# Connecticut
# Youth Suicide Prevention Initiative
# Local Evaluation

# Final Report

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## *Introduction*

### *Overview*

The local evaluation conducted by the Institute for Public Health Research at the University of Connecticut Health Center (UCHC) examined the following components of the Connecticut Youth Suicide Prevention Initiative funded under the Garrett Lee Smith Act:

A) **Middle school program**: A pilot program involving depression screening, brief treatment and referral for middle school students was implemented at the Pediatric Outpatient Clinic at St. Francis Hospital and the school-based health clinics at Quirk Middle School and Hartford Public High School in Hartford, Connecticut. The middle school program compared the feasibility and efficacy of providing mental health services through the school-based clinics relative to services provided at St. Francis Outpatient Clinic.

B) **High school program**: An evaluation of the High School SOS suicide prevention program implemented in the 17 Technical High Schools and the comprehensive Trumbull High School and affiliated vocational Regional Agriscience & Biotechnology Center.

C) **College programs:** The College Response Suicide Prevention program developed by Screening for Mental Health (SMH) was implemented at the 4 Connecticut State University (CSU) campuses. The program includes the College SOS program and both in-person and online screening for depression through National Depression Screening Day. In addition, at least one mental health professional on each CSU campus completed the Question Persuade Refer (QPR) training program, and then QPR was offered to all staff and faculty at the 4 CSU campuses.

D) **High risk youth programs:** The Applied Suicide Intervention Skills Training (ASIST) gatekeeper training was provided to professionals who work with high-risk populations: juvenile justice employees, school nurses, workers in the Department of Children and Families, and foster parents.

In addition to the UCHC designed local evaluation of these initiatives, the UCHC team has developed methods to assist with the data collection for the ORC-Macro International cross-site evaluation project involving all SAMHSA Smith grantees.

## *Background*

### *Mental Health Needs and Suicide Risk Factors for Youth in Connecticut*

Connecticut has a mixed record with respect to mental health status, suicide risk, and the provision of mental health services. In 2009, a National Alliance for the Mentally Ill (NAMI) report indicated that there were 108,730 citizens with serious mental illness living in Connecticut out of a total population of approximately 3.5 million. The agency gave the state their highest rating for provision of services to the mentally ill, an overall letter grade of "B" with sub-score grades of "B" for Health Promotion and Measurement, "B" for Financing and Core

Treatment/Recovery Services, "A" for Consumer and Family Empowerment, and "C" for Social Inclusion (http://www.nami.org/gtstemplate09.cfm?section=State_by_State09 accessed June 25, 2009).

However, statewide task forces have identified Connecticut youth as a group of particular concern related to mental health risk. In 2005, a statewide suicide prevention plan published by the Department of Public Health (DPH), recommended increased focus on early mental illness prevention, intervention for mental health concerns, and expanded school-based services. This report also underscored the need for access to behavioral healthcare in a timely manner. DPH further included recommendations that colleges and universities develop and implement clear action plans to support students with mental health concerns.

Recently there has been a good deal of criticism of the adequacy of behavioral health services provided to youth in the state, prompted in part by data showing a steady increase in visits to Emergency Departments throughout Connecticut by children and youth in psychiatric crisis from 2000-2005 (Geballe, 2000; Waldman, 2007). A report to the Attorney General in 2007 indicated that Connecticut's children may be losing access to mental health care (Blumenthal & Milstein, 2007). In order to address this trend, Connecticut identified cross-agency work as the top challenge to delivering mental health services to youth in the state (Cooper, et al. 2008).

### *Data on Suicidal Behavior among Connecticut Youth*

In the past decade, only three years of Youth Risk Behavior Survey (YRBS) administration have included large enough samples for the CDC to break out Connecticut specific data. As a result, YRBS data for Connecticut are limited to the years 1997, 2005 and 2007. These data suggest that 9$^{th}$ grade students are at considerable risk for suicide attempt with 9-12% reporting a recent attempt (see Table A1). There also appears to be a growing trend of increased risk among youth in grade 12 suggesting that the transition years into and out of high school are a time of particularly high risk for youth in the state. Given the high graduation rate in Connecticut, reportedly 92% in 2007 (http://www.csde.state.ct.us/public/cedar/cedar/grads/grad_rate_2002_07.htm accessed June 20, 2009), the vast majority of youth in the state are still in school until age 18 and have an opportunity to benefit from suicide prevention education in high school.

Table A2 presents self-inflicted injury rates by age and race/ethnicity. Overall, youth aged 15-19 had the highest rate of self-inflicted injury and young adults between the ages of 20-24 had the second highest rates of emergency department visits for self-inflicted injuries (Backus & Mueller, 2007). Overall, Hispanics had the highest rates (67.7/100K) of self-inflicted injury whereas Connecticut's Black (40.4/100K) and White (39.3/100K) populations had similar rates of self-injury (See Table A2). It is not possible to infer whether the self-harm that led to these

***Table A1: Percentage of Self-reported suicide attempts by youth in Connecticut: 1997-2007****

| | 1997 | 2005 | 2007 |
|---|---|---|---|
| Grade 9 | 10.9 | 13.3 | 10.0 |
| Grade 10 | 9.2 | 10.7 | 7.2 |
| Grade 11 | 8.9 | 10.6 | 8.3 |
| Grade 12 | 6.3 | 12.8 | 11.4 |
| Total | 9.1 | 12.1 | 9.8 |

*in CDC YRBS 2008

emergency department visits were suicide attempts; however, important work around harm reduction is clearly indicated for this population.

***Table A2: Self-inflicted Injury ED Visits by Age & Race/Ethnicity, CT Residents, 2005 – 2007 (CT Dept. of Public Health)***

| Age Group | White Non-Hispanic | Black Non-Hispanic | Asian Pacific Islander Non-Hispanic | Hispanic | Total |
|---|---|---|---|---|---|
| 0-4 | 1.2 | 2.5 | 0.0 | 0.0 | 1.9 |
| 5-9 | 1.6 | 1.2 | 0.0 | 0.0 | 1.4 |
| 10-14 | 39.9 | 36.4 | 0.0 | 55.6 | 47.2 |
| 15-19 | 140.9 | 108.7 | 31.3 | 180.4 | 162.1 |
| 20-24 | 116.9 | 68.8 | 44.8 | 164.7 | 127.8 |

The Centers for Disease Control reported that suicide in the state of Connecticut was the third leading cause of death for young people ages 10-14 and for youth ages 15-24 between 2000 and 2006. These statewide statistics are consistent with national trends (CDC, 2009). Per the Office of the Chief Medical Examiner, there have been 370 deaths by suicide among youth and young adults in the decade between 1998 and 2008. Although young women accounted for more of the self-reported attempts and deliberate self-injury seen in hospital based Emergency Departments, in the past decade males accounted for the majority of deaths by suicide among Connecticut youth.

The most common method of suicide among young people under age 18 in Connecticut is hanging/strangulation which makes Connecticut unique among New England states (personal communication with Faith Vos Winkle, Office of the Child Advocate, August 4, 2009) (see Table A3). This method is particularly difficult to address because means restriction efforts are almost impossible without constant observation of imminently suicidal youth.

***Table A3: Youth Method of Death by Suicide in Connecticut: 2001-2008***
**(Office of the Child Advocate 2009)**

| Year | Hanging/ Strangulation | Gunshot | Overdose | Other |
|---|---|---|---|---|
| 2001 | 11 | 4 | 0 | 0 |
| 2002 | 1 | 1 | 3 | 2 |
| 2003 | 3 | 0 | 1 | 0 |
| 2004 | 8 | 1 | 0 | 0 |
| 2005 | 6 | 2 | 1 | 1 |
| 2006 | 9 | 2 | 0 | 0 |
| 2007 | 1 | 0 | 1 | 0 |
| 2008 | 10 | 0 | 0 | 0 |
| Totals | 49 | 10 | 6 | 3 |

### *Connecticut's Statewide Youth Suicide Prevention Efforts*

Connecticut has made youth suicide prevention a priority since the 1980's. The Connecticut Youth Suicide Advisory Board (YSAB) was established within the Connecticut Department of Children and Families as a result of a legislative mandate in 1989. This interagency board meets regularly to monitor trends, address needs and make recommendations to address youth suicide within the state. A subcommittee of the YSAB, the Connecticut Youth Suicide Prevention Initiative (CYSPI), provides oversight for the state's Garrett Lee Smith grant.

There are several state statutes that address universal suicide prevention strategies. The Connecticut State Department of Education requires that each high school include suicide prevention education as part of the health curriculum: (a) In the public schools the program of instruction offered shall include at least the following subject matter, as taught by legally qualified teachers, the arts; career education; consumer education; health and safety, including, but not limited to, human growth and development, nutrition, first aid, disease prevention, community and consumer health, physical, ***mental and emotional health, including youth suicide prevention***, substance abuse prevention, safety, which may include the dangers of gang membership, and accident prevention (Sec 10-16b). Other sections of Connecticut General Law direct mental health professionals to facilitate screening and early detection of mental illness (Sec. 10-76). As a result of these initiatives and a growing awareness of youth suicide risk, Connecticut youth have a number of supports available to them if they are in fact suicidal. The United Way of Connecticut operates a "211" 24 hour hotline that is part of the national Suicide Prevention Lifeline crisis response network. There was a notable increase in calls to the suicide prevention hotline for youth and young adults between the ages of 10 and 24 in 2006 and 2007, which may be indicative of a greater awareness of the hotline as a resource and of successful educational initiatives designed to encourage youth in need of mental health assistance to seek help from appropriate sources. Other statewide services include Emergency Mobile Psychiatric Services for children and youth throughout the state via regional offices contracted with the Department of Children and Families (DCF). These mobile crisis teams provide assessment, crisis response and stabilization to youth in schools and in the community with a range of mental health concerns.

## EVALUATION RESULTS: MIDDLE SCHOOL PILOT PROGRAM

### *Background*

Addressing depression symptoms in middle school is an essential component to a comprehensive youth suicide prevention strategy. Several studies have shown that middle school youth who have experienced symptoms of major depression are at risk for a number of serious problems in later adolescence and young adulthood, including substance abuse (Deykin, Levy, & Wells, 1987; Kelder et al., 2001) and risky sexual behaviors (Lehrer, Shrier, Gortmaker & Buka, 2006). Depression screening is particularly appropriate for Connecticut youth that utilize the services of urban pediatric clinics and school-based health clinics (Dubowitz et al., 2007; Horowitz, Ballard, and Pao, 2009). A national survey of school-based health clinics during the 2002-2003 school year indicated that between 12-31% of middle school-based health clinics reported that depression and grief reactions were among the top three problems that are addressed by school-based mental health staff (Teich, Robinson & Weist, 2007). Per a 2006 report to the Connecticut Commissioner of Public Health, as well as the 2006-2007 Annual Report of Connecticut School-based Health Clinics (DPH, 2009), slightly more than 20,000 students received services annually at school-based clinics in the State. Approximately one third of the visits to School-based Health Clinics statewide during the 2004-2005 school year and the 2006-2007 school year were for mental health concerns. This number exceeds previously published research regarding the proportion of youth utilizing school-based health clinics primarily for mental health concerns (Flaherty & Weist, 1999). The DPH (2009) report further reveals that the highest utilization of mental health services during the 2006-2007 school year occurred in 7-8$^{th}$ grade for boys and in grades 8-10 for girls.

In response to these findings, annual depression screening has been recommended as part of the standard of care for all "well child" visits and annual physicals by The American Academy of Pediatrics and the Society of Adolescent Medicine. It has also been identified as a priority issue for the state of Connecticut in the Department of Public Health's *Adolescent Health Strategic Plan* (2005). We sought to incorporate this prevention strategy into CYSPI by conducting a pilot program involving depression screening, brief treatment and referral for middle school students was implemented at the Pediatric Outpatient Clinic at St. Francis Hospital and the school-based health clinics at Quirk Middle School and Hartford Public High School in Hartford, Connecticut. The middle school pilot program compared the feasibility and efficacy of providing mental health services through the school-based clinic relative to services provided at St. Francis Outpatient Clinic.

### *Methods*

Table B1 presents demographic information for the target populations. Quirk Middle School enrolled 575 7$^{th}$ and 8$^{th}$ grade students during the 2007-2008 school year and 583 during the 2008-2009 school year. The Strategic School Profile provided by the State Department of Education (2007-2008) indicates that the student racial/ethnic composition of Quirk Middle School was 1% white, 78% Hispanic, 20% Black and 1% other. The majority of these students (73%) came from homes where English was not the primary language and 39% were identified as needing ESL services. Hartford High School had a predominately Black and Hispanic student population, with a higher proportion of Blacks (29%) and a lower proportion of Hispanics (68%)

than Quirk and slightly more whites (2%) and Asians (2%). Almost all of the students (95%) qualified for free or reduced price meals.

***Table B1. Demographic characteristics of youth at the School-based Health Clinics and Hospital Based Pediatric Clinic in 2007-2008***

| | *St. Francis* | | *Quirk Middle School* | | *Hartford Public High School* | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | **%** |
| Eligible for free/reduced price lunch | | | | | n/a | >95% |
| State Medicaid eligible (HUSKY) | 90% | | | | | |
| Race: | 80% minority | | | | | |
| Asian | | | 5 | 0.9 | 26 | 1.7 |
| African American/Black | | | 112 | 19.5 | 449 | 28.6 |
| Hispanic | | | 449 | 78.1 | 1,059 | 67.5 |
| White | | | 7 | 1.2 | 30 | 1.9 |
| American Indian | | | 2 | 0.3 | 5 | 0.3 |

Consent language allowing mental health screening was incorporated in the standard forms that parents and guardians signed giving their children permission to use the school-based health clinic. Consent to participate in the research project was obtained using St. Francis IRB-approved consent forms. For the 2008-2009 school year, the intention was for the consent forms for the study to be stapled to the permission slips required to use the school-based clinic. As of November, 2008, the consent forms for the study were sent home to the families of students at Quirk and Hartford HS with all new consents to use the school-based clinic. In addition, the Hartford school-based clinics added an incentive, starting in December 2008, whereby youth who returned the research consent form received a gift card to a local store.

For the purposes of the research project, all youth were screened with the Reynolds Adolescent Depression Scale-2 (RADS-2). This instrument was selected by the research staff at St. Francis and has a reported sensitivity of .78-1.0 and specificity of .90 (Levitt, Saka, Romanelli & Hoagwood, 2008; Reynolds & Mazza, 1998). Additional assessments included: the student rating scales of the BRP (Brown & Hammill, 1983) which assesses home, peer and school relationships, and a coping subscale from the Oregon Youth Authority (OYA) Questionnaire chosen for ongoing monitoring of student functioning.

Participating youth were evaluated by a clinical interview following the screening. When appropriate, youth who met screening criteria and/or were assessed by a clinician to be at-risk were offered brief psychological services by mental health clinicians employed at each site or referred to other community mental health agencies. Youth seen at the outpatient clinic or school-based clinics were then reassessed after 6-8 sessions and were either referred on to community based services or their cases were closed. The research plan called for all youth who received treatment to be followed at 3 months. Youth in the study were to be reassessed at 6, 12, 18 and 24 months with the aforementioned screening tools.

For the 2008-2009 school year, a bilingual (Spanish-English) mental health clinician working at Hartford HS was added to the research team in September of 2008 with the expectation that she would follow up with youth who had been recruited while in 8$^{th}$ grade at Quirk Middle

School and would attend high school at Hartford HS. In addition, 9th grade students making the transition from middle school were recruited as part of the pilot project. Targeting the 9th grade is consistent with research regarding increased risk for youth in grade 9 (Hacker et al. 2006) as well as Connecticut specific YRBS data (see Table A1). There were 20 8th graders who were planning to attend Hartford HS at the end of the 2007-2008 school year; however only 6 enrolled at Hartford HS as of September 2008. Some of the youth left the district; others went to magnet schools or other high schools and have been lost to follow up.

In cooperation with clinical staff from St. Francis and Quirk, UCHC research staff developed a web-based program that enabled the mental health clinicians at each site to administer all three screening tools on computers in the clinic. Clinicians at all three sites tracked youths by major clinical concerns, screening outcome and follow-up using this database, which was housed at UCHC. To provide security for the online data management tool, each site was granted password protected access to the website for research staff. In addition, Quirk and St. Francis clinical staff were provided a key to track enrolled subjects using a study identification number which was housed at each site. The UCHC Staff were blind to the identities of enrolled participants. The keys were the only link between the internet-based data and the identifying participant information. A built-in failsafe identifier utilizing an acrostic (first two letters of the first name and last name and day of birth) alerted study staff at each site to any apparent duplication of enrollment. The study keys enabled the staff members to reconcile any potential duplicates. Data entry was more consistent in the second year of collection and improvements were made in tracking appointments and referrals.

For the purposes of the ORC-Macro International cross site evaluation, the EIRF required questions were also part of the electronic record and were uploaded by UCHC staff to the ORC-Macro website on a quarterly basis. In addition, St. Francis staff entered monthly screening data reports directly to the ORC Macro International web site.

There were significant changes to the initial protocol. Initially, only screened positive youth were to be entered into the system, but the research team elected to enter all consented youth into the database, independent of their RADS-2 scores. As a result there are a large number of consented youth who are not at-risk in the online system. This resulted in some questions about the tracking data on the EIRF as the majority of these youth did not require further services. The ORC macro site did not permit data entry of youth who were receiving services but did not have active parental permission to participate in the study.

***Results***

Participating sites reported that a total of 806 youth were screened with the RADS-2 during the2007-2008 and 2008-2009 school years. Table B2 presents the number of these screens reported by each site. From this group, youth were recruited and consented to be part of the pilot program and current evaluation. Only data from the subset of consented youth were included in the analysis presented below.

***Table B2: Number of Screened and Consented Youth***

| | St Francis Hosp.Clinic grade 7-9 | Quirk MS SBHC grade 7-8 | Hartford HS SBHC grade 9 | Totals |
|---|---|---|---|---|
| Total Screens* | 282 | 404 | 120 | 806 |
| # positive at risk* | 44 | 63 | 10 | 117 |
| # consented | 237 | 141 | 10 | 388 |
| # at risk by RADS-2 with consent | 15 | 48 | 6 | 69 |
| # at risk by clinical judgment with consent | 15 | 11 | 2 | 28 |

*Source: St. Francis Final Report

Table B3 presents the demographic characteristics of consented students screened at St. Francis and the school sites who had valid RADS-2 data. The demographic profiles of participants differed by site. Youth screened at St. Francis were slightly more likely to be female (51%) than male (49%). The majority were Hispanic (54%) and Black (38%), with only 2% white; the average age was 14 ½. At the school sites, almost 2/3 of the youth screened were female (64%) and the proportion that were Hispanic (76%) was even greater than at the St. Francis site. About 19% were Black and 1% were white. The average age was 13.

***Table B3. Demographic characteristics of consented youth with valid RADS-2 data screened at the School-based Health Clinics and Hospital Based Pediatric Clinic***

| **Variable** | **St. Francis Sites (n=237)** | **School Sites (n=151)** |
|---|---|---|
| Gender: | | |
| Male | 116 (48.9%) | 54 (35.8%) |
| Female | 121 (51.1%) | 97 (64.2%) |
| Depressed by RADS | 15 (6.3%) | 54 (35.8%) |
| Mean Age at first Screen | 14.6 (1.6) | 13.2 (0.95) |
| Race: | | |
| Hispanic | 128 (54.0%) | 114 (75.5%) |
| Black | 91 (38.4%) | 28 (18.5%) |
| White | 5 (2.1%) | 2 (1.3%) |
| Other | 13 (5.5%) | 7 (4.6%) |

Table B4 presents RADS-2 scores for screened students at baseline and at each of the follow-up assessments. Baseline RADS-2 scores were obtained from 388 students at all sites. The mean score was 55 with a standard deviation of about 17. Of these screened students, 69 screened positive on the RADS-2 with either a RADS-2 score of 77 or above, or an endorsement of self-injury. Sixty-nine of the 388 screened students met the screening criteria; of these, 15 were from St. Francis (6% of the total screened) and 54 were from the school sites (36% of the total screened). These students had a mean RADS-2 score of 82 with a standard deviation of 10.

Table B5 presents the breakdown of criteria used to classify the students as at-risk. Of the 15 students who screened positive by the RADS-2 at St. Francis, 6 screened positive with a RADS-2 score of 77 or higher, 5 screened positive because they acknowledged self-injury, and 4 met both criteria. Of the 54 students who screened positive on the RADS-2 at the school sites, 18 screened positive with a RADS-2 score of 77 or higher, 12 screened positive because they acknowledged self-injury, and 24 met both criteria. In addition to the students who screened positive by RADS-2 criteria, clinical judgment was employed to include 28 additional students in the at-risk group; 15 of these were from St. Francis and 13 from the school sites (see Table B5). Thus, as illustrated in Table B4, 97 students from both sites were deemed at risk at baseline and these students had a mean RADS-2 score of 75 (SD=14). By site, the average among at-risk students was 70 (SD=19) at St. Francis and 78 (SD=12) at the school sites.

Table B4 also presents the RADS-2 means and standard deviations of at-risk students at the 6, 12, 18 and 24 month follow-up assessments for all students with valid data at those timepoints.

***Table B4: RADS-2 Means and Standard Deviations for consented students***

| Assessment time | Number | Mean | SD |
|---|---|---|---|
| Total | | | |
| Baseline (all) | 388 | 55.0 | 16.5 |
| Baseline (at risk by RADS-2 and self-injury) | 69 | 81.5 | 10.2 |
| Baseline (at risk by RADS-2 and self-injury and clinical judgment) | 97 | 75.3 | 14.2 |
| 6 month (all) | 40 | 70.2 | 16.8 |
| 12 month (all) | 27 | 60.3 | 15.0 |
| 18 month (all) | 8 | 60.6 | 19.0 |
| 24 month (all) | 2 | 32.0 | 5.7 |
| St. Francis (n=237) | | | |
| Baseline (all) | 237 | 49.8 | 13.2 |
| Baseline (at risk by RADS-2 and self-injury) | 15 | 82.4 | 8.2 |
| Baseline (at risk by RADS-2 and self-injury and clinical judgment) | 30 | 69.3 | 16.4 |
| 6 month (all) | 10 | 69.7 | 18.6 |
| 12 month (all) | 8 | 59.0 | 20.8 |
| 18 month (all) | 5 | 72.8 | 9.2 |
| 24 month (all) | 2 | 32.0 | 5.7 |
| School sites (n=151) | | | |
| Baseline (all) | 151 | 63.0 | 17.9 |
| Baseline (at risk by RADS-2 and self-injury) | 54 | 81.2 | 10.7 |

| ***Table B4: RADS-2 Means and Standard Deviations for consented students*** | | | |
|---|---|---|---|
| Assessment time | Number | Mean | SD |
| Baseline (at risk by RADS-2 and self-injury and clinical judgment) | 67 | 78.0 | 12.3 |
| 6 month (all) | 30 | 70.4 | 16.5 |
| 12 month (all) | 19 | 60.8 | 12.4 |
| 18 month (all) | 3 | 40.3 | 10.4 |
| 24 month (all) | 0 | | |

| ***Table B5: Risk status at baseline*** | | |
|---|---|---|
| Variable | St. Francis Sites (n=237) | School sites—Quirk (n=151) |
| At risk per RADS-2 only | 6 | 18 |
| At risk per self-injury only | 5 | 12 |
| At risk per both | 4 | 24 |
| At risk per clinical judgment | 15 | 13 |
| Not at risk | 207 | 84 |

The original middle school protocol called for rescreening enrolled at-risk youth at 6, 12 and 18 months. Overall rescreening rates were quite low (see Table B4). Less than half (41%) of the total enrolled participants were rescreened at the 6 month follow up; this included 33% of the St. Francis participants and 45% of those at the school sites. About 28% were rescreened at 12 months; this rate was identical at both sites. RADS-2 rescreening rates varied significantly by site. At the 18 and 24 month screenings, there were 5 or fewer rescreened participants at each site.

Mean RADS-2 scores for all rescreened participants are presented in Table B4. Except for a spike at St. Francis at 18 months, average scores fell over time to about 70 at 6 months and about 60 at 12 months. The standard deviations were fairly large, however, indicating that there was substantial variation in follow-up RADS-2 scores, with some students remaining depressed.

Table B6 presents RADS-2 scores for the same participants at baseline and follow-up to demonstrate the trajectory of the mean RADS-2 scores. Forty participants were rescreened at 6 months, 27 at 12 months, and 11 at 6 and 12 months. In each case, RADS-2 scores decreased over time. Again, standard deviations were fairly large, indicating wide variability in individual scores. At 6 months, the mean was 6 points lower than at baseline. This difference approached but did not achieve statistical significance at the .05 level ($p < .10$). At 12 months, the mean was 16 points lower than at baseline. This difference is statistically significant, $p < .001$. Finally, for those students with scores at all 3 assessments, the mean RADS-2 scores decreased by 7 points at 6 months; this difference was not significant. However, by 12 months, the mean had decreased by almost 18 points and this difference was statistically significant, $p < .05$.

***Table B6: RADS-2 Means and Standard Deviations for subsets of children who have follow-up information***

| Assessment time | In Baseline and 6 months (n=40) | In Baseline and 12 month (n=27) | In Baseline, 6 month and 12 month (n=11) |
|---|---|---|---|
| Total | Mean (SD) | Mean (SD) | Mean (SD) |
| Baseline | 76.3 (14.4) | 76.3 (14.1) | 79.8 (13.7) |
| 6 month | 70.2 (16.8)+ | --- | 72.5 (20.0) |
| 12 month | --- | 60.3 (15.0)* | 62.0 (18.7)* |

*p < .05; +p < .10 (compared to baseline)

Table B7 presents a summary of the services provided by St. Francis outpatient clinic and Quirk SBHC. A number of students identified at risk by the screening were already seeing mental health professionals; others were in need of long term or more intensive services and were referred immediately to community mental health service providers. The majority of youth identified at risk were seen by mental health professionals at the Quirk Middle or Hartford HS SBHCs and the St. Francis outpatient pediatric clinic. Appointment data is available only for the Quirk and St. Francis sites.

Table B7 demonstrates that students at the Middle School-based health clinic were offered about 3 times as many appointments and kept almost all of the appointments offered. Although the brief treatment model was to offer services for 4-6 sessions, the average number of clinical appointments was more than double that target at the Quirk SBHC.

***Table B7: Services Provided to Middle School (grades 7-9) for At-Risk Youth***

| | # Youth | Average Number of Appointments Made | Range of Appointments Made | Average Number of Appoint-ments Kept | % Appoint-ments Kept |
|---|---|---|---|---|---|
| St. Francis 2007-2008 | 15 | 4.7 | 1 - 16 | 3.7 | 79% |
| St. Francis 2008-2009 | 7 | 3.4 | 1 – 9 | 2.4 | 71% |
| Quirk SBHC 2007-2008 | 12 | 16.8 | 3 - 32 | 15.6 | 93% |
| Quirk SBHC 2008-2009 | 37 | 14.1 | 1 - 34 | 13.8 | 98% |

***Summary***

The design of the middle school pilot program involved screening all students attending the following medical clinics for symptoms of depression: St. Francis pediatric outpatient clinic, Quirk Middle School-based Health Clinic (SBHC), and Hartford High SBHC. Students were screened with the Reynolds Adolescent Depression Scale-2 (RADS-2). Participating youth who met screening criteria, or were determined by a clinician to be at-risk, were offered brief psychological services on-site or referred to other community mental health agencies. Youth at St. Francis or the SBHCs were reassessed after 6-8 sessions; depending on the outcome of the assessment, the case was closed or the youth was referred to community based services. The study protocol called for follow-up assessments to be administered at 6, 12, 18 and 24 months.

Baseline RADS-2 scores were obtained for 388 students who were consented to be part of the current evaluation. Of these 237 were from the St. Francis outpatient clinic and 151 were from the SBHCs. Of the total sample, 69 screened positive by RADS-2 criteria and an additional 28 were deemed at risk by clinical judgment. The overall RADS-2 mean for this total sample was 55 (SD=16.5). Over a third of the SBHC students screened positive on the RADS-2 with a score of 77 or higher or acknowledgement of self-injury, whereas less than 10% of the students from the St. Francis outpatient clinic met these criteria. Rescreening rates were quite low; less than half of the total enrolled participants were rescreened at the 6 month follow-up. Standard deviations were quite high, indicating wide variability in outcomes over time. Among rescreened students, RADS-2 scores generally diminished over time. For students with 6 months follow-up data, the decrease in the RADS-2 mean from baseline was not statistically significant. However, for those students with 12-month follow-up data, the RADS-2 mean was significantly lower than the baseline mean.

Appointment data was obtained for St. Francis outpatient clinic and Quirk SBHC. Students at the Middle School-based health clinic were offered about 3 times as many appointments and kept almost all of the appointments offered. Although the brief treatment model was to offer services for 4-6 sessions, the average number of clinical appointments was more than double that target at the Quirk SBHC.

## HIGH SCHOOL SOS SUICIDE PREVENTION

### *Background*

To address the problem of suicide in Connecticut among high school students, 17 Connecticut high schools implemented *SOS: Signs of Suicide,* a suicide prevention program with documented efficacy (Aseltine, 2003; Aseltine & DeMartino, 2004; Aseltine, James, Schilling, & Glanovsky, 2007). These schools included the 16 Technical High Schools and the large comprehensive Trumbull High School and affiliated vocational Regional Agriscience & Biotechnology Center Magnet Program. *SOS* educates students to understand that suicide is directly related to mental illness, typically depression, and that it is not a normal reaction to stress or emotional upset (Andrews & Lewinsohn, 1992; Brent & Kolko, 1990; Jacobs, Brewer, & Klein-Benheim, 1999; Lewinsohn, Rohde, & Seeley, 1994; Velez & Cohen, 1988). This approach stands in direct contrast to other programs that seek to de-stigmatize and therefore normalize suicide by separating it from mental illness. Promoting the understanding that suicidal intent and behavior are symptoms of mental illness and are, in fact, a part of the diagnostic criteria for major depressive disorder is a crucial component of the *SOS* program.

The basic message of the program is to teach high school students to respond to the signs of suicide as a mental health emergency, much as one would react to a heart attack as a health emergency. The program focuses on teaching youths to recognize the signs of suicide and depression in themselves and others and the specific action steps needed to respond to those signs. The goal is to make the action step -- ACT -- as instinctual a response as the Heimlich maneuver and as familiar an acronym as "CPR." ACT stands for Acknowledge, Care, and Tell. First, ACKNOWLEDGE the signs of suicide that others display and take them seriously. Next,

let that person know you CARE about him or her and that you want to help. Then, TELL a responsible adult.

The *SOS* program's main teaching materials consist of a video and a discussion guide. The video includes dramatizations depicting the right and wrong ways to react to someone who is depressed and suicidal as well as interviews with real people whose lives have been touched by suicide. Schools participating in the program receive a kit of materials containing the video, discussion guide, screening forms and other educational and promotional items. They also receive the Procedure Manual that describes methods of implementing the program and discusses some of the issues involved (i.e., parental notification, anonymous versus identified screening, and referrals).

This report presents process and outcome data from an evaluation of the *SOS* program in Connecticut during the 2007-2008 and 2008-2009 school years. Specifically, this report attempts to address four basic questions: 1) Did the program affect students' knowledge and attitudes about depression and suicide, 2) Did the program affect suicidal behaviors during the 3 months following the program, 3) did the program have any adverse or negative effects on depressed or suicidal youths, and 4) was the program successful in encouraging help-seeking among depressed youth and by friends of depressed youth?

## *Methods*

The University of Connecticut Health Center's Institutional Review Board approved all procedures for this study.

### Measures and instruments

The questionnaire included items relevant to 4 specific categories of outcome: (1) self-reported suicidal ideation and suicide attempts, (2) knowledge and attitudes about depression and suicide, (3) help-seeking behavior, and (4) perception of social support from adults at school. The primary endpoint for our study was a single-item measure of self-reported suicide attempts taken from the Centers for Disease Control and Prevention's (CDC) Youth Risk Behavior Survey: "During the past 3 months, did you actually attempt suicide (yes or no)?" [4] Suicidal ideation also was assessed with a question taken from the YRBS: "During the past 3 months, did you ever seriously consider attempting suicide (yes or no)?"

The measures of knowledge and attitudes about depression and suicide were adapted from instruments previously used to evaluate school-based suicide prevention programs. Knowledge of depression and suicide was measured with 7 true/false items that reflect the central themes of the SOS program (e.g., "People who talk about suicide don't really kill themselves"; "Depression is an illness that doctors can treat"). Scores on this variable reflected the number of correct answers. The measure of attitudes toward depression and suicide was a 10-item summary scale that assessed attitudes toward suicidal people and suicidal behaviors (e.g., "If someone really wants to kill him/herself, there is not much I can do about it"; "If a friend told me he/she is thinking about committing suicide, I would keep it to myself"). Responses to these questions ranged from "strongly disagree" to "strongly agree" on a 5-point scale, with higher values indicating more adaptive attitudes about depression and suicide (Cronbach $\alpha$=.73).

Eight questions were used to assess help-seeking behavior. Students were asked whether in the past 3 months, " . . . you received treatment from a psychiatrist, psychologist, or social worker because you were feeling depressed or suicidal (yes or no)"; whether ". . . you talked to some other person (parent or guardian, brother or sister, teacher or guidance counselor, other adult, friend, crisis or telephone hotline worker) because you were feeling depressed or suicidal" ("yes" or "no" for each type of person); and whether ". . . you talked to an adult about a friend you thought was feeling depressed or suicidal (yes or no)."

In an effort to control for assessment reactivity, three truncated versions of the pretest questionnaire, each of which included a different subset of items in the full version, were developed. Versions of the pre-test questionnaire were distributed randomly by class period. Post-test questionnaires were completed 3 months following the pretest in April through June by students in the treatment and control groups. Following post-test data collection, the program was presented to schools in the control group.

### *Participants*

Table C1 presents the schools participating in the program and year of program participation.

| ***Table C1: Technical School Cohorts for the SOS Evaluation*** | | |
|---|---|---|
| **Cohort I: Technical Schools involved in evaluation for the 2007-2008 school year** | | |
| Cheney Technical HS | 791 West Middle Turnpike | Manchester, CT 06040 |
| Ellis Technical HS | 613 Upper Maple Street | Danielson, CT 0623 |
| Goodwin Technical HS | 735 Slater Road | New Britain, CT 06053 |
| Grasso Technical HS | 189 Fort Hill Road | Groton CT 06340 |
| Norwich Technical HS | 590 New London Turnpike | Norwich, CT 06360 |
| Prince Technical HS | 401 Flatbush Avenue | Hartford, CT 06106 |
| Windham Technical HS | 210 Birch Street | Willimantic, CT 06226 |
| Wolcott Technical HS | 75 Oliver Street | Torrington, CT 06790 |
| **Cohort II: Technical Schools involved in evaluation for the 2008-2009 school year** | | |
| Abbott Technical HS | Hayestown Avenue | Danbury CT 06811 |
| Bullard Haven Technical HS | 500 Palisade Avenue | Bridgeport CT 06610 |
| Kaynor Technical HS | 43 Tompkins Street | Waterbury CT 06708 |
| O'Brien Technical HS | 141 Prindle Avenue | Ansonia, CT 06401 |
| Platt Technical HS | 600 Orange Avenue | Milford, CT 06461 |
| Vinal Technical HS | 60 Daniels Street | Middletown, CT 06457 |
| Whitney Technical HS | 71 Jones Road | Hamden, CT 06514 |
| Wilcox Technical HS | 298 Oregon Road | Meriden, CT 06451 |

Individual technical schools in Connecticut vary considerably in size and demographic composition (See Table C2). They draw from all but one Connecticut town and may have overlapping contributing school districts. The only school that was not involved in the SOS

evaluation was Wright Technical High School in Stamford Connecticut. The school was slated for closure and did not have a large enough 9th grade class to conduct the evaluation.

***Table C2: 2007-2008 School Year Strategic School Profile Demographics***

| School | Enrolled | A | B | H | W | AI | % free /reduced lunch | % ESL/ELL |
|---|---|---|---|---|---|---|---|---|
| Abbott Tech | 570 | 1.1 | 4.2 | 20.9 | 73.9 | 0 | 17.4 | 6.1 |
| Bullard Haven | 877 | .9 | 37.7 | 54.2 | 7.0 | .2 | 44.6 | 2.7 |
| Cheney Tech | 564 | 2.3 | 9.9 | 9.9 | 77.7 | .2 | 14 | 1.4 |
| Ellis Tech | 563 | 1.2 | .5 | 2.8 | 93.6 | 1.8 | 18.1 | 0 |
| Grasso Tech | 589 | 1.2 | 12.9 | 21.9 | 62.3 | 1.7 | 26.5 | 2.2 |
| Kaynor Tech | 704 | .7 | 18.2 | 30.3 | 50.3 | .6 | 32.4 | 2.1 |
| Norwich Tech | 410 | .7 | 5.1 | 8.8 | 84.1 | 1.2 | 20.5 | .5 |
| O'Brien Tech | 530 | .4 | 4.5 | 10.9 | 83.6 | .6 | 15.1 | 2.3 |
| Platt Tech | 853 | .9 | 14.0 | 19.6 | 65.3 | .4 | 20.6 | .9 |
| Prince Tech | 581 | .3 | 36.1 | 58.0 | 5.3 | .2 | 51.6 | 9.5 |
| Whitney Tech | 529 | .4 | 44.6 | 47.4 | 7.2 | .4 | 45.9 | 9.1 |
| Wilcox Tech | 695 | .3 | 6.8 | 29.4 | 62.9 | .7 | 26 | 3.5 |
| Windham Tech | 483 | 1.0 | 1.4 | 22.6 | 74.1 | .8 | 22.6 | 2.1 |
| Wolcott Tech | 720 | .8 | .8 | 1.7 | 2.2 | .4 | 13.5 | 0 |
| Trumbull HS | 2094 | 4.1 | 4.8 | 5.4 | 85.6 | 0 | 4.0 | 0 |

(Key: A=Asian, B=Black, H=Hispanic, W=White, AI= American Indian)

Table C3 presents demographic information on the schools. Differences are apparent between the demographic profile of the Technical High Schools and Trumbull. Although the majority of students are white in all schools, the percentage is much higher in Trumbull. Approximately one third of the students in the technical high schools qualify for free or reduced school lunches, compared to 4% in Trumbull. In addition, none of the Trumbull students have English as a Second Language (ESL) status, whereas the proportion at the technical schools ranges from 0% to 9.5%.

***Table C3. Demographic data for treatment and control groups***

| | Control | | Treatment | | Total | |
|---|---|---|---|---|---|---|
| | n | **%** | % | % | n | % |
| **Race/Ethnicity*** | | | | | | |
| White (non-Hispanic) | 301 | 54.2% | 469 | 64.8% | 770 | 60.2% |
| Black (non-Hispanic) | 48 | 8.6% | 30 | 4.1% | 78 | 6.1% |

| ***Table C3. Demographic data for treatment and control groups*** | | | | | | |
|---|---|---|---|---|---|---|
| | Control | | Treatment | | Total | |
| | n | **%** | % | % | n | % |
| Hispanic | 156 | 28.1% | 133 | 18.4% | 289 | 22.6% |
| Other | 4 | .7% | 21 | 2.9% | 25 | 2.0% |
| Multiethnic | 46 | 8.3% | 71 | 9.8% | 117 | 9.1% |
| **Gender*** | | | | | | |
| Male | 342 | 61.6% | 407 | 55.8% | 749 | 58.3% |
| Female | 213 | 38.4% | 322 | 44.2% | 535 | 41.7% |
| **ESL** | | | | | | |
| Yes | 57 | 10.2% | 69 | 9.5% | 126 | 9.8% |
| No | 500 | 89.8% | 658 | 90.5% | 1158 | 90.2% |
| **Free Lunch*** | | | | | | |
| Yes | 210 | 41.9% | 163 | 24.7% | 373 | 32.1% |
| No | 291 | 58.1% | 497 | 75.3% | 788 | 67.9% |
| **Grades*** | | | | | | |
| **A** | 111 | 20.2% | 207 | 28.7% | 318 | 25.0% |
| **B** | 301 | 54.8% | 380 | 52.6% | 681 | 53.6% |
| **C** | 121 | 22.0% | 105 | 14.5% | 226 | 17.8% |
| **D** | 11 | 2.0% | 25 | 3.5% | 36 | 2.8% |
| **F** | 5 | 0.9% | 5 | 0.7% | 10 | 0.8% |

The demographic profile for participants in the current study is presented in Table C3. The students were mostly male (58%) and predominantly white (60%) and Hispanic (23%). Only 6% identified themselves as non-Hispanic black. About 10% had ESL status and almost a third qualified for free lunches.

### *Procedure*

Schools were randomly assigned to treatment and control groups.y. The program was presented in schools in the treatment group from November through January; during the same period, students in the control group completed the pre-test questionnaires but did not participate in the program.

Questionnaires for this evaluation were collected before (pre-test) and after (post-test) the SOS program implementation from ninth grade students in 16 of the 17 Connecticut Technical High Schools that participated in the program during the 2007-2009 school years. The 17$^{th}$ school did not participate for administrative reasons. Eight of the technical schools and Trumbull High School completed the program in the 2007-2008 school year, and the remaining eight technical schools completed the program in the 2008-2009 school year. Prior to program presentation, all eligible students were given a permission slip (consent form) to be completed by

their parents. Only students with signed permission slips were included in the evaluation. In order to encourage the return of permission slips, each returned slip signed by the parent/guardian and child was entered in a drawing for an American Express gift card or a portable DVD player. Entry in the drawing was independent of research participation. Gift cards were distributed at the conclusion of the pretest data collection at each school. The drawing for the two DVD players occurred following the completion of the post-test data collection.

***Results***

Outcomes from the data collection process are listed in Tables C4 and C5.

***Table C4. Data collection outcomes (n=1586)***

| | ***Pre*** | | | | ***Post*** | | | |
|---|---|---|---|---|---|---|---|---|
| | 2007-2008 | | 2008-2009 | | 2007-2008 | | **2008-2009** | |
| | n | % | n | % | n | % | n | **%** |
| Valid data | 476 | 80.3 | 826 | 83.2 | 494 | 83.3 | 774 | **78.0** |
| Full version | 434 | | | | 548 | | | |
| Version 1 | 16 | | | | 98 | | | |
| Version 2 | 12 | | | | 103 | | | |
| Version 3 | 14 | | | | 64 | | | |
| Not available | 107 | 18.0 | 149 | 15.0 | 82 | 13.8 | 86 | **8.7** |
| Refused | 10 | 1.7 | 7 | 0.7 | 15 | 2.5 | 10 | **1.0** |
| Not consented | | | 11 | 1.1 | | | 12 | **1.2** |
| School withdrawn | | | | | | | 111 | **11.2** |
| Data invalidated | | | | | 2 | .3 | | |
| Total | **593** | **100%** | **993** | **100%** | **593** | **100%** | **993** | **100%** |

***Table C5. Number participating by school in pre-test and post-test***

| School | Consented | Pre-test | Post-test | Both pre- and post-test |
|---|---|---|---|---|
| Cheney | 77 | 52 | 59 | 48 |
| Ellis | 61 | 52 | 44 | 39 |
| Goodwin | 51 | 0 | 41 | 0 |
| Grasso | 16 | 15 | 11 | 7 |
| Norwich | 113 | 68 | 59 | 58 |
| Prince | 39 | 33 | 34 | 31 |
| Windham | 119 | 103 | 110 | 99 |
| Wollcott | 62 | 57 | 54 | 52 |
| Trumbull | 344 | 229 | 269 | 199 |
| Abbot | 83 | 79 | 74 | 71 |
| O'Brien | 112 | 104 | 96 | 95 |
| Vinal | 70 | 64 | 65 | 62 |
| Bullard Haven | 140 | 90 | 121 | 85 |
| Wilcox | 111 | 106 | 0 | 0 |
| Platt | 160 | 148 | 151 | 141 |
| Kaynor | 56 | 52 | 51 | 49 |

| | | | | |
|---|---|---|---|---|
| Whitney | 24 | 22 | 17 | 16 |
| Total | 1638 | 1274 | 1256 | 1052 |
| Total (tech only) | 1294 | 1045 | 987 | 853 |

During the 2007-2008 school year, parental permission slips were distributed to all ninth grade students prior to program implementation. A total of 593 students were granted parental permission to participate in the SOS evaluation. Of these, 476 completed the pretest, 10 were formally withdrawn by a parent or declined to participate, and 107 were absent or otherwise unavailable to research staff at the time of data collection. Unavailable students included those from one of the schools at which 48 students with consent never received the pretest, as the SOS program was inadvertently delivered by school staff before the pretest data could be collected. Of the 593 consented students, 494 completed the post-test, 82 were absent or otherwise unavailable to research staff at the time of data collection, 15 declined to participate, and 3 had demonstrably invalid data as determined by research staff administering the data collection.

During the 2008-2009 school year, parental permission slips were distributed to all ninth grade students prior to program implementation. A total of 982 students were granted parental permission to participate in the SOS evaluation. Of these, 826 completed the pretest, 7 were formally withdrawn by a parent or declined to participate, and 149 were absent or otherwise unavailable to research staff at the time of data collection. In addition, data for 11 students who completed the survey although they had not been consented were discarded. Of the 982 consented students, 774 completed the post-test, 86 were absent or otherwise unavailable to research staff at the time of data collection, 10 declined to participate, and 111 were withdrawn by their school at which a suicide occurred. In addition, data for 12 students who completed the survey although they had not previously been consented were discarded.

Preliminary analyses were conducted to assess the comparability of the treatment and control groups in terms of race/ethnicity, gender, ESL status, eligibility for free lunches, and grades (see Table C3). Chi square tests revealed statistically significant differences in the composition of treatment and control groups by race/ethnicity ($X^2 = 44.0$, df = 7, $p < .001$), gender ($X^2 = 4.3$, df = 1, $p < .04$), free lunch eligibility ($X^2 = 38.7$, df = 1, $p < .001$) and grades ($X^2 = 21.6$, df = 4, $p < .001$). ESL status did not differ between groups. The treatment group had a higher percentage of whites and females and a lower percentage of Blacks and Hispanics. Participants in the treatment group were less likely to be eligible for free lunches and performed slightly better academically.

The prevalence of suicidal thoughts and behaviors, and of knowledge and attitudes about suicide, are presented in Table C6 by treatment group at pre-test and post-test. Knowledge differs slightly at pre-test in the treatment and control groups with the treatment group demonstrating slightly more knowledge ($F(1,976) = 4.3$, $p < .04$). Attitudes and levels of suicidal thoughts and behaviors did not differ at pre-test, however.

***Table C6. Prevalence of suicidal thoughts and behaviors, and levels of knowledge and attitudes in treatment and control groups at pre-test and post-test***

| Treated for depression/suicidal ideation | | | | | | |
|---|---|---|---|---|---|---|
| | Control | Control % | Treatment | Treatment % | Total | Total |
| | N=553 (pre)<br>N=396 (post) | N=719 (pre)<br>36.9% (post) | N=719 (pre)<br>N=650 (post) | 56.5%<br>62.1% | N=1272<br>N=1046 | 100% |
| Pre | 41 | 7.4% | 58 | 8.1% | 99 | 7.8% |
| Post | 19 | 4.8% | 39 | 6.0% | 58 | 5.5% |
| Suicidal ideation during past 3 months, % | | | | | | |
| | Control | Control | Treatment | Treatment | Total | Total |
| | N=556 (pre)<br>N=397 (post) | 43.3%<br>37.9% | N=728 (pre)<br>N=651 (post) | 56.7%<br>62.1% | N=1284<br>N=1048 | 100 % |
| Pre | 47 | 8.5% | 51 | 7.0% | 98 | 7.7% |
| Post | 36 | 9.0% | 45 | 6.9% | 81 | 7.7% |
| Suicide plan during past 3 month, % | | | | | | |
| Pre | 46 | 8.3% | 45 | 6.2% | 91 | 7.1% |
| Post | 29 | 7.3% | 40 | 6.1% | 69 | 6.6% |
| Suicide attempt during past 3 month, % | | | | | | |
| Pre | 14 | 2.5% | 13 | 1.8% | 27 | 2.1% |
| Post* | 20 | 5.0% | 11 | 1.7% | 31 | 2.9% |
| Lifetime suicide attempt, % | | | | | | |
| Pre | 52 | 9.4% | 56 | 7.7% | 108 | 8.5% |
| Post* | 59 | 14.9% | 55 | 8.4% | 114 | 10.9% |
| Suicide of someone close | | | | | | |
| Pre | 201 | 36.5% | 238 | 32.9% | 439 | 34.5% |
| Post* | 157 | 39.5% | 213 | 32.8% | 370 | 35.4% |

| Knowledge of depression/suicide, mean (SD) [(Missing values are ignored in the count unless all items are missing in which case result (count) is missing)—Persons with full version of pretest] | | | | | | |
|---|---|---|---|---|---|---|
| | Control<br>N=504 (pre)<br>N=349 (post) | | Treatment<br>N=474 (pre)<br>N=420 (post) | | Total<br>N=978 (pre)<br>N=769 (post) | |
| | Mean | S.D. | Mean | S.D. | Mean | S.D. |
| Pre* | 4.45 | 1.28 | 4.62 | 1.31 | 4.53 | 1.30 |
| Post* | 4.59 | 1.33 | 5.15 | 1.33 | 4.90 | 1.36 |
| Post – Pre* | .18 | 1.54 | .57 | 1.50 | .39 | 1.53 |
| Attitudes toward depression/suicide | | | | | | |
| mean (SD)—persons with full version of pretest | Control<br>N=504 (pre)<br>N=350 (post)<br>N=349 (both) | | Treatment<br>N=474 (pre)<br>N=420 (post)<br>N=420(both) | | Total<br>N=978 (pre)<br>N=770 (post)<br>N=769 (both) | |
| Pre (full version) | 3.67 | .63 | 3.71 | .61 | 3.69 | .62 |
| Post* | 3.61 | .64 | 3.74 | .66 | 3.68 | .65 |
| Post – Pre* | -.10 | .54 | .01 | .60 | -.04 | .58 |

*$p < .05$

The prevalence of help-seeking behaviors is presented in Table C7. Treatment and control groups differed only on whether they have talked to an adult about a friend in the last 3 months at pretest, prior to exposure to the program ($p < .03$). Adjusting for the many comparisons of pre-test measures renders this one significant result inconsequential in term of assessing the equivalence of the treatment and control groups.

***Table C7.Prevalence of help seeking among treatment and control groups at pre-test and post-test***

| Talked to… | Control N=556 (pre) N=397 (post) | Control 43.3% 37.9% | Treatment N=728 (pre) N=651 (post) | Treatment 56.7% 62.1% | Total N=1284 N=1048 | Total 100 % |
|---|---|---|---|---|---|---|
| Parents or guardians | | | | | | |
| Pre | 67 | 12.1% | 97 | 13.3% | 164 | 12.8% |
| Post | 42 | 10.6% | 64 | 9.8% | 106 | 10.1% |
| Brother or sister | | | | | | |
| Pre | 41 | 7.4% | 59 | 8.1% | 100 | 7.8% |
| Post | 37 | 9.3% | 40 | 6.1% | 77 | 7.3% |
| Teacher or guidance counselor | | | | | | |
| Pre | 33 | 6.0% | 29 | 4.0% | 62 | 4.9% |
| Post | 13 | 3.3% | 26 | 4.0% | 39 | 3.7% |
| Other adult | | | | | | |
| Pre | 42 | 7.6% | 47 | 6.5% | 89 | 7.0% |
| Post | 23 | 5.8% | 41 | 6.3% | 64 | 6.1% |
| Friend | | | | | | |
| Pre | 157 | 28.4% | 201 | 27.6% | 358 | 28.0% |
| Post | 98 | 24.6% | 153 | 23.5% | 251 | 23.9% |
| Crisis or telephone hotline worker | | | | | | |
| Pre | 3 | .5% | 6 | .8% | 9 | .7% |
| Post* | 12 | 3.0% | 5 | .8% | 17 | 1.6% |
| Any adult | | | | | | |
| Pre | | | | | | |
| Post | | | | | | |
| Adult about a friend | | | | | | |
| Pre * | 57 | 10.3% | 103 | 14.1% | 160 | 12.5% |
| Post | 47 | 11.8% | 75 | 11.5% | 122 | 11.6% |

*$p < .05$

### *Outcome Evaluation: Indications of Program Efficacy*

SOS intervention effects were estimated using SAS Proc MIXED and SAS Proc GLIMMIX to perform regression and logistic regression analyses, respectively, which account for the clustered sampling design in which students were nested within schools. In our analysis, the effect of exposure to SOS on suicide outcomes (knowledge, attitudes and behavior) ($S_2$) was estimated with the following regression model:

*(Equation 1)*

$$\mathbf{S_2 = B_0 + B_1S_1 + B_2G_1 + B_{3\text{-}5}Controls_{3\text{-}5}}$$

where $S_2$ is the suicidal outcome at follow-up and $S_1$ is the baseline outcome; $G_1$ is a dummy variable for intervention status; $Controls_{3\text{-}5}$ refers to a series of demographic characteristics which include dummy variables for sex (female vs. male), race/ethnicity (Black, Hispanic, Multi-racial, and Other race) with White race as the omitted reference category, and average grades. Grades were included with race and gender because they were significantly related to intervention status at pre-test.

The effects of the SOS program on students' knowledge of and attitudes toward depression and suicide; help-seeking behavior; and suicidal ideation, planning, and attempts are shown in Table C8 for the entire sample and in Table C10 for technical schools only. For attitudes and knowledge, these tables show coefficients from a standard regression analysis in Proc MIXED. For help-seeking behavior, suicidal ideation, suicide, planning, and suicide attempts, these tables show coefficients from a logistic regression analysis in Proc GLIMMIX.

First, for the entire sample, the coefficients shown in column 1 of Tables C8 indicate that exposure to the SOS program was associated with significantly fewer self-reported suicide attempts in the past 3 months controlling for the pre-test report of lifetime attempts. The coefficient for the effect of the SOS program on attempts is -1.19, which when converted to an odds ratio (OR) indicates that the ninth-grade students in the treatment group were approximately 70% less likely to report a suicide attempt in the past 3 months compared with students in the control group (OR = $e^{-1.19}$ = .304). The magnitude of the difference between the treatment group and the control group also is indicated by the descriptive statistics shown in Table C6; the rate of self-reported suicide attempts among students in the control group was 5.0%, a doubling of the prevalence from the pre-test level, compared with only 1.7% among students in the treatment group, a small prevalence decrease from the pre-test level. In the technical school sample, the direction of the effect on self-reported suicide attempts is consistent with the full sample, but does not reach statistical significance.

Similarly, in both samples, exposure to the SOS program resulted in greater knowledge of depression and suicide and more adaptive attitudes toward these problems (Tables C8 and C10, columns 4 and 5). The effect of the SOS program on knowledge was modest in magnitude and resulted in effect sizes of approximately one-third of a standard deviation (e.g., knowledge: .47/1.30=.36 in the entire sample and .33 in the technical sample). Although also significant, the effect of the SOS program on attitudes was somewhat smaller, about 1/5 of a standard deviation.

In contrast to attitudes and knowledge, the effects of the SOS program on help-seeking behavior did not generally achieve statistical significance in either sample. The exception to this

pattern was for help-seeking from a sibling among technical school students. The coefficient for the effect of the SOS program on help-seeking from a sibling was -.64, which when converted to an odds ratio indicates that the ninth-grade students in the treatment group were approximately 50% less likely to report help-seeking from a sibling in the past 3 months compared with students in the control group (OR = $e^{-.64}$ = .53). The coefficient in the full sample was consistent in direction but did not achieve statistical significance.

Finally, although the descriptive statistics in Table C6 for the full sample indicate a slight decrease of suicidal ideation among the treatment group compared to a slight increase in the control group, this difference fell short of statistical significance at the .05 level in the full multilevel model, and also in the model for the technical school sample (Tables C8 and C10, column 2). The prevalence of planning a suicide decreased in the control group by a greater percentage than the treatment group, although the absolute level at both pre-test and post-test was lower for the treatment group. Again, this difference was not statistically significant in the full model in either sample (Tables C8 and C10, column 3).

Results for technical schools only are presented in Tables C10 and C11. As a whole, the results are very similar to the results in Tables C8 and C9 for the total sample. The effects for knowledge and attitudes are of comparable magnitude and statistically significant. Similarly, the effects for planning and considering suicide are of similar magnitude and again, not statistically significant. The effect of the SOS program on help-seeking are presented in Table C11; as in the total sample these effects are generally not significant. The one exception involves help-seeking from a sibling; the likelihood that students in the treatment group report seeking help from a sibling decreases from pre-test to post-test compared to students in the control group.

***Table C8: Multilevel regressions on suicidal behaviors with all schools included***

| | Attempts in past 3 months | | Consider | | Plan | | Attitude | | Knowledge | |
|---|---|---|---|---|---|---|---|---|---|---|
| Effect | B | SE | B | SE | B | SE | B | SE | B | SE |
| Intercept | -2.40* | 1.05 | -1.83* | 0.63 | -1.09 | 0.65 | 1.01* | 0.15 | 2.72* | 0.29 |
| Pre-test | 2.97* | 0.43 | 2.11* | 0.29 | 1.66* | 0.32 | 0.62* | 0.03 | 0.32* | 0.035 |
| SOS program | -1.19* | 0.54 | -0.27 | 0.25 | -0.15 | 0.33 | 0.13* | 0.05 | 0.47* | 0.13 |
| Female | 0.17 | 0.43 | 0.58* | 0.26 | 0.66* | 0.28 | 0.05 | 0.04 | 0.18 | 0.10 |
| Black | -0.97 | 1.10 | -0.80 | 0.63 | -1.11 | 0.75 | 0.06 | 0.08 | -0.41* | 0.19 |
| Other | 0.16 | 1.21 | 0.71 | 0.64 | 0.47 | 0.70 | 0.01 | 0.16 | 0.09 | 0.38 |
| Hispanic | 0.018 | 0.49 | -0.31 | 0.32 | -0.32 | 0.34 | 0.07 | 0.05 | -0.20 | 0.12 |
| Multi-ethnic | -0.74 | 0.81 | -0.16 | 0.42 | -0.50 | 0.50 | 0.11 | 0.06 | -0.23 | 0.15 |
| Grades | -0.33 | 0.26 | -0.25+ | 0.15 | -0.49* | 0.16 | 0.06* | 0.03 | 0.14* | 0.06 |
| N | 1036 | | 1034 | | 1033 | | 759 | | 759 | |

| ***Table C9: Multilevel regressions on help-seeking behaviors with all schools included*** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Treatment by professional | | Help from parent | | Help from sibling | | Help from teacher | | Help from friend | |
| Effect | B | SE | B | SE | B | SE | B | SE | B | SE |
| Intercept | -2.78* | 0.78 | -3.08* | 0.63 | -2.22* | 0.67 | -2.53* | 0.84 | -1.09* | 0.46 |
| Pre-test | 2.56* | 0.34 | 2.04* | 0.23 | 2.38* | 0.29 | 2.45* | 0.40 | 2.24* | 0.17 |
| SOS program | 0.15 | 0.41 | -0.05 | 0.23 | -0.48+ | 0.27 | 0.42 | 0.37 | -0.04 | 0.20 |
| Female | 0.14 | 0.31 | 0.28 | 0.23 | 0.61* | 0.28 | -0.11 | 0.36 | 0.81* | 0.18 |
| Black | -0.48 | 0.78 | 0.11 | 0.43 | -0.08 | 0.51 | 0.05 | 0.78 | -0.68 | 0.40 |
| Other | 0.98 | 0.79 | -1.27 | 1.06 | 0.86 | 0.68 | 0.86 | 1.07 | 1.12 | 0.50 |
| Hispanic | -0.22 | 0.39 | 0.16 | 0.27 | -0.03 | 0.32 | 0.59 | 0.39 | 0.01 | 0.21 |
| Multi-ethnic | -0.09 | 0.49 | -0.07 | 0.38 | 0.25 | 0.41 | 0.24 | 0.58 | -0.50 | 0.31 |
| Grades | -0.16 | 0.18 | 0.07 | 0.15 | -0.22 | 0.17 | -0.38+ | 0.21 | -0.31* | 0.11 |

| ***Table C9 (continued): Multilevel regressions on help-seeking behaviors with all schools included*** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Help from all persons | | Help from a person | | Help from hotline | | Help for friend | |
| Effect | B | SE | B | SE | B | SE | B | SE |
| Intercept | 0.52* | 0.16 | -1.07* | 0.44 | | | -1.99* | 0.58 |
| Pre-test | 0.45* | 0.03 | 2.10* | 0.16 | | | 1.30* | 0.23 |
| SOS program | -0.04 | 0.06 | -0.11 | 0.17 | | | -0.05 | 0.34 |
| Female | 0.12+ | 0.06 | 0.75* | 0.17 | | | 1.15* | 0.22 |
| Black | -0.13 | 0.12 | -0.83* | 0.36 | | | -0.62 | 0.51 |
| Other | 0.14 | 0.20 | 0.62 | 0.51 | | | 0.45 | 0.61 |
| Hispanic | 0.02 | 0.07 | -0.09 | 0.20 | | | 0.03 | 0.26 |
| Multi-ethnic | -0.13 | 0.10 | -0.43 | 0.28 | | | -0.33 | 0.38 |
| Grades | -0.07+ | 0.04 | -0.24* | 0.11 | | | -0.20 | 0.13 |
| N | 1023 | | 1023 | | Didn't converge | | 1042 | |

| ***Table C10: Multilevel regressions on suicidal behaviors for technical schools only*** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Attempt | | Consider | | Plan | | Attitude | | Knowledge | |
| Effect | B | SE | B | SE | B | SE | B | SE | B | SE |
| Intercept | -2.75* | 1.11 | -2.64* | 0.75 | -1.66 | 0.77 | 0.97* | 0.15 | 2.86* | 0.31 |
| Pre-test | 3.08* | 0.44 | 2.40* | 0.32 | 1.94* | 0.35 | 0.63* | 0.03 | 0.30* | 0.04 |
| SOS program | -0.97 | 0.55 | -0.27 | 0.28 | -0.14 | 0.40 | 0.15* | 0.04 | 0.43* | 0.14 |
| Female | 0.16 | 0.44 | 0.49 | 0.29 | 0.75* | 0.31 | 0.07 | 0.04 | 0.16 | 0.10 |
| Black | -1.00 | 1.11 | -1.18 | 0.77 | -1.90 | 1.05 | 0.06 | 0.08 | -0.46* | 0.10 |
| Other | 0.38 | 1.29 | 1.09 | 0.81 | -0.48 | 1.17 | -0.01 | 0.16 | 0.11 | 0.38 |
| Hispanic | -0.02 | 0.50 | -0.26 | 0.34 | -0.47 | 0.37 | 0.06 | 0.05 | -0.20 | 0.12 |
| Multi-ethnic | -0.81 | 0.82 | -0.49 | 0.49 | -0.82 | 0.57 | 0.10 | 0.06 | -0.22 | 0.15 |
| Grades | -0.25 | 0.27 | -0.05 | 0.18 | -0.34 | 0.18 | 0.07* | 0.03 | 0.13* | 0.06 |
| N | 836 | | 834 | | 833 | | 715 | | 715 | |

| ***Table C11: Multilevel regressions on help-seeking behaviors for technical schools only*** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Treatment by professional | | Help from parent | | Help from sibling | | Help from teacher | | Help from friend | |
| Effect | B | SE | B | SE | B | SE | B | SE | B | SE |
| Intercept | -2.59 | .82 | Didn't converge | | -1.74* | .73 | Didn't converge | | -1.24 | .51 |
| Pre-test | 2.52 | .36 | | | 2.22* | .33 | | | 2.23 | .20 |
| SOS program | .24 | .41 | | | -.64* | .30 | | | .03 | .22 |
| Female | .06 | .34 | | | .56+ | .31 | | | .86 | .20 |
| Black | -.36 | .79 | | | -.32 | .60 | | | -1.01 | .46 |
| Other | 1.69 | .85 | | | .34 | 1.11 | | | 1.37 | .68 |
| Hispanic | -.27 | .41 | | | .01 | .34 | | | .02 | .23 |
| Multi-ethnic | -0.01 | .50 | | | .15 | .45 | | | -.71 | .33 |
| Grades | -.21 | .19 | | | -.31+ | .19 | | | -.26 | .12 |
| N | 828 | | 837 | | 835 | | | | 835 | |

| ***Table C11 (continued): Multilevel regressions on help-seeking behaviors for technical schools only*** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Help from all persons | | Help from any person | | Help from hotline | | Help for friend | |
| Effect | B | SE | B | SE | B | SE | B | SE |
| Intercept | .56* | .18 | -1.19* | .48 | | | -.66 | .67 |
| Pre-test | .46* | .03 | 2.17* | .19 | | | 1.49* | .27 |
| SOS program | -.03 | .07 | -.08 | .19 | | | .02 | .36 |
| Female | .10 | .07 | .72* | .19 | | | 1.08* | .24 |
| Black | -.18 | .13 | -1.03* | .41 | | | -1.10+ | .64 |
| Other | .22 | .28 | 1.31+ | .70 | | | .60 | .77 |
| Hispanic | .03 | .08 | -.07 | .22 | | | -.04 | .28 |
| Multi-ethnic | -.17+ | .10 | -.58+ | .31 | | | -.26 | .39 |
| Grades | -.07+ | .04 | -.21+ | .12 | | | -.15 | .15 |
| N | 826 | | 826 | | Didn't converge | | 842 | |

## *Summary*

To address the problem of suicide in Connecticut among high school students, 17 Connecticut high schools implemented *SOS: Signs of Suicide,* a suicide prevention program with documented efficacy, at 16 Technical High Schools and the large comprehensive Trumbull High School and affiliated vocational Regional Agriscience & Biotechnology Center Magnet Program. Schools were randomly assigned to treatment and control groups and students were recruited into the study. The program was presented in schools in the treatment group in November through January; during the same period, students in the control group completed the pre-test questionnaires but did not participate in the program.

For the entire sample, exposure to the SOS program was associated with significantly fewer self-reported suicide attempts in the past 3 months controlling for the pre-test report of lifetime attempts. Ninth-grade students in the treatment group were approximately 70% less likely to report a suicide attempt in the past 3 months compared with students in the control group. Similarly, exposure to the SOS program resulted in greater knowledge of depression and suicide and more adaptive attitudes toward these problems. In contrast to attitudes and knowledge, the effects of the SOS program on help-seeking behavior did not generally achieve statistical significance in either sample. The exception to this pattern was for help-seeking from a sibling among technical school students; the ninth-grade students in the treatment group were approximately 50% less likely to report help-seeking from a sibling in the past 3 months compared with students in the control group.

## COLLEGE SUICIDE PREVENTION

### *Background*

Recent surveys of college students indicate that a large number of young adults who attend institutions of higher education have arrived with a history of mental health issues and continue to struggle with depression, anxiety, trauma histories, eating disorders and substance abuse throughout their college careers (ACHA, 2009; CSCMH, 2009; Kitzrow, 2003). Of particular concern, recent studies indicate that 10% of the general student college population (ACHA, 2009) and as many as 14% of those who utilize college counseling services have seriously considered suicide (CSCMH, 2009). The CSCMH study also found that 8% of college counseling clients had made a suicide attempt prior to and/or after starting college. Not surprisingly, those with a history of suicidal ideation and attempts reported lower grade point averages and higher academic distress than those with no history. In addition, 51% of counseling center clients in the CSCMH study reported some prior experience with counseling and had a positive enough experience to seek mental health assistance on campus. The authors of the CSCMH found individuals with suicidal ideation that received treatment at college counseling centers experienced a statistically significant reduction in suicidal thoughts.

### *Overview*

The college-level intervention involved four components:

1) The College SOS program
2) In-person and online depression screening designed by Screening for Mental Health
3) Monitoring suicidal thoughts and behaviors of counseling center clients
4) Providing QPR training to counseling center staff

Connecticut's suicide prevention efforts were implemented at all four Connecticut State University campuses. The university system serves more than 36,000 full and part time students (24,307 full time undergraduate and 1,669 full time graduate students) (CSU System News Release September 29, 2009 http://www.ctstateu.edu/documents/pr092909recordyear.pdf accessed October 16, 2009).

One of the components of the SMH College Response program involved online and in-person screening efforts for National Depression Screening Day (NDSD). All four campuses utilized online screening and three offered in-person screening as part of NDSD activities. The goals of the screening programs were to increase the numbers of students reached in person and online and to facilitate referral to on-campus and community mental health services for those who were in need of further assessment and treatment.

In addition to addressing the needs of students directly through screening and monitoring, campus mental health clinicians were provided training developed by the Suicide Prevention Resource Centers (SPRC) and the American Association of Suicidology (AAS) entitled *Assessing and Managing Suicide Risk* (AMSR). Gatekeeper training via the Question Persuade Refer (QPR) program was provided to residential and other campus staff.

The evaluation of these initiatives included satisfaction surveys of the SOS College program, baseline data of counseling center utilization and a comparison of utilization after the three prevention components. In addition, the QPR program that was presented to potential gatekeepers (residential staff, faculty and emergency responders) was evaluated in the final year of the grant.

Table D1 outlines the demographic composition of students enrolled at the four universities. During the course of the grant, two of the counseling centers underwent significant changes in leadership. One campus counseling center had two interim directors followed by a permanent director; another had an interim director who then went on a 6-month maternity leave with a temporary replacement. The absence of continuous leadership in these two sites affected data collection, data reporting, and implementation of gatekeeper training.

***Table D1. Demographic Composition of Undergraduate students enrolled in Connecticut State Universities (CSUs) in 2009-2010 (http://www.collegeportraits.org/CT)***

| | CSU1 | | CSU2 | | CSU3 | | CSU4 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| Number enrolled | | | | | | | | | | |
| Undergraduate full time | 7,859 | 79% | 4,326 | 83% | 7,366 | 86% | 4,756 | 81% | 24,307 | 82% |
| Undergraduate part-time | 2,130 | 21% | 917 | 17% | 1,228 | 14% | 1,113 | 19% | 5,388 | 18% |
| Total | 9,989 | 100% | 5,243 | 100% | 8,594 | 100% | 5,869 | 100% | 29,695 | 100% |
| | | | | | | | | | | |
| Average Age | 22 | | 22 | | 22 | | 22 | | 22 | |
| % Female | 4,868 | 49% | 2,825 | 54% | 5,380 | 63% | 3,177 | 54% | 16,250 | 55% |
| Racial Composition (%) | | | | | | | | | | |
| African American | 829 | 8% | 381 | 7% | 1,081 | 13% | 392 | 7% | 2,683 | 9% |
| Am. Indian/Alaskan Native | 38 | <1% | 32 | 1% | 23 | <1% | 20 | <1% | 113 | <1% |
| Asian/Pacific Islander | 302 | 3% | 103 | 2% | 201 | 2% | 199 | 3% | 805 | 3% |
| Hispanic | 671 | 7% | 302 | 6% | 522 | 6% | 454 | 8% | 1,949 | 7% |
| White | 7,293 | 73% | 3,829 | 73% | 5,853 | 68% | 4,389 | 75% | 21,364 | 72% |
| International | 125 | 1% | 64 | 1% | 53 | 1% | 19 | <1% | 261 | 1% |
| Not reported | 731 | 7% | 532 | 10% | 861 | 10% | 396 | 7% | 2,520 | 8% |
| Total | | | | | | | | | | 100% |

**Universal Peer Education: College SOS**

***Background***

All four campuses provided the College SOS program, developed by Screening for Mental Health (SMH) of Wellesley, Massachusetts. College SOS, modeled after its well-received evidence-based high school program, consists of a video and a guided, interactive discussion.

The goal was to reach first year students early in the school year when they are potentially under the greatest stress from the transition to college life. In particular, those who were living away from home and their established social support networks were thought to be particularly vulnerable. The study design required that two of the campuses present the program to 200 students during the 2007-2008 school year and the 2008-2009 school year. The other two campuses presented the program to 100 students during the 2008-2009 school year. Following program implementation, the satisfaction surveys that were completed by participants during the 2009-2010 school year were examined.

***Methods***

A total of 455 students who completed the College SOS program completed surveys assessing the program. The demographic composition of these students is presented in Table D2. Approximately 1/3 of the participants were male and 2/3 were female. The average age of respondents was 19 and the majority was white (80%) and freshmen (70%). Compared to the target population of CSU students profiled in Table D1, participants in the College SOS program were more likely to be female and somewhat more likely to be white. In addition, CSU 1 was somewhat overrepresented in the program and CSU 2 was somewhat underrepresented.

***Table D2. Demographic characteristics of college SOS participants***

| Variable | N | % |
|---|---|---|
| Gender | | |
| Male | 141 | 31.3 |
| Female | 308 | 68.4 |
| Race | | |
| Hispanic | 34 | 7.5 |
| Black | 38 | 8.6 |
| White | 356 | 80.2 |
| Other | 17 | 3.8 |
| Year in School | | |
| Freshman | 317 | 70.4 |
| Sophomore | 52 | 11.6 |
| Junior | 54 | 12.0 |
| Senior | 26 | 5.8 |
| Training location: | | |
| CSU 1 | 187 | 41.1 |
| CSU 2 | 55 | 12.1 |
| CSU 3 | 124 | 27.3 |
| CSU 4 | 89 | 19.6 |
| | Mean | SD |
| Age | 19.3 | 3.9 |

***Results***

Results from the satisfaction survey are presented in Table D3. More than four-fifths of the students reported being satisfied or very satisfied with the quality of College SOS program training and indicated that they expected to use the information gained.

Less than 5% indicated any dissatisfaction with any aspect of the quality of their experience. A large majority of participants also indicated that the program was useful and relevant and that they would recommend it to a friend. The most dissatisfaction was expressed about the relevance of the training content to their needs; however this percentage was still low (less than 9%).

***Table D3. Satisfaction with SOS College training***

| | Satisfied or very satisfied | | Neutral | | Dissatisfied or very dissatisfied | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| How satisfied are you with… | | | | | | |
| The overall quality of this training? | 384 | 84.8 | 56 | 12.4 | 13 | 2.8 |
| The quality of the information/instruction from this training? | 400 | 88.3 | 36 | 7.9 | 17 | 3.7 |
| The quality of the training materials? | 357 | 78.8 | 80 | 17.7 | 16 | 3.5 |
| Overall, how satisfied are you with the training experience? (2007-2008) | 178 | 73.9 | 80 | 17.7 | 16 | 3.5 |
| The instructor's presentation of this training? (2008-2009) | 224 | 93.0 | 11 | 4.6 | 6 | 2.5 |
| | | | | | | |
| The training was well organized | 400 | 88.3 | 40 | 8.8 | 13 | 2.9 |
| The training space met my needs | 378 | 83.6 | 54 | 11.9 | 20 | 4.5 |
| This training [content] was relevant to my needs. | 317 | 70.3 | 96 | 21.3 | 38 | 8.4 |
| I expect to use the information gained from this training (2008-2009) | 187 | 77.6 | 44 | 18.3 | 10 | 4.2 |
| I expect to use the information gained from this training (2007-2008) | 158 | 76.3 | 38 | 18.4 | 11 | 5.3 |
| I would recommend this training to a friend [others] | 208 | 86.3 | 22 | 9.1 | 11 | 4.6 |
| I would recommend this training to a friend [others] | 171 | 81.0 | 33 | 15.6 | 7 | 3.3 |
| How useful was the information you received? (2007-2008) | 174 | 82.9 | 30 | 14.3 | 6 | 2.8 |

***Summary***

The four Connecticut State University campuses provided the College SOS program to 455 students. The goal was to reach first year students early in the school year when they are potentially under the greatest stress from the transition to college life. Most of the participating students were female and most were white and freshmen. Over 80% of the participating students

reported being satisfied or very satisfied with the quality of the College SOS program and indicated that they expected to use the information gained.

## NATIONAL DEPRESSION SCREENING DAY (NDSD) SCREENING

### *Methods*

The second component of the college suicide prevention effort involved in-person screening initiatives as part of National Depression Screening Day (NDSD) activities and online screening available at all times to students on each of the four campuses. All four campus counseling centers monitored utilization rates and kept monthly records of suicide assessments of counseling center clients. In order to collect this information in a uniform and consistent manner, each counseling center submitted monthly utilization reports via an on-line data collection tool, developed in cooperation with counseling center staff from all four of the campuses. All counseling centers used it to provide information regarding counseling center utilization.

### *Results*

Table D4 presents the numbers of in-person and online screenings completed at each campus. Overall a total of 826 students were screened in 2008-2009 compared with 770 during the 2007-2008 school year, a 7% increase. In addition, the proportion of online to in-person screening increased dramatically, from 58% to 79%, but in-person screening numbers decreased substantially on all 3 participating campuses. Campus 3 relied entirely upon the online screening in both years, directing students to computer kiosks during their National Depression Screening Day efforts and using the broadcast or "blast" email capabilities to make students aware of the various screening tools available on the home page of the counseling center. All campuses improved their online screening numbers; most notably, campus 1 successfully increased students' utilization of the online screening option). Only campus 4 reached fewer students (n=71) utilizing both screening approaches in the second year of the grant evaluation period compared to the first year (n=87).

***Table D4.: Number of In Person Vs. On Line Depression Screening***

| | 2007-2008 | | | | 2008-2009 | | | |
|---|---|---|---|---|---|---|---|---|
| **Campus** | In Person | Positive | On Line | Positive | In Person | Positive | On Line | Positive |
| **1** | 133 | 29% | 12 | 83% | 100 | 12% | 130 | 83% |
| **2** | 123 | 47% | 88 | 83% | 27 | 41% | 94 | 84% |
| **3** | 0 | 0 | 327 | 65% | 0 | 0 | 404 | 73% |
| **4** | 67 | 42% | 20 | 55% | 45 | 27% | 26 | 92% |
| Overall | 323 | | 447 | | 172 | | 654 | |

The demographic composition of students who participated in the in-person screening is presented in Table D5. Approximately half of the in-person NDSD participants were CSU1 students. Compared to the target population of CSU students profiled in Table D1, CSU2 were somewhat overrepresented in the NDSD screening and CSU4 was somewhat underrepresented.

As with the College SOS program, female students were somewhat overrepresented, although not to the same degree. Hispanic students were somewhat underrepresented (about 7%), but the percentages of white (about 75%) and black (about 8%) students were very similar to the target population.

***Table D5 . Demographic Composition of students who participated in the in-person screening.***

| | Total | | | | |
|---|---|---|---|---|---|
| | N | Percent | CSU1 | CSU2 | CSU4 |
| School enrolled at | | | | | |
| CSU1 | 233 | 47.1% | | | |
| CSU2 | 150 | 30.3% | | | |
| CSU4 | 112 | 22.6% | | | |
| College year (%) | | | | | |
| Freshman | 115 | 30.3% | 31.8% | 29.9% | 29.2% |
| Sophomore | 100 | 26.4% | 24.0% | 26.4% | 29.2% |
| Junior | 82 | 21.6% | 19.4% | 21.5% | 24.5% |
| Senior | 66 | 17.4% | 17.8% | 18.8% | 15.1% |
| Grad student/other | 16 | 4.2% | 7.0% | 3.5% | 1.8% |
| | | | | | |
| Age Mean (SD) | 20.4 (4.3) | | 20.2 (3.9) | 20.9 (4.9) | 20.3 (4.3) |
| | | | | | |
| % Female | 278 | 58.5% | 58.3% | 59.2% | 58.1% |
| Racial Composition (%) | | | | | |
| Caucasian | 351 | 73.1% | 74.0% | 72.1% | 72.6% |
| African American | 38 | 7.9% | 4.8% | 9.5% | 12.3% |
| Hispanic | 48 | 10.0% | 11.0% | 8.2% | 10.4% |
| Asian American | 10 | 2.1% | 2.2% | 3.4% | n/a |
| American Indian | 1 | 0.2% | 0.4% | n/a | n/a |
| Other | 27 | 5.6% | 7.0% | 5.4% | 2.8% |
| Multiracial | 5 | 1.0% | 0.4% | 1.4% | 1.9% |

Table D6 presents the self-reported mental health history of participants in terms of previous mental disorder diagnoses. Because a substantial number of participants did not respond to individual questions about mental health history, the reported percentages in the table are based on valid responders only. Depression and anxiety were most frequently reported, with 20% and 12% of in-person screening participants reporting a history of these disorders. Slightly more than 8% reported a previous suicide attempt. The prevalences of other disorders were all less than 5%; of these, bipolar disorder, PTSD, chronic pain and eating disorder had self-reported occurrence rates of between 3 and 5%.

| ***Table D6. Mental Health History of Participants (total n=495).*** | | | | |
|---|---|---|---|---|
| | Endorse prior treatment for | | Treatment included medication | |
| | N | % of those with valid response* | N | % |
| Depression | 88 | 19.1 | 68 | 79.1 |
| Bipolar | 14 | 3.3 | 14 | 100.0 |
| Anxiety | 52 | 11.7 | 43 | 82.7 |
| PTSD | 16 | 3.7 | 10 | 62.5 |
| Alcohol Abuse | 7 | 1.5 | --- | --- |
| Chronic pain | 15 | 3.1 | --- | --- |
| Diabetes | 3 | 0.6 | --- | --- |
| Drug Abuse | 11 | 2.3 | --- | --- |
| Eating Disorder | 16 | 4.2 | --- | --- |
| HIV | 2 | 0.4 | --- | --- |
| Seizure Disorder | 10 | 2.1 | --- | --- |
| Thyroid Problem | 7 | 1.5 | --- | --- |
| | | | | |
| Suicide Attempt | 38 | 8.3 | | |

*Because a substantial proportion of participants did not respond to individual questions about mental health history, % was based on valid responders only, not the total n of 495.

Table D7 includes results from the computer scored forms. Approximately one-third of participants scored high enough to warrant a recommendation of further evaluation for depression, generalized anxiety disorder, or PTSD. Almost 12% screened positive for bipolar disorder with further evaluation recommended. Table D7 also reveals that the proportion of those who screened positive for each disorder that were recommended for further follow-up was between 60% and 80%. Thus, a substantial proportion of those who screened positive were not referred for additional evaluation.

| ***Table D7. Computer scored in-person screening results*** | | | | |
|---|---|---|---|---|
| | Screen positive | | | Screen negative |
| | Total N (%) | Follow-up recommended N (%) | Follow-up not recommended N (%) | Follow-up recommended N (%) |
| Depression | 166 (33.6) | 127 (77.9) | 36 (22.1) | 14 (4.3) |
| Bipolar | 57 (11.6) | 37 (64.9) | 20 (35.1) | 19 (4.4) |
| Generalized Anxiety Disorder | 167 (34.2) | 123 (74.5) | 42 (25.5) | 10 (3.1) |
| PTSD | 144 (30.8) | 85 (59.4) | 58 (40.6) | 3 (0.9) |
| Referrals: | | | | |
| Outpatient | 126 (39.9) | | | |
| Inpatient | 9 (2.9) | | | |

The demographic composition of the online screening participants are presented in Table D8. Most (approximately 70%) of the students utilizing the online depression screen were between 18 and 22, with about 25% older than 22 and fewer than 5% younger than 18. Although distributional comparisons cannot be made with the target population profiled in Table D1, the mean age of 20.7 (calculated with 25+ coded as 26, which certainly biased the mean downward) was fairly close to the student population age of 22. The racial distribution was also very similar

although whites are slightly overrepresented and minority groups slightly underrepresented. However, participation levels among students at the 4 CSU campuses were very different than that of the target sample presented in Table D1. CSU3 was overrepresented and both CSU1 and CSU4 were underrepresented. In addition, females are vastly overrepresented in the online participant sample (75% female compared to 55% in the CSU student population).

***Table D8. Demographic composition of online depression screening at Connecticut State Universities from 8/1/2007 – 5/31/2009***

| | Number | Percent | | Number | Percent |
|---|---|---|---|---|---|
| Age | | | Gender | | |
| Under 17 | 7 | 0.6% | Male | 263 | 23.9% |
| 17 | 36 | 3.3% | Female | 827 | 75.1% |
| 18 | 198 | 18.0% | No Response | 11 | 1.0% |
| 19 | 189 | 17.2% | | | |
| 20 | 165 | 15.0% | Ethnic/Racial Group | | |
| 21 | 120 | 10.9% | African American | 74 | 6.7% |
| 22 | 97 | 8.8% | American Indian | 3 | 0.3% |
| 23 | 56 | 5.1% | Asian American | 26 | 2.4% |
| 24 | 32 | 2.9% | Caucasian | 828 | 75.2% |
| 25 | 26 | 2.4% | Hispanic | 71 | 6.4% |
| Over 25 | 166 | 15.1% | Other | 48 | 4.4% |
| No Response | 9 | 0.8% | No Response | 51 | 4.6% |
| Total | 1101 | 100% | | | |
| Year in College | | | Residence | | |
| Freshman | 254 | 23.1% | On Campus | 438 | 39.8% |
| Sophomore | 210 | 19.1% | Off Campus | 615 | 55.9% |
| Junior | 245 | 22.3% | No Response | 48 | 4.4% |
| Senior | 193 | 17.5% | | | |
| Graduate Student | 116 | 10.5% | Campus | | |
| No Response | 83 | 7.5% | 1 | 142 | 12.9% |
| | | | 2 | 182 | 16.5% |
| | | | 3 | 731 | 66.4% |
| | | | 4 | 46 | 4.2% |

Table D9 presents the distribution of depression risk by demographic groups. The risk of screening positive for depression was similar across demographic groups. Among students in the 18-22 age range, approximately ¾ screened positive for depression with 2/3 of those deemed "likely" depressed and the other 1/3 as "very likely." At age 20 the overall rate of positive screens (almost 77%) was slightly higher than in the other age groups, but fewer reached the "very likely" cutoff. In a related fashion, sophomores had the highest percentage of positive screens (almost 80%), although in contrast to students aged 20 years, they also had the highest percentage of screens scoring in "very likely" depressed range. For gender and residence (on

versus off campus), a similar pattern held, with slightly less than ¾ screening positive and about 20% screening as "very likely" to be depressed.

***Table D9. Summary Depression Report for Connecticut State Universities from 8/1/2007 to 5/31/2009: Participant characteristics by depression severity***

| Totals for completed survey | Count | | Severity of Depression (%) | | |
|---|---|---|---|---|---|
| | | | Unlikely | Likely | Very Likely |
| **Age** | | | | | |
| Under 17 | 7 | 0.6% | 14.3% | 57.1% | 28.6% |
| 17 | 36 | 3.3% | 36.1% | 50.0% | 13.9% |
| 18 | 198 | 18.0% | 25.8% | 51.0% | 23.2% |
| 19 | 189 | 17.2% | 24.3% | 48.1% | 27.5% |
| 20 | 165 | 15.0% | 22.4% | 62.4% | 15.1% |
| 21 | 120 | 10.9% | 27.5% | 49.2% | 23.3% |
| 22 | 97 | 8.8% | 24.7% | 49.5% | 25.8% |
| 23 | 56 | 5.1% | 28.6% | 50.0% | 21.4% |
| 24 | 32 | 2.9% | 18.7% | 65.6% | 15.6% |
| 25 | 26 | 2.4% | 26.9% | 42.3% | 30.8% |
| Over 25 | 166 | 15.1% | 41.6% | 45.2% | 13.3% |
| No Response | 9 | 0.8% | 55.6% | 11.1% | 33.3% |
| Total | 1101 | 100.0% | | | |
| **Gender** | | | | | |
| Male | 263 | 23.9% | 26.2% | 54.4% | 19.4% |
| Female | 827 | 75.1% | 28.5% | 50.1% | 21.4% |
| No Response | 11 | 1.0% | 27.3% | 27.3% | 45.5% |
| Total | 1101 | 100.0% | | | |
| **Year in College** | | | | | |
| Freshman | 254 | 23.1% | 27.6% | 51.2% | 21.3% |
| Sophomore | 210 | 19.1% | 21.4% | 52.4% | 26.2% |
| Junior | 245 | 22.3% | 25.3% | 55.1% | 19.6% |
| Senior | 193 | 17.5% | 30.6% | 48.2% | 21.2% |
| Graduate Student | 116 | 10.5% | 40.5% | 48.3% | 11.2% |
| No Response | 83 | 7.5% | 30.1% | 43.4% | 26.5% |
| Total | 1101 | 100.0% | | | |
| **Residence** | | | | | |
| On Campus | 438 | 39.8% | 26.9% | 52.1% | 21.0% |
| Off Campus | 615 | 55.9% | 28.8% | 50.9% | 20.3% |
| No Response | 48 | 4.4% | 27.1% | 39.6% | 33.3% |
| Total | 1101 | 100.0% | | | |
| **Ethnic/Racial Group** | | | | | |
| African American | 74 | 6.7% | 37.8% | 44.6% | 17.6% |

***Table D9. Summary Depression Report for Connecticut State Universities from 8/1/2007 to 5/31/2009: Participant characteristics by depression severity***

| Totals for completed survey | Count | | Severity of Depression (%) | | |
|---|---|---|---|---|---|
| | | | Unlikely | Likely | Very Likely |
| American Indian | 3 | 0.3% | 33.3% | 33.3% | 33.3% |
| Asian American | 26 | 2.4% | 23.1% | 57.7% | 19.2% |
| Caucasian | 828 | 75.2% | 27.4% | 51.4% | 21.1% |
| Hispanic | 71 | 6.4% | 26.8% | 52.1% | 21.1% |
| Other | 48 | 4.4% | 27.1% | 52.1% | 20.8% |
| No Response | 51 | 4.6% | 27.5% | 45.1% | 27.5% |
| Total | 1101 | 100.0% | | | |
| Freshman Orientation | | | | | |
| Yes | 11 | 1.0% | 45.5% | 36.4% | 18.2% |
| No | 1038 | 94.3% | 27.8% | 51.4% | 20.7% |
| No Response | 52 | 4.7% | 26.9% | 42.3% | 30.8% |
| Total | 1101 | 100.0% | | | |

Table D10 presents the distribution of depression risk by the participant's rating of the screening's level of usefulness to him/her. Only 132 out of 1101 participants responded to this question. Of those respondents who found the screening to be "quite" or "extremely" helpful, about 65% screened as "likely" or "very likely" depressed. Almost all respondents who screened positive found the screening to be at least "a little helpful." Table D11 includes percentages by each level of depression. Almost 80% of participants who screened as "very likely" to have depression considered the screening to be at least "moderately" helpful. Approximately a third of participants who screened as "very likely" to have depression reported that they used the college counseling center for mental health or alcohol problems, compared to about a quarter in each of the other two groups. Finally, participants were increasingly more likely to indicate plans to contact someone on campus for further evaluation as their risk for depression increased; almost 90% for those "very likely" to have depression planned to contact someone on-campus compared to less than 65% for those "unlikely."

***Table D10. Usefulness of screening, past use of counseling centers, and expectation for type of future mental health service for subset of screening participants: Percentages of depression level by response level***

| | Count | Percent | Severity of Depression (%) | | |
|---|---|---|---|---|---|
| | | | Unlikely | Likely | Very Likely |
| Usefulness of Screening | | | | | |
| Extremely Helpful | 12 | 9.1% | 33.3% | 58.3% | 8.3% |
| Quite Helpful | 22 | 16.7% | 36.4% | 50.0% | 13.6% |
| Moderately Helpful | 28 | 21.2% | 21.4% | 53.6% | 25.0% |
| A Little Helpful | 24 | 18.2% | 37.5% | 50.0% | 12.5% |
| Not at All Helpful | 8 | 6.1% | 50.0% | 50.0% | 0.0% |
| Other * | 2 | 1.5% | 100.0% | 0.0% | 0.0% |
| No Response | 36 | 27.3% | 30.6% | 38.9% | 30.6% |
| Total | 132 | 100.0% | | | |
| Have you used the college's counseling center for a mental health or alcohol problem in the past? | | | | | |
| Yes | 35 | 26.5% | 31.4% | 45.7% | 22.9% |
| No | 94 | 71.2% | 31.9% | 50.0% | 18.1% |
| No Response | 3 | 2.3% | 100.0% | 0.0% | 0.0% |
| Total | 132 | 100.0% | | | |
| If you seek further evaluation, will you contact someone: | | | | | |
| On campus | 79 | 59.8% | 29.1% | 51.9% | 19.0% |
| Off campus | 28 | 21.2% | 46.4% | 46.4% | 7.1% |
| No Response | 25 | 18.9% | 32.0% | 36.0% | 32.0% |
| Total | 132 | 100.0% | | | |

* "Other" is the count for the "Usefulness of Screening" Feedback Question - first answer: "I did not take the depression screening".

***Table D11. Usefulness of screening, past use of counseling centers, and expectation for type of future mental health service for subset of screening participants: Percentages of response level by depression level***

| Usefulness of Screening | | | | | |
|---|---|---|---|---|---|
| | Count | Percent | Severity of Depression (%) | | |
| | | | Unlikely (n=31) | Likely (n=49) | Very Likely (n=14) |
| Extremely Helpful | 12 | 12.8% | 12.9% | 14.3% | 12.8% |
| Quite Helpful | 22 | 23.4% | 25.8% | 22.4% | 23.4% |
| Moderately Helpful | 28 | 29.8% | 19.4% | 30.6% | 29.8% |
| A Little Helpful | 24 | 25.5% | 29.0% | 24.5% | 25.5% |
| Not at All Helpful | 8 | 8.5% | 12.9% | 8.2% | 8.5% |
| Total* | 94 | 100.0% | 100.0% | 100.0% | 100.0% |
| Have you used the college's counseling center for a mental health or alcohol problem in the past? | | | | | |
| | Count | Percent | Severity of Depression (%) | | |
| | | | Unlikely (n=41) | Likely (n=63) | Very Likely (n=25) |
| Yes | 35 | 27.1% | 26.8% | 25.4% | 32.0% |
| No | 94 | 72.9% | 73.2% | 74.6% | 68.0% |
| Total | 129 | 100.0% | 100.0% | 100.0% | 100.0% |
| | | | | | |
| | Count | Percent | Severity of Depression (%) | | |
| | | | Unlikely (n=36) | Likely (n=54) | Very Likely (n=17) |
| If you seek further evaluation, will you contact someone: | | | | | |
| On campus | 79 | 73.8% | 63.9% | 75.9% | 88.2% |
| Off campus | 28 | 26.2% | 36.1% | 24.1% | 11.8% |
| Total* | 107 | 100.0% | 100.0% | 99.1% | 100.0% |

* only persons with valid responses are included

Finally, 508 participants were asked whether they planned to seek further evaluation for depression. Results are presented in Table D12. The higher the risk of depression, the greater the likelihood that the participant planned to get further evaluation. Sixty percent of those scoring in the "very likely" range planned to seek help, compared to only 21% of those in the "unlikely" range. A cause for concern, however, is that many participants did not indicate that they planned further follow-up (either responding "no" or not making a response). Only 36% of those scoring in the "likely" range planned to seek further evaluation, with 28% stating that they did not plan on further evaluation.

| ***Table D12. Participant plans to seek further evaluation by depression severity*** | | | | |
|---|---|---|---|---|
| | Do you plan to seek further evaluation for depression? | | | |
| | Yes | No | No Response | Total |
| Severity of Depression | | | | |
| Unlikely | 21.4% | 60.0% | 18.6% | 140 |
| Likely | 36.0% | 27.5% | 36.4% | 258 |
| Very Likely | 59.1% | 13.6% | 27.3% | 110 |
| Total | | | | 508 |

Finally, all participants were asked about whether they were currently receiving treatment for depression; results are presented in Table D13. Although the likelihood of current treatment increased by risk severity, very few participants stated that they were currently receiving treatment. Ninety-two percent of those who screened positive were not receiving current treatment. Fewer than 11% of those who screened as "very likely" to be depressed were receiving current treatment; 21% reported receiving treatment in the past. The respective percentages for those who screened as "likely" were 7% and 17%, respectively.

| ***Table D13. Online depression screening participant's depression treatment history by depression severity*** | | | | | |
|---|---|---|---|---|---|
| | | | Depression Treatment History | | |
| | Count | Percent | Current | Past | Never |
| Severity of Depression | | | | | |
| Unlikely | 308 | 28.0% | 3.9% | 15.9% | 80.2% |
| Likely | 560 | 50.9% | 6.8% | 17.0% | 76.3% |
| Very Likely | 233 | 21.2% | 10.7% | 21.0% | 68.2% |
| Total | 1101 | 100.0% | | | |

Among those who completed the online depression screening roughly the same percentage reported that they intended to seek further evaluation for depression in each of the school years, however a somewhat larger proportion, 64% overall said they intended to seek help on campus in the 2008-2009 school year compared with 56% in the 2007-2008 school year (see D14).

| ***Table D14: Plan to seek further treatment responses to online screening*** | | | | |
|---|---|---|---|---|
| | **2007-2008** | | **2008-2009** | |
| School | Seek further help for depression | Seek Help on Campus | Seek further help for depression | Seek Help on Campus |
| **1** | 2/4 (50%) | No response | 28/66 (41%) | 6/11 (55%) |
| **2** | 30/53 (57%) | 13/18 (72%) | 18/59 (31%) | 20/27 (74%) |
| **3** | 57/180 (32%) | 18/38 (47%) | 34/114 (30%) | 15/26 (58%) |
| **4** | 8/16 (50%) | 4/7 (57%) | 11/16 (69%) | 3/5 (60%) |
| Overall | 97/253 (38%) | 35/63 (56%) | 91/255 (36%) | 44/69 (64%) |

The in-person screening revealed that a total of 38 (8%) students over the two year period had made a previous suicide attempt. Because this question was not captured by the online

screening instrument, comparisons of lifetime suicide attempt rates between students participating in-person and online screening cannot be made.

### Summary

The second component of the college suicide prevention effort involved in-person screening initiatives as part of National Depression Screening Day (NDSD) activities and online screening available at all times to students on each of the four campuses. All four campus counseling centers monitored utilization rates and kept monthly records of suicide assessments of counseling center clients. A total of 1596 students were screened in the 2007-2008 and 2008-2009. The number of students screened increased over the course of the two academic years by 7%. In addition, the proportion of online to in-person screening increased dramatically, from 58% to 79%, but in-person screening numbers decreased substantially on all 3 participating campuses.

Of in-person screening participants, approximately one-third scored high enough to warrant a recommendation of further evaluation for depression, generalized anxiety disorder, or PTSD. A third screened positive for depression and almost 12% screened positive for bipolar disorder. However, a substantial proportion of those who screened positive were not referred for additional evaluation. Of online screening participants in the 18-22 age range, approximately ¾ screened positive for depression with 2/3 of those deemed "likely" depressed and the other 1/3 as "very likely." Thus, a much higher proportion of online screening participants screened positive for depression compared to in-person screening participants, suggesting that the two types of screening reached different populations of students.

Approximately half of the online participants reported whether they planned to seek further evaluation for depression. The higher the risk of depression, the greater was the likelihood that the participant planned to get further evaluation. A cause for concern, however, is that many participants did not indicate that they planned further follow-up (either responding "no" or not making a response). Of those in the "likely" range, about 1/3 planned to seek further evaluation; 28% stating that they did not plan on further evaluation. Of those scoring in the "very likely" range, about 60% planned on further evaluation, but 14% did not.

## CAMPUS COUNSELING CENTER BASED SUICIDE PREVENTION

### Methods

One of the goals of the college suicide prevention efforts was to increase the number of referrals from self, friends, faculty and staff. To evaluate this goal, data were collected on campus counseling center utilization rates at each CSU. Table E1 presents number of monthly unique clients and number of client visits at each counseling center for each of the four semesters in the 2007-2008 and 2008-2009 academic years.

### Results

The number of sessions provided to clients at the four counseling centers in the fall semester (September through December) of 2008 (n=4,380) (see Table E1) was over a third greater than the number seen in the fall semester of 2007 (n=3,150). In addition, inspection of monthly totals in 2007-2008 compared to the same month in 2008-2009 reveals an increase in the total visits

seen across all CSUs for every month without exception. Because the number of clients listed in Table E1 is only unique by month (the same client may be counted in each month), total numbers of unique clients seen by counseling centers in a semester could not be calculated. However, inspection of monthly unique client totals in Table E1 reveals that, for all months with data from all CSUs (i.e., excluding August), the total number of unique clients increased from the 2007-2008 academic year to the 2008-2009 academic year.

***Table E1: Client Visits to the Connecticut State University (CSU) Counseling Centers In the2007-2008 and 2008-2009 School Years***

| | CSU1 | | CSU 2 | | CSU 3 | | CSU 4 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | clients | visits | clients | visits | clients | visits | clients | Visits | Clients | Visits |
| **Fall 2007** | | | | | | | | | | |
| **August** | --- | --- | 29 | 67 | 51 | 126 | --- | --- | 80 | 193 |
| **September** | 56 | 89 | 28 | 185 | 108 | 219 | 13 | 39 | 205 | 532 |
| **October** | 97 | 163 | 46 | 334 | 144 | 335 | 35 | 91 | 322 | 923 |
| **November** | 105 | 173 | 27 | 291 | 130 | 282 | 43 | 93 | 305 | 839 |
| **December** | 82 | 124 | 17 | 274 | 123 | 202 | 31 | 63 | 253 | 663 |
| **Total** | --- | 549 | --- | 1,151 | --- | 1,164 | --- | 286 | --- | 3,150 |
| **Spring 2008** | | | | | | | | | | |
| **January** | 54 | 71 | 10 | 157 | 80 | 144 | 17 | 24 | 161 | 396 |
| **February** | 86 | 177 | 23 | 385 | 118 | 258 | 26 | 65 | 253 | 885 |
| **March** | 93 | 172 | 26 | 316 | 138 | 288 | 40 | 88 | 297 | 864 |
| **April** | 120 | 256 | 30 | 472 | 138 | 346 | 34 | 100 | 322 | 1,174 |
| **May** | 83 | 142 | 4 | 224 | 114 | 203 | 22 | 47 | 223 | 616 |
| **Total** | --- | 818 | --- | 1,554 | --- | 1,239 | --- | 324 | --- | 3,935 |
| **Fall 2008** | | | | | | | | | | |
| **August** | 20 | 41 | --- | --- | 41 | 74 | 10 | 20 | 71 | 135 |
| **September** | 91 | 195 | 35 | 201 | 116 | 276 | 115 | 256 | 357 | 928 |
| **October** | 137 | 328 | 30 | 250 | 167 | 411 | 143 | 387 | 477 | 1,376 |
| **November** | 126 | 244 | 30 | 246 | 152 | 285 | 128 | 297 | 436 | 1,072 |
| **December** | 112 | 183 | 24 | 195 | 134 | 252 | 119 | 239 | 389 | 869 |
| **Total** | --- | 991 | --- | 892 | --- | 1,298 | --- | 1,199 | -- | 4,380 |
| **Spring 2009** | | | | | | | | | | |
| **January** | 46 | 84 | 10 | 106 | 61 | 104 | 57 | 105 | 174 | 399 |
| **February** | 94 | 178 | 28 | 237 | 135 | 275 | 125 | 262 | 382 | 952 |
| **March** | 117 | 222 | 21 | 282 | 133 | 273 | 129 | 292 | 400 | 1,069 |
| **April** | 121 | 222 | 34 | 298 | 142 | 356 | 164 | 365 | 461 | 1,241 |
| **May** | 105 | 157 | 12 | 205 | 120 | 231 | 97 | 196 | 334 | 789 |
| **Total** | --- | 863 | --- | 1,128 | --- | 1,239 | --- | 1,220 | --- | 4,450 |

Table E2 presents the source of referrals for all CSU campuses. From the fall of 2007 to the fall of 2008, faculty referrals remained stable; self and Residential Life/Other referrals each declined by slightly less than 15%. However, friend referrals increased by 13%. From the spring of 2008 to the spring of 2009, all referral types increased in number. Self referrals increased by 12%, faculty referrals increased by 21%, friend referrals increased by 33%, and Residential Life/other referrals increased by 45%. None of these differences were statistically significant at the .05 level, however. From the 2007-2008 academic year to the 2008-2009 academic year, all referral types increased in number. Of referral types, friend and faculty referrals increased the most. Friend referrals increased by almost 25%, from an average of 8.8 per month in 2007-2008 to 11.4 per month in 2008-2009; this difference is statistically significant $t(35) = 2.2$, $p < .05$. Faculty referrals increased by 12%, from 9.2 per month in 2007-2008 to 10.6 per month in 2008-2009, a statistically significant difference, $t(35)=2.2$, $p < .05$.

***Table E2. : Source of Referrals for all CSU Campuses: 2007-2008 and 2008-2009***

| | **2007-2008** | | **2008-2009** | |
|---|---|---|---|---|
| | **Fall** | **Spring** | **Fall** | **Spring** |
| Self | 646 | 725 | 562 | 811 |
| Faculty | 165 | 178 | 168 | 215 |
| Friend | 145 | 185 | 164 | 246 |
| Res Life or other staff | 141 | 121 | 121 | 176 |

Table E3 presents the presenting concerns of counseling center clients. The trends differed by campus. Campuses 1 and 4 had increases in presenting concerns of depression and suicide from the fall to the spring semesters in each academic year; campus 3 had decreases from fall to spring and campus 2 had inconsistent changes. Campus 4 had particularly notable increases, with depression and suicide as presenting concerns increasing 13% and 63%, respectively, from fall 2007 to spring 2008. The same campus saw an identical increase in suicide as a presenting concern from fall 2008 to spring 2009, and depression as a presenting concern saw a huge increase of almost 250% during that time period.

***Table E3. : Presenting Concerns for all CSU Campuses: 2007-2008 and 2008-2009***

| **Depression** | | | | |
|---|---|---|---|---|
| Campus | **2007-2008** | | **2008-2009** | |
| | **Fall** | **Spring** | **Fall** | **Spring** |
| 1 | 31 | 95 | 42 | 46 |
| 2 | 95 | 52 | 66 | 55 |
| 3 | 136 | 117 | 89 | 98 |
| 4 | 78 | 88 | 75 | 260 |
| **Total** | **340** | **352** | **272** | **459** |
| **Suicide** | | | | |
| 1 | 8 | 55 | 17 | 31 |
| 2 | 14 | 6 | 18 | 8 |
| 3 | 7 | 2 | 5 | 15 |
| 4 | 19 | 31 | 19 | 31 |
| **Total** | **48** | **94** | **59** | **85** |

Finally, Table E4 presents the number of suicide assessments completed by clinicians at the CSU campuses. The number of assessments completed, and the trend in this number over the course of the 4 semesters, varied widely by campus. There was not a consistent pattern of change within campuses or across campuses. Campuses 1 and 3 conducted more suicide assessments than they had students with presenting concerns of depression or suicide (Table E3) by a wide margin. At campuses 2 and 4, the trend was reversed. Clinicians at these campuses conducted fewer suicide assessments than the number of students presenting with depression or suicide. In 2007-2008, Campus 2 saw a consistent decrease in suicide assessments along with a decrease in suicide and depression as presenting concerns. However, Campus 4 experienced in increase in depression and suicide as presenting concerns from the fall to spring in 2007-2008, but the number of suicide assessments decreased during the same time period. However, in the 2008-2009 school year for both schools, the number of suicide assessments as campuses 2 and 4 followed the trend in suicide as a presenting concern.

***Table E4. Clinical Suicide Assessments CSU Campuses: 2007-2008 and 2008-2009***

| | **2007-2008** | | **2008-2009** | |
|---|---|---|---|---|
| **Campus** | **Fall** | **Spring** | **Fall** | **Spring** |
| 1 | 158 | 208 | 172 | 120 |
| 2 | 113 | 44 | 20 | 13 |
| 3 | 222 | 232 | 303 | 303 |
| 4 | 65 | 20 | 50 | 109 |
| **Total** | **558** | **504** | **545** | **545** |

**Summary**

One of the goals of the college suicide prevention efforts was to increase the number of referrals from self, friends, faculty and staff. To evaluate this goal, monthly data were collected on campus counseling center utilization rates at each CSU. These data indicate that this goal was successfully achieved, with monthly visit totals across all CSUs in 2008-2009 compared to the same month in 2007-2008 higher for every month without exception. In addition, the number of referrals for each type of referral source (self, faculty, friend, Residential Life or Other) was obtained for each semester in the two academic years of the study. From the 2007-2008 academic year to the 2008-2009 academic year, all referral types increased in number. Of referral types, friend referrals increased the most, by almost 25%.

Presenting concerns of counseling center clients were obtained, with trends differing by campus. Campuses 1 and 4 had increases in presenting concerns of depression and suicide from the fall to the spring semesters in each academic year; campus 3 had decreases from fall to spring and campus 2 had inconsistent changes. Campus 4 had particularly notable increases in depression and suicide from fall 2008 to spring 2009.

Finally, the numbers of suicide assessments completed by clinicians at the CSU campuses were recorded. Campuses 1 and 3 conducted more suicide assessments than they had students with presenting concerns of depression or suicide by a wide margin. The relationship between the trend of suicide as a presenting concern and the number of suicide assessments completed was consistent for campus 3 in both academic years and for campus 4 in 2008-2009.

## GATEKEEPER TRAINING

### *Background*

The university based Connecticut Garrett Lee Smith (GLS) partners chose to use the 1.5 hour Question Persuade Refer (QPR) (Quinnett, 2007) suicide prevention gatekeeper training program at each of the four Connecticut State University (CSU) campuses. At least one mental health professional on each campus completed QPR trainer certification which involved eleven individual training sessions during the 2007-2008 and 2008-2009 school years. The training was offered to all staff and faculty on the four campuses; however, recruiting efforts were focused on the residential staff. A total of 335 individuals completed QPR gatekeeper training as part of GLS efforts.

A separate suicide prevention training, Connecticut's "2-1-1" 24 hour call center funded by the United Way, is part of the National Suicide Prevention Hotline. Two managers of the Hotline were trained to provide the two day Applied Suicide Intervention Skills Training (ASIST) gatekeeper training to professionals who work with high-risk populations. The ASIST trainers offered the two day programs to juvenile justice, school nurses, workers in the Department of Children and Families and foster parents. A total of 144 individuals were trained in 8 ASIST training sessions.

### *Methods*

In the fall of 2009, all of the individuals who had completed either ASIST (n=144) or QPR (n=335) were invited via email to complete an anonymous online survey that would assess knowledge, attitudes, and suicide prevention skill utilization. The University of Connecticut Health Center IRB determined that, as part of a program evaluation, this survey was not human subjects research. At the end of the survey, participants were directed to a community partner (Clearinghouse) website. The Clearinghouse then mailed a $20.00 department store (TARGET) gift card to each participant as compensation. A total of 166 QPR and 76 ASIST participants completed the on-line evaluation.

### *Results*

Table F1 presents information about the QPR and ASIST training programs as well as the demographic composition of QPR and ASIST participants who responded to the online survey. The survey participation rate was 50% for QPR trainees and 53% for ASIST trainees. Inspection of Table F1 reveals the very different types of participants in the two programs. QPR trainees were much younger; almost 75% were 22 years old or younger. In contrast, half of the ASIST trainees were 40 or older, and none were younger than 23. There was also a wide gender gap. The majority of both types of trainees were female; however, the ASIST group was almost exclusively female (94%) compared to 67% of the QPR group. The racial composition of the two groups also varied considerably. The QPR group was about 2/3 white, 1/5 black and almost 10% Hispanic. The ASIST group had a higher representation of Blacks (almost 2/5 Black, a lower representation of whites (1/2 white) and a similar proportion of Hispanics (9%).

| ***Table F1. Demographic characteristics of QPR and ASIST participants who responded to the online survey*** | | |
|---|---|---|
| | QPR | ASIST |
| Location | 4 CSU Campuses | United Way CT |
| Number of Sessions | 11 | 8 |
| Individuals Trained | 335 | 144 (55%) |
| Participants in Evaluation | 166 | 76 |
| Demographics | | |
| Gender (%female)* | N=110 (67.1%) | N=59 (93.7%) |
| Age* | | |
| 17-22 | N=122 (74.4%) | N=0 |
| 23-29 | N=35 (21.3%) | N=6 (9.5%) |
| 30-39 | N=4 (2.4%) | N=26 (41.3%) |
| 40-49 | N=0 | N=21 (33.3%) |
| 50+ | N=3 (1.8%) | N=10 (15.9%) |
| Race | | |
| White | N=101 (63.1%) | N=30 (50.8%) |
| Black | N=33 (20.6%) | N=23 (39.0%) |
| Hispanic | N=15 (9.4%) | N=5 (8.5%) |
| Asian | N=3 (1.9%) | N=0 (0.0%) |
| Other | N=8 (5.0%) | N=1 (1.7%) |

Survey participants were asked about their training history and needs which are presented in Table F2. The majority of the ASIST group reported having received previous instruction on how to respond to a suicidal person, whereas only about a third of QPR trainees reported previous training, a difference that was statistically significant at $p < .05$. The ASIST group was also more interested in additional training, with over 80% indicating that they would like to receive additional training, compared to 64% of QPR trainees. This difference was also statistically significant ($p < .05$). Finally, the great majority of both groups -- 95% of QPR trainee respondents and almost 90% of ASIST trainee respondents -- reported that the QPR/ASIST training introduced them to new concepts about suicide prevention. This difference was not statistically significant.

| ***Table F2. Training history and needs of survey respondents*** | | | | |
|---|---|---|---|---|
| | QPR | | ASIST | |
| | n | % yes | n | % yes |
| Had previous suicide prevention training?* | 50 | 30.5% | 36 | 58.1% |
| Introduced to new prevention concepts? | 155 | 94.5% | 54 | 88.5% |
| Desire for Additional training ?* | 99 | 63.9% | 47 | 82.5% |

* $p < .05$; + $p < .10$

Table F3 presents survey respondents' reports of their experiences with support-seeking by youth. These items originated in a survey developed by Wyman, Brown, Inman Cross, Schmeelk-Cone, Guo and Pena (manuscript in preparation). Although ASIST trainee respondents report somewhat higher rates of frequent ("often") support seeking, none of the differences in

types of support seeking between QPR and ASIST respondents were statistically different. Slightly over 90% of both groups reported that young people talk to them about their thoughts and feelings "sometimes" or "often." About 90% of both groups reported that young people come to them for advice or assistance when they are troubled. Finally, about 80% of both groups reported that young people turn to them when they are concerned about a friend "sometimes" or "often." Finally, these three questions were combined as a measure of participants' perceived relationship with young people they are in contact with (presented in Table F4), from Often (1) to never (coded as 4). The means for both groups were between "often" and "sometimes," closer to "sometimes," and the difference was not statistically different.

***Table F3. Participant self-reported frequency of support-seeking by young people***

| | QPR | | | | ASIST | | | |
|---|---|---|---|---|---|---|---|---|
| | Often | | Sometimes | | Often | | Sometimes | |
| | n | % | n | % | n | % | n | % |
| Youth talk to you | 67 | 40.9% | 82 | 50.0% | 29 | 46.8% | 28 | 45.2% |
| Youth seek advice and assistance + | 61 | 37.2% | 86. | 52.4% | 32 | 52.5% | 24 | 39.3% |
| Seek support when concerned about friend | 40 | 24.4% | 92 | 56.1% | 16 | 26.7% | 32 | 53.3% |

* $p < .05$; + $p < .10$

Table F4 presents respondents' attitudes about, and knowledge of, suicide prevention. The measure of attitudes is a scale created from 8 items in Wymen et al.'s survey. It measures respondents' self-assessment of their preparedness to competently interact with a suicidal young person. This scale involves the following skills: (1) asking appropriate questions about suicide, (2) responding to disclosure of suicidal thoughts, (3) identifying suicide indicators based on the person's history or behavior, (4) eliciting a commitment not to attempt suicide, (5) persuading someone to seek help, (6) documenting the encounter with a suicidal young person, (7) reporting suicide ideation or attempts, and (8) making appropriate referrals for suicidal people. QPR and ASIST trainee respondents assessed their preparedness similarly as quite well prepared—the mean for both was about midway between "very prepared" and "somewhat prepared." Although the ASIST respondents rated their preparedness slightly higher on average, this difference was not statistically significant.

Self-evaluated knowledge about suicide was measured by a scale created from 5 items in Wymen et al.'s survey. Respondents indicated on a 4 point scale ("a lot," "some," "a little," and "not at all") how much they believe they know about the following items "with regard to a young person experiencing suicide ideation or attempts:" (1) signs or symptoms of suicide ideation or attempt, (2) what questions to ask to identify suicide ideation or attempt, (3) referral sources for young people who are experiencing suicidal thoughts, (4) why a young person might not disclose suicide ideation or attempt, and (5) what to say and not say in a discussion about suicide with a young person. QPR and ASIST trainee respondents rated their average knowledge about these skills very similarly, between "a lot" and "some," closer to "some." The difference between the QPR and ASIST mean ratings was very small and not statistically significant.

Objective suicide knowledge was assessed with a count of the number of 12 items assessing knowledge about suicide that were answered correctly. These items were also from the Wymen et al. survey. The mean number answered correctly out of 12 in both groups was midway between 9 and 10. Although the average knowledge of the QPR respondents was slightly greater,

the difference between the groups was not statistically significant.

Finally, respondents were asked about their agreement with two items. The first assesses their belief that they can help if a young person experiences thoughts of suicide but does not acknowledge them. Respondents in both groups mainly disagreed, with the mean level of disagreement between "strongly disagree" and "disagree", very close to "disagree." The second item assessed the respondents' perception that their workplace encourages them to ask young people about thoughts of suicide. QPR trainee respondents rated their workplaces as more encouraging; the mean of their responses was between "neither agree or disagree" and agree, close to "agree." ASIST trainee respondents rated their workplaces as less encouraging, also between "neither agree or disagree" and agree, closer to "neither agree or disagree." This difference was statistically significant at the .05 level.

| ***Table F4. Attitudes and knowledge about suicide prevention*** | | | | |
|---|---|---|---|---|
| | QPR | | ASIST | |
| | Mean | SD | Mean | SD |
| **Staff relationship with young people, (items in Table F3)** (1=often to 4=never) | 1.79 | .52 | 1.71 | .57 |
| | | | | |
| **Attitudes about Suicide Prevention** | | | | |
| Preparedness (4= "very prepared" to 1="not at all prepared" ) | 3.42 | .40 | 3.51 | .43 |
| | | | | |
| **Self-evaluated knowledge** (4=a lot to 1=not at all) | 3.25 | .46 | 3.27 | .57 |
| Suicide Knowledge (q18-29) | 9.61 | 1.41 | 9.44 | 1.32 |
| Agreement (1=strongly disagree to 5=strongly agree) | | | | |
| If a young person experiences thoughts of suicide and does not acknowledge the situation there is very little I can do to help. | 1.83 | .84 | 1.88 | .71 |
| My workplace encourages me to ask young people about thoughts of suicide. * | 3.78 | 1.06 | 3.11 | 1.29 |

* $p < .05$; + $p < .10$

Finally, gatekeeper trainees were asked about behaviors related to suicide intervention with a young person in the last 6 months. For analysis purposes, response categories were coded as the midway point between the range of the response category: 0="none," 1.5="1-2," 4= "3-5," 8="6-10," 11="more than 10." Average responses are presented in Table F5. Differences between QPR and ASIST trainees in the reported frequency of these behaviors are evident; all behaviors were more likely to have been performed by ASIST trainees, and all differences were statistically significant at the .05 level. The average estimate of the number of times that respondents had encountered a young person in emotional distress was 2.3 in the QPR groups and almost twice that, 4.5, in the ASIST group. ASIST trainees reported asking a young person whether he/she was considering suicide 6 times as often as QPR trainees, about 3 compared to about 0.5 times, respectively, in the last 6 months. ASIST trainees reported referring a young person in distress to an agency or school/campus based mental health resource about twice as often (about 3 compared to about 1.4). The frequency of referral of a young person to a suicide hotline was over 5 times as great for the ASIST group (1.4 compared to about 0.3). The ASIST/QPR referral ratio of a young person to 911 and/or the emergency room was 3:1, with ASIST trainees referring about 1.7 times on average compared to about 0.6 for the QPR group. The highest ASIST/QPR ratio of over 15:1 involved referral of a young person to Mobile Crisis

Response; ASIST trainees reported making this referral almost 2 times in the last 6 months, whereas the average frequency for QPR respondents was close to 0 at 0.1.

***Table F5. Gatekeeper behaviors performed in the last 6 months.***

| | QPR | | ASIST | |
|---|---|---|---|---|
| | Mean | SD | Mean | SD |
| How many times in the last 6 months have you… | | | | |
| …encountered a young person in emotional distress?* | 2.32 | 2.35 | 4.53 | 4.16 |
| …asked a young person whether he/she was considering suicide?* | .53 | .95 | 3.19 | 3.53 |
| … referred a young person in distress to an agency or school/campus based mental health resource?* | 1.43 | 1.83 | 2.96 | 3.76 |
| … referred a young person to a suicide hotline?* | .26 | .93 | 1.41 | 2.71 |
| … referred a young person to 911 and/or emergency room?* | .56 | 1.18 | 1.68 | .35 |
| … referred a young person to Mobile Crisis Response?* | .12 | .40 | 1.86 | 3.09 |

* $p < .05$; + $p < .10$

***Summary***

The Question Persuade Refer (QPR) (Quinnett, 2007) suicide prevention gatekeeper training program was offered at each of the four Connecticut State University (CSU) campuses. A total of 335 individuals completed QPR gatekeeper training as part of GLS efforts. A second gatekeeper program, Applied Suicide Intervention Skills Training (ASIST), was provided to professionals who work with high-risk populations. The ASIST trainers offered the two day programs to juvenile justice, school nurses, workers in the Department of Children and Families and foster parents. A total of 144 individuals were trained in 8 ASIST training sessions.

All of the individuals who had completed either ASIST or QPR were invited via email to complete an anonymous online survey that would assess knowledge, attitudes, and suicide prevention skill utilization. The survey participation rate was 50% for QPR trainees (n=166) and 53% for ASIST trainees (n=76). The demographic characteristics of the two types of participants reflected the different populations they were drawn from: ASIST trainees were older, almost exclusively female, and more likely to be from a racial minority.

The great majority of both groups reported that the QPR/ASIST training introduced them to new concepts about suicide prevention. QPR and ASIST trainees assessed their preparedness similarly as quite well prepared to competently interact with a suicidal young person. Both types of trainees rated their average knowledge about a variety of skills for assessing, interacting, and referring a suicidal young person very similarly, between “a lot” and “some,” closer to “some.” Both groups answered correctly between 9 and 10 out of 12 items which assessed knowledge about suicide. Finally, gatekeeper trainees were asked about behaviors related to suicide intervention with a young person in the last 6 months; all behaviors were more likely to have been performed by ASIST trainees.

## CONCLUSIONS AND RECOMMENDATIONS

### *Middle School Pilot Program*

Our results suggest that the provision of mental health services in school-based health clinics could lead to increased rates of identification of depressed students and better access to students for the provision of counseling services. Efforts to reach young at-risk urban students, securing consent for evaluation, and providing mental health services were far more successful in school-based health centers than in an outpatient, hospital based pediatric clinic. Youths seen at the school-based health clinic also were seen more frequently for mental health appointments and received more follow-up screenings, even though the school-based clinics were only available for the 10 months of the school year while the community clinic was open year round. The proportion of kept appointments was quite high for a community outpatient clinic, particularly one serving younger clients from a largely Latino Population (Kruse, Rholand, & Wu, 2002; Donaldson, Spirito & Esposito-Smythers, 2005). Our findings support conclusions made by other researchers who have examined the accessibility and efficacy of school-based mental health services (Kataoka et al 2003; Flaherty et al 1996; Flaherty & Weist, 1999). However, follow-up rescreening rates were low in both the school and hospital contexts, suggesting that targeted efforts to improve tracking and follow-up procedures are warranted in order to document and hopefully improve student outcomes.

The adoption of screening as part of the standard of care at all three sites may potentially serve as a model for the 41 of 59 school-based health clinics in Connecticut which serve middle and/or high school students. This effort would be consistent with the 2005 Connecticut Comprehensive Suicide Prevention Plan (DPH, CT State Judicial Branch). The stated goal to "conduct rapid assessment and planning of care for children and youth; promote system changes to expand the scope of services in schools and assess utilization of school-based mental health services," may be well served by the adoption of a standard of care in which all youth utilizing school-based health clinics are screened for depression. As of this report however, there are no plans to adopt mental health screening at the other school-based clinics.

A limitation of this study is that only data from students consented to be part of the evaluation could be included in our analyses. If consented students differed in a systematic way from non-consented students, the results from this evaluation may be biased.

### *High School SOS Suicide Prevention*

Results from the current study generally corroborate findings from previous SOS intervention evaluations (Aseltine, 2003; Aseltine & DeMartino, 2004; Aseltine, James, Schilling, & Glanovsky, 2007). Once again, the participation in the SOS program was associated with lower rates of suicide attempts at 3 months following the program. As in previous studies, the SOS program had an important short-term impact on the attitudes and behaviors of high-school aged youth, and increased students' knowledge of, and adaptive attitudes toward, depression and suicide. Once again, evidence was not found that the program altered suicidal ideation or help-seeking behaviors. However, this study offered the SOS program to a unique subgroup of high school students who may in some respects be at higher risk than the general public school population. Confirmation of the SOS program's efficacy in this subgroup of students adds to its appeal as a very robust universal prevention program.

This study also extended previous research by utilizing a randomized pre-test/post-test design, which was more rigorous than previous post-test only designs used to evaluate SOS. This study demonstrated that the treatment and control groups were statistically indistinguishable at pre-test, increasing confidence in the results. In addition, because analyses of the effects of the SOS program controlled for pre-test levels of the outcome, the results are less likely to be affected by differential attrition between treatment and control groups. Thus, by replicating and extending previous research, results from the current study increase confidence in the efficacy of the SOS program.

### *College Suicide Prevention*

The first component of the college suicide prevention effort involved implementation of the College SOS program. The program was well-received at the four Connecticut State University campuses. The great majority of participating students reported being satisfied or very satisfied with the quality of the College SOS program and indicated that they expected to use the information gained. Unfortunately, Screening for Mental Health no longer supports this program, so continuation and expansion of the program is not currently feasible. A successor to the College SOS program is currently in development.

The second component of the college suicide prevention effort involved in-person screening initiatives as part of National Depression Screening Day (NDSD) activities and online screening available at all times to students on each of the four campuses during the 2007-2008 and 2008-2009 academic years. The number of students screened increased over the course of the two academic years. In addition, the proportion of online to in-person screening increased dramatically; however, in-person screening numbers decreased substantially on all 3 participating campuses. A much higher proportion of online screening participants screened positive for depression compared to in-person screening participants, suggesting that the two types of screening reached different populations of students. Approximately half of the online participants reported whether they planned to seek further evaluation for depression. The higher the risk of depression, the greater was the likelihood that the participant planned to get further evaluation. A cause for concern, however, is that many participants did not indicate that they planned further follow-up (either responding "no" or not making a response).

There are several advantages to the in-person screening campaign. First, the "paper and pencil" screening form includes measures for Depression (HANDS), Bipolar Disorder (Mood Disorder Questionnaire), Generalized Anxiety Disorder (Carroll-Davidson GAD Screen) and Post Traumatic Stress Disorder (SPRINT-4 for PTSD). Second, the screening included questions about previous treatment for several mental health concerns and past suicide attempts. Third, the format of the in-person screening provides contact with college counseling center personnel which may encourage further assessment or treatment at the counseling center or community health center. There are, however, important disadvantages to the in-person screening event. Most limiting is the fact is that in-person screening was offered during a designated day or two in the fall semester, most frequently designed to bring attention to National Depression Screening Day in October of each year. Especially given the temporal suicide risk for adults that peaks in the spring and continues through the summer (Milane, Suchard, Wong, & Licinio, 2006; Warren, Smith, & Tyler, 2008), the "screening day" format precludes ongoing screening and referral for a student population over the course of the school year.

Similarly, there are advantages and disadvantages to online screening. Advantages include the availability, privacy, automatic scoring, and instant results of screening tools from any networked computer. A disadvantage of the online screening is that there is no contact with counseling center personnel at the time of the screening; this may limit the likelihood of further evaluation and treatment. In addition, screenings for disorders (Depression, PTSD, GAD, etc.) are separate so that the student may first "self-diagnose" and only complete the screening he or she believes is appropriate. Thus, the student may not then get screened for an important co-occurring disorder or may falsely conclude that he/she is not experiencing a mental illness.

Those who completed the online screening were far more likely to have depression symptoms, possibly indicating that those who seek the depression screen are accurately recognizing that they might be experiencing depression compared to those who happen upon the NDSD activities. The increased usage of online screening across the two academic years of the study bodes well for the future of this tool. It appears that as awareness of the availability of online screening increased, more students made use of it.

### *Campus Counseling Center Suicide Prevention*

One of the goals of the college suicide prevention effort was to increase the number of referrals from self, friends, faculty and staff. Counseling center utilization rates increased at each CSU campus. In addition, from the 2007-2008 academic year to the 2008-2009 academic year, all types of referrals (self, faculty, friend, Residential Life or Other) increased in number. Although the reason for the increase in counseling center utilization and referral rates from 2007-2008 to 2008-2009, and from fall to spring, is impossible to determine, it is consistent with an effect from gatekeeper training on faculty and Residential Life/Other staff referrals (see below) and from the college SOS program on friend referrals. However, at least some of the increase is likely due to changes in policies at several of the sites limiting the number of individual sessions per student. In addition, the pattern of increases in depression and suicide as presenting concerns from fall to spring is consistent with prior research (Kposowa, & D'Auria, 2009; Milane, Suchard, Wong, & Licinio, 2006). It is somewhat surprising that the numbers of suicide assessments do not follow this seasonal pattern on all campuses. It should be noted that suicide assessments were counted, not individual clients, however, so it is possible that chronically suicidal clients could bias the number of assessments upward compared to the number of clients served; this further complicates interpretation of these data.

### *Gatekeeper Training*

Two gatekeeper training programs were offered: Question Persuade Refer (QPR) (Quinnett, 2007) suicide prevention gatekeeper training program was offered at each of the four Connecticut State University (CSU) campuses, and Applied Suicide Intervention Skills Training (ASIST), was provided to professionals who work with high-risk populations. An online survey of the QPR and ASIST trainees revealed that both QPR and ASIST were well-received by trainees and both types of trainees reported that the training introduced them to new concepts about suicide prevention. QPR and ASIST trainees assessed their preparedness similarly as quite well prepared to competently interact with a suicidal young person. In addition, both types of trainees rated their average knowledge about a variety of skills for assessing, interacting, and referring a suicidal young person very similarly, and both groups revealed similar levels of knowledge about suicide.

Data on campus counseling center utilization and referrals (see above) revealed that the implementation of QPR coincided with increased rates of referrals at campus counseling centers.

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