Published in final edited form as:

J Addict Med. 2013 ; 7(6): . doi:10.1097/ADM.0b013e31829faa1c.

The Association of Co-morbid Generalized Anxiety Disorder and Alcohol Use Disorder Symptoms with Health-related Quality of Life: Results from the National Epidemiological Survey on Alcohol and Related Conditions

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Abstract

Background—Although prior studies have documented the co-occurrence of generalized anxiety disorder (GAD) and alcohol use disorder (AUD) disorders, there is a paucity of research assessing the patterns of alcohol involvement among individuals with GAD symptoms. This study investigated subtypes, or classes, of co-morbid AUD and GAD symptoms, and assessed the association of class membership with health-related quality of life.

Methods—Using data from the Wave 1 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a latent class analysis was performed on the subset of individuals who were current drinkers and had reported ever experiencing a six month episode of feeling tense, nervous or worried most of the time. We examined the association of these latent classes with physical and mental health-related quality of life as measured by the Short Form-12 version 2 (SF-12v2).

Results—Latent class analysis identified a five class model of AUD and GAD symptoms. A significant graded relationship was observed between the ordered classes and severity of impairment on the mental health scale of the SF-12v2, but no significant relationship was found with the physical health scale.

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Sources of Support

The analyses and preparation of this project were supported by a grant from the National Institute on Alcohol Abuse and Alcoholism (AA016346), and the National Institute on Drug Abuse (DA030460). Preparation of this paper also was supported by a Johns Hopkins School of Medicine Clinician Scientist Award (AA).

Conclusions—Mental, but not physical, health-related quality of life in this population is associated with both the number and pattern of co-morbid GAD and AUD symptoms.

Keywords

alcohol abuse; alcohol dependence; alcohol use disorder; generalized anxiety disorder; health-related quality of life; latent class analysis

Introduction

Both generalized anxiety disorder (GAD) and alcohol use disorders (AUD) are highly prevalent in the general population (Grant et al., 2005; Hasin et al., 2007) and, individually, have significant social and medical impacts on the lives of individuals and on society as a whole (Jones et al., 2001; Kessler et al., 2001; Wittchen, 2002; Goetzl et al., 2003; Bobes et al., 2011; Comer et al., 2011). Furthermore, the link between these two disorders has been well established (Grant et al., 2004; Kessler et al., 2005; Conway et al., 2006) and prior analyses of population-based samples such as the National Co-morbidity Survey have found annual co-morbid prevalence estimates of 11.6% for those with GAD and alcohol dependence (Kessler et al., 1996).

The impact of the co-occurrence of GAD and AUD on an array of health outcomes has been investigated in both clinical and population-based studies. Smith & Book (2010) examined the clinical characteristics of individuals with GAD and AUD compared to those with AUD alone and found a higher level of worry and a history of significantly more suicide attempts in the co-morbid group. In prior analyses of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), Magidson et al. (2012) found that individuals with co-morbid substance use disorders (including AUD) and GAD had worse clinical outcomes compared to those with substance use disorders alone. Using the Short Form-12 version 2 (SF-12 v2) (Ware et al., 1996) to assess level of functioning, Magidson et al. found that the physical health component score of the SF-12 v2 was lower at Wave 1 and worsened over time in the co-morbid group. Grant et al. (2005) used the NESARC to identify the prevalence, correlates, co-morbidity and comparative disability of GAD utilizing the four mental health disability subscales of the SF-12 v2. They found no increase in disability associated with either GAD or AUD alone compared to GAD co-morbid with AUD. Hasin et al. (2007) used the NESARC to explore the prevalence, correlates, co-morbidity and comparative disability of AUD. In their analysis, they found a positive association between AUD and GAD, but the strength of the association was reduced after controlling for other co-morbid conditions. These authors also reported that mental health impairment, as assessed by the SF-12 v2, increased as AUD severity increased even after adjusting for other Axis I disorders. In summary, although ample literature attests to the co-occurrence of alcohol problems and GAD, less is known about the patterns of alcohol involvement among individuals with GAD symptoms and the implications of this co-morbidity for health-related functional outcomes

Most of the prior work on AUD and GAD has focused on diagnostic categories which can be restrictive; for example providing little information on clinical severity. Latent class analysis is a statistical method that permits classification of individuals according to similar symptom profiles. Such an approach permits the study of co-morbid symptom profiles, specifically how individuals with varying symptoms of GAD and AUD differ on health-related functional outcomes. One of these outcomes is their level of physical and mental functioning. In the current report, we aimed to extend prior analyses and to explore the association of co-morbid AUD and GAD symptom profiles with health status. Specifically, we aimed to a) identify subgroups of individuals with co-morbid AUD and GAD symptoms

among adults in a representative sample of the U.S. population, and b) compare these subgroups across domains of health-related quality of life.

Methods

Study population

The Wave 1 NESARC dataset is comprised of 43,093 adults aged 18 years and older who participated in structured, computer-based interviews. Details of the survey are described elsewhere (Grant et al., 2004). From this population, a subset of subjects was selected who were current drinkers and screened positive for a history of key GAD symptoms (ever having had a six-month period of feeling tense, nervous, or worried most of the time). There were 1,969 subjects who fulfilled both of these criteria, and their data formed the basis of this analysis.

Measures

Functional status—The Short Form-12 Health Survey, version 2 (SF-12 v2) is a self-reported instrument that measures health-related quality of life. It is designed to measure general health concepts, including physical functioning, physical and emotional role functioning, bodily pain, general health, vitality, social functioning, and mental health (Ware et al., 1996). Results of the SF-12 v2 are compiled into two subscales: the mental health component summary and physical health component summary. The mental and physical health component scores are normed to the general population and have a score range of 0–100, where 0 represents the lowest level of health and 100 indicates the highest health level. In the present analyses, the mental and physical health component summary scores were operationalized as continuous outcome variables.

Alcohol use disorder symptom criteria—Alcohol abuse and dependence symptom criteria were assessed with the Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS-IV) (Grant et al., 2003), a structured diagnostic interview used to assess alcohol, drug, and mental disorders based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (American Psychiatric Association, 2000) diagnostic criteria. Consistent with our prior research (La Flair et al., 2012), four alcohol abuse and seven alcohol dependence symptom criteria were created as binary variables from a set of past-year symptom questions at Wave 1. Alcohol abuse symptom criteria included: recurrent drinking resulting in failure to fulfill major role obligations; recurrent drinking in hazardous situations; recurrent drinking-related legal problems; and continued drinking despite recurrent interpersonal problems caused or exacerbated by drinking. Alcohol dependence symptom criteria included: tolerance; having two or more withdrawal symptoms; drinking larger amounts or for a longer period than intended; having a persistent desire or unsuccessful attempts to cut down on drinking; spending a great deal of time obtaining alcohol, drinking, or recovering from the effects of alcohol; giving up important social, occupational, or recreational activities to drink; and continued use of alcohol despite physical or psychological problems caused by drinking.

Generalized anxiety disorder symptoms—Among those positive for at least six months of the key screening GAD symptoms, binary indicators were created from six symptoms of GAD present during the worst 6-month period of GAD symptoms assessed at Wave 1. These symptoms were: restlessness, being easily fatigued, having difficulty with concentration, irritability, muscle tension, and sleep difficulty.

Covariates—The following characteristics assessed at Wave 1 were included as potential confounders in the adjusted analyses based on evidence from prior literature: family history

of alcoholism (first-degree relative), lifetime diagnosis of an anxiety disorder other than generalized anxiety disorder (social phobia, panic disorder without agoraphobia, specific phobia), lifetime diagnosis of unipolar mood disorder (major depression or dysthymia), and lifetime treatment for anxiety or alcohol symptoms, including outpatient therapy, medication treatment and inpatient hospitalization. Posttraumatic stress disorder was not included in this analysis as it was not assessed in Wave 1. Sociodemographic characteristics assessed at Wave 1 were included in the adjusted analyses. Sex was included as a binary variable (0=male, 1=female). Age was measured in years and included as categories: 18–29 years, 30–49 years, and 50+ years. Race/ethnicity (0=non-Hispanic Black, Hispanic, or other race, including Asian and Native American, 1=non-Hispanic White), and educational attainment (0=less than high school, 1=high school or higher) were included as binary variables.

Statistical analysis

In the present study, latent class analysis was applied to the six GAD symptoms and 10 alcohol use disorder symptom criteria (one criterion, legal problems, was removed from analyses due to low endorsement) to generate latent classes of co-morbidity. Latent class analysis is a data-driven statistical method used to classify individuals into subtypes according to responses to categorical items (McCutcheon, 1987). Latent class analysis is used to derive the most likely class membership for each individual as well as the probability of item endorsement used to measure each mutually exclusive class or subtype. For categorical latent class indicators, such as those used in the present study, the relationships between indicators and latent classes are characterized by a set of logistic regression equations. Latent class analysis operates on the assumptions of local independence between observed variables, meaning that after fitting the correct model, the identified latent classes would explain the associations among the indicator variables. Models were fit (1 through 8 classes) using an expectation-maximization algorithm and maximum likelihood estimation with robust standard errors. Model goodness of fit was assessed using conventional fit indices, including the Akaike Information Criterion, sample-size adjusted Bayesian Information Criterion, and the Lo-Mendell-Rubin test (McCutcheon, 1987; Nylund et al., 2007). Entropy, a measure of classification quality, was also considered. The best-fitting model to the data was selected based on a combination of model fit indices, parsimony, and clinical significance.

In order to examine the association between latent class membership and functional outcomes, a “hard-binning” approach, using posterior probabilities as weights, to individual class assignment was used (Clark & Muthén, 2009). With class assignment recorded, models were then extended to relate the resultant GAD-alcohol classes to a distal outcome of functioning on both the physical and mental health subscales of the SF-12 v2 using a linear regression formulation. Latent class modeling was carried out using the *MPlus* software version 7.0 (Muthén & Muthén, (1998–2010)). Linear regression analyses were conducted in SAS version 9.3. All analyses were weighted and included survey sampling variables to account for the complex survey design of the NESARC.

Results

Sample Characteristics

Table 1 lists the characteristics of the study participants, classified as current drinkers who reported ever experiencing at least a 6 month history of “feeling tense, nervous or anxious most of the time”. The majority (61.8%) of the sample was female and White (82.8%), with most having completed at least a high school education. The near-majority also reported a lifetime diagnosis of other anxiety disorders (social phobia –19.2%, specific phobia – 28.0%, panic disorder – 14.4%) and a family history of alcoholism.

Results of Latent Class Analysis

Fit indices for the 1–8 latent class models are provided in Appendix A. Although model fit indices indicate that the 7-class model is the best fit to the data, there were concerns about the small class sizes, clinical significance, and interpretation of classes in this model. There was little change in the adjusted Bayesian Information Criterion from the 5-, 6- and 7-class models. Thus, based on substantive interpretation and high entropy (0.85), the more parsimonious 5-class model was selected.

Successful class assignment (i.e., the most likely class) was achieved, with the majority of individuals assigned to classes at 0.90 or higher probability. Figure 1 presents the alcohol abuse/dependence and generalized anxiety disorder symptom probabilities for each of the classes. The five distinct classes of AUD and GAD symptoms are ordered by probability of endorsement and number of co-occurring symptoms. Two classes demonstrated co-morbid profiles. Class 1, (prevalence 3.1%) is a pattern in which nearly all of the alcohol symptom criteria have a high probability of endorsement and all GAD symptoms have a moderately-high probability. Class 2 (prevalence 9.5%) is characterized by moderate probability of endorsement of some alcohol symptom criteria and moderate-high probability of endorsement of all GAD symptoms. The remaining three classes are characterized by low to no endorsement of alcohol problems but vary by endorsement of GAD symptoms. The majority of the sample was assigned to Class 3, (prevalence 40.7%), characterized by high endorsement of GAD symptoms. Class 4 (prevalence 19.6%) contained individuals with a high probability of endorsement of three GAD symptoms – restlessness, trouble with concentration, and sleep difficulty. Class 5 (prevalence 27.1%) was characterized by low endorsement of overall GAD symptoms. Class 5 served as the reference group for subsequent regression analyses.

Mental and Physical Health Functioning Outcomes

Tables 2 presents the linear regression results from a series of models examining the association between GAD-alcohol latent classes and the mental health subscale of the SF-12 v2. Mean mental health component summary scores ranged from 35.4 (SD=12.6; Class 1) to 48.9 (SD=10.7; Class 5). A graded relationship was found between the GAD-alcohol latent class and functional status on the mental health subscale so that classes that had greater symptom severity were associated with poor mental functioning (Table 2, Regression Model 1). Class 1 membership, the most severe GAD-alcohol latent class, was associated with the poorest mental health functioning ($\beta = -13.78$, $p < 0.001$) and Class 4 membership was associated with no significant difference in mental health functioning compared to the reference class, Class 5 ($\beta = -1.10$, n.s.). The association between class membership and mental health functioning was statistically significant for Classes 1–3 relative to Class 5 in regression model 1. This graded relationship between GAD-alcohol classes and mental health functioning maintained statistical significance for Classes 1–3 relative to Class 5 after the inclusion of sociodemographic characteristics (Regression Model 2) and adjustment for other potential confounders (Regression Model 3). Both lifetime history of other anxiety disorders and mood disorder were also significantly associated with poor mental health function, whereas treatment and family history of alcoholism were not statistically related to mental health impairment.

Table 3 presents the linear regression results from a series of models examining the association between GAD-alcohol latent classes and the physical health subscale of the SF-12v2. Mean physical health component summary scores ranged from 47.0 (SD=14.7; Class 2) to 51.5 (SD=11.4; Class 1). There were few associations found between the physical health subscale and the various co-morbid GAD-alcohol latent classes. In regression model 1 (Table 3), unadjusted analyses, only Class 4 was statistically

significantly associated with physical health functioning ($\beta = 2.22$, $p = 0.02$). This class, which was high on three GAD symptoms and low on alcohol symptoms was associated with better physical health relative to the reference class. Regression model 2 results, which adjusted for demographic characteristics, showed poorer physical health component summary scores for Classes 1 and 3 relative to Class 5, but these associations did not retain statistical significance after the inclusion of additional covariates (psychiatric disorders, treatment, and family history) in regression model 3. Other anxiety disorders, treatment, and family history of alcoholism were associated with a significant decline in physical health functioning. In contrast to the mental health component summary scale results, the presence of mood disorder showed no significant association with physical functional impairment.

Discussion

This study employed a data-driven approach to investigate the patterns of AUD and GAD symptom co-morbidity among current drinkers with a history of anxiety symptoms in a representative sample of the U.S. population. In this study, latent class analysis identified five classes characterized by varying patterns of GAD and AUD symptoms. Among the two classes having moderate or high probabilities of having AUD symptoms, there were correspondingly high probabilities of having several GAD symptoms, while a variety of GAD symptom patterns was observed in 3 classes with little or no co-occurring AUD symptoms. In addition, the most prevalent class among this U.S. population-based sample was that associated with low numbers of AUD symptoms and high numbers GAD symptoms (40.7%). These findings are interesting for a number of reasons. Firstly, in this sample of current drinkers who screened into the GAD assessment, the presence of multiple AUD symptoms was associated with high numbers of GAD symptoms. Perhaps these classes contain individuals who were using alcohol to self-medicate their anxiety symptoms and in doing so developed significant alcohol problems. In contrast, the majority of current drinkers in this sample did not endorse AUD symptoms despite their GAD symptoms. This finding suggests that this latter group of drinkers possesses a resiliency that might protect them from developing alcohol problems. Clinically, recognizing and understanding these at risk and resilience groups could potentially lead to treatments which would prevent the development of alcohol problems in those with GAD symptoms. Further analysis of these classes is needed to clarify these relationships.

The results from this study further our understanding of the association of co-morbid GAD and AUD symptoms with health-related quality of life especially as it pertains to mental health functioning. While it has been previously found that co-morbid GAD and AUD results in a low mental health component summary score (Grant, et al., 2005) this study revealed a graded association between this score and co-morbid symptom severity with the greatest impairment occurring when the probability of endorsing multiple symptoms of both disorders is high. These associations remained significant even after controlling for demographic and clinical characteristics including treatment status. Future analysis using the same symptom-level approach is warranted to assess changes in the mental health component summary score over time and to determine whether latent class membership at Wave 1 is associated with the magnitude of these changes. Grant et al. (2005) found no significant increase in the mental health component summary score of those with a diagnosis of co-morbid GAD and AUD compared to the disability associated with either disorder alone. This finding is difficult to understand given that the disability associated with GAD alone was found to be higher than that found with AUD alone. The authors propose that these findings could be explained if those with GAD were using alcohol to self medicate their symptoms, thus reducing the greater disability associated with GAD as demonstrated by non-significant differences in disability between those co-morbid AUD and GAD and those with disorder alone. The results from our study suggest a possible alternative

explanation. Our findings indicate that it may be the number and pattern of symptoms that predict the mental health component summary score both for AUD and GAD alone and in combination, and this may explain the discrepancies found in prior assessments of disability levels. The findings of Hasin et al. (2007) suggest that this inference may have merit. They examined the mental health component summary scores at Wave 1 of those with alcohol dependence and found that as the severity of the disorder increased (more intensity and number of symptoms) disability increased. Although the current data do not support the hypothesis that treatment has an impact on this score future analyses that assess details of the treatment history including, the duration, specific type and timing of treatment, may provide a clearer picture of the potential impact of treatment on mental health functioning. If we are able to improve our understanding of the pattern of symptom co-morbidity, we may be able to implement treatments that specifically and effectively target these co-morbid patterns, and potentially affect functional outcomes. The ultimate aim would be to improve the mental health-related quality of life for these individuals.

The associations between co-morbid GAD and AUD symptoms and the physical health component summary found in this study are consistent with prior research. Although certain patterns of co-morbidity (e.g., classes 1 and 3) were initially associated with poor physical health functioning, this was not sustained after adjusting for other mood and anxiety disorders, treatment and family history of alcoholism. This finding is consistent with a previous study by Comer et al. (2011) in which GAD alone had a significant association with all subscales of the SF-12 v2 with the exception of the physical health scale.

Evaluating the impact of co-morbid GAD and AUD from a symptom-level perspective allows greater refinement in understanding how these disorders interact with each other. The subtypes provide a more complete assessment of the severity range and patterns of symptoms than the diagnostic categories might. Furthermore the population-based sample provides insight into these co-morbidities among individuals irrespective of whether they have ever sought treatment for their symptoms. However, our results should be considered in the context of some limitations. The present analysis did not adjust for all potentially confounding Axis I disorders, which may have affected the results especially as they relate to changes in the physical health component summary scores. In addition, to improve the power of the study, we used a lifetime diagnosis of GAD symptoms and a current diagnosis of AUD symptoms to form the latent classes. It is possible that the differences in interval of assessment may have implications for the subtyping strategy if there were a true temporal discrepancy in onset of AUD and GAD symptoms in our sample. Yet, it should be kept in mind that it is common for GAD symptoms to be chronic (Yonkers et al., 1996; Bruce et al., 2005) and in the current sample, a large proportion of those with lifetime GAD symptoms also had current symptoms. Lastly, this analysis was based on cross-sectional data, and so we are unable to infer causal or temporal associations between the SF-12 v2 and co-morbid GAD and AUD symptoms. Therefore, we do not know if the identified classes and their impact on mental health functioning would remain stable over time. Future studies should include prospective assessments of these classes of co-morbidity.

Conclusions

The results of this study affirm that, when GAD and AUD symptoms are co-morbid, they are associated with significant impairment in mental health functioning. Using latent class analysis to identify distinct co-morbid classes provides evidence to indicate that mental health-related quality of life scores are associated with the pattern and number of symptoms of both disorders. Those classes that have greater co-morbid symptoms are associated with poorer mental health functioning. This information has clinical implications by potentially impacting the clinicians' approach to patients through raising their awareness of the

relationship between co-morbid GAD and AUD symptoms and mental health functioning. Additionally, the analysis revealed that within this study sample the majority of current drinkers did not endorse AUD symptoms despite having GAD symptoms. This finding suggests that these individuals may possess a certain resiliency which clinicians should take into consideration when treating patients. Further investigation is needed to assess whether the latent classes of co-morbid GAD and AUD symptoms remain stable over time and if changes in mental health component summary scores are a function of co-morbid class membership.

Acknowledgments

The analyses and preparation of this project were supported by a grant from the National Institute on Alcohol Abuse and Alcoholism (AA016346), and the National Institute on Drug Abuse (DA030460). Preparation of this paper also was supported by a Johns Hopkins School of Medicine Clinician Scientist Award (AA).

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Figure 1.
Probabilities of alcohol and generalized anxiety disorder criteria for the five latent classes (n=1969), NESARC, Wave 1, 2001–02.

Table 1

Characteristics of study participants classified as current drinkers and having ever experienced a 6-month period of feeling tense, nervous or worried most of the time, NESARC Wave 1, 2001–02 (n=1,969).

	N	%	SE
<i>Sex</i>			
Male	686	38.24	0.85
Female	1283	61.76	0.85
<i>Race/ethnicity</i>			
White	1397	82.8	0.27
Non-White	572	17.2	0.27
<i>Age Category</i>			
18–29	179	11.12	0.52
30–49	752	45.26	0.76
50+	750	43.63	0.77
<i>Education</i>			
High school and above	1721	88.78	0.47
Less than high school	248	11.22	0.47
<i>Lifetime other anxiety disorder^a</i>			
Present	895	45.5	0.73
Absent	1094	54.5	0.73
<i>Lifetime unipolar mood disorder^b</i>			
Present	1155	59.8	0.65
Absent	814	40.2	0.65
<i>Family history of alcoholism</i>			
Present	939	48.16	0.62
Absent	1030	51.84	0.62
<i>Ever treated for anxiety or alcohol symptoms^c</i>			
Yes	813	57.83	0.59
No	1156	42.17	0.59

^a Other anxiety disorder includes social phobia (361, 19.2%), specific phobia (538, 28%), and panic disorder (282, 14.4%).

^b Unipolar mood disorder includes major depressive disorder or dysthymia.

^c Treatment includes outpatient therapy, medication treatment and inpatient hospitalization.

Table 2

Estimated linear regression coefficients and associated standard errors for the association between GAD-alcohol latent classes and SF-12 v2 Mental Health Component Summary Score (n=1,969), NESARC Wave 1, 2001–02.

	Regression Model 1		Regression Model 2		Regression Model 3	
		SE		SE		SE
Intercept	49.22 ***	0.55	42.67 ***	1.63	45.71 ***	1.72
Class 1	-13.78 ***	1.84	-12.41 ***	1.83	-8.95 ***	1.80
Class 2	-8.05 ***	1.12	-7.16 ***	1.14	-5.17 ***	1.17
Class 3	-6.15 ***	0.73	-5.5 ***	0.74	-3.56 ***	0.77
Class 4	-1.10	0.93	-0.78	0.91	-0.07	0.95
Age in years			0.05 **	0.02	0.03	0.02
Female gender			-2.04 **	0.60	-1.22 *	0.59
White (race/ethnicity)			1.70 *	0.71	2.34 **	0.73
Education (high school and above)			4.02 **	1.17	3.90 **	1.19
Lifetime other anxiety disorder					-2.32 **	0.64
Lifetime unipolar mood disorder					-3.47 ***	0.65
Ever treated for anxiety or alcohol					-1.26	0.72
Family history of alcoholism					-1.12	0.59

* p<0.05.

** p<0.01.

*** p<0.001

Note: Mental health summary scores are scored 0–100, where 0 = lowest level of health and 100 = highest level of health.

Table 3

Estimated linear regression coefficients and associated standard errors for the association between GAD-alcohol latent classes and SF-12 v2 Physical Health Component Summary Score (n=1969), NESARC Wave 1, 2001–02.

	Regression Model 1	Regression Model 2	Regression Model 3
	SE	SE	SE
Intercept	48.85 ***	53.60 ***	54.65 ***
Class 1	0.69	1.49	1.65
Class 2	-3.36	2.33	2.38
Class 3	2.23	2.33	1.18
Class 4	-0.39	0.84	0.91
Age in years	2.22 *	1.73	2.04 *
Female gender		0.02	0.02
White (race/ethnicity)		1.15	1.49 *
Education (high school and above)		1.68 *	2.00 **
Lifetime other anxiety disorder		4.80 ***	4.81 ***
Lifetime unipolar mood disorder			-1.42 *
Ever treated for anxiety or alcohol symptoms			-0.01
Family history of alcoholism			-1.56 *
			-1.30 *

* p<0.05.

** p<0.01.

*** p<0.001

Note: Physical health component summary scores are scored 0–100, where 0 = lowest level of health and 100 = highest level of health

APPENDIX A

Fit indices for latent class analysis models of current drinkers with generalized anxiety (n=1969), NESARC Wave 1, 2001–02.

	Number of Classes							
	1	2	3	4	5	6	7	8
Pearson χ^2	27486.273	27260.300	26790.823	26584.165	26558.334	26558.242	26560.910	26553.298
Pearson p-value	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LR χ^2	26518.459	26519.135	26414.083	26394.002	26373.898	26368.173	26353.238	26348.139
df	65405	65449	65443	65431	65414	65406	65389	65375
Log likelihood	-12599.348	-11016.104	-9884.180	-9713.171	-9577.901	-9480.296	-9388.686	-9360.735
# parameters	16	33	50	67	84	101	118	135
AIC	25230.696	22098.208	19868.361	19560.342	19323.801	19162.592	19013.372	18991.470
BIC	25320.060	22282.523	20147.625	19934.556	19792.965	19726.705	19672.435	19745.483
nBIC	25269.227	22177.680	19988.773	19721.694	19526.094	19405.824	19297.545	19316.583
LMR p*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BLRT p (n/a for type =complex)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Entropy	n/a	0.963	0.949	0.941	0.846	0.852	0.836	0.846