of sadness or to have planned suicide.

Conclusions: Our findings confirm the inverse relationship between screen time and mental health. The data suggest that excessive recreational computer or video game use among females almost doubles the odds of significant mental health problems. Future research is needed to clarify the nature of these associations.

KEYWORDS

Mental health, screen time, adolescent, risk behavior

INTRODUCTION

The use of computer and web-based media for social networking, music, television, video gaming and information gathering is virtually

omnipresent in the lives of young people in the United States. Ninety-five percent of teens use the Internet (Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013,) and the average 8 to 18 year old spends 7 ½ hours daily, 7 days a week, using various forms of media. This represents an increase of almost 2 ¼ hours of media exposure over the last 5 years (Rideout, Foehr, & Roberts, 2010). Eighty-four percent of young people have Internet access at home, 33% have Internet in their bedrooms, and 29% have laptops. Access to high-speed internet has jumped from 31% to 59% from 2005 – 2009 (Rideout, Roehr, & Roberts, 2010).

Internet

Access to often-free wireless service has dramatically increased access to the Internet through use of always-on mobile technology such as smartphones, MP3 devices, and tablets. Almost three-fourths (74%) of teens aged 12-17 say they access the Internet on various mobile devices at least occasionally, with over one-third (37%) of all teens having a smartphone and almost one-fourth of teens owning a tablet (Madden, Lenhart, Cortesi, Gasser, Duggan, Smith, & Beaton, 2013.).

Social Media

Eighty-one percent of teenagers who access the internet use some form of social media; 77% of these teens report using Facebook, and 24% use Twitter (Madden *et al.*, 2013.). In addition, two-thirds (68%) of teens use text messaging, half (51%) visit a social networking site, and almost one-third (30%) use email at least once daily (Common Sense Media, 2012).

Media use is increasingly seen as shaping the social, emotional, and academic development of adolescents, with positive and negative consequences (Moreno, Jelenchick, Cox, Young, & Christakis 2011). On the positive side, Guan and Subrahmanyam (2009) reported that Internet use can improve academic test scores and enhance motivation for learning. Benefits of social media include community engagement, enhanced creativity, broader social connections, and improved communication (O’Keeffe & Clarke-Pearson, 2011).

However, non-school computer use, or informal computer use, is also associated with several negative consequences. A recent Kaiser Family Foundation study compared heavy, moderate, and light media users. Heavy users were those who consumed more than 16 hours of media content in a typical day (21% of all 8-18 year olds), moderate users consumed 3-16 hours of content (63%), and light users consumed less than three hours of media (17%) during a typical day. Researchers found that heavy users were significantly more likely than light users to earn fair or poor grades (47% vs. 23%), frequently get into trouble (33% vs. 16%), and more often report feeling sad or unhappy (32% vs. 22%) (Rideout, Foehr, & Roberts, 2010). The negative consequences of Internet use can also include online harassment, including cyber-bullying, exposure to explicit sexual materials, and privacy issues (Guan & Subrahmanyam, 2009; O’Keeffe *et al.*, 2011).

Heavy use of media has also been associated with higher levels of social isolation. A study of 1,789 people (92.6% male) showed that “problem video game users found it easier to meet people online and had fewer friends in real life” (Porter, Starcevic, Berle, & Fenech, 2010). Still unknown is whether difficulty

socializing is what leads gamers to develop problem use of media or if poor socialization skills are the result of problem use. Heavy Internet use may relate to what some researchers are calling Internet addiction. Problem Internet use and Internet addiction are two areas that need consistent measures with specific attention on the adolescent population that spends more and more time online.

Heavy media use has also been associated with increased levels of depression in teens, leading some researchers to coin the term "Facebook depression" (O'Keeffe & Clarke-Pearson, 2011). In one study, youth ages 13 to 18 were evaluated and found the relative risk for depression was increased for those who reported pathological internet use (IRR, 2.5; 95% CI, 1.3-4.3) than that of the group who did not (Lam & Peng, 2010), after controlling for confounding factors. Another study with a nationally representative sample of youth found that three hours of Internet use or more per day was associated with depressive symptoms in 30% of youth sampled (Ybarra, Alexander, & Mitchell, 2005).

Suicide and self-injurious behavior related to Internet use is also an important issue among young people. Suicide is the third leading cause of death among youth aged 15 to 19, and potential contributing factors are of interest to researchers (Centers for Disease Control and Prevention [CDC], 2009). Whitlock, Powers, and Eckenrode (2006) investigated the role of Internet in the lives of adolescents who use self-injurious behavior (SIB) to cope with anxiety or distress. Researchers identified over 400 Internet-based message boards about self-injury and profiled the primarily female users who identified themselves as between 12 and 20 years of age (Whitlock, Powers, Eckenrode, 2006). More studies are needed evaluating the role of the Internet and off-line behavior, especially as it relates to the practice of self-injurious behavior among youth.

Gender differences have also been noted in computer use. For example, adolescent males spend about 42 more minutes per day online than females and are more likely to play computer games, while females are more likely to visit social networking sites (Rideout, Foehr, & Roberts, 2010). These differences between genders may relate to varied psychological and behavioral outcomes. For example, Obannessian (2009) found that females who reported high levels of video game playing (1 hour or more per day) also reported the highest levels of anxiety; however, the opposite was true for males. A larger study (Desai, Krishnan-Sarin, Cavallo and Potenza, 2010) examined the health correlates of problematic gaming use and gender differences in high school students. The researchers surveyed 4,028 adolescents (76.3% males and 29.2% females) and reported that male gaming had no significant effect on negative health correlates but female gaming was associated with moderate risk of depression (OR: 0.7) and moderate increases in serious fights (OR: 1.7) and carrying a weapon (OR: 2.1, p. 1419).

This study is designed to better understand how amount of time spent with media is related to psychological and behavioral effects. For this reason, we sought to answer two significant research questions on media use and psychological / behavioral effects on adolescents. First, are there differences between adolescent male and female media use and self-reported depressive symptoms, and suicidal thoughts and behaviors? This research question focused on whether boys or girls who consumed large amounts of informal media were more likely to report feeling of sadness, thoughts of suicide, or suicidal gestures than boys or girls who consumed less informal media; and second, were girls

who consumed high levels of informal media more likely than boys to experience these symptoms?

PURPOSE

Using the 2011 Idaho YRBS, we examined whether adolescents who reported three or more hours of daily informal computer or video game use were at higher risk of psychological distress in the form of feelings of sadness or hopelessness, suicidal ideation, suicide planning, or suicide attempts.

METHODS

INSTRUMENTATION

Developed by the CDC, the Youth Risk Behavior Survey (YRBS) collects school-based, nationally representative data in the U. S. in the following categories: behaviors that contribute to unintentional injuries and violence; use of alcohol and other drugs; tobacco use; unhealthy dietary behaviors; inadequate physical activity, and sexual behaviors contributing to unintended pregnancy and sexually transmitted diseases (CDC, 2012). The survey is updated regularly and questions have been modified or added based on item rationale (CDC, 2009).

The YRBS questions that assess suicidal behaviors and thoughts were determined to have both convergent and discriminant validity (May & Klonsky, 2011). Questions 23 through 27 measure sadness, suicide ideation, attempted suicide, and severity of attempts. Question 82 asked, "On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Include activities such as Nintendo, Game Boy, PlayStation, Xbox, computer games, and the Internet.)" (CDC, 2009).

Participants

Of the 1,702 sampled Idaho students who submitted questionnaires, 1,678 were usable after data editing. Sociodemographic characteristics included gender, age, grade (9-12), and race/ethnicity (Caucasian, African-American, Hispanic, Asian, other). The YRBS ethnicity/race variable includes eight categories: American Indian/Alaska Native (N=35), Asian (N=28), Black or African American (N=13), Native Hawaiian/other Pacific Islander (N=9), White (N=1208), Hispanic/Latino (N=128), Multiple – Hispanic (N=147), Multiple non-Hispanic (N=84). We re-categorized those eight ethnicity/race categories into five: Caucasian (White), African-American (Black or African-American), Hispanic (Hispanic/Latino and Multiple – Hispanic), and "Other" (all remaining non-missing subjects).

PROCEDURE

Data Analysis

In this study, we examined the relationship between the extent of self-reported informal computer and video game use (3hours daily use versus two hours or less daily use) and self-reported psychological distress symptoms. Independent and dependent variables were coded dichotomously. See Table 1 for variable definitions and coding.

Table 1 *Study variable operational definitions and coding rules*

Variable Name	Operational Definition	Coding
Informal computer and video game use*	On an average school day, how many hours do you play video games or computer games or use a computer for something that is not school work? (Include activities such as Nintendo, Game Boy, Playstation, Xbox, computer games, and the Internet.)	0-2 hours = 0 3 or more hours = 1
Psychological distress**		
Sad or hopeless	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?	No = 0 Yes = 1
Suicidal ideation	During the past 12 months, did you ever seriously consider attempting suicide?	No = 0 Yes = 1
Planned suicide	During the past 12 months, did you make a plan about how you would attempt suicide?	No = 0 Yes = 1
Past suicide attempts	During the past 12 months, how many times did you actually attempt suicide?	No previous attempts = 0 1 or more attempts = 1

**Independent variable; **dependent variable*

Data were analyzed using SPSS 22 software (SPSS Inc., Chicago, IL). The level of significance was set at .05. First, we conducted frequency analysis, described the sample and evaluated sociodemographics. Second, we used cross-tabulations to examine bivariate associations of informal computer and video game use and psychological distress by gender. Finally, we used binary logistic regression analysis to examine the relationship between informal computer and video game use and psychological distress by gender.

RESULTS

Table 2 presents the sociodemographic characteristics of participants. More than three quarters (80%) of the youths were non-Hispanic White, consistent with regional demographics. About 27% of youths reported they were 17 years old.

Table 2 *Weighted Descriptive Statistics of Idaho Youth*

Total participants	% of total*
Gender	
Female	49
Male	51
Age	
14	9
15	25
16	25
17	27
18<	15
Grade level	
9 th	26
10 th	25
11 th	24
12 th	24
Ethnicity	
Caucasian	80
African-American	<1
Hispanic	13
Asian	1
Other	4

Table 3 presents bivariate associations between levels of informal media use (less than 3 hours daily use, 3 hours or more daily use) and four indicators of psychological distress. Informal media use was consistently associated with increased likelihood of psychological distress across all measures, including depressive symptoms, suicidal ideation, planned suicide, and suicide attempts.

Table 3. *Extent of Media Use related to Prevalence of Psychological Distress: YRBS, Idaho, 2011.*

	Depressive Symptoms		Suicidal Ideation		Suicide Plan		Suicide Attempt	
	No. (%)	Chi-square	No. (%)	Chi-square	No. (%)	Chi-square	No. (%)	Chi-square
Informal Media Use		329.73***		172.01***		563.49***		49.77***
3+ hours daily (n=369)	122 (33.1)		76 (20.6)		70 (19)		31 (8.4)	
<3 hours daily (n=1309)	351 (26.8)		200 (15.3)		147 (11.2)		80 (6.1)	

Note: All measures are for the past 12 months

*** $P \leq .000$ for association between hours of informal media use and indicator of psychological distress.

Table 4 displays logistic regressions modeling the relationship between informal media use and psychological distress. Consistent with the bivariate associations, there were strong relationships between informal media use and psychological distress across all levels of distress for both males and females. Overall, the risk of experiencing any level of psychological distress was higher for males or females who reported using informal media for 3 or more hours daily. For example, compared to females who used less than 3 hours daily informal media, those with higher rates were almost 2 times as likely to report depressive symptoms (OR=1.81; 99% CI=1.72-1.92), suicidal ideation (OR=1.75; 99% CI=1.64-1.86), suicide planning (OR=1.92; 99% CI=1.80-2.06), and suicide attempts (OR=1.45; 99% CI=1.35-1.62). Males with higher informal media use were also at higher risk than peers for psychological distress (ORs from 1.41 to 1.17), although demonstrating an overall lower risk for distress than females with high rates of informal media use.

Table 4 Adjusted Odds Ratio (OR) with 95% confidence interval (CI) for high informal media use (3+ hours daily) versus lower use (<3 hours daily) by gender, Idaho YRBS 2009.

		OR	CI
Felt sad or hopeless last 12 months	Females	1.81	1.72-1.92
	Males	1.41	1.33-1.48
Considered suicide last 12 months	Females	1.75	1.64-1.86
	Males	1.17	1.64-1.86
Planned suicide last 12 months	Females	1.92	1.80-2.06
	Males	1.77	1.66-1.89
Number of times purposefully hurt self	Females	1.45	1.35-1.62
	Males	1.34	1.21-1.49

Note: All measures are for the past 12 months

**P<.000 for association between hours of informal media use and indicator of psychological distress.*

DISCUSSION AND IMPLICATIONS

Electronic media helps us learn and increases our ready access to knowledge, which can translate into higher quality work. Our lives are also enhanced by keeping in touch with family and friends, which the Internet helps make possible. However, researchers such as Robert Putnam (2000) have suggested that heavy reliance on electronic social media is resulting in decreased face to face social interaction and community/civic involvement. He was concerned that this social isolation would have negative societal consequences for communities and nations and increase individual levels of isolation and depression.

The data presented in this study suggest that some of the concerns and findings expressed in the research literature are valid. The sense of isolation and depression reported in previous studies is evident in our own findings on the rates of sadness, suicidal ideation and suicide attempts, as well as self-harm among Idaho youth. The data showed that on all of the items examined, both males and females who engaged in 3 more hours of video gaming a day were significantly

more likely, in the last year, to feel sad/hopeless, consider suicide, plan a suicide, or physically harm themselves. This suggests that families, teachers and health providers as well as researchers should be concerned about the impact of excessive use of electronic media on depression, self-harming behavior, and suicide for both genders. The data further suggest that the potential impact of excessive media use is greater for females than for males. Our findings show that females are almost twice as likely to consider suicide when they spend 3 hours or more per day on media use.

The data have a number of implications for parents, teachers and health providers. Prior research has suggested the importance of parental monitoring in reducing youth risk behaviors. In a previous study in the Pacific Northwest, Johnson and colleagues (2014) found that parental monitoring played a significant role in lower rates of health risk behaviors. It is important for parents to be aware of their children's Internet use, for recreational purposes, social networking, or gaming. In addition, the number of hours spent using media each day appears to be crucial. Parental monitoring can play a major role in preventing high risk media use and limit the amount of electronic media use each day. Strategies can include youth only using media in family public places, no use of media during family dinners, no media use after a reasonable hour at night and no electronic media in the child's bedroom.

The data also suggest that teachers and health providers should be sensitive to youth expressions of sadness/hopelessness and suicidal and self-harm ideation, and be aware of video gaming that might be considered excessive (e.g. staying up all night playing games; failing to get homework completed due to media use, etc.). It may also be important for schools to include materials in their health education curricula on the physical and psychological risks of excessive media use such as online gaming.

STRENGTHS AND LIMITATIONS

This study has several limitations. First, the YRBS is a data collection tool which relies on participant self-report, as such data may be constrained by levels of participant understanding, introspection and honesty. Additionally, analysis was constrained by the limits of archival data; for example, the dependent variable consisted of a single item which merged several forms of media exposure (video games, computer games, or Internet use), making more specific analysis impossible. To this point, the lack of specific measurements also limited analyses of possible confounding factors, such as type of games played or content consumed. Additionally, psychological distress indicators were measured using self-report items. While these items are widely studied, they cannot provide a diagnosis. Also, the cross-sectional nature of the analysis means that we cannot attribute causality between informal media consumption and psychological distress. Additionally, the results are regional, and generalizability to other populations, including urban and rural school, is limited.

Despite these limitations, our study has several strengths. First, the sample was large, permitting examination of infrequently surveyed forms of psychological distress, such as suicide attempts, in girls as well as boys. Second, YRBS questions have been shown to have strong test-retest reliability (Brener *et al.*, 2002). Third, as the survey was administered at school, response rates were high. Our confidence in these finds has been improved by these strengths.

In summary, the percentage of high school age youth in Idaho who engage in high levels of non-school media use is relatively high (17% of females and 27% of males) and the consequences are significant for psychological health, suicidal ideation, attempts and self-harm. It is important for parents, teachers, and health care providers to be aware of these consequences, watch for warning signs of excessive use or distress, and develop tools for reducing excessive media use.

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