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## Correlates of Anxiety Symptoms in Physically Disabled Older Women

Gretchen A. Brenes, Ph.D.<sup>1</sup>, Jack M. Guralnik, M.D.<sup>2</sup>, Jeff Williamson, M.D.<sup>3</sup>, Linda P. Fried, M.D., M.P.H.<sup>4</sup>, and Brenda W.J.H. Penninx, Ph.D.<sup>3</sup>

<sup>1</sup> Department of Psychiatry and Behavioral Medicine, Wake Forest University School of Medicine

<sup>2</sup> Epidemiology, Demography, and Biometry Program, National Institute on Aging

<sup>3</sup> Sticht Center on Aging, Wake Forest University School of Medicine

<sup>4</sup> Departments of Medicine and Epidemiology, Johns Hopkins Medical Institutions

### Abstract

**Objective**—The authors describe characteristics that are associated with chronic anxiety symptoms and examine the use of anxiolytic and anti-depressant medications in physically disabled women with and without symptoms of anxiety.

**Methods**—Participants are 791 physically disabled women aged 65 years and older who participated in the Women’s Health and Aging Study for 2 to 3 years. Anxiety symptoms were measured with 4 questions from the Hopkins Symptom Checklist, and women were categorized as having no anxiety, intermittent anxiety, and chronic anxiety symptoms. Health-related characteristics, medications, physical functioning, physical activity, and psychosocial variables were also measured.

**Results**—Forty-nine percent of women reported no anxiety symptoms, 41% reported intermittent symptoms, and 10% reported chronic symptoms of anxiety. Depressive symptoms and lack of emotional support were significant correlates of intermittent anxiety symptoms, while depressive symptoms, negative life events, and lack of emotional support were significant correlates of chronic anxiety symptoms. Over the course of 3 years, 20.3% of women with no anxiety, 33.0% of women with intermittent anxiety, and 48.7% of women with chronic anxiety symptoms took anxiolytic and/or anti-depressant medications.

**Conclusion**—Anxiety symptoms are common among disabled older women. Psychosocial variables were significantly different in women with intermittent or chronic anxiety symptoms compared with women without anxiety.

### Keywords

anxiety symptoms; chronic anxiety; aged (65+)

### Introduction

Anxiety is an important problem for many older adults. Surveys of community-dwelling older adults have found that 10% to 24% experience significant feelings of anxiety.<sup>1–5</sup> Magni and

Correspondence: Dr. Gretchen A. Brenes, Department of Psychiatry and Behavioral Medicine, Wake Forest University School of Medicine, Medical Center Blvd., Winston-Salem, NC 25157 Phone: 336-716-4551, Fax: 336-716-6830, e-mail:gbrenes@wfubmc.edu.

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colleagues found that 40% of older general medical patients have symptoms of anxiety.<sup>6</sup> Anxiety is associated with increased disability and diminished well-being.<sup>7</sup> Specifically, individuals with anxiety disorders tend to be higher utilizers of medical care,<sup>8–10</sup> have higher rates of emergency room visits,<sup>11</sup> have more disability,<sup>11</sup> spend more time with their primary care physician,<sup>12</sup> have impaired functional status,<sup>13–17</sup> and engage in fewer physical activities.<sup>7</sup> Further, deBeurs and colleagues found that self-reported anxiety symptoms had the same level of negative impact on physical function and well-being in older adults as anxiety disorders fulfilling official DSM criteria.<sup>7</sup>

Given the prevalence and impact of anxiety, surprisingly few studies have taken a comprehensive look at anxiety symptoms in older adults. Of those that do, even fewer take a longitudinal approach. In this study, we examine correlates of anxiety symptoms using a biopsychosocial framework. Identifying correlates of chronic anxiety symptoms may lead to the development of preventive interventions as well as improved anxiety management interventions. The Women's Health and Aging Study (WHAS)<sup>18</sup> affords the opportunity to examine anxiety symptoms over the course of three years in a large sample of elderly and physically disabled women. The prevalence of physical disability increases with advancing age<sup>19</sup> and symptoms of anxiety and depression are associated with physical limitations.<sup>11, 20</sup> In a review of the topic, Lenze and colleagues<sup>21</sup> identified a handful of studies that examined the relationship between anxiety and physical disability among older adults. The authors concluded that "anxiety is a risk factor for disability" (p 125). Thus, this group is at particular risk of suffering the effects of anxiety on physical disability and well-being. The current study addresses the following question: What characteristics are associated with whether a person expresses chronic symptoms of anxiety? In addition, we will also describe the use of anxiolytic and anti-depressant medications among anxious and non-anxious older women with physical disabilities.

## Methods

### Study Population

Data are from the Women's Health and Aging Study I, a longitudinal, observational study of aging and disability. An age-stratified random sampling of Medicare beneficiaries in Baltimore, MD was undertaken to identify participants. A total of 5,316 women were eligible for screening and 81% were screened. Of these women, 1,409 were eligible for the study and 1,002 women agreed to participate. All participants were women aged 65 years and older who were disabled. Disability was defined as self-reported difficulty in at least 2 of the following domains: mobility or exercise tolerance (e.g., walking ¼ mile), upper extremity ability (e.g., raising arms over head), higher functioning tasks (e.g., using the telephone), or basic self-care (e.g., bathing)<sup>22–23</sup>. Participants who were cognitively impaired as indicated by a Mini Mental Status Exam<sup>24</sup> score <18 were excluded. All participants were interviewed by a trained nurse in their home every 6 months over the course of 3 years. This study was approved by the Institutional Review Board of Johns Hopkins University and all participants provided written informed consent at enrollment.

### Measures

Demographic, physical functioning, physical activity, and psychosocial variables were all analyzed using baseline data. Anxiety symptoms and medication use were analyzed using data assessed at baseline and at each follow-up visit.

**Demographics**—Demographic information, including age, race (white, not white), marital status (married, not married), and years of education was obtained at baseline.

**Anxiety**—Anxiety symptoms were assessed at baseline and each follow-up visit with 4 questions from the Hopkins Symptom Checklist.<sup>25</sup> Participants indicated whether they felt nervous or shaky, avoided certain things, felt tense or keyed up, or felt fearful. Responses were summed, creating a measure of anxiety symptoms that ranged from 0 to 4. In order to examine the course of anxiety symptoms over time, only women who had anxiety data for a minimum of 4 out of 7 measurement points were included in these analyses. These 791 women are divided into 3 groups based on their self-reported levels of anxiety. Women who reported 0–1 symptoms of anxiety at all time points were considered *not anxious* ( $N=389$ ). Women who reported 2 or more symptoms of anxiety for 3 or more consecutive measurement periods were considered to have *chronic anxiety* ( $N=78$ ). Women who reported 2 or more symptoms of anxiety at any of the time points, but did not meet the criteria for chronic anxiety were considered to have *intermittent anxiety* ( $N=324$ ).

**Health-related characteristics**—Cognitive functioning was assessed with the Mini-Mental Status Exam.<sup>24</sup> Participants rated their health on a 5-point scale ranging from “excellent” to “poor.” The presence of 17 major chronic conditions was determined using standardized algorithms that incorporated participant self-report, physical examination findings, medication use, physician reports, and review of medical records.<sup>26</sup> A variable representing the number of diseases present was created. Participants reported frequency of urinary incontinence during the typical week. The presence of a vision problem was assessed by asking women whether they could see well enough to watch television, read a newspaper, or recognize someone across the room. The presence of a hearing problem was assessed by asking women whether they could hear well enough to use the telephone or to carry on a conversation in a crowded room. All of these characteristics were assessed at baseline.

**Medications**—All medications used by participants were recorded at baseline and each follow-up visit. During the interviews, participants displayed all prescription and over the counter medications they had used within the previous 2 weeks. Interviewers transcribed the names and dosages of all medications. This method of medication ascertainment is similar to that used in other large epidemiological studies and has been shown to be reliable and valid.<sup>27</sup> For this report, use of anxiolytic and anti-depressant medications at all measurement points was combined. Thus, a variable that represented whether a particular medication was used at any point in the study was created. Information regarding dosage was not analyzed in this study.

**Physical functioning**—Physical functioning was assessed using the Short Physical Performance Battery (SPPB) which consists of 3 tests: (1) walking 4 m at usual pace, (2) standing up from and sitting down in a chair 5 times as rapidly as possible, and (3) 3 standing balance tests (side-by-side, semi-tandem, and tandem). Participants received a score from 0 (unable to perform) to 4 (best performance) on each test, based on scoring criteria from the Established Populations for Epidemiologic Studies of the Elderly (EPESE).<sup>28</sup> Scores on each test were summed to create a summary measure of physical functioning that ranged from 0 to 12, with higher scores indicating better physical functioning.

**Physical activity**—Physical activity was assessed with 2 self-report questions. First, participants were asked how many blocks they had walked during the last week. Responses were divided into 4 categories: 0 blocks, 1–5 blocks, 6–12 blocks, and  $\geq 13$  blocks. Then, participants were asked how many times they had exercised during the last 2 weeks. These responses were divided into 3 categories: none, 1–8 times, and  $\geq 9$  times.

**Psychosocial variables**—Depressive symptoms were assessed with the Geriatric Depression Scale.<sup>29</sup> Participants were asked if they had experienced 6 negative life events in the last 6 months, including the loss of a spouse; serious illness or accident of a spouse; death

of a close relative or friend; separation from a child, friend, or relative who provides help to the participant; loss of a pet; or giving up a hobby or important activity. A summary variable representing the number of negative life events experienced was created. Participants were asked if they could have used more emotional support than they received in the last year. Self-reported frequency of face-to-face and telephone contacts with friends, family, neighbors, or relatives during a typical week was also assessed.

### Statistical Analyses

In order to determine correlates of anxiety symptoms, a 2 step analysis was conducted. First, bivariate relationships between anxiety status and baseline demographics, health-related characteristics, physical functioning, physical activity, and psychosocial variables were tested with ANOVAs, Kruskal-Wallis one-way ANOVAs, Chi-square analyses, or Fisher's exact tests as appropriate. Due to the increased risk of Type 1 error that accompanies multiple statistical comparisons, a significance level of  $p \leq .001$  was used. In the second step, variables with a bivariate relationship with anxiety at  $p \leq .001$  were entered into a multinomial logistic regression analysis, with no anxiety, intermittent anxiety, and chronic anxiety symptoms as the outcome.

### Results

The WHAS baseline sample consisted of 1,002 women with an average age of 78.3 years. Only women for whom data had been collected at 4 or more different time points were included. Thus, a total of 791 women were included in these analyses: 389 women with no anxiety, 324 women with intermittent anxiety, and 78 women with chronic anxiety symptoms. Women included in the analyses were younger [77.39 years ( $SD=7.83$ ) vs. 81.85 years ( $SD=8.04$ ),  $F_{[1, 1000]}=53.45$ ,  $p<0.001$ ], more educated [10.07 years ( $SD=5.48$ ) vs. 9.19 years ( $SD=3.55$ ),  $F_{[1, 998]}=4.91$ ,  $p=0.03$ ], and more likely to be married [22.78% vs. 14.69%;  $X^2_{[1]}=6.56$ ,  $p=0.01$ ] than women who were excluded from the analyses. Women included in the analyses also reported fewer depressive symptoms [7.58 ( $SD=5.47$ ) vs. 9.61 ( $SD=6.00$ ),  $F_{[1, 999]}=21.80$ ,  $p<0.001$ ] as well. However, no significant differences were found with respect to baseline levels of anxiety symptoms [ $X^2_{[4]}=6.42$ ,  $p=0.17$ ] or race [ $X^2_{[1]}=0.00$ ,  $p=0.55$ ].

Self-rated health, depressive symptoms, negative life events, lack of emotional support, and disability were included as covariates in the regression analysis. (See Table 1.) Table 2 presents the results of the multinomial logistic regression analysis. Women with intermittent anxiety symptoms were more likely to report more depressive symptoms (OR: 1.11 [CI: 1.07–1.15]; Wald<sub>[1]</sub>: 31.86;  $p<0.001$ ) and a lack of emotional support (OR: 1.80 [CI: 1.26–2.57]; Wald<sub>[1]</sub>: 10.33;  $p=0.001$ ) than women with no symptoms of anxiety. Women with chronic anxiety symptoms were more likely to report more depressive symptoms (OR: 1.21 [CI: 1.15–1.27]; Wald<sub>[1]</sub>: 51.03;  $p<0.001$ ), have more negative life events (1 event: OR: 2.67 [CI: 1.37–5.21]; Wald<sub>[1]</sub>: 8.33;  $p=0.004$ ; 3+ events: OR: 3.76 [CI: 1.08–13.08]; Wald<sub>[1]</sub>: 4.34;  $p=0.037$ ), and report a lack of emotional support (OR: 3.40 [CI: 1.92–6.04]; Wald<sub>[1]</sub>: 17.58;  $p<0.001$ ), than women with no anxiety symptoms.

Analyses were conducted to examine the medication patterns of women with no anxiety, intermittent anxiety, and chronic anxiety symptoms. As can be seen in Table 3, women with chronic anxiety symptoms were more likely to have used an anxiolytic than women with no anxiety or intermittent anxiety symptoms. Over the course of the 3 year study, 10.5% of women with no anxiety, 18.8% of women with intermittent anxiety, and 30.8% of women with chronic anxiety symptoms were prescribed an anxiolytic. Specifically, rates of benzodiazepine prescriptions differ by anxiety status, while non-significant differences were found for rates of prescriptions for barbituates or other anxiolytics (e.g., buspirone). Similarly, higher rates of anti-depressant prescriptions were associated with worsening anxiety status: 14.4% of women

with no anxiety, 21.6% of women with intermittent anxiety, and 35.9% of women with chronic anxiety symptoms used some type of anti-depressant medication. Specifically, rates of prescriptions for tricyclics, selective serotonin reuptake inhibitors (SSRIs), and monoamine oxidase inhibitors (MAOIs) differed by anxiety status. More than half of the women with chronic anxiety symptoms (51.3%) reported taking no psychiatric medications.

## Discussion

The results of this study suggest that anxiety symptoms are very common in disabled older women. Fifty-one percent of the sample reported anxiety symptoms over the course of 3 years. Among the women who reported anxiety, 19% reported chronic symptoms over the duration of the study. Since anxiety is associated with increased disability in older adults,<sup>11</sup> it is important to identify factors that are associated with anxiety. In multivariate analyses, depressive symptoms, negative life events, and lack of emotional support were all associated with chronic anxiety symptoms, and depressive symptoms and lack of emotional support were associated with intermittent anxiety symptoms as well. As expected women with chronic anxiety symptoms were distinguished more easily from women with no anxiety symptoms than were women with intermittent symptoms of anxiety.

There are some limitations of this study. First, the sample is not representative of older women in general, as this sample was selected to reflect disabled elderly women. Thus, these results may not be generalizable to younger, non-disabled women. Similarly, because older men were excluded, the results may not generalize to them as well. This study does demonstrate, however, that anxiety symptoms are highly prevalent among disabled older women in the community. Second, we are unable to determine the cause of anxiety symptoms. It is likely that psychosocial and disease factors interact to increase anxiety. However, because the sample includes only disabled women, we are unable to determine if disease and psychosocial variables act independently to increase anxiety or have an interactive relationship. A third limitation is that anxiety symptoms were measured with 4 questions from the Hopkins Symptoms Checklist, rather than a full anxiety symptoms scale or a clinical interview. In an effort to reduce the numbers of false positives, we used the strict criteria of the presence of 2 or more symptoms to be reflective of significant anxiety. Chronic anxiety was defined as the presence of 2 or more symptoms for at least 4 measurement points. Thus, it is erroneous to assume chronic anxiety symptoms can be equated with anxiety disorders and all conclusions must be limited to women with anxiety symptoms. Furthermore, because we did not exclude women who had anxiety symptoms at baseline from participating in the study, we cannot infer that any of the variables we measured caused anxiety symptoms to develop.

Depressive symptoms have been consistently linked with anxiety, especially in older adults.<sup>1,10,14,30–34</sup> One potential explanation is that anxiety and depression share the same basic biological or psychological predisposition,<sup>35</sup> while another is that this comorbidity “may reflect a phenomenon in which the features of one act as risk factors for the other” (p 58).<sup>36</sup> There is some recent evidence that suggests that anxiety may precipitate a depressive episode among older adults.<sup>37–39</sup> The results of this study suggest that depressive symptoms are associated with chronic anxiety symptoms.

Perceived lack of emotional support was also significantly associated with anxiety symptoms. Beekman and colleagues<sup>30,40–41</sup> found that lack of emotional support was a significant correlate of anxiety symptoms and clinical disorders in older adults. The number of face-to-face contacts was significantly related to anxiety symptoms in bivariate analyses. However, when entered into the multivariate analysis, it was no longer significant. A likely explanation for this finding is that the actual number of contacts is not as important as the quality of the relationships.<sup>42–43</sup>

Negative life events were also associated with chronic anxiety symptoms. More specifically, being separated from a child, close friend, or relative and giving up a hobby or interest were significantly associated with anxiety symptoms. (See Footnote 1.) This is consistent with a recent report by Mehta and colleagues<sup>4</sup> who found that people who had reported negative life events were also more likely to report symptoms of anxiety. This is also similar to Beekman et al.'s<sup>40</sup> findings that negative life events, such as a recent loss in the family, were related to increased risk of anxiety among older adults. Thus, negative life events serve as stressors that appear to increase older adults' vulnerability to anxiety.

In this paper, we also examined anxiolytic and anti-depressant medication use. Twenty percent of women with no self-reported anxiety symptoms used at least one anxiolytic or antidepressant. These women may have had symptoms of anxiety that were being adequately controlled by medications. Another explanation is that these women may have had depressive symptoms without comorbid anxiety symptoms for which they took medications. Conversely, more than half of the women with chronic anxiety symptoms received no psychiatric medication over the course of the 3 years.

Among the psychiatric medications reported, benzodiazepines were the most commonly used. Benzodiazepines are associated with ADL and IADL disability,<sup>44–45</sup> increased risk of hip fracture,<sup>46</sup> psychomotor retardation,<sup>47</sup> and memory impairment.<sup>47</sup> Due to the risks associated with benzodiazepine use, medications such as SSRIs, selective norepinephrine reuptake inhibitors, and buspirone, as well as nonpharmacologic treatments (e.g., cognitive-behavioral therapy), should be considered for the treatment of late-life anxiety.<sup>48–49</sup> When benzodiazepines are used, close clinical monitoring is recommended.<sup>50</sup> Our observation that the majority of psychiatric medications consists of benzodiazepines suggests that more appropriate first treatment options are still not considered for a large portion of older women with anxiety symptoms.

This study takes a biopsychosocial approach to the study of anxiety symptoms, allowing for a more comprehensive look at factors that contribute to the development or maintenance of anxiety symptoms. Because this is a longitudinal study, we are able to distinguish women with intermittent and chronic anxiety symptoms from those with no symptoms of anxiety. Future research should use a more extensive measure of anxiety or a clinical interview to further examine the relationship between anxiety and disability. Samples should include participants both with and without any disability, as well as both men and women. Future studies are needed to determine if interventions that reduce anxiety symptoms also reduce the occurrence of physical disability. Reduction in anxiety may result in a decrease in disability through improved social support and decreased benzodiazepine use. Somatic symptoms associated with anxiety may affect physical disability, and treatment of these symptoms may result in better functioning. Treatment of anxiety may result in more healthy behaviors (e.g., decreased alcohol consumption) that could also produce improved functioning.

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Footnote 1 The relationships between individual life events and anxiety status are as follows. loss of a spouse:  $X^2_{[1]}=0.00, p=0.98$ ; serious illness or accident of a spouse:  $X^2_{[1]}=1.25, p=0.26$ ; death of a close relative or friend:  $X^2_{[1]}=2.1, p=0.15$ ; separation from a child, friend, or relative:  $X^2_{[1]}=4.10, p=0.043$ ; loss of a pet:  $X^2_{[1]}=1.38, p=0.24$ ; and giving up a hobby or important activity:  $X^2_{[1]}=9.98, p=0.002$

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**Table 1**

Baseline Characteristics of WHAS Participants.

Variables	No Anxiety (N = 389)	Intermittent Anxiety (N = 324)	Chronic Anxiety (N = 78)	Statistic [df]; p value
Self-rated health (M, SD)	3.26 (1.04)	3.51 (1.07)	3.77 (0.95)	$K.W._{[2]}=19.59; < .001$
Number of domains of disability (M, SD)	2.90 (0.83)	3.00 (0.81)	3.33 (0.78)	$F_{[2,788]}=9.34; < .001$
Depressive symptoms (M, SD)	5.76 (3.86)	8.57 (5.83)	12.64 (6.60)	$F_{[2,788]}=9.34; < .001$
Life events (M, SD)	0.80 (0.80)	0.90 (0.86)	1.22 (1.03)	$F_{[2,787]}=70.01; < .001$
Not enough emotional support	19.5%	36.7%	60.3%	$X^2_{[2]}=60.46; < .001$

Note: K.W. = Kruskal Wallis one-way analysis of variance by ranks.

**Table 2**

Multivariate Analyses of Likelihood of Intermittent or Chronic Anxiety Symptoms Compared with No Anxiety Symptoms.

Variables	Intermittent Anxiety			Chronic Anxiety		
	O.R.	C.I.	Wald <sub>[df]</sub> ; <i>p</i>	O.R.	C.I.	Wald <sub>[df]</sub> ; <i>p</i>
Self-rated health	1.12	0.97–1.35	2.69 <sub>[1]</sub> ; 0.15	1.31	0.89–1.54	1.86 <sub>[1]</sub> ; 0.25
Number of domains of disability	0.96	0.79–1.17	0.06 <sub>[1]</sub> ; 0.70	1.25	0.85–1.75	1.58 <sub>[1]</sub> ; 0.21
Depressive symptoms	1.11	1.07–1.15	29.93 <sub>[1]</sub> ; <.001	1.21	1.15–1.27	51.03 <sub>[1]</sub> ; <.001
Life events						
0	1.0			1.0		
1	1.11	0.79–1.57	0.33 <sub>[1]</sub> ; 0.54	2.67	1.37–5.21	8.33 <sub>[1]</sub> ; 0.004
2	1.04	0.66–1.65	0.00 <sub>[1]</sub> ; 0.87	1.59	0.68–3.74	1.12 <sub>[1]</sub> ; 0.29
3+	1.63	0.64–4.17	0.83 <sub>[1]</sub> ; 0.31	3.76	1.08–13.08	4.34 <sub>[1]</sub> ; 0.037
Emotional support	1.80	1.26–2.57	12.98 <sub>[1]</sub> ; <.001	3.40	1.92–6.04	17.58 <sub>[1]</sub> ; <.001

Note: O.R. = Odds Ratio; C.I. = 95% Confidence Interval

**Table 3**  
Medication Use Over the Course of 3 Years by Anxiety Status.

	No Anxiety (N = 389)	Intermittent Anxiety (N = 324)	Chronic Anxiety (N = 78)	Statistic
Anxiolytics	10.5%	18.8%	30.8%	$\chi^2_{[2]}=19.46; p < 0.001$
Benzodiazepines	8.0%	17.0%	25.6%	$\chi^2_{[2]}=21.69; p < 0.001$
Barbituates	1.0%	0.3%	1.3%	Fisher exact=.25 <sup>a</sup>
Others	1.8%	2.5%	5.1%	Fisher exact=.36 <sup>a</sup>
Anti-depressants	14.4%	21.6%	35.9%	$\chi^2_{[2]}=21.96; p < 0.001$
Tricyclics	7.2%	11.7%	14.1%	$\chi^2_{[2]}=6.01; p = 0.05$
SSRIs	8.2%	13.0%	21.8%	$\chi^2_{[2]}=14.07; p = .001$
MAOIs	0.3%	0.3%	3.8%	Fisher exact=.79 <sup>a</sup>
Trazadone	1.3%	1.9%	2.6%	Fisher exact=.016 <sup>b</sup>
Any psychiatric medication	20.3%	33.0%	48.7%	Fisher exact=.73 <sup>a</sup> $\chi^2_{[2]}=31.82; p < 0.001$

<sup>a</sup>No anxiety versus intermittent anxiety.

<sup>b</sup>No anxiety versus chronic anxiety.