

# Depression and Disability: Comparisons with Common Physical Conditions in the Ibadan Study of Aging

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**OBJECTIVES:** To compare the effects of depression and chronic physical conditions on disability in elderly persons.

**SETTING:** Yoruba-speaking areas of Nigeria.

**DESIGN:** Interviews.

**PATICIPANTS:** Community-dwelling persons aged 65 and older.

**METHOD:** Face-to-face interviews were conducted with a representative sample of community-dwelling persons aged 65 and older (N = 2,152) in the Yoruba-speaking areas of Nigeria (representing ~22% of the national population). Major depressive disorder (MDD) was assessed using the World Health Organization Composite International Diagnostic Interview. Chronic pain and medical disorders were assessed using self-report. Disorder-specific disability was evaluated using the Sheehan Disability Scale (SDS).

**RESULTS:** MDD was highly comorbid with each of the medical conditions (odds ratio range 1.3–2.0). A higher proportion of persons with MDD (47.2%) were rated severely disabled globally than those with arthritis (20.6%), chronic spinal pain (24.2%), or high blood pressure (25.0%). Subjects with MDD were also more likely to be severely disabled in three of the four domains of the SDS. In pair-wise comparisons, persons with MDD had significantly higher levels of disability than those with any of the disorders, with differences in mean scores ranging between –3.74 and –27.50.

**CONCLUSION:** To reduce the public health burden of depression, its prevention and treatment require more clinical and research attention than currently given by developing countries. *J Am Geriatr Soc* 56:2033–2038, 2008.

**Key words:** depression; physical disorders; disability; elderly; Nigerians

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Depression is a common and debilitating illness globally.<sup>1,2</sup> Accounting for 4.4% of the total disability adjusted life years (DALYs) in 2000, it is projected to become the second most burdensome disorder by 2020.<sup>3</sup> Several studies have shown that depression is often comorbid with chronic physical conditions. Persons with diabetes mellitus, asthma, and chronic pain conditions, for example, are at higher risk for comorbid depression.<sup>4,5</sup> These studies, mainly conducted in the developed countries of Western Europe and North America, have also shown that the presence of depression in persons with chronic physical conditions is associated with higher disability and greater impairment in quality of life.<sup>6</sup> A recent survey of the general population in several countries, developed and developing, found that chronic physical conditions are highly comorbid with depression.<sup>7</sup> The study also showed that, when conditions were considered in their pure non-comorbid state, depression was associated with a higher level of disability than chronic physical conditions such as diabetes mellitus, arthritis, asthma, and angina pectoris. Conducted in general adult populations,<sup>7</sup> the study compares the disabling nature of depression with that of common chronic conditions in the community.

Depression is also common in elderly people.<sup>8,9</sup> A previous study showed that elderly Nigerians had a rate of major depressive disorder (MDD) that was much higher than that in the general adult population.<sup>10</sup> In elderly people, depression was associated with impaired quality of life and high risks of disability in diverse areas of functioning,<sup>10,11</sup> but because aging is also associated with a higher prevalence of chronic physical conditions and with greater risk of functional disability,<sup>12</sup> it was unclear whether comorbid chronic physical conditions substantially or even predominantly accounted for the level of disability found. Contextual factors play an important role in determining the level of disability associated with a health condition.<sup>13</sup> Other than access to treatment, the attitudes of patients and caregivers may affect the level of disability associated with different health conditions in elderly people. Consequently, even though previous studies, largely conducted in the developed countries of North America and Western Europe, have shown that depression may carry a higher risk of dis-

ability than many chronic physical conditions in the general population,<sup>14</sup> the same pattern may not apply to elderly persons living in a sub-Saharan African setting where the pattern of access to care, both formal and informal, for different health conditions may be different.

With a growing proportion of elderly persons in their populations, developing countries will face an increasing dilemma about allocation of resources for health service to elderly people. Given the traditional neglect of mental health problems in these countries,<sup>15,16</sup> it is likely that the focus for the alleviation of functional disability in elderly people will be on chronic physical conditions unless compelling evidence is available to suggest a different approach. This article, using data from a community-based study of elderly persons, results of an evaluation of the disability associated with MDD and a number of chronic medical conditions in elderly Nigerians.

## METHOD

The method of the Ibadan Study of Aging (ISA) has been described in full elsewhere,<sup>10,12</sup> and only a brief summary is provided here. The ISA is a community survey of the mental and physical health status and the functioning and disability of elderly persons (aged  $\geq 65$ ) residing in the Yoruba-speaking areas of Nigeria, consisting of eight contiguous states in the southwestern and north-central regions (Lagos, Ogun, Osun, Oyo, Ondo, Ekiti, Kogi, and Kwara). These states account for approximately 22% of the Nigerian population (~25 million people). The survey was conducted between November 2003 and August 2004. Respondents were selected using a multistage stratified-area probability sampling of households. In households with more than one eligible person (aged  $\geq 65$  and fluent in the language of the study, Yoruba), the Kish table selection method was used to select one respondent. Face-to-face interviews were conducted with 2,152 respondents who provided consent to participate, representing a response rate of 74.2%.

The University of Ibadan/University College Hospital, Ibadan, Joint Ethical Review Board approved the survey.

## Measures

Depression was assessed using the World Health Organization Composite International Diagnostic Interview (CIDI) Version 3, a fully structured diagnostic interview.<sup>17</sup> Diagnosis of MDD was based on the criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV).<sup>18</sup> DSM-IV organic exclusion rules were imposed in making the diagnosis of depression. A psychiatrist made judgments about which organic conditions could explain a co-occurring MDD during clinical reviews of all questionnaires in which endorsements of depression features were made.

A checklist of chronic physical and pain conditions was included in the ISA.<sup>19</sup> Respondents were asked whether they had any chronic respiratory conditions (asthma, tuberculosis, other lung disease), digestive conditions (irritable bowel syndrome, ulcer), cardiovascular conditions (high blood pressure, heart disease, heart attack, stroke), cancer, diabetes mellitus, or epilepsy. Respondents were asked whether they had experienced any of the symptom-based

conditions in the previous 12 months. The checklist also ascertained the presence of any chronic pain. These included back or neck pain, arthritis, frequent headaches, and a general category of chronic pain in any other body parts.

Role impairment was assessed using the Sheehan Disability Scale (SDS).<sup>20</sup> For persons with 12-month MDD, this was done after the assessment for depression. For persons with a chronic physical condition, this was done after the assessment for the condition. Persons with multiple chronic physical conditions were asked to identify the most disabling of the conditions in the prior 12 months. The SDS rating was determined for the condition so chosen by the respondent. The SDS was used to assess the extent to which the health condition affected work, household activities, close relationships, and social roles in the worst month in the previous year. A visual analogue scale was used to score responses: none (0), mild (1–3), moderate (4–6), severe (7–9), and very severe (10).

## Data Analysis

To take into account the stratified multistage sampling procedure and the associated clustering, weights have been derived and applied to the rates presented in this report. Also, poststratification to the target sex and age range was performed to adjust for differences between the sample and the total Nigerian population (according to 2000 United Nations projections<sup>21</sup>).

Two sets of analysis of the SDS were made. Domain-specific and global means were calculated for each condition. In addition, the proportions of respondents rated severe or very severe in each domain and globally were calculated for each condition. Pairwise comparisons were made between these values for depression and the chronic physical conditions. To take into account the sample design, the jackknife replication method implemented with the STATA statistical package was used to estimate standard errors for the means and proportions (Stata Corp., College Station, TX). Statistical significance was set at 0.05 in two-sided tests.

## RESULTS

### 12-Month Prevalence

Arthritis was the most common disorder, reported by almost 70% of the sample, followed by another pain condition: chronic back or neck pain. MDD was present in 7% of the sample. Women were significantly more likely to report arthritis, whereas men had significantly higher prevalence of diabetes mellitus (Table 1).

Depression was highly comorbid with each of the medical conditions (Table 2). Other than diabetes mellitus, in which the risk of comorbid MDD was no greater than chance, the odds of having MDD ranged between 1.6 and 2.0 for persons with the other chronic conditions.

Table 3 shows the proportions of subjects in each disorder group with a rating of severe or very severe ( $\geq 7$ ) on any of the four domains of the SDS. Subjects with MDD were more likely than those with any of the other disorders to rate themselves as severely disabled in at least one domain. Although 47.2% of subject with MDD were so rated, the proportions for arthritis, spinal pain, and high blood

**Table 1. 12-Month Prevalence of Major Depressive Disorder and Chronic Physical Conditions**

Condition	Male	Female	Total	Chi-Square	P-Value
	N; % (Standard Error)				
Depression	66; 6.6 (0.8)	85; 7.4 (0.8)	151; 7.0 (0.6)	0.4	.52
Arthritis	646; 64.9 (1.5)	842; 72.8 (1.3)	1,488; 69.1 (1.0)	15.5	<.001
Back or neck pain	492; 49.5 (1.6)	596; 51.5 (1.5)	1,088; 50.6 (1.1)	0.9	.34
High blood pressure	97; 10.0 (1.0)	119; 10.5 (0.9)	216; 10.3 (0.7)	0.1	.72
Asthma	63; 6.3 (0.8)	96; 8.3 (0.8)	159; 7.4 (0.6)	3.0	.08
Diabetes mellitus	29; 3.0 (0.6)	18; 1.6 (0.4)	47; 2.2 (0.3)	4.7	.03

pressure were 20.6%, 24.2%, and 25.0%, respectively (chi-square 4.21; degrees of freedom (*df*) 3;  $P < .05$ ). In persons with depression, significantly more men than women had a severe disability rating in at least one domain (58.0% vs 39.7%). There were no sex differences in the other disorders.

Table 4 compares proportions of subjects with MDD who rated themselves severely disabled ( $\geq 7$ ) in each of the specific domains of the SDS with those with pain or medical conditions. For this analysis, arthritis and chronic spinal pain were combined to form a pain group, and high blood pressure, asthma, and diabetes mellitus were combined to form a chronic medical conditions group. The results show that, in each of the SDS domains other than close relationships, more depressed subjects were likely to rate themselves as severely disabled than those with chronic pain or chronic medical conditions. The differences were more pronounced in the domains of home activities and work.

Table 5 presents the means of the sum of the SDS ratings in the four domains for each of the disorders. Comparisons are made between men and women and between MDD and each of the other disorders. The mean rating for depression (13.3) was the highest of the disorders. Men and women had similar scores for each of the disorders except for arthritis, on which women scored significantly higher than men (11.9 vs 9.9). Subjects with MDD had significantly higher levels of disability than those with any of the other disorders. The mean SDS score of subjects with MDD

was significantly higher than the score for each of the disorders. The difference was highest between depression and arthritis ( $-27.50$ ) and least between depression and diabetes mellitus ( $-3.74$ ).

## DISCUSSION

This study has shown that, among elderly Nigerians, the disability associated with MDD is far in excess of that associated with some common chronic and medical conditions. Elderly persons with MDD had worse disability ratings on the SDS and were more likely to be severely disabled globally and in regard to work, home, and social roles than those with arthritis, chronic spinal pain, high blood pressure, asthma, or diabetes mellitus.

This study has limitations. First, diagnosis of pain and medical conditions were based on self-report. Even though underreporting was unlikely to significantly affect conditions such as arthritis and spinal pain, high blood pressure and diabetes mellitus could have been affected, because for these conditions, only those who reported having been informed of such diagnosis from their physicians were regarded as cases. Second, the comparisons were based on small numbers in some of the categories. By focusing the analysis on subjects with pure disorders and excluding comorbid (depression and physical conditions) cases in the analysis, the numbers were considerably reduced, although underreporting and comparing only pure cases would have resulted in conservative estimates of the extent of differ-

**Table 2. Comorbidity of Depression and Chronic Physical Conditions**

Condition	N	Prevalence of Depression n; % (95% CI)	Odds Ratio (95% CI) of Having Depression
Arthritis+	1,488	117; 7.9 (6.6–9.4)	1.9 (1.1–2.3)
Arthritis–	664	34; 5.1 (3.7–7.1)	1
Back or neck pain+	1,088	92; 8.5 (6.9–10.3)	1.6 (1.1–2.2)
Back or neck pain–	1,064	59; 5.6 (4.3–7.1)	1
High blood pressure+	216	26; 12.0 (8.3–17.1)	2.0 (1.3–3.2)
High blood pressure–	1,881	119; 6.3 (5.3–7.5)	1
Asthma+	159	18; 11.3 (7.3–17.3)	1.8 (1.1–3.0)
Asthma–	1,993	133; 6.7 (5.7–7.9)	1
Diabetes mellitus+	47	4; 8.5 (3.2–20.6)	1.3 (0.4–3.6)
Diabetes mellitus–	2,050	141; 6.9 (5.9–8.1)	1

CI = confidence interval; + = present; – = absent.

**Table 3. Proportion of Subjects in Each Disorder Group with a Global Rating of Severe Disability**

Condition	Male	Female	Total	Chi-Square	P-Value
	n (%) Standard Error				
Depression	29; 58.0 (7.0)	29; 39.7 (5.8)	58; 47.2 (4.5)	3.98	.05
Arthritis	42; 18.5 (2.6)	54; 22.6 (2.7)	96; 20.6 (1.9)	1.20	.78
Back or neck pain	15; 23.1 (5.2)	22; 25.0 (4.6)	37; 24.2 (3.5)	0.08	.39
High blood pressure	5; 31.2 (11.8)	2; 16.7 (11.0)	7; 25.0 (8.3)	0.78	.39
Asthma	0; 0.00 (0.0)	3; 17.6 (9.5)	3; 13.6 (7.5)	1.02	.32
Diabetes mellitus	0; 0.00 (0.0)	1; 14.3 (13.9)	1; 10.0 (10.0)	0.47	.52

ences between the disorders and would thus have served to strengthen rather than weaken the findings. Another limitation is that disability was assessed using a self-report scale rather than by an interviewer using a clinical tool. It could be argued that elderly persons with depression might have rated their functioning much less than it was as a result of their mental condition. For example, people with depression might have given overly pessimistic appraisals of their functioning, although in this sample, as shown in a previous report,<sup>10</sup> there was congruence between self-rated SDS ratings of disability and interviewer assessment of functional limitations, suggesting that the subjective evaluations of disability conducted by the respondents were likely to be valid. The SDS is designed for the rating of condition-specific disability and has been used for mental and physical disorders in several surveys across the world.<sup>22</sup>

Several studies have shown that depression is a highly disabling disorder in elderly people.<sup>10,11,23</sup> A few studies, conducted in general adult populations, have also shown that depression is commonly associated with greater disability than chronic medical conditions such as arthritis, asthma, diabetes mellitus, and angina pectoris,<sup>7,24</sup> although the high prevalence of chronic pain and medical conditions in elderly people could lead to these conditions being presumed to be a more likely cause of disability than depression might be. Indeed, this study showed that arthritis and spinal pain were much more prevalent conditions in elderly people than depression but that depression is a greater cause of disability than any of these conditions. It is instructive that the greater disability associated with depression was not observed only in regard to social roles. Depression was also more impairing than the chronic physical conditions with regard to work and home roles as well.

Several studies have documented the considerable burden associated with depression. Using measures such as

absence and disability losses, quality of life, and overall health scores, previous reports have shown that depression has comparable, and sometimes worse, consequences as several common physical conditions.<sup>7,24-27</sup> Two recent reports of large population-based surveys of general adult populations in the United States and several other countries around the world provide particularly compelling evidence of the comparatively higher burden of disability associated with depression.<sup>6,24</sup> The ISA has extended the results of such studies by showing that, in this largely understudied population of elderly persons in a developing country, for whom the profile of mental and physical disorders can be expected to be substantially different from that of elderly persons in developed countries, depression is associated with considerably higher disability burden than arthritis, spinal pain, high blood pressure, asthma, or diabetes mellitus. In this regard, the findings of the current study complement those of a previous study<sup>28</sup> that examined a sample of middle-aged and older Dutch respondents and found that, even though depression and common medical conditions such as arthritis and back pain affect subjectively rated wellbeing and objective evaluations of disability differently, depression nevertheless makes a unique contribution to dysfunction, poor health perception, and well-being that exceeds that of medical conditions.<sup>28</sup> Except for some reports,<sup>6,24</sup> when comparisons have been made between depression and chronic physical conditions, disability has not been assessed in a specific manner relative to the disorders. In this study, respondents were asked to rate the disability associated with each of the conditions. The disability assessments were therefore specific for the conditions reported. In addition, for the physical conditions, respondents with multiple conditions were asked to identify the most disabling and focus on this for the rating of the SDS. On the contrary every subject with depression completed the SDS. In essence, the ratings for the physical conditions

**Table 4. Proportion of Subjects in Each Disorder Group with Domain-Specific Rating of Severe Disability**

Condition	Pain	Physical	Depression	Pain Versus Depression		Physical Condition Versus Depression	
	n (%) Standard Error			Chi-Square	P-Value	Chi-Square	P-Value
Work	51; 7.3 (1.0)	1; 1.4 (1.4)	11; 15.9 (4.4)	6.40	.01	9.28	.003
Home	119; 16.0 (1.4)	10; 13.2 (3.9)	25; 35.2 (5.7)	16.40	.001	9.84	.002
Social roles	56; 8.9 (1.1)	3; 4.8 (2.8)	11; 16.4 (4.5)	4.01	.045	4.46	.04
Close relationships	60; 9.5 (1.2)	4; 6.4 (3.1)	11; 16.2 (4.5)	2.99	.08	3.11	.08

**Table 5. Sex and Disorder Comparisons of Global Sheehan Disability Scale Rating**

Condition	Male	Female	Total	Male Versus Female		Depression Versus Physical Condition*	
	n; Mean (Standard Error)			Z	P-Value	Z	P-Value
Depression	5; 14.5 (2.5)	40; 12.5 (1.7)	65; 13.3 (1.4)	-0.56	.58		
Arthritis	221; 9.9 (0.6)	233; 11.9 (0.7)	454; 10.9 (0.5)	-2.21	.03	-27.50	.001
Back or neck pain	64; 11.8 (1.2)	81; 9.8 (0.9)	145; 10.7 (0.7)	-1.16	.25	-14.80	.001
High blood pressure	16; 11.5 (2.5)	12; 6.9 (2.4)	28; 9.5 (1.8)	-0.95	.34	-7.14	.01
Asthma	5; 9.6 (2.6)	16; 8.6 (2.1)	21; 8.9 (1.7)	-0.53	.55	-6.00	.01
Diabetes mellitus	3; 2.7 (2.7)	6; 6.0 (4.1)	9; 4.9 (2.8)	-0.31	.76	-3.74	.01

\* Analysis controlled for age and sex.

represented assessment of the more-serious cases, whereas the ratings of MDD spanned the entire spectrum of severity of that condition. The differences reported between depression and the chronic physical conditions are therefore conservative.

At its current rate of growth, the elderly population in developing countries will soon represent more than three-quarters of the world's elderly population.<sup>21</sup> The common focus on the physical health of elderly people, to the neglect of their mental health, may become even more pronounced as they make increasing demands on the health systems of low- and middle-income countries, where limited resources are bound to lead to hard choices in the provision of care. The results of the current study should inform a broader approach to healthcare services for elderly people in these countries. This study has shown that the presence of chronic pain and physical conditions is associated with a higher risk for comorbid MDD. Therefore, elderly persons with any of these conditions should be seen as having a greater likelihood of also being depressed. On top of that, this study showed that, even when chronic pain and physical conditions are not present, elderly persons with MDD are considerably more disabled than those with chronic pain or physical conditions. Thus, any healthcare policy for elderly people must have the treatment of depression as a priority.

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