

ANXIETY IN PERSONS 75 AND OLDER: FINDINGS FROM A TRI-ETHNIC POPULATION

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Purpose: Little research has been reported about anxiety in older populations. We assessed the prevalence of anxiety and examined associations between anxiety and socio-demographic, physical, mental, and functional health characteristics in an older tri-ethnic population.

Design and methods: A cross-sectional, population-based study of older, noninstitutionalized non-Hispanic Whites, non-Hispanic Blacks, and Hispanics was conducted from the baseline assessment of the Health of the Public (HoP) database. Measurements included a self-report anxiety scale and physical, mental, and functional health. Data were analyzed with general linear models and logistic regression models.

Results: Overall, 31.4% reported anxiety (score ≥ 45); 32.3% of woman and 30.5% of men ($P=.67$). Older Hispanics (22.2%) reported the lowest prevalence of anxiety followed by non-Hispanic Blacks (26.6%) and non-Hispanic Whites (44.3%) ($P=.0001$). Common predictors of anxiety seen after linear and logistic regression included being married, White, and increasing number of medications and depressive symptoms.

Implications: Anxiety is prevalent in older adults. The findings also indicate higher rates of anxiety in older non-Hispanic Whites compared with older non-Hispanic Blacks and Hispanics. (*Ethn Dis.* 2006;16:22–27)

Key Words: Aged, Ethnic Groups, Mental Health

INTRODUCTION

Anxiety is the most common mental disorder in the United States;^{1,2} it affects $\approx 13.3\%$ of adults aged 18–54 years.³ *Diagnostic and Statistical Manual of Mental Disorders: DSM IV* (DSM-IV) describes anxiety as an “apprehensive anticipation of future danger or misfortune accompanied by a feeling of dysphoria or somatic symptoms of tension.”⁴ It is characterized by high negative affect, difficulty concentrating, and increased uncertainty and worry.

Anxiety encompasses a group of disorders that includes generalized anxiety disorder, phobias, posttraumatic stress disorder, obsessive-compulsive disorders, and panic disorders.^{1,3} Of the five disorders, panic disorder has the strongest genetic basis, while the others are more associated with stressful life events such as crime or poverty.³ Personality also plays a role, as individuals with low self-esteem or poor coping skills are at risk for anxiety.^{1,3} However, research indicates that no single situation or event causes anxiety; instead, the development of anxiety involves some combination of life experiences, environmental situations, psychological traits, and genetic factors.⁵ The longitudinal course of anxiety indicates an early onset, chronicity, and recurrent episodes of illness.

Most information on anxiety is limited to younger or middle-aged adults^{2,6,7} or older non-Hispanic Whites.^{8,9} Alwahabi⁶ suggests that although anxiety is common in older adults, it is underestimated and poorly studied. Bruce and McNamara¹⁰ found anxiety to be common in older adults who were housebound, and Watson¹¹ suggested a link between anxiety and fear of crime. Kvaal et al¹² found a high prevalence of anxiety

among older inpatients, and the rate remained high three months after discharge from hospital. Anxiety also occurs more frequently in older subjects with depressive symptoms¹³ and may be associated with social isolation or poor physical or functional health.⁶

Given the reported high prevalence of anxiety in older adults,² the social and economic impact of anxiety in this population, and the limited research examining anxiety, we conducted a study to explore associations between socio-demographic, physical, mental, and functional health characteristics and anxiety for persons ≥ 75 years of age. Data are from a tri-ethnic sample of non-Hispanic Whites, non-Hispanic Blacks, and Hispanics living in the community.

METHODS

Subjects

Data are from the Health of the Public (HoP) Study,¹⁴ a population-based needs-assessment study of persons ≥ 75 years of age living in Galveston County, Texas. A detailed description of the sampling methods has been published elsewhere.¹⁴ Briefly, differential sampling techniques were used to ensure equal numbers of each major ethnic group (non-Hispanic White, non-Hispanic Black, and Hispanic) and equal numbers of men and women in each ethnic group. Sample subjects were identified from a master enrollment file of Medicare beneficiaries obtained from the Healthcare Finance Administration (HCFA).

The study sample consisted of 200 non-Hispanic Whites, 200 non-Hispanic Blacks, and 200 Hispanics for a total of 600 subjects.¹⁴ Equal numbers of men and women were in each of the three ethnic

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groups. The overall participation rate was 85.6% and did not vary significantly among the three ethnic groups or by sex. Most Hispanics interviewed were Mexican Americans (87%).¹⁴

Data were collected in 1995 by in-home interviews with subject or proxy by trained bilingual interviewers. The rate of proxy interview did not vary between non-Hispanic Whites (11.5%) and non-Hispanic Blacks (11.9%); however, Hispanics had a significantly higher proxy rate (23.5%).¹⁴ In the current study, only non-Hispanic Whites ($n=176$), non-Hispanic Blacks ($n=177$), and Hispanics ($n=153$) who were interviewed in person and had complete information were included in the analysis ($N=506$).

Measures

Anxiety

Anxiety was measured by using the Zung self-rating anxiety scale.¹⁵ The self-rating anxiety scale, based on diagnostic conceptualizations in DSM-II, consisted of 20 items. Of the 20 items, 15 related to somatic symptoms. Responses were scored on a four-point scale ranging from "none of the time" to "most or all of the time." The 20 items were summed for a raw scale score (range 20–80) and then converted to an index scale score (range 25–100) by dividing the raw score by 80 and multiplying by 100.¹⁵ The anxiety scale was used both as a continuous variable, with a potential range of 25 to 100, and as a dichotomized variable, with a score

<45 indicating low anxiety and a score ≥ 45 indicating anxiety¹⁵; based on a sample of 739 patients at a family medical center, a score ≥ 50 indicates clinically significant anxiety.⁹ Cronbach α was reported as .81; and test-retest reliability over a period ranging from 1 to 16 weeks was .81–.84.¹⁶

Covariates. Based on previous anxiety studies and the potential for association with anxiety in older subjects, the current study included the following sociodemographic, physical, mental, and functional health factors.

Sociodemographics

Sociodemographic characteristics included age (range 75–100), sex, ethnicity (non-Hispanic White, non-Hispanic Black, and Hispanic), marital status (married and unmarried), years of education (high school and less than high school), and fear of neighborhood crime. Fear of neighborhood crime included a perceived fear in at least one of the following six situations: being cheated, conned or swindled out of money; having someone break into the home while away; having someone break into the home while there; being physically attacked or assaulted on the street; being murdered; and having property damaged by vandals.

Physical and Mental Health

Physical health was assessed by asking subjects if they ever had a physician diagnosis of stroke, cancer, diabetes, or myocardial infarction. Mental health was assessed by number of depressive symptoms according to the Center for Epidemiological Studies – Depression (CES-D) scale. The scale was used as a continuous and categorical variable. Subjects who scored ≥ 16 on the CES-D scale¹⁷ were categorized as having high depressive symptoms.

Functional Health

Functional health was assessed by the activities of daily living scale

(ADLs)¹⁸ and instrumental activities of daily living (IADLs). Subjects were coded as ADL disabled if they reported one or more ADL limitations: bathing, using the toilet, transferring from bed to chair, walking across a small room, personal grooming, dressing, and eating.¹⁸ Subjects were coded as IADL disabled if they reported one or more IADL limitations: using the telephone, using private or public transportation, shopping for groceries or clothing, preparing meals, doing housework, taking medicine, and handling money.

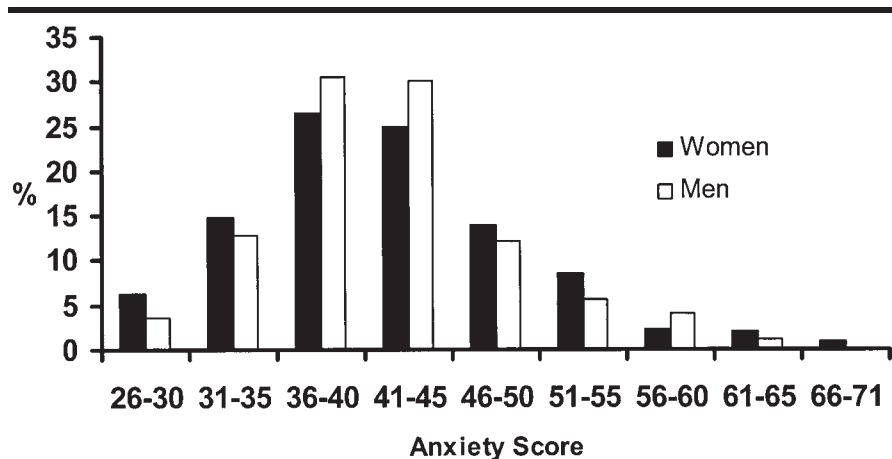
Medications

Medication usage was assessed by first asking subjects if they used doctor-prescribed medications in the past two weeks. Those who used doctor-prescribed medications were asked to show the interviewer their medications. The number of doctor-prescribed medications ranged from 1 to 10.

Statistical Analysis

We examined sociodemographic, physical, mental, and functional health characteristics for all subjects by using descriptive and univariate statistics for continuous variables and contingency tables (chi-square) for categorical variables. Chi-square analyses were used to test for differences between anxiety and nonanxiety cases and for sociodemographic and physical, mental, and functional health characteristics.

We used general linear models (GLM) to estimate associations between the continuous anxiety scale and sociodemographic and physical, mental, and functional health characteristics, adjusting for relevant risk factors. Logistic regression models were used to estimate odds ratios (OR) between the dichotomized anxiety scale (≥ 45 or ≥ 50 vs <45) and sociodemographic and physical, mental, and functional health characteristics, adjusting for relevant risk factors. An α level of .05 was chosen to determine statistical significance in the above analysis. All analyses



were performed by using SAS (Version 9.0, SAS Institute, Cary, NC).

RESULTS

The mean age at baseline interview was 80.8 years (standard deviation [SD] 4.4, range 75–100); 50.7% were female, 41.6% were married, and 33.0% had ≥ 12 years of formal schooling (mean 8.4 years, SD 4.3). Approximately equal percentages of non-Hispanic Whites (34.8%), non-Hispanic Blacks (35.0%), and Hispanics (30.2%) were included in the study.

Figure 1 shows the distribution of the anxiety scale by sex. Overall, 31.4% of the sample was categorized with anxiety (score ≥ 45). Comparable percentages of women (32.3%) and men (30.5%) were categorized with anxiety ($P = .67$). The figure also shows that 15.2% of the sample had clinically significant anxiety (score ≥ 50).

Tables 1 and 2 contain sociodemographic and physical, mental, and functional health characteristics for the entire sample and stratified by anxiety score (≥ 45 and ≥ 50). Significant associations were observed between anxiety (score ≥ 45) and ethnicity ($P = .0001$), where older Hispanics reported the lowest percentage of anxiety (22.2%), followed by non-Hispanic

Blacks (26.6%) and non-Hispanic Whites (44.3%). Anxiety (score ≥ 45) was also associated with perceived fear of crime ($P = .0003$). Similar results were seen when comparing subjects with clinically significant anxiety (score ≥ 50 , Table 1). Table 2 shows significant associations between each health

characteristic and the prevalence of anxiety or clinically significant anxiety. In all cases, the association was in the direction of less healthy, more impaired subjects with higher prevalence of anxiety.

In Table 3 multivariate GLM assessed the independent associations among continuous and categorical sociodemographic and physical, mental, and functional health characteristics and the continuous anxiety scale scores; multivariate logistic regression models assessed the independent associations between continuous and categorical sociodemographic and physical, mental, and functional health characteristics and the odds of being classified with anxiety (score ≥ 45 or ≥ 50 vs < 45).

DISCUSSION

Consistent with previous studies, we found a high percentage of older

Table 1. Sociodemographic characteristics of sample by anxiety cases

Sociodemographic Characteristic	Total Sample (N=506) n	Anxiety Score					
		Anxiety ≥ 45 Cases (n=159)			Anxiety ≥ 50 Cases (n=77)		
		n	(%)	P value	n	(%)	P value
Sex							
Male	249	76	(30.5)		34	(13.7)	
Female	257	83	(32.3)	.67	43	(16.7)	.37
Marital status							
Married	210	74	(35.2)		33	(15.7)	
Unmarried	296	85	(28.7)	.12	44	(14.9)	.55
Ethnicity							
Non-Hispanic White	176	78	(44.3)		38	(21.6)	
Non-Hispanic Black	177	47	(26.6)		20	(11.3)	
Hispanic	153	34	(22.2)	<.001	19	(12.7)	.002
Years of schooling							
<High school	339	101	(29.8)		51	(15.0)	
\geq High school	167	58	(34.7)	.26	26	(15.6)	.19
Household income							
<\$7,000	182	53	(29.1)		28	(15.4)	
\$7,000–15,000	191	59	(30.9)		28	(14.7)	
>\$15,000	133	47	(35.3)	.25	21	(15.8)	.74
Fear of crime							
Yes	278	99	(35.6)		51	(18.4)	
No	228	70	(26.3)	.03	26	(11.4)	.02

Table 2. Physical, mental, and functional health characteristics of sample by anxiety score

Health Characteristic	Anxiety Score					
	Anxiety ≥45 Cases (n=159)			Anxiety ≥50 Cases (n=77)		
	n	(%)	P value	n	(%)	P value
Medical conditions						
0	56	(25.8)		25	(11.5)	
1	51	(28.0)		18	(9.9)	
≥2	52	(48.6)	<.001	34	(31.8)	<.001
Number of medications						
0	17	(15.9)		8	(11.3)	
1	15	(17.7)		8	(21.9)	
2	45	(42.9)		16	(28.6)	
≥3	82	(39.2)	.002	45	(26.2)	<.001
CES-D						
<16	112	(25.9)		47	(10.9)	
≥16	47	(63.5)	<.001	30	(40.5)	<.001
ADLs						
0	140	(30.2)		64	(13.8)	
≥1	19	(44.2)	.06	13	(30.2)	.005
IADLs						
0	69	(24.1)		24	(8.4)	
≥1	90	(40.9)	<.001	53	(24.1)	<.001

CES-D=Center for Epidemiological Studies-Depression; ADL=activities of daily living; IADL= instrumental activities of daily living.

community-dwelling adults with anxiety.⁸ In a Swedish study of persons aged ≥78 years, ≈25% of the sample who underwent a structured psychiatric examination were classified with anxiety.⁸ In a large, population-based study of US adults aged ≥55 years, Himmelfarb and Murrell¹⁹ estimated that 17.1% of males and 21.5% of females had anxiety. Kvaal et al²⁰ found an overall anxiety rate of 43.0% in a study of hospitalized geriatric patients, with somewhat higher rates among males (47.0%) than females (41.0%). However, the reported prevalence in our sample, and other samples that include older adults, may be underestimated because of pharmacologic treatments of anxiety. Benzodiazepines, which are the most frequently prescribed medications for anxiety,²¹ are more often used in older than younger adults.²² In addition, treatment of anxiety with antidepressant medications such as selective serotonin reuptake inhibitors has increased over the past decade.

Table 3. Multivariate linear and logistic regression analysis assessing associations of anxiety with sociodemographic and physical, mental, and functional health characteristics*

Characteristic	Model 1			Model 2		Model 3	
	Anxiety Continuous			Anxiety ≥45 vs <45		Anxiety ≥50 vs <45	
	beta	SE	P	OR	(95% CI)	OR	(95% CI)
Age (75–100)	.03	.08	.73	1.05	(.99–1.10)	1.06	(.99–1.12)
Female (vs male)	.20	.74	.78	1.26	(.80–2.00)	1.32	(.71–2.44)
Married (vs unmarried)	1.54	.75	.04	1.78	(1.12–2.84)	1.56	(.84–2.91)
Ethnicity							
Non-Hispanic Black	–4.05	.88	< .001	.37	(.21–.63)	.28	(.14–.59)
Hispanic	–4.67	.91	< .001	.27	(.16–.48)	.28	(.14–.57)
Non-Hispanic White		1.00			1.00		1.00
Years of schooling (≥12 vs <12)	–.82	.79	.30	.77	(.47–1.26)	.66	(.34–1.28)
Fear of crime (vs no)	1.42	.66	.03	1.81	(1.20–2.74)	2.15	(1.23–3.75)
Medical conditions (0–2+)	.85	.41	.04	1.02	(.76–1.39)	1.31	(.85–2.00)
Number of medications (0–3+)	.44	.21	.04	1.24	(1.05–1.46)	1.14	(.93–1.47)
CES-D (0–60)	.37	.04	< .001	1.12	(1.08–1.15)	1.17	(1.12–1.22)
ADLs (0–7)	–.86	.47	.07	.87	(.66–1.16)	.93	(.68–1.28)
IADLS (0–7)	.91	.23	< .001	1.24	(1.09–1.43)	1.33	(1.12–1.59)

* Three models were used to assess anxiety: a general linear model (N=506) and two logistic regression models. The first logistic model (n=159) categorized subjects with (score ≥45) and without (score <45) anxiety. The second logistic regression model (n=77) categorized subjects with clinically significant anxiety (score ≥50) and those without anxiety (score <45).

SE=standard error; OR=odds ratio; CI=confidence interval; CES-D=Center for Epidemiological Studies-Depression; ADL=activities of daily living; IADL=instrumental activities of daily living.

Our finding of lower rates of anxiety among minority ethnic groups and the unmarried was unexpected. Why marriage, usually seen as a major component of social support, was associated with higher rates of anxiety is unclear. An extensive literature has established positive associations between marriage and better mental health.^{23,24} Our sample was much older than those from other studies. Research has shown deterioration in physical and mental health of the spouse whose partner is in ill health.²⁵ In separate studies, Axelsson and Sjoden²⁶ and Hinton²⁷ reported that spouses had higher levels of anxiety than their ill partners. Given the advanced age of our sample, perhaps ill health of the spouse played a major role in the increased prevalence of anxiety found among married subjects. However, additional studies are needed to confirm our results and examine in greater detail factors that may influence the marriage – anxiety association.

Because most studies to date have been restricted to older non-Hispanic Whites, research is also needed to examine the variability in anxiety among older ethnic groups. Zung,⁹ in a sample of 739 adults, mostly young to middle-aged, found 31.1% of Whites (75% of sample) and 41.2% of African Americans scored ≥ 45 on the Zung anxiety rating scale. Scott et al,²⁸ in a sample of younger adults, found the highest rates of worry (associated with general anxiety disorder), among Asian Americans, followed by non-Hispanic Whites and African Americans. Heimberg et al,²⁹ using data from the National Comorbidity Survey that included 8098 persons aged 15–84 years, found significantly lower odds of social anxiety among African Americans compared with non-Hispanic Whites, with a non-significant difference between non-Hispanic Whites and Hispanics.

These findings have the potential to contribute insights into why some individuals from minority populations do well and others do poorly in the face

of health challenges. For example, evidence from large epidemiologic studies indicates that mental well-being can decrease the risk of acute medical events in older minority populations.^{30,31} In a sample of older, community-dwelling African Americans, mental well-being was significantly associated with a reduced risk of incident stroke during a six-year period³¹ and significantly reduced risk of incident disability, mobility problems, and mortality during a two-year period in older Mexican Americans.³⁰ Our findings are also in agreement with the so-called “Hispanic paradox” that older Mexican Americans have many health indicators similar to or better than older non-Hispanic Whites, despite clear disadvantages in income, health insurance, housing, and education.^{32,33} One hypothesis is that strong social network structures within the Mexican-American community help buffer the negative effects that low social and economic status has on mental health.³⁴

Identifying anxiety in a clinical setting is difficult, however, because it often co-occurs with mood disorders including depression.³⁵ Gorman³⁶ reported that $\approx 85\%$ of patients with depression also experienced anxiety. Zung et al,³⁷ in a general medical setting, found that 67% of depressed patients also reported anxiety. Although anxiety can independently affect health,^{38–40} when it co-occurs with depression, findings consistently show greater functional disability, increased consumption of healthcare resources, and longer recovery times, than if either anxiety or depression occurred alone.^{1,12,35,40–43}

This study has three limitations. First, because this was a cross-sectional study, we could not determine the temporal sequence of health factors such as disease, depression, or functional ability and anxiety. Longitudinal studies are needed to sort out whether health outcomes differ depending on the sequence of anxiety to physical or

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functional health. Second, because the Zung anxiety scale is self-rating, misclassification could have occurred. However, the scale is based on diagnostic conceptualizations in DSM-II. Third is the fact that medical conditions were obtained by self-report. However, previous researchers have reported good validity for self-reported medical conditions confirmed by physician diagnosis.^{44,45} Strengths of the study include the large, tri-ethnic sample size of persons aged ≥ 75 years and a relatively homogenous sample in terms of socioeconomic status (ie, education and income).

Anxiety in older adults is common and underrecognized. Mendlowicz and Stein,⁴³ in a review of the literature, concluded that even subthreshold forms of anxiety could have a substantial impact on the quality of life and psychosocial functioning of the older person. With the ≥ 65 population expected to increase from ≈ 35 million in 2000 to an estimated 71 million in 2030,⁴⁶ and the number of persons aged ≥ 80 to more than double, from 9.3 million in 2000 to 19.5 million in 2030,⁴⁶ a need exists to better understand anxiety and its association with health and quality of life.

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