Depressive Symptoms and Alcohol Abuse/ Misuse in Older Adults: Results from the Florida BRITE Project

Carlos A. Rodriguez, Lawrence Schonfeld, Bellinda King-Kallimanis, and Amber M. Gum

Previous research has suggested that older adults who misuse alcohol frequently report depressive symptoms as an antecedent to drinking. The objective of the present study was to investigate the extent to which higher levels of depressive symptoms were associated with elders' problem drinking by examining screening data from a three-year pilot program known as the Florida BRITE Project. BRITE (BRief Intervention and Treatment for Elders) is a multisite program offering brief interventions for community-based older adults screening positive for alcohol or medication misuse. Depressive symptoms were assessed using the Short Geriatric Depression Scale; alcohol use was assessed with the first three questions from the Alcohol Use Disorders Identification Test and the Short-Michigan Alcoholism Screening Test-Geriatric version. Multivariate logistic regression revealed that older adults with higher levels of depressive symptoms were at greater risk for screening positive for alcohol problems, particularly among the "young-old" adults. The results not only suggest the importance of screening for both depressive symptoms and alcohol misuse in an older population, but also indicate that older adults are not a homogeneous group.

Keywords: *depression; alcohol; older adults; SBIRT; screening*

Carlos A. Rodriguez, BA, is a graduate student studying clinical aging in the Clinical Science program of the Department of Psychology at the University of Southern California in Los Angeles. Bellinda King-Kallimanis is biostatistician at the Department of Aging and Mental Health Disparities, Louis de la Parte Florida Mental Health Institute, University of South Florida and a PhD candidate in the Department of Medical Psychology at the Academic Medical Center, University of Amsterdam. Dr. Lawrence Schonfeld is professor and chair of the Department of Aging and Mental Health Disparities, Louis de la Parte Florida Mental Health Institute, University of South Florida. Amber Gum is assistant professor in the Department of Aging and Mental Health Disparities, Louis de la Parte Florida Mental Health Institute, University of South Florida.

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Alcohol abuse and misuse among older adults is a growing public health concern (Center for Substance Abuse Treatment [CSAT], 1998). Results from the National Survey on Drug Use and Health (Office of Applied Studies, 2004) indicated that among people aged 65 years and older, 1.8 percent were heavy drinkers and 6.9 percent were binge drinkers. The number of elders misusing alcohol is only expected to increase, because by 2011, approximately 75 million baby boomers—a generation holding more favorable attitudes toward alcohol and illicit drugs than previous generations—will reach the age of 65 (Gfrorer, Penne, Pemberton, & Folsom, 2003; Korper & Council, 2002; National Institute on Alcohol Abuse and Alcoholism (NIAAA), 1998; Office of Applied Studies, 1996; Oslin, Schonfeld, Wilford, & MacArthur, 2006). Adults age 65 and older already account for four times the general health care expenditures of middle-aged adults (Oslin et al., 2006), and the potential increase in substance abuse treatment is likely to place greater demands on the health care system.

In addition to the impending demands brought about by the increasing numbers of older adults with substance abuse/misuse problems, there are population-specific considerations that the current health care system may not be adequately equipped to manage regarding physical co-morbidities. Older adults are at an increased risk for health consequences (i.e., cardiovascular disease, esophageal cancer, liver disease) associated with substance abuse/misuse in comparison with younger adults (Rigler, 2000; Smith, 1995). Further, many older adults are simultaneously dealing with the loss of significant others (e.g., death of a spouse, loss of job-related social-support systems, moving away from friends) and retirement (i.e., reduction in income, redefining personal identity), increasing the likelihood for alcohol problems, depressive symptoms, and suicide (Brennan & Moos, 1996). Finally, older adults experience age-related physiological changes that significantly increase sensitivity and decrease tolerance to alcohol and other drugs, therefore increasing the potential for pernicious levels of that drug to accumulate within the body (DaSilva & Alexander, 2003).

Given the susceptibility of older adults to the harmful effects of substances and the anticipated rise of substance abuse or misuse among this population, the NIAAA and the Substance Abuse and Mental Health Services Administration (SAMHSA) have advocated for research aimed at the identification of demographic or co-occurring factors with substance abuse or misuse by older adults that may impact prevention or treatment (Schinke, Brounstein, & Gardner, 2002). Such research advocacy is necessary, given evidence that physicians continue to screen and discuss substance abuse with elder patients significantly less frequently than with younger patients, perhaps because elders are viewed as less likely to be substance abusers (Bertakis & Azari, 2007). However, early identification and prevention of substance misuse in elders can lead to decreased mental and physical health problems and related costs by helping providers identify substance abuse/misuse more accurately and offer appropriate services sooner (U.S. Preventive Task Force Services, 2004).

Prior research indicates that older adults often report feelings of negative emotional states such as depression, boredom, and loneliness prior to consuming

their first drink or drug use on a typical day of use (Schonfeld & Dupree, 1991). Schonfeld, Dupree, and Rohrer (1995) compared older adults (age 55 and older) and younger adults (under age 55) enrolled in an alcohol abuse treatment program with relation to their high-risk situations leading to drinking. Among other antecedents to drinking, older adults were found to have reported depression and loneliness just prior to drinking significantly more often than the younger adults. Similarly, another study found a high precedence of self-reported depression and loneliness prior to drinking among older veterans with substance abuse problems (Schonfeld et al., 2000). However, in both studies, depression was measured using open-ended criteria, allowing participants to provide their own meaning for depression. Without the use of a standardized definition for depression, it is difficult to know what constructs were described by these participants, and to what degree they relate to formal conceptualizations of depressive symptoms.

Kirchner et al. (2007) used the General Health Questionnaire, a well-established index of clinical depression and anxiety, to assess patterns and characteristics related to at-risk drinking in a large sample ($N = 24{,}863$) of primary-care patients, age 65 and older. Heavy drinking was associated with the depression/anxiety items. The authors noted, however, that the findings may not generalize to older adults in usual care and that they were unable to statistically control for education or income of client. Furthermore, they cautioned that due to the large sample size of the study, statistical significance may have been more indicative of small relative differences than clinically significant differences.

The present study investigated the extent to which older adults' depressive symptoms are associated with misuse of alcohol using a standardized measure of depressive symptoms by analyses of secondary data from the Florida BRITE Project (BRief Intervention and Treatment for Elders). BRITE began as a multisite pilot project targeting people ages 60 and older at risk for, or demonstrating problems with alcohol, prescription medications, over-the-counter medications, and illicit drugs, as well as screening for depression and suicide risk (Schonfeld et al., 2009). The pilot program was initiated by the state of Florida to address the needs of older adults identified through aging services and outreach efforts. Based on previous research, we hypothesized that the presence of moderate or severe clinically depressive symptoms in older adults would be associated with the presence of alcohol abuse/misuse. We statistically controlled for educational level, gender, race, site location, year of entry into program, and living alone (yes/no). Finally, recognizing that older adults are often mistakenly treated as a homogeneous age group in the research literature (Berkman, 1988), age was explored as a moderator of the relationship between depressive symptoms and alcohol abuse/misuse.

Method

Subjects

Data for this study were derived from 3,497 people (unduplicated cases) screened by Florida BRITE Project agencies in Broward, Orange, Pinellas, and

Sarasota counties. Each of the four agencies was a licensed behavioral health care provider agency, contracted by the state's Substance Abuse Program Office to implement screening, brief intervention, brief treatment, or referral to treatment as a pilot to SAMHSA's screening, brief intervention, and referral for treatment (SBIRT) initiative (Center for Substance Abuse Treatment, 2005). The SBIRT initiative targets risky and problematic drinking and illicit substance use in primary care and other medical settings, and provides brief intervention or brief treatment, but refers out people with serious alcohol or drug dependence to more intensive treatment services. Unlike the SBIRT model used in other states in which screening is conducted almost exclusively in medical settings, BRITE identified older adults through aging services, social services, retirement communities, other senior housing, and other outreach efforts such as presentations at health fairs. The pilot project data were collected from March 2004 through May 2007. Staff employed by the BRITE provider agencies screened older adults for potential problems with alcohol, prescription medications, over-the-counter medications, illicit drugs, depressive symptoms, or suicide risk (Schonfeld et al., 2009). All cases included in the analyses were required to have complete data on the depressive symptoms and alcohol measures of the project's screening instrument to be included in the present study. Only those older adults who reported having consumed any alcohol in the past five years were included in the study. Because many of the people screened were nondrinkers and about 1 percent were found to be younger than 60 years of age, the final sample size of 1,552 was 45 percent of all people screened ($N = 3{,}497$).

Measures

Older adults referred to, or identified by, the four service-provider agencies were interviewed by BRITE counselors using the BRITE Screening Tool (Schonfeld et al., 2009). Items included demographic variables, referral information (e.g., reason for referral, source), history of previous treatment for substance misuse, and screening on the six domains of potential risk or problems related to misuse of alcohol, over-the-counter medications, prescription medication, or illicit drugs. In addition, BRITE counselors also screened for depressive symptoms and suicide risk.

Alcohol abuse/misuse. To measure quantity and frequency of alcohol consumption, the first three questions from the Alcohol Use Disorders Identification Test (AUDIT) questionnaire were included in the BRITE screening tool (Babor, de la Fuente, Saunders, & Grant, 1992). If the person indicated use of alcohol within the past five years, the 10-item Short-Michigan Alcoholism Screening Test-Geriatric version (SMAST-G; Blow, Gillespie, Barry, Mudd, & Hill, 1998) was administered. A score of 2 or more on the SMAST-G indicated need for further assessment. Studies have indicated that the SMAST-G has adequate validity for older adults when compared with DSM-III-R diagnoses of alcohol abuse or dependence (Blow et al., 1998), and when compared with hazardous drinking as defined by the World Health Organization (Johnson-Greene, McCaul, & Roger, 2009).

Depressive symptoms. The Short-Geriatric Depression Scale (S-GDS; Sheikh & Yesavage, 1986) is a well-validated, 15-item screen for older adults. Clinical cutoff scores for interpreting level of depressive symptoms were: 0–4 points (none to mildly depressive symptoms), 5–9 points (moderately depressive symptoms), and 10–15 points (severe depressive symptoms).

Data Analyses

Responses to alcohol consumption measures were categorized into two mutually exclusive categories: those responses indicating a positive alcohol screening (PAS) requiring further assessment and those responses considered as a negative alcohol screening (NAS). In accordance with recommendations made within Treatment Improvement Protocol (TIP #26) on Substance Abuse Among Older Adults (CSAT, 1998), three identifiers were used to code responses as a PAS: (a) consuming three or more drinks containing alcohol on a typical day of drinking (from the AUDIT); (b) having six or more drinks on any one occasion (from the AUDIT); or (c) score of 2 or higher on the SMAST-G.

A hierarchical logistic regression analysis was used to address the study's questions. The outcome variable was PAS (yes or no). The primary co-variates were age and level of depressive symptoms as indicated by the S-GDS. Additional co-variates included gender, living status (i.e., living alone or with others), race (white or other), site location (Broward, Sarasota, Pinellas, or Orange County), and educational level (below high school, high school graduate, and higher education). Due to a nonequivalent number of ethnic minorities in the sample to allow for analyses per ethnic group, race was dichotomized. We also controlled for year of entry into program (March 2004–June 2006 or July 2006–May 2007) due to programmatic changes in BRITE's referral process after June 2006.

Initial relationships between PAS and co-variates were initially examined bivariately using chi-square tests, *t* tests, and ANOVA. Variables demonstrating a statistically significant relationship with PAS ($\alpha = .05$) were included as co-variates in the subsequent analyses. Based on these results, a hierarchical logistic regression model was designed using three blocks: sociodemographic variables were entered into block 1, age and the three categories of the S-GDS were entered into block 2, and block 3 contained the interaction of S-GDS and age. For clarity in the interpretation of results, age was centered at the sample mean (M = 73.8). All analyses were conducted using SPSS version 15.0.

Results

In the study sample of 1,552 older adults, the mean age was 73.8, ranging from 53 to 100 years of age. Table 1 provides detailed descriptive characteristics and depressive symptoms of the sample as well as those with a PAS (n = 366 or 24%) and without a PAS (n = 1186 or 86%). The majority of people were white, female, high school or higher education, and classified at screening as having none to mild depressive symptoms. More than half were screened in Broward

Table 1 Descriptive Characteristics for Older Adults with Positive Alcohol Screens (PAS) and Negative Alcohol Screens (NAS)

Characteristic	PAS (n = 366)	NAS (n = 1186)	Total (n = 1552)
Age, median (interquartile range)‡	66.8 (12.6)	75.0 (14.2)	73.1 (14.8)
Race, n (%)			
White	291 (79.5)	986 (83.1)	1277 (82.3)
Nonwhite	75 (20.5)	200 (16.9)	275 (17.7)
Gender, n (%)‡			
Male	241 (65.8)	363 (30.6)	604 (38.9)
Female	125 (34.2)	823 (69.4)	948 (61.1)
Education, n (%)*			
Less than High School	97 (26.5)	236 (19.9)	333 (21.5)
High School	118 (32.2)	461 (38.9)	579 (37.3)
Higher Education	151 (41.3)	489 (41.2)	640 (41.2)
Living status, n (%)*			
Living alone	173 (47.3)	651 (54.9)	824 (53.1)
Not living alone	193 (52.7)	535 (45.1)	728 (46.9)
Site location, n (%)‡			
Broward County	216 (59.0)	635 (53.5)	851 (54.8)
Sarasota	53 (14.5)	233 (19.6)	286 (18.4)
Pinellas	56 (15.3)	248 (20.9)	304 (19.6)
Orange	41 (11.2)	70 (5.9)	111 (7.2)
Year of entry into program, n (%)*			
March 2004–June 2006	256 (69.9)	898 (75.7)	1154 (74.4)
July 2006–May 2007	110 (30.1)	288 (24.3)	398 (25.6)
Depressive symptoms, n (%)‡			
None to mild	215 (58.7)	881 (74.3)	1096 (70.6)
Moderate	99 (27.0)	237 (20.0)	336 (21.6)
Severe	52 (14.2)	68 (5.7)	120 (7.7)

Note. $P <$ *.05, †.01, ‡.001

County. Race was the only variable that did not differ significantly between older adults with and without a PAS.

The S-GDS classified over half the sample (70.6%) as having none to mild symptoms, 336 (21.6%) had moderate symptoms, and 120 (7.7%) had severe symptoms of depression. Table 2 provides detailed descriptive characteristics for older adults with varying levels of depressive symptoms. One-way between subjects ANOVA indicated that age varied significantly across the levels of S-GDS, $F(2, 1549) = 20.9$, $p < 0.001$. Specifically, participants with none to mildly depressive symptoms ($M = 74.6$) were significantly older than participants with moderately ($M = 72.1$) or severe ($M = 70.0$) depressive symptoms. Participants with moderately depressive symptoms did not differ significantly in age from those participants with severe depressive symptoms. Gender, education, and living status did not have a significant relationship with the S-GDS.

Table 2 Descriptive Characteristics and Comparisons for Older Adults with Varying Levels of Depressive Symptoms

Characteristic	None to Mild Depressive Symptoms	Moderately Depressive Symptoms	Severely Depressive Symptoms	Total Depressive Symptoms
Age, median (interquartile range)‡	74.1 (14.1)	71.1 (15.0)	67.0 (17.6)	73.1 (14.8)
Race, n (%)†				
White	887 (80.9)	277 (82.4)	113 (94.2)	1277 (82.3)
Nonwhite	209 (19.1)	59 (17.6)	7 (5.8)	275 (17.7)
Gender, n (%)				
Male	416 (38.0)	132 (39.3)	56 (46.7)	604 (38.9)
Female	680 (62.0)	204 (60.7)	64 (53.3)	948 (61.1)
Education, n (%)				
Less than High School	235 (21.4)	79 (23.5)	19 (15.8)	333 (21.5)
High School	412 (37.6)	122 (36.3)	45 (37.5)	579 (37.3)
Higher Education	449 (41.0)	135 (40.2)	56 (46.7)	640 (41.2)
Living status, n (%)				
Living alone	570 (52.0)	187 (55.7)	67 (55.8)	824 (53.1)
Not living alone	526 (48.0)	149 (44.3)	53 (44.2)	728 (46.9)
Site location, n (%)†				
Broward County	577 (52.6)	208 (61.9)	66 (55.0)	851 (54.8)
Sarasota	218 (19.9)	44 (13.1)	24 (20.0)	286 (18.4)
Pinellas	227 (20.7)	61 (18.2)	16 (13.3)	304 (19.6)
Orange	74 (6.8)	23 (6.8)	14 (11.7)	111 (7.2)
Year of entry into program, n (%)*				
March 2004–June 2006	832 (75.9)	230 (68.5)	92 (76.7)	1154 (74.4)
July 2006–May 2007	264 (24.1)	106 (31.5)	28 (23.3)	398 (25.6)
Alcohol abuse/misuse, n (%)‡				
Positive Alcohol Screen	881 (80.4)	237 (70.5)	68 (56.7)	1186 (76.4)
Negative Alcohol Screen	215 (19.6)	99 (29.5)	52 (43.3)	366 (23.6)

Note. $P <$ *.05, †.01, ‡.001

The results of the hierarchical logistic regression can be seen in Table 3. The odds ratios indicated that reduced risk for being classified as a problem drinker is associated with being female, having a high school education, and site location. Those with at least some higher education trended toward having less risk of being classified as a problem drinker. Risk of screening positive for a high-risk of abusing/misusing alcohol was not related to race, living status, or year of entry into program. Together, level of depressive symptoms and age reliably distinguished between problem-drinkers and non-problem drinkers, while controlling for race, gender, education, living status, site location, and year of entry into program: $\chi^2\,(2) = 134.85$, $p < 0.001$. This finding is qualified by a significant interaction of depressive symptoms and age: $\chi^2\,(2) = 7.26$, $p < 0.05$.

Figure 1 illustrates the interaction of depressive symptoms and age. This interaction suggests that, for older adults with moderate levels of depressive symptoms,

Table 3 Hierarchical Logistic Regression

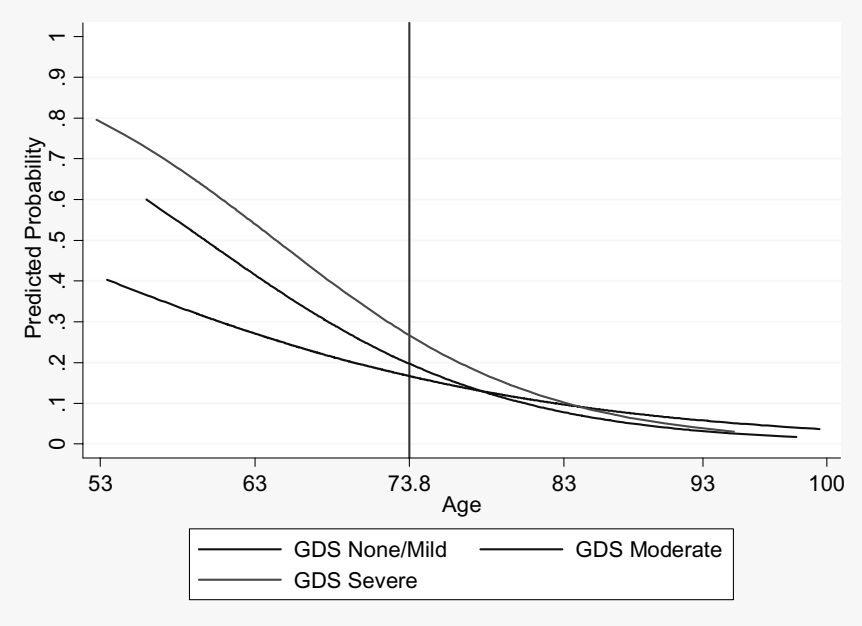
	Block 1 Odds Ratios	Block 2 Odds Ratios	Block 3 Odds Ratios	95% CI for final model
Age (centered)		.92‡	.94‡	.92–.96
Race: Other	1.11	.95	.96	.67–1.36
Female	.23‡	.24‡	.24‡	.18–.31
Education				
Less than High School	Reference			
High School	.76	.69*	.70*	.49–1.00
Higher Education	.82	.71(p = .057)	.71(p = .053)	.50–1.00
Living Alone	.96	1.07	1.07	.81–1.41
Site Location				
Broward County	Reference			
Pinellas County	.80	.88	.87	.60–1.26
Orange County	2.04†	2.23†	2.13†	1.32–3.44
Sarasota County	.78	.94	.91	.62–1.34
Year of Entry: July 2006–May 2007	1.37*	1.24	1.27	.95–1.70
S-GDS (depression)				
None to mild		Reference		
Moderate		1.45*	1.23	.85–1.77
Severe		2.32‡	1.81*	1.03–3.20
S-GDS: Moderate x age			.96*	.92–1.00
S-GDS: Severe x age			.95(p = .055)	.90–1.00
Fit statistics				
Log likelihood	–763.26	–695.83	–692.20	
AIC	1452.278	1415.76	1412.467	

Note. $P <$ * .05, † .01, ‡ .001 *CI = Confidence Interval AIC = Akaike Information Criterion*

the likelihood of a PAS was significantly reduced by 0.96 for each additional year of age (95% CI = 0.92–1.00), compared with those with none to mild depressive symptoms: $p < 0.001$. For example, using the final model's equation, an adult at age 60 with a moderate level of depression will, after one year, have a 0.96 reduction in likelihood for having a PAS, but at age 65 the adult's likelihood for having a PAS would be reduced by a multiplicative factor of 4.8. For older adults whose screening results indicate severe levels of depressive symptoms, the likelihood of being classified as a PAS trended toward a reduction of 0.95 (95% CI = 0.90–1.00) as their age increases every year, compared with those with none/mild levels of depression: p [=] 0.055. There was no significant difference between adults with moderate or severe levels of depression with regard to the interaction with age.

The Hosmer-Lemeshow goodness-of-fit statistic was nonsignificant—χ^2 (8) = 5.81, $p = 0.67$—and the area under the receiver operating characteristic curve for the data had a value of 0.79, both suggesting that the model fits well. Additionally, the variance inflation factors were investigated, and these values suggested that there was no multicollinearity in the final model.

Figure 1 Depressive Symptoms x Age (centered at M = 73.8) Interaction



Discussion

The present study utilized well-validated measures of depressive symptoms and problematic drinking from a multisite project targeting older adults at risk for or demonstrating problems with substance abuse/misuse. In contrast with previous studies examining depression and drinking within primary-care settings and hospital emergency departments, the Florida BRITE Project screened older adults in community-based settings, using age-appropriate screening instruments. Results indicated that older adults with moderate or severe levels of depressive symptoms were more likely to be classified as problematic drinkers, thus supporting assumptions in previous research involving older adults identified by using open-ended criteria to measure depression (Schonfeld & Dupree, 1991; Schonfeld, Dupree, & Rohrer, 1995; Schonfeld et al., 2000). Consistent with past findings (Droomers, Schrijvers, & Machenback, 2004), those with less than a high school education were more likely to have a positive alcohol screen than those with at least a high school education.

The analyses demonstrated that males were more likely to have a positive alcohol screen than females, a finding consistent with previous reports (Blazer, 2003; CSAT, 2005). However, given elder females' greater exposure to potent prescription medicines (Simoni-Wastali, 2000), they may be at risk for problematic use of

prescription and over-the-counter medications, substances not examined within the present study. Counterintuitive to what we might have expected, there were no significant differences between men and women in depression scores. The lack of difference in depression scores may have been influenced by the outreach method used by BRITE counselors to contact and screen older adults in various community settings, where many elders were found to be positive for depression, but not for substance misuse.

Perhaps the most noteworthy finding was that age interacted with level of depressive symptoms in classifying older adults as being at risk or demonstrating problems with alcohol abuse/misuse. The positive relationship between depressive symptoms and risk for problematic drinking was more pronounced for the younger adults, and as age increased, the association between depressive symptoms and risk for problematic drinking grew weaker. As suggested by Figure 1, depressive symptoms seem to have almost no relation to risk for problematic drinking by age 80. Possible explanations might include baby boomers' and the young-old adults' having more favorable attitudes about alcohol (Gfrorer et al., 2003) or the diminished alcohol consumption as one reaches the later years. Another possibility is that age and gender are confounded, and the finding more accurately portrays the greater problematic drinking among males who are found in greater number in the young-old group.

Replication of the study's findings may allow future community-based outreach programs greater effectiveness in screening elders for problematic drinking by including depression screening measurements in their assessment batteries. At the least, elders identified as having elevated depressive symptomatology should be asked about their use of alcohol. Health professionals and clinicians across practice settings should recognize that despite the general decrease in alcohol use with advancing age, there still exists the need to assess for problematic drinking in the heterogeneous population of elders.

The results of the study are limited by the reliance on self-report methodology to identify and exclude abstainers from the final analyses, suggesting that our findings must be considered a conservative estimate of the link between depressive symptoms and risk for problematic drinking. However, most research supports the accuracy of self-reported levels of drinking (Connors & Volk, 2004). Further limitations include the cross-sectional design and the methods that BRITE providers used to identify participants, but nevertheless demonstrate the importance of screening older adults in settings that are served by aging and social service providers, health care providers, and other community-based settings. Most older adults are not screened for substance use, and those demonstrating risky or problematic use rarely receive substance abuse services. Thus, initiatives such as the SAMHSA/CSAT SBIRT model,which focuses on screening and brief interventions, lend themselves well to the identification of such problems.

The three-year BRITE pilot study provided important data to enable the state of Florida to obtain a SAMHSA/CSAT SBIRT grant in late 2006. Through this five-year, $14 million SBIRT grant, BRITE expanded to 22 sites in 15 counties, with

locations in aging services, hospital emergency rooms, urgent care centers/walk-in medical clinics, retirement communities, and other settings. In less than three years into the project, more than 11,500 older Floridians have been screened, and approximately 20 percent have received at least one brief intervention. In addition, through this grant, we continue to screen for depressive symptoms, recognizing the strong relationship between depression and substance misuse.

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