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Suicide Risk Factors among Victims of Bullying and Other Forms of Violence: Data from the 2009 and 2011 Oklahoma Youth Risk Behavior Surveys

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ABSTRACT

Purpose: The purpose of this study was to examine the association between exposure to bullying and other forms of violence and suicide risk among public high school students in Oklahoma.

Methods: Data from the 2009 and 2011 Oklahoma Youth Risk Behavior Surveys were used for this analysis and were representative of public school students in grades 9-12 in Oklahoma.

Results: Students who were bullied, threatened or injured by someone with a weapon, physically hurt by their partner, or had ever been forced to have sex, were twice as likely as students who had not experienced victimization to have experienced persistent sadness, considered attempting suicide, made a plan to attempt suicide, and attempted suicide.

Conclusions: The results of this study indicate that being a victim of bullying or other forms of violence significantly increases the likelihood for experiencing signs and symptoms of depression, suicidal thoughts, suicidal plans, or suicidal attempts.

INTRODUCTION

Suicide is a serious public health problem in the United States and Oklahoma. Nationally, suicide is the third leading cause of death among youth ages 15-24 years; while in Oklahoma, suicide is the second leading cause of death in this age group. The suicide death rate among 15-24 year olds in the United States has seen moderate decreases over the past 30 years from 12.2 deaths per 100,000 persons in 1981 to 10.5 deaths per 100,000 persons aged 15-24 in 2010. Oklahoma also experienced suicide rate decreases in this age group over the past 30 years from 17.9 in 1981 to 13.6 in 2010. In Oklahoma, the male suicide death rate is three times that of females and the suicide death rate among 20-24 year olds is twice that of 15-19 year olds. The decrease in suicide death rates in Oklahoma over the past 30 years is attributable primarily to a rate decrease among females and among 20-24 year olds.[1]

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Suicidal behavior is a result of complex interactions between psychological, biological, socio-cultural, and relationship factors. Risk factors including alcohol and drug use, impulsive behavior, social isolation, and family factors have been linked to suicidal behavior.[2,3] Studies have shown that experiencing interpersonal violence, both perpetration and victimization, is a risk factor for depression, suicidal thoughts, and suicide attempts.[2-7]

Youth are frequently exposed to interpersonal violence at school by peers. One study showed that 12% of adolescents were victims of physical dating violence in the past year.[8] Nearly one-third of students ages 12-18 years reported being bullied at school during the school year.[9] Adolescents who had been threatened at school or experienced dating violence in the past year had almost twice the risk of engaging in suicidal behaviors.[10] Adolescent females who had experienced both physical and sexual violence from a dating partner were 6 to 9 times more likely to consider and attempt suicide than females who had not experienced both physical and sexual violence from a dating partner.[2]

The purpose of this study was to examine the association between exposure to violence and suicidal thoughts and behaviors among Oklahoma public high school students using data from the Youth Risk Behavior Survey (YRBS). A range of violent experiences were measured: being a victim of bullying; receiving threats of physical harm; being a victim of dating violence; and having ever been forced to have sexual intercourse. We hypothesized that students who reported having been a victim of bullying or other forms of violence would have increased likelihood of signs and symptoms of depression, suicidal thoughts, and suicide attempts.

METHODS

Participants

For the 2009 YRBS, 1,413 questionnaires were completed in 42 public high schools for an overall response rate of 69%. For the 2011 YRBS, 1,147 questionnaires were completed in 36 public high schools for an overall response rate of 60%. Demographic characteristics of the students who participated in the 2009 and 2011 YRBS are presented in **Table 1**.

Table 1. Demographic Characteristics of Youth Risk Behavior Survey (YRBS) Participants: Oklahoma YRBS 2009 and 2011

	2009		2011	
	Unweighted	Weighted	Unweighted	Weighted
Characteristics	**n[1]**	**%[2]**	**n**	**%**
Gender				
Female	707	49.1	599	50.0
Male	701	50.9	542	50.0
Total	**1,408**	**100.0**	**1,141**	**100.0**
Missing	*5*		*6*	
Grade				
9th	389	27.5	381	27.3
10th	366	26.5	289	25.9
11th	392	23.9	237	24.1
12th	263	22.1	235	22.7
Total	**1,410**	**100.0**	**1,142**	**100.0**
Missing	*3*		*5*	
Race/Ethnicity[3]				
NH White	789	60.8	633	58.8
NH Black	141	10.5	96	10.7
NH Native American	101	19.1	105	19.2
NH Asian/Pacific Islander	46	1.2	32	0.5
NH Multiple	139	3.6	136	1.8
Hispanic	189	4.8	137	9.0
Total	**1,405**	**100.0**	**1,139**	**100.0**
Missing	*8*		*8*	

1 Unweighted n= number of survey respondents

2 Weighted %= representative of all public school 9-12 graders

3 NH=Non-Hispanic

INSTRUMENTS

The 2009 and 2011 Oklahoma YRBS surveys included questions regarding six categories of health-risk behaviors, the prevalence of obesity, and other health-related topics. The six categories of health-risk behaviors included: behaviors that contribute to unintentional injuries and violence; tobacco use; alcohol and other drug use; sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases; unhealthy dietary behaviors; and physical inactivity. A detailed explanation of YRBS methodology has been well-documented elsewhere.[11]

Four questions were used in determining a student's suicide risk factor status: 1) 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?; 2) During the past 12 months, did you ever seriously consider attempting suicide?; 3) During the past 12 months, did you make a plan about how you would attempt suicide?; and 4) During the past 12 months, how many times did you actually attempt suicide? The fourth question had five response options but was treated dichotomously in this paper for analysis purposes. If the participant responded that they attempted suicide "0 times" then they were categorized as "did not attempt suicide". If the participant responded they had attempted suicide one or more times then they were categorized as "attempted suicide".

Throughout the remainder of this paper, when referring to these four variables collectively, we will use the term suicide risk factors. There was an additional suicide question on the 2009 and 2011 surveys, which read "If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?" Due to the rare nature of this event and statistical imprecision produced when stratified by cross-tabulation procedures, this variable was excluded from analysis.

Four questions were used to identify students who experienced victimization: 1) During the past 12 months, have you ever been bullied on school property?; 2) During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?; 3) During the past 12 months, did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?; and 4) Have you ever been physically forced to have sexual intercourse when you did not want to? The following definition for bullying was given in the survey: Bullying is when one or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not bullying when two students of about the same strength or power argue or fight or tease each other in a friendly way. These questions were then analyzed for their association with suicide risk factors measured in the YRBS. Throughout the remainder of this paper, when referring to these four variables collectively, we will refer to them as victimization indicators, experiencing victimization, or being victimized.

PROCEDURE

The statewide, randomized YRBS is conducted biennially on odd-numbered years. Two years of data, 2009 and 2011, were used for this study to achieve sufficient power for analysis. Samples were selected using a two-stage sampling design. Schools were selected for YRBS participation based on probability proportional to size (PPS), with size defined as school enrollment in grades 9-12. Then classes were selected from each school using systematic equal probability sampling with a random start. The sample was weighted to be representative of public high school students in grades 9-12 in Oklahoma based on the demographic distribution of the enrolled student population provided by the Oklahoma State Department of Education.

DATA ANALYSIS

Due to the complex survey design and weighted sample, SAS 9.2 was used to perform the analysis.[12] SAS *PROC SURVEYFREQ* was used to generate descriptive statistics and to perform bivariate analysis. SAS *PROC SURVEYLOGISTIC* was used to perform multivariable analysis. Variables were examined using percentages and 95% confidence intervals. The Chi-square test was used to test for differences in proportions. Logistic regression was used to produce adjusted odds ratios (AOR) as measures of association between selected independent variables and risk indicators. Variables were considered statistically significant at $p<0.05$. Previous studies have shown the association between alcohol and other drug abuse with increased suicide risk; therefore, lifetime alcohol or other drug use and current alcohol use was controlled for in the logistic regression model.[5,13] Lifetime alcohol or drug use was defined as during one's lifetime having ever used alcohol, heroine, methamphetamines, ecstasy, steroids, marijuana, cocaine, or the injection of illegal drugs. Current alcohol use was defined as having had at least one drink of alcohol during the 30 days before the survey. Due to the collinearity between the victimization variables, all four were controlled for when modeling on the dependent variables.

RESULTS

During the 12 months before the survey, more than one-fourth (28.4%) of all students experienced persistent sadness, 14.6% of students considered attempting suicide, 10.8% made a plan to attempt suicide, and 6.6% attempted suicide **(Table 2)**. Statistically significant differences were observed for suicide risk factors by demographic characteristics. Females were more likely than males to have experienced persistent sadness, considered attempting suicide, made a plan to attempt suicide, and attempted suicide. Statistically significant differences also were observed by grade for all four suicide risk factors. Among racial and ethnic groups, differences were observed only for having experienced persistent sadness.

During the 12 months before the survey, more than one in six students (17.1%) were bullied on school property, 5.7% had been threatened or injured by someone with a weapon on school property, and 7.1% had been hit, slapped, or physically hurt on purpose by their boyfriend or girlfriend. One in fourteen students (7.6%) had ever been forced to have sex **(Table 3)**. Statistically significant differences were observed for victimization by demographic characteristics. Females were more likely than males to have been bullied on school property, to have been threatened or injured by someone with a weapon on school property, and to have ever been forced to have sex. Differences also were observed by grade and race/ethnicity for being bullied on school property and by race/ethnicity for having been physically hurt by their partner.

Figure 1 displays the prevalence of suicide risk factors by victimization status. Among students who were bullied, threatened or injured by someone with a weapon, physically hurt by their partner, or had ever been forced to have sex, the percentage that experienced persistent sadness, considered attempting suicide, made a plan to attempt suicide, or attempted suicide was twice that of students who had not experienced victimization. For example, among students who had been bullied at school during the past 12 months, 50.1% reported persistent sadness compared with 23.8% among students who had not been bullied. All associations were statistically significant, chi-square $p<.05$.

Multivariable logistic regression analyses were used to assess

Table 2. Prevalence of Suicide Risk Factors within the Previous 12 Months by Demographic Characteristics: Oklahoma YRBS 2009 and 2011

	Experienced persistent sadness			Seriously considered attempting suicide			Made a plan to attempt suicide			Attempted suicide		
Characteristics	**Weighted %[1]**	**(SE)[2]**	**P-value**	**Weighted %**	**(SE)**	**P-value**	**Weighted %**	**(SE)**	**P-value**	**Weighted %**	**(SE)**	**P-value**
Gender												
Female	36.2	(1.9)		19.7	(1.2)		13.8	(1.2)		9.0	(0.8)	
Male	20.6	(1.4)	<.0001	9.5	(1.1)	<.0001	7.7	(0.8)	0.0002	4.2	(0.8)	0.0004
Grade												
9th	24.9	(1.5)		14.3	(1.4)		10.7	(1.1)		6.8	(1.1)	
10th	30.5	(1.8)		18.6	(1.7)		14.5	(1.2)		9.8	(1.2)	
11th	32.6	(2.2)		14.1	(1.6)		9.6	(1.2)		5.9	(1.3)	
12th	25.2	(3.2)	0.0363	10.5	(1.4)	0.0044	7.5	(1.0)	0.0006	3.6	(0.7)	0.0023
Race/Ethnicity[3]												
NH White	26.4	(1.4)		14.2	(1.0)		10.7	(0.5)		9.0	(0.5)	
NH Black	26.3	(2.4)		13.8	(2.0)		9.5	(1.7)		7.6	(2.8)	
NH Native American	34.4	(3.8)		15.1	(2.3)		9.3	(2.2)		5.8	(1.6)	
NH Multiple	32.1	(2.9)		20.8	(3.1)		17.6	(3.1)		12.0	(2.6)	
Hispanic	29.2	(2.9)	0.0258	13.5	(2.6)	0.6017	12.3	(2.6)	0.3767	10.4	(2.8)	0.2077
Total	**28.4**	**(1.2)**		**14.6**	**(0.8)**		**10.8**	**(0.5)**		**6.6**	**(0.6)**	

1 Weighted %= representative of all public school 9-12 graders

2 (SE)= Standard error of the weighted percent

3 NH=Non-Hispanic (Data for Asian and Pacific Islanders are not shown due to statistical imprecision)

the odds of suicide risk factors among students who reported being victimized while adjusting for covariates of gender, grade, race/ethnicity, and lifetime alcohol or drug use. All but one of the associations between victimization and suicide risk factors remained statistically significant in the multivariable models **(Table 4)**. Being hit, slapped, or physically hurt by your partner was not associated with having made a plan to attempt suicide, AOR 1.54 (95% CI 0.97-2.44). Nearly all of the remaining associations between victimization and suicide risk factors had AORs of 2 or more. Two associations, having been threatened or injured by someone with a weapon on school property with having made a plan to attempt suicide and having attempted suicide had AOR of 3.42 and 3.53, respectively.

Interaction was observed for suicide risk factors by gender. Females who had ever been forced to have sex were more likely than females who had not ever been forced to have sex to have experienced persistent sadness (AOR 2.88, 95% CI 1.99-4.15), considered attempting suicide (AOR 3.27, 95% CI 2.08-5.15), made a plan to attempt suicide (AOR 3.08, 95% CI 1.94-4.89), and attempted suicide (AOR 3.06, 95% CI 1.77-5.29). Other than attempting suicide, males who had ever been forced to have sex were no more likely than males who had not ever been forced to have sex to have experienced persistent sadness, considered attempting suicide, or made a plan to attempt suicide. However, this may have been due to the small numbers of males that reported ever been forced to have sex (n=49).

DISCUSSION

The results of this study indicate that experiencing violence significantly increases the likelihood of experiencing persistent sadness, suicidal ideation, and suicide attempts. Female students reported a significantly higher prevalence of both victimization and suicide risk factors than males. Cash and Bridge (2009)

Table 3. Prevalence of Victimization Indicators within the Previous 12 Months by Demographic Characteristics: Oklahoma YRBS 2009 and 2011

	Bullied on School Property			Threatened or injured by someone with a weapon			Hit, slapped, or physically hurt by their partner			Ever been forced to have sex		
Characteristics	**Weighted %[1]**	**(SE)[2]**	**P-value**	**Weighted %**	**(SE)**	**P-value**	**Weighted %**	**(SE)**	**P-value**	**Weighted %**	**(SE)**	**P-value**
Gender												
Female	19.6	(1.3)		4.1	(.08)		6.7	(0.7)		11.7	(1.1)	
Male	14.5	(1.0)	0.0036	7.2	(0.8)	0.0321	7.4	(0.6)	0.5767	3.6	(0.6)	<.0001
Grade												
9th	22.1	(1.8)		6.2	(1.2)		6.4	(1.0)		5.4	(0.9)	
10th	15.2	(1.8)		5.9	(1.0)		7.0	(0.9)		8.1	(1.2)	
11th	16.2	(1.3)		5.7	(0.9)		7.2	(1.3)		7.3	(1.3)	
12th	13.8	(1.6)	0.0028	4.6	(1.1)	0.7946	7.8	(1.7)	0.9282	10.1	(1.6)	0.0523
Race/Ethnicity[2]												
NH White	17.9	(1.1)		5.0	(0.6)		6.6	(0.6)		8.0	(0.8)	
NH Black	10.5	(2.1)		9.1	(1.9)		10.2	(1.3)		10.3	(2.0)	
NH Native American	17.6	(1.9)		5.3	(1.8)		5.4	(0.9)		4.5	(1.4)	
NH Multiple	24.0	(3.2)		8.8	(2.0)		9.9	(1.9)		10.5	(2.1)	
Hispanic	13.8	(2.2)	0.0113	5.4	(1.5)	0.2613	10.3	(2.2)	0.0131	7.4	(1.7)	0.2077
Total	**17.1**	**(0.8)**		**5.7**	**(0.4)**		**7.1**	**(0.4)**		**7.6**	**(0.7)**	

1 Weighted %= representative of all public school 9-12 graders

2 (SE)= Standard error of the weighted percent

3 NH=Non-Hispanic (Data for Asian and Pacific Islanders are not shown due to statistical imprecision)

Figure 1. Prevalence of Suicide Risk Factors by Victimization Status: Oklahoma YRBS 2009 and 2011

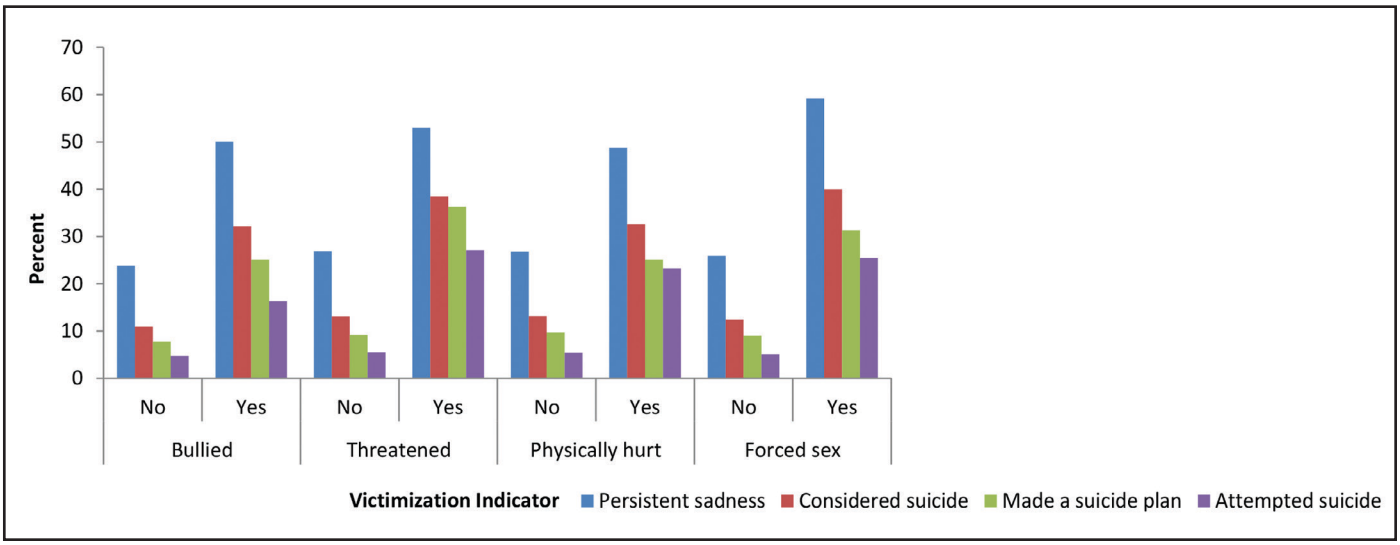

Table 4. Adjusted Odds Ratios (AOR)[1] and 95% Confidence Intervals (95% CI) for the Association of Victimization with Suicide Risk Factors: Oklahoma YRBS 2009 and 2011

	Experienced persistent sadness[2]	Seriously considered attempting suicide[2]	Made a plan to attempt suicide[2]	Attempted suicide[2]
	AOR (95%CI)	**AOR (95%CI)**	**AOR (95%CI)**	**AOR (95%CI)**
Bullied on school property[2]				
No	1.00	1.00	1.00	1.00
Yes	2.64 (2.07-3.36)	2.72 (2.08-3.55)	2.66 (1.79-3.95)	2.46 (1.69-5.59)
Threatened or injured by someone with a weapon on school property[2]				
No	1.00	1.00	1.00	1.00
Yes	1.98 (1.39-2.81)	2.57 (1.56-4.23)	3.42 (2.26-5.16)	3.53 (2.00-6.22)
Hit, slapped, or physically hurt by parnter[2]				
No	1.00	1.00	1.00	1.00
Yes	1.58 (1.09-2.27)	1.76 (1.15-2.68)	1.54 (0.97-2.44)	2.73 (1.63-4.55)
Ever been forced to have sex				
No	1.00	1.00	1.00	1.00
Yes	2.52 (1.82-3.48)	2.55 (1.81-3.61)	2.43 (1.54-3.83)	2.94 (2.04-4.22)
Interaction by Gender				
Males who have ever been forced to have sex	2.04 (0.82-5.06)	1.33 (0.54-3.23)	1.71 (0.63-4.63)	2.87 (1.18-6.98)
Females who have ever been forced to have sex	2.88 (1.99-4.15)	3.27 (2.08-5.15)	3.08 (1.94-4.89)	3.06 (1.77-5.29)

1 Multivariable logistic regression adjusting for gender, grade, race/ethnicity, and alcohol or other drug use.

2 During the 12 months before the survey

also noted this association for females.[14] However, despite females reporting higher suicide risk factors; males have higher rates of completed suicide than females.[1] This may be accounted for by females being more likely to report victimization and to discuss their feelings relating to victimization or depression. Furthermore, while females report more suicide attempts overall, they tend to use less lethal means of suicide than males, creating a greater probability of surviving their attempt.[13]

LIMITATIONS

The YRBS is a cross-sectional study; therefore, the measured associations reflect only a snapshot in time and do not imply a causal relationship. These data were representative of public school students in grades 9-12 in Oklahoma. Adolescents who attended private institutions, were home-schooled, or did not attend any school were not represented in this study.

There is potential underreporting of risk behaviors by students participating in the YRBS. Despite efforts to conduct the YRBS in such a manner as to preserve confidentiality, some students may not report events if they feel the answers will in some way identify them. Since victimization and depression are often sensitive topics, some students may not report as a result. Victims of dating violence or rape also may not report these incidents because of fear of causing problems for their partner, concern for their safety or the safety of their friends and family, or fear of stigmatization. Furthermore, students interpret the questions and form their answers without any

external assistance; students may have different interpretations of the YRBS questions.

CONCLUSIONS

Numerous recent studies have sought to explore risk and protective factors for youth. The results of this study indicate that experiencing victimization significantly increases the likelihood of experiencing persistent sadness, considering attempting suicide, making a plan to attempt suicide, and attempting suicide. After controlling for grade, gender, race/ethnicity, and alcohol or other drug use, students who reported being a victim of violence displayed at least twice the odds of suicide risk factors as students who did not report victimization. Other studies also have found an association between problems at school and youth suicide.[15] The trauma of experiencing physical or sexual violence may contribute to increased risk of mental illness leading to suicidal ideation and suicidal attempts.[16]

In this study, female students reported a significantly higher prevalence than males for all four suicide risk factors and two of the four victimization indicators. Cash and Bridge (2009) also noted this association for females and other studies have found differences by gender for suicide attempts and completed suicides.[14,17,18] While many analyses, including this study, show similar rates of experiencing dating violence, more in-depth studies found that females experience more severe violence in dating relationships, including sexual violence and physical injury, than males.[19,20]

As noted in **Figure 1**, among students who did not experience victimization, approximately one in four experienced persistent sadness, one in ten considered attempting suicide, one in twelve made suicidal plans, and one in twenty attempted suicide. While students experiencing any category of victimization demonstrated significantly increased likelihood of suicide risk factors, students who did not experience victimization also exhibited suicide risk factors, indicating that prevention strategies aimed at the entire student population could prove beneficial.

IMPLICATIONS FOR PHYSICIANS WORKING WITH CHILDREN AND ADOLESCENTS

There is growing awareness that increasing numbers of children and adolescents are exposed to traumatic events and have experiences that may negatively impact their functioning. The National Institute of Mental Health defines childhood trauma as, "Emotionally painful or distressful childhood experience(s) which result in mental and physical sequalae". The impact of trauma in childhood manifests throughout the entire life course as demonstrated by the Adverse Childhood Experiences (ACE) study published in the American Journal of Preventive Medicine in 1998. It is not just the stress or stressors, but the individual's physiologic response or reactivity to those stressors that counts.

The goal of pediatric providers should be to ensure that children, adolescents, and families who experience trauma have access to quality treatment and support through assessment for traumatic responses, education about handling normal reactions, and referrals to address the more severe symptoms of traumatic exposure. The National Center for Trauma Informed Care suggests trauma informed practices be developed based on an understanding of the vulnerabilities of trauma survivors that traditional service deliver approaches may not recognize and to provide services that are supportive while avoiding re-traumatization. Trauma informed pediatric practice ensures appropriate response to victimized children, adolescents, and families in a safe and secure space. Medical home principles can be applied to children and adolescents exposed to trauma by:

- Identifying the population through screening or surveillance and following up on them
- Assessing the family and patient strengths, resiliencies, and needs for specific services
- Making referrals
- Providing self-management tools
- Following up on referrals and closing any communication gaps

With an increased awareness of events that may cause trauma and recognition of the common symptoms of trauma, pediatricians can more effectively assess children and adolescents presenting with a range of social, emotional, and behavioral issues. Resources from the National Child Traumatic Stress Network can help pediatricians offer valuable guidance to families on ways to cope with their children's traumatic responses, support healing, and access additional care if necessary.

HUMAN SUBJECTS APPROVAL STATEMENT

This study was approved by the Oklahoma State Department of Health Institutional Review Board.

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