Solitary Participation in the "Choking Game" in Oregon

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abstract

OBJECTIVE: The purpose of this study was to compare characteristics of youth who participate in the choking game alone versus those who participate in a group.

METHODS: Lifetime prevalence estimates were obtained from the 2011 (n = 5682) and 2013 (n = 15 150) Oregon Healthy Teens survey. The 2011 and 2013 data sets were merged (N = 20 832) to compare youth who participate alone versus those who participate in a group in the choking game. Multivariate modeling was conducted to examine individual characteristics of young people who engaged in the choking game alone versus those who engaged in the game in a group.

RESULTS: In 2011, 3.8% of eighth-grade participants reported a lifetime prevalence of choking game participation; 3.7% reported lifetime prevalence of participation in 2013. In the merged 2011/2013 data set, 17.6% (n = 93) of choking game participants indicated that they had participated alone. Compared with those who reported participating in a group, youth who participated alone had significantly higher rates of suicide contemplation (odds ratio: 4.58; P < .001) and poor mental health (odds ratio: 2.13; P < .05).

CONCLUSIONS: Youth who participate alone in the choking game are a particularly high risk group, exhibiting substantially higher rates of suicidal ideation and poorer mental health compared with youth who participate in the choking game in a group. Adolescent health care providers should be aware of these associations, assess whether prevention messaging is appropriate, and be prepared to explain the high risks of morbidity and mortality associated with participation.

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WHAT'S KNOWN ON THIS SUBJECT: Youth participation in a strangulation activity is associated with other high risk behaviors (eg, substance use, sexual activity, physical violence). Those who participate in the choking game alone versus in a group have the highest rates of morbidity and mortality.

WHAT THIS STUDY ADDS: Youth who participate in the choking game alone have higher odds of contemplating suicide and fair/poor emotional health compared with those who participate in groups. Adolescent providers should be aware of these associations and assess whether prevention messaging is appropriate.

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Youth who engage in a strangulation activity, often referred to as the "choking game," are at risk for significant injury or death.[1] Participation occurs when pressure (using hands/fingers or a ligature such as a belt or tie) is applied to the carotid artery to temporarily limit blood flow and oxygen. The goal is to achieve a euphoric feeling once the flow of oxygen and blood is restored to the brain. This activity puts participants at great risk for injury or death, particularly if they participate alone.[1] Previous research has found that 96% of choking game deaths occurred when the participant was alone.[1] Without other individuals present to interrupt the asphyxiation, there is an increased risk of loss of consciousness and inability to stop the strangulation when a noose, belt, or other ligature is being used.

Previous research has established general lifetime prevalence among youth at between 5% and 11%.[2–5] Determining an exact number of fatalities is difficult; the peer-reviewed literature reports 99 deaths,[5] but advocacy groups suggest that the number is >1000.[6] Contributing to the lack of accurate mortality statistics is the fact that adolescent deaths due to asphyxial games, such as the choking game, are often misclassified as suicides or accidental deaths.[7–9] Contrary to early hypotheses that participation in the choking game was more common among youth with low rates of other health risks,[10] more recent research has established that participation in the choking game is far more common among youth who experience substance use, poor mental health, violence, early-onset sexual activity, and other health risk behaviors,[4,6,11] as well as those who have a thrill-seeking personality.[12]

Awareness of the choking game and its risks is limited among youth,[3,13] parents,[14,15] and providers.[15,16] Little exists in the way of evidence-based education, prevention messages, or screening tools specific to this risk behavior. Earlier research has recommended that adolescent primary care providers consider incorporating questions about awareness and participation into a comprehensive adolescent well-care visit for youth who may exhibit other co-occurring risk behaviors,[11] but the degree to which this questioning is occurring is unknown.

Oregon is the only state to have conducted statewide formal surveillance on this topic. The Oregon Public Health Division has made questions about prevalence (beginning 2008) and mode of participation (alone versus in groups, beginning 2011) a routine part of their biannual youth health surveillance effort (Oregon Healthy Teens [OHT] survey). Limited data suggest that the vast majority of deaths from the choking game occur when the participant is alone,[1,6] making it important to identify youth who do participate by themselves and understand how they may differ from their peers who participate in groups. The goal of the present article was to address that important gap in the literature by offering surveillance data on this population of solitary choking game participants.

The primary research question for the present study was as follows: Do youth who report participating alone in the choking game differ significantly in demographic characteristics or health risks from those youth who participated in the choking game in groups? Based on our knowledge of the increased health risks associated with solitary participation, we predicted that youth who participated alone would present higher levels of other health risks compared with those who participated in the choking game with other youth.

METHODS

Choking game awareness (ie, heard of someone participating), lifetime prevalence, and most recent mode of participation (ie, alone, in group) were analyzed by using data from the OHT survey (Fig 1). The OHT is a population-based survey of Oregon eighth- and 11th-grade students, conducted in odd years, that is designed to measure the health and well-being of adolescents. The survey includes questions about physical and mental health, sexual activity, substance use, physical activity/nutrition, absenteeism (number of school days missed due to any reason [emotional and/or physical reasons, and cutting class]) and community characteristics. The OHT survey began in 2001 as an annual survey and has been conducted in odd years since 2009. It is optional and anonymous and utilizes an active notification/passive consent parent policy where parents are notified about the survey and its contents and can elect to opt their students out of participation. More information about OHT can be found here: https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/index.aspx.

All Oregon public secondary schools were included in the sampling frame. School districts were randomly sampled; in larger districts, schools were also randomly sampled from within those districts. OHT data were weighted to achieve a statewide representative sample based on the probability of students being selected. While OHT surveys both 8th and 11th grade students, questions about choking game participation are part of the 8th grade survey only; hence, all our results refer to 8th grade students.

Figure 1 displays the choking game questions asked on the 2011 and 2013 OHT surveys (2015 OHT data was not available in time to be included in this analysis).

The next questions refer to the "Choking Game," also called Knock Out, Space Monkey, Flatlining, or The Fainting Game.

This is an activity that some youth participate in to get a high by cutting off blood and oxygen to the brain using a variety of methods. Which of the following is true for you? (**Select one or more responses.**)

I have never heard of the Choking Game

I've heard of someone participating in the Choking Game

I have helped someone else participate in the Choking Game

I have participated in the Choking Game myself

Thinking back to the last time you yourself participated in the "Choking Game," were you alone or with other people?

I have never participated in the "Choking Game"

I was alone

I was with other people

FIGURE 1
OHT survey question.

Trends in Lifetime Choking Game Awareness and Participation

Prevalence rates for lifetime choking game awareness and participation were calculated separately for each year by using weighted data from the individual 2011 (n = 5682) and 2013 (n = 15 150) OHT data sets.*

Association Between Mode of Participation and Health Risks

Bivariate analysis and multivariate logistic regression analyses examining the relationship between solitary choking game participation (versus in groups) and specific health risks were conducted by using merged, unweighted data from 2011 and 2013. Although each data set existed independently, the decision to merge 2 years of data without weights was made to increase sample size on a relatively rare outcome and to account for variability in weighting between years.[17] Although estimates of prevalence may be slightly biased with unweighted data, we chose not to use weights in our logistic regression analysis because we were interested only in the presence, direction, and relative strength of associations between selected risk factor variables and group participation, which are largely unaffected by weighting. Furthermore, it is unclear to what extent weights developed for the population would apply to the subset of individuals used in that analysis.

Stata version 13.0 (Stata Corp, College Station, TX) was used to calculate descriptive statistics and odds ratios for the relationships between solitary choking game participation, demographic characteristics, and health risks. For the sake of consistency with previous research, this analysis included adjustment for geographic location (urban/rural) and sex.

RESULTS

Of the combined 20 832 students in eighth-grade who took the survey in 2011 and 2013, a total of 19 418 answered the question on choking

*Survey contractors and collection period changed between 2011 and 2013, leading to differences in sample size.

game participation (93.2% response rate). A total of 529 of the 727 choking game participants answered the question on participation type (72.7% response rate). Inconsistent answers were removed from analysis (eg, if a student said he or she had never participated in the first question but indicated a participation type in the second question). Table 1 provides demographic characteristics for youth who responded to each of the 2 choking game questions.

TABLE 1 Demographic Characteristics of OHT Survey Respondents to Choking Game Questions, 2011 to 2013

Variable	Responded to Choking Game Awareness/ Participation Question (*N* = 19 418)	Responded to Type of Choking Game Participation Question (*N* = 529)
Age, mean, y	13.7	13.8
Sex		
Female	50.4%	52.2%
Male	49.6%	48.8%
Race/ethnicity		
White, non-Hispanic	60.5%	55.2%
Hispanic	21.2%	21.4%
Multirace, non-Hispanic	8.3%	13.2%
Asian, non-Hispanic	3.7%	2.1%
Native American, non-Hispanic	3.1%	4.4%
Black, non-Hispanic	2.2%	3.2%
Pacific Islander/Native Hawaiian, non-Hispanic	1.0%	0.6%

Lifetime Choking Game Awareness and Participation

In 2011, 22.7% (95% confidence interval [CI]: 17.9–28.3) reported hearing of someone participating in the choking game, and 3.8% (95% CI: 2.8–5.2) participated themselves. In 2013, 17.2% (95% CI: 14.9–19.8) of Oregon eighth-grade students reported that they had heard of someone participating in the choking game, and 3.7% (95% CI: 3.2–4.4) reported personally participating in the choking game.

Association Between Mode of Participation and Health Risks

Of the 727 youth in the 2011/2013 unweighted data set who indicated past participation in the choking game, 17.6% (CI: 14.3–20.8) reported that they were alone the last time they engaged in the choking game. Across our entire sample, prevalence of solitary participation in the choking game was 0.4%. Table 2 displays results for each of the 2 choking game questions.

TABLE 2 Results From Choking Game Prevalence and Mode of Participation Questions, OHT 2011 to 2013

Question	2011, *N*/%	2013, *N*/%	Total, *N*/% (*N* = 19 418)
Which of the following is true for you? Select all that apply			
I have never heard of the choking game	2695/70.6	10 336/79.1	14 866/76.6
I've heard of someone participating in the choking game	912/22.7	2165/17.2	3641/18.8
I have helped someone else participate in the choking game	33/0.9	107/0.8	164/0.8
I have participated in the choking game myself	142/3.8	442/3.7	727/3.7
			N/% (*n* = 529)
[Of those who participated] Thinking back to the last time you yourself participated in the choking game, were you alone or with other people?			
I was alone	22/16.1	60/19.8	93/17.6
I was with other people	96/83.9	243/80.2	436/82.4

Data for individual years shows unweighted *N* values and weighted percentages. Data for the combined total shows unweighted *N* values and unweighted percentages. Years do not sum to total because individual year *N* values exclude cases that were not part of the official state sample.

Our assessment of bivariate relationships between health risks and solitary choking game participation indicated that, compared with youth who participated in groups, those who reported participating alone had significantly higher rates of poor mental health and feeling unsafe at school (Table 3). Each of the variables with a statistically significant bivariate relationship was then put through a forward stepwise multivariate logistic regression, controlling for geographic location (urban/rural) and sex, to understand which variables are independently associated with solitary participation in the choking game. Table 3 displays the results of all health risk variables that were examined along with their unadjusted odds ratios and *P* values.

Results in the final model indicated that solitary participation was significantly associated with suicidal ideation and fair/poor emotional health status, when adjusted for sex and geographic location (Table 4). No significant difference was found between solitary and group participants on variables related to substance use, sexual activity, exposure to violence, and physical health and nutrition.

DISCUSSION

Results from the present study indicate that youth who participate in the choking game alone have higher odds of contemplating suicide and reporting fair/poor emotional health

TABLE 3 Bivariate Analyses: Unadjusted Odds Ratios for Association Between Risk Behaviors and Solitary Participation in the Choking Game, Oregon Eighth-Graders, 2011 and 2013

Demographic/Health Risk Variable	Value	Odds Ratio (95% CI)	*P*
Geographic location (*n* = 529)	Urban	1.00	.205
	Rural	0.74 (0.47–1.17)	
Sex (*n* = 529)	Female	1.00	.913
	Male	0.98 (0.62–1.53)	
Physical health status in past year (*n* = 522)	Excellent/very good/good	1.00	.172
	Fair/poor	1.49 (0.84–2.63)	
Emotional/mental health status in past year (*n* = 520)	Excellent/very good/good	1.00	<.001
	Fair/poor	3.04 (1.91–4.83)	
Had an unmet physical health need in past year (*n* = 516)	Yes	1.44 (0.90–2.23)	.13
Had an unmet mental health need in past year (*n* = 518)	Yes	2.09 (1.32–3.29)	.002
Contemplated suicide in past year (*n* = 516)	Yes	5.41 (3.12–9.40)	<.001
Felt sad/hopeless for ≥2 wk in past year (*n* = 520)	Yes	4.31 (2.49–7.46)	<.001
Attempted suicide in past year (*n* = 493)	Yes	5.25 (3.18 – 8.67)	<.001
Gambled in past 30 d (*n* = 513)	Yes	0.83 (0.53–1.30)	.416
Grades in school in past year (*n* = 495)	Mostly As or Bs	1.00	.979
	Mostly Cs, Ds or Fs	1.00 (0.63–1.60)	
Ever had sex (*n* = 519)	Yes	0.97 (0.61–1.52)	.886
Had ≥3 sexual partners in last 3 mo (*n* = 281)	Yes	1.39 (0.6–3.27)	.444
Food insecure in past 12 mo (*n* = 522)	Yes	1.44 (0.91–2.29)	.124
Skipped school due to feeling unsafe in past 30 d (*n* = 505)	Yes	2.50 (1.47–4.26)	.001
Harassed at school in past 30 d (*n* = 515)	Yes	2.16 (1.32–3.55)	.002
Been threatened with a weapon in past 12 mo (*n* = 522)	Yes	1.48 (0.87–2.52)	.145
Been in physical fight in past 12 mo (*n* = 521)	Yes	0.89 (0.56–1.42)	.634
Used alcohol in past 30 d (*n* = 488)	Yes	1.24 (0.77–2.00)	.386
Binge drank in past 30 d (*n* = 478)	Yes	1.03 (0.62–1.70)	.909
Smoked cigarettes in past 30 d (*n* = 507)	Yes	1.34 (0.81–2.20)	.250
Used marijuana in past 30 d (*n* = 489)	Yes	1.11 (0.69–1.81)	.664
Any drug use in past 30 d (*n* = 483)	Yes	1.10 (0.68–1.79)	.703
Any drug use excluding marijuana in past 30 d (*n* = 468)	Yes	1.30 (0.74–2.28)	.368
Illicit prescription drug use in past 30 d (*n* = 489)	Yes	1.45 (0.85–2.49)	.177

N values represent the number of eighth graders in the bivariate analysis for each question (eg, who participated in the choking game and answered the question).

TABLE 4 Multivariate Model: Adjusted Odds Ratios for the Relationship Between Health Risks and Solitary Participation (Versus in Groups) in the Choking Game, Oregon Eighth-Graders, 2011 and 2013 (*n* = 507)

Variable	Odds Ratio	95% CI	*P*
Considered suicide in the past 12 mo	4.6	2.5–8.4	<.001
Fair or poor mental health status	2.1	1.3–3.6	.02

Data were adjusted for sex and geographic location.

compared with those who participate in groups. To our knowledge, Oregon remains the only state to conduct systematic, statewide surveillance on the choking game among youth. Previous results demonstrated the association between choking game participation and health risks such as substance use and violence[11] and helped to raise awareness of participation as a potential issue to be addressed by adolescent health care providers. Because there is currently a gap in the literature on solitary participation and risk behaviors, the present study provides novel information on youth who are participating alone in this game and thereby have increased rates of morbidity/mortality. Even among a group of youth at increased risk for substance use, violence, and poor mental health, those who participated in the choking game alone demonstrated exceptionally poor mental health and high rates of suicidal ideation. However, this association between solitary participation and suicide contemplation should not necessarily lead to the assumption that adolescents participating in the choking game while alone are doing so as a suicide attempt. Instead, those who participate alone may do so as an attempt to decrease psychological pain or distress, as is common among those who participate in nonsuicidal self-injury (NSSI).[18]

Although, by definition, NSSI is intentional self-injury without intent to die, individuals who engage in NSSI have been found to have greater rates of future suicidal thoughts and behaviors, indicating that NSSI may serve as a gateway behavior for suicide, and it should be identified and addressed with appropriate interventions.[19] At least 1 study examined the overlap between any choking game participation and NSSI, with 6.5% of high school–aged youth reporting both behaviors in the past 12 months in an Illinois sample; these youth were also found to report more suicidal behaviors compared with youth who reported only NSSI or only choking game behaviors.[12]

Results of previous research, as well as the findings of the present study that point to increased suicide risk for youth who engage in the choking game alone, signify the need for additional examination of the overlap between these behaviors. The inclusion of questions related to NSSI within the OHT survey is needed to better understand this relationship and to more precisely classify and conceptualize solitary choking game behavior within the spectrum of self-directed violence or risk-taking behaviors

Previous research has shown that almost one-third of pediatricians and family physicians are unaware of the choking game, and only 1.9% currently include choking game participation in anticipatory guidance.[22] The present study provides salient information on health risk characteristics associated with solitary choking game participation among youth that can be used to support provider awareness and prevention messaging. In addition to using the adolescent well-care visit as an opportunity to assess risk for choking game participation, child and adolescent providers should be aware of the potential link between solitary participation and suicidal ideation/poor mental health. As made evident by our findings, solitary participation is associated with health conditions that indicate underlying distress, and it is important to assess whether youth who participate alone are also suicidal. Adolescents who engage in risky behaviors, such as substance use, increased sexual activity, and school absenteeism, have higher rates of participation in the choking game; participants at greater risk of poor mental health may be participating in the choking game alone, which is known to be associated with higher rates of morbidity and mortality. Providers should communicate about the increased morbidity and mortality rates associated with solitary participation and assess whether referrals to mental health services may be necessary.

Although our study contains a robust sample and continues to provide the only data on the choking game from statewide surveillance, it also has several limitations. One such limitation is that the choking game survey questions were not tested for reliability or validity, and therefore we do not know how well or consistently the students understood the questions and response categories. Previous research has indicated that almost all items from the Youth Risk Behavior Surveillance Survey, upon which the OHT survey is based, have been found to have moderate to substantial test–retest reliability.[15] However, this reliability would apply only to the covariate items and not the choking game questions themselves. In addition, the limited methodology associated with cross-sectional data analysis does not allow for a prospective assessment of risks. Third, because the survey is administered only to public schools in Oregon, it is not representative of the entire population: it excludes those who attend school in alternative settings, who are in juvenile detention, or who have dropped out of school. Lastly, because the merged data set was analyzed unweighted, it cannot be generalized to the state or to other locations.

CONCLUSIONS

Participation in the choking game among youth is an area of research with very little scientific data and understanding. Previous literature has sought to establish prevalence of participation and describe health risk profiles of those Oregon youth who participate, as well as to encourage adolescent providers to consider incorporating screening/prevention messaging related to the choking game in an adolescent well-care visit. The data presented in this article reveal how, even among a group of youth bearing substantial health risks, those with suicidal ideation and poor mental health have higher rates of solitary participation in the choking game. These youth could benefit from clear communication from their providers about the risks of participation (particularly alone) and consideration of referrals for mental health services.

ABBREVIATIONS

CI: confidence interval
NSSI: nonsuicidal self-injury
OHT: Oregon Healthy Teens

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