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Do Centenarians Show Higher Levels of Depression? Findings from the Georgia Centenarian Study

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Abstract

BACKGROUND—Depressive symptoms are often reported to be higher in very old populations when compared to younger age groups. However, it is unclear whether the differences are due to age differences in dysphoria or in other components of depression.

OBJECTIVES—The purpose of this study was to examine age differences for specific items and subscales of the Geriatric Depression Scale (GDS).

DESIGN—The current study compared specific items, subscales, and the total score from the GDS among three age groups.

SETTING—Community-dwelling older adults were tested.

PARTICIPANTS—One hundred and thirty-nine centenarians were compared to 93 octogenarians and 91 sexagenarians.

MEASUREMENTS—The GDS (Brink et al., 1982) was used in this study.

RESULTS—Results indicated age-group differences in the overall depression score and in the withdrawal-apathy-vigor (WAV), mental impairment, and hopelessness subscale scores, as well as on the item level with significant age group differences on 12 of the 30 items. Centenarians rated higher on all subscales, but there was no difference in dysphoria.

CONCLUSION—It is important to distinguish different dimensions of depression when assessing very old populations because some of the questions on the GDS are associated with fatigue, mild cognitive decline, and decline in physical functioning which increase with aging. Future research should revisit the concept of depression in very late life.

Keywords

Depression; fatigue; centenarians

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INTRODUCTION

It appears that late life depression is quite common and that depressive symptoms are more frequent among oldest-old persons [1, 2]. Some of these factors related to depression can be explained by changes during the later years. When controlling for factors associated with aging (i.e., gender, physical disability, and cognitive impairment) there is no relationship between depressive symptoms and age [3]. Other studies have suggested that among older adults the symptoms of depression may also be different [1, 4]. Some have suggested that older adults experience “depression without sadness,” a depletion syndrome, which involves a withdrawal from social activities and a lack of vitality, but an absence of dysphoria [1, 4].

Depression is not part of the aging process itself [3, 5], but older adults 85 and older are more vulnerable to depression than other age groups [6, 7]. This vulnerability may be due to age-related structural and biochemical changes [6]. Higher depression rates may also be related to the increase in risk factors in later-life (i.e., bereavement, loneliness, physical illness, and institutionalization [8]). The major factors associated with depression among oldest old persons appear to be problems with completing tasks for daily functioning and problems with cognition [8].

According to Margrett et al. [9], mental health in later life is linked to indicators of cognition and functioning. The study found that in octogenarians a significant predictor of depressive symptoms was diminished cognitive problem-solving ability and the perception of declining cognitive abilities may contribute to depressive symptoms [9]. Steck et al. [8] noted that the relationship between depression, cognition, and disability is complicated. Many times older adults have coexisting physical and psychiatric diseases, which make it difficult to study a single variable [8]. “Diminished mental health could affect cognitive abilities, such as problem-solving ability, which in turn is an important resource in combating issues like depression” (9, p. 97).

It appears that even within the oldest old there may be differences in depression. A recent study [10] demonstrated that both depression and fatigue increased in centenarians. When examining depressive symptoms in centenarians, living in a personal care facility or nursing home and being more neurotic were symptoms of depression; unlike octogenarians, cognition was not a strong predictor of depressive symptoms among centenarians [9]. Margrett et al. [9] suggested that centenarians may have a more positive outlook based on their appreciation of the abilities they have maintained. The same may also be true for disability. While octogenarians and centenarians reported higher levels of disability, their subjective health ratings and emotions were less likely to be impacted by their disability when compared to younger old adults [7].

Literature does suggest that subjective health, a person’s perception of his/her own health, mediates the link between physical and mental health [2, 11]. Through subjective health, disease and disability would have both a direct and indirect impact on depressive symptoms [2]. Jang et al. also found that those who were older had less education; older adults with more comorbidity and disability were likely to rate their subjective health as more negative and list more depressive symptoms [2]. However, another study found that older adults’ subjective health rating was no more significant than other predictors of depressive symptoms [9]. It is important to note that older adults base their subjective health on comparisons with others, and for the oldest adults many of their peers have more health problems and increased mortality rates [2]. There is also the possibility of selective survivorship when studying centenarians; they have lived well beyond their expected lifespan, so despite their health conditions centenarians may view their health more positively than younger old adults [5].

The Geriatric Depression Scale (GDS) is a popular and well-established tool in screening for depression that has been widely used in the past 20 years, with translations into 24 languages [12]. This scale was developed to eliminate some of the problems with existing scales which were over diagnosing depression, due to the fact that they included many questions about physical symptoms [13]. “Thus, the GDS was written with much less emphasis on somatic complaints” [14, p.770].

However, some GDS items still may not apply to older adults entering a long-term care facility (i.e., giving up activities and interests) [15]. Another critique of the scale is that all items are equally weighted, giving the impression that each item is an equally important symptom, suggesting that older adult do not differ from younger adults [14]. Adams [14] noted that although the GDS is a good screening tool for depression in older adults, there may be additional benefits to examining several subscales.

Adams et al. [12] developed a five-factor measurement model which obtained an overall good fit using 26 of the 30 items of the GDS. The five subscales include dysphoric mood, withdrawal-apathy-vigor (WAV), worry, cognitive impairment, and hopelessness. Adams et al. noted that the dysphoric mood and hopeless subscales include the most worrisome symptoms of depression and recommended that clinicians use these to evaluate the severity of depression, whereas the WAV subscale is more related to one’s health or age-related frailty. The other two subscales have lower reliability coefficients, and Adams et al. commented that these subscales “may be tapping symptoms that frequently accompany depression but may also be indicative of a number of other conditions” (p. 825). However, it is not just subscales that can be useful. Examining specific items on the GDS can be important as well in understanding depression among older adults, especially across age groups.

In order to gain a better understanding of depression in very old adults, this study examined each item on the GDS for specific age groups differences (i.e., 60s, 80s and 100s). Based on previous literature, we hypothesized (1) that centenarians would score higher than the other two age groups on questions addressing items related to cognition, physical functioning, and fatigue; (2) there would be mean age differences for different subscales of the GDS.

METHODS

Participants

Data were collected from community-dwelling and cognitively intact sexagenarians, octogenarians, and centenarians in the first phase of the Georgia Centenarian Study collected from 1988–1997 [16]. The goal of this larger research project was to examine how biological, psychological, and social factors contribute to successful adaptation in the oldest-old [16].

Octogenarian and sexagenarian participants were recruited using probability samples imitating the gender and ethnicity of those cohorts in Georgia. The probability samples were based on voter registration lists and then selected persons were called by professional interviewers. About 39% of those who were contacted met the inclusion criteria (i.e., community dwelling, cognitively intact, and in reasonable health) and agreed to participate [16]. The number of centenarians who could meet the inclusion criteria was small so all centenarians who qualified and consented to being tested were tested [16].

The sample included a total of 319 sexagenarians, octogenarians, and centenarians comprised of 91 sexagenarians (M_{age}: 64.88 years, SD: ±2.847; range: 60–69), 93 octogenarians (M_{age}: 82.63, SD: ±2.353; range: 79–89), and 139 centenarians (M_{age}: 100.74,

SD: ±1.554; range: 99–110). As noted in Table 1, the majority of the participants was female (67.7%), Caucasian (72.3%), and had completed at least a trade school or some college (45.5%).

Measures

Depressive symptoms were measured using the GDS [17] which consists of 30 dichotomous items assessing the presence of depressive symptoms during the last week. Higher scores indicate more symptoms of depression (possible range of 0–30, observed range of 6–26). Some of the questions included, “Are you basically satisfied with your life?” and “Do you feel downhearted and blue?” Internal consistency for the GDS have been reported as high with Cronbach’s alpha reliabilities reported of .94 [17] and .87 [15]. For the current study the internal consistency was also high with a Cronbach’s alpha reliability of .86. This study also examined Adams, Matto, and Sanders [12] five sub-scales, Dysphoric Mood (original $\alpha = .796$, current $\alpha = .725$), WAV (original $\alpha = .717$, current $\alpha = .659$), Hopelessness (original $\alpha = .646$, current $\alpha = .631$), Cognitive Impairment (original $\alpha = .508$, and current $\alpha = .571$), and Anxiety (original $\alpha = .588$ and current $\alpha = .657$).

Data Analysis

Crosstabulations with χ^2 tests were performed in SPSS Version 17.0 for each of the individual items in the GDS to test for mean differences between age groups (i.e., 60s, 80s, and 100s). Subscales were then created and ANOVAs were computed to examine mean differences within the subscales between age groups (i.e., 60s, 80’s, and 100s).

RESULTS

Participant responses on each item of the GDS, separated by age group, are provided in Table 2. In general, centenarians, more than other age groups, had dropped activities and interests (79.1%), preferred to stay home (69.7%), and did not feel full of energy (57.1%). However, all centenarians reported being in good spirits. Of the 30 GDS items, there were significant mean differences between age groups on 12 items (i.e., dropped activities and interests, preferred to stay home, did not feel full of energy, hard to get started on new projects, avoided social gatherings, felt worthless, did not find life exciting, felt helpless, trouble concentrating, did not think they are better off than most, felt situation was helpless, and not in good spirits), verifying the importance of looking at questions individually.

The results indicate there were indeed differences between age groups on the GDS subscales (Table 3) but this is not the case for all subgroups. There were no differences between age groups on the dysphoria and anxiety subscales. Centenarians had the highest scores ($M = 3.34$, $SD = \pm 1.47$) in the WAV subscale and the differences between groups were highly significant $F(2, 293) = 32.21$, $p < .001$. Differences between age groups were also significant for mental impairment, $F(2, 301) = 3.81$, $p < .05$, and for the hopelessness subscale $F(2, 301) = 12.58$, $p < .001$. Overall, centenarians had the highest scores for depression, ($N = 117$, $M = 13.40$, $SD = \pm 3.58$), and the difference between age groups was significant $F(2, 273) = 15.43$, $p < .001$.

Bonferoni post-hoc tests indicate there were significant differences between all age groups on the WAV subscale, significant differences between sexagenarians and octogenarians on mental impairment, centenarians were significantly different from sexagenarians and octogenarians on the hopelessness subscale, and centenarians were also significantly different than sexagenarians and octogenarians on the GDS summary score. In all cases, older age groups scored higher on the depression subscales.

DISCUSSION

The study examined differences in depression among old and very old persons. Overall, this study indicates that there are significant differences in depression between age groups (i.e., 60s, 80s, and 100s). Results indicate that there were significant age differences on 12 specific items, 3 subscales, and the summary score.

The purpose of this study was to examine age group (i.e., 60s, 80s, and 100s) differences among all individual items of the GDS and GDS subscales. The first hypothesis was supported in that centenarian responses to questions pertaining to fatigue, physical functioning, and cognition were higher than the other two age groups. This was especially true in GDS items dealing with fatigue (i.e., dropped activities and interests, did not feel full of energy, and found it hard to get started on new projects).

The second hypothesis was somewhat supported in that there were significant age group differences on three of the five subscales including WAV, mental impairment, and hopelessness. These results are consistent with previous research. Adams [14] suggested that items in the WAV subscale are influenced by age and physical frailty, which may possibly explain the significant age differences found in this study. Mental impairment according to Adams et al. [12] had a stronger association with WAV than it did with dysphoric mood, hopelessness, and worry. Adams et al. [12] also suggested that these cognitive symptoms may be caused by other conditions (i.e., early dementia, stroke, and other cognitive changes related to age). WAV and mental impairment in older adults appear to be related to age decline and physical health problems and less related to significant depression.

Hopelessness, on the other hand, Adams et al. [12] suggested is more worrisome because items on this subscale are related to suicidal thoughts. Adams [12] also recommended using the hopelessness subscale as a screening tool for older adults with suicidal intentions. It is unclear whether items in the hopelessness subscale are as effective for centenarians. The four items deal with feelings of helplessness, worthlessness, and hope for the future. Compared to sexagenarians and octogenarians, centenarians have a relatively shorter projected life-span, which may reflect why they have a different perspective on some of the GDS questions. Because of the functional limitations very old adults face, these types of items may have different meanings for centenarians than they do for younger age groups. For example, centenarians may be realistic not to assume any physical limitations would change in the future. To our knowledge, no literature has tested age differences on hopelessness.

All of the centenarians reported being in good spirits, this was significantly different from sexagenarians and octogenarians. This is a particularly interesting finding, because in spite of reporting feeling more helpless and worthless than those in their sixties and eighties, more centenarians report being in good spirits than any other older age group. It may be that dropping activities and finding life exciting are not as important for centenarians as they are for younger-old adults, thus having no impact on their spirits. Significant age group differences were also found for the GDS summary score. However, with the differences found among the subscales, this is not surprising.

When just the overall GDS summary score is examined, it appeared that centenarians were more depressed than the other two age groups. Specific items and subscales suggested that much of this is due to functional limitation and mental impairment associated with very old age. The hopelessness subscale, likewise, may be age related in that as older adult's functional limitations and mental impairments increase they may feel more helpless than younger old adults, but feeling helpless is not the same as feeling depressed. Therefore, the suggestion that centenarians are more depressed than younger adults may not be entirely

true. It is more likely, given that all of the community-dwelling centenarians reported being in good spirits, that centenarians are more fatigued than young old adults and this fatigue is reflected in a high GDS score.

Although significant differences among ages were found, a key limitation of the study is that the population was drawn from the Southeast United States and therefore may not be truly representative of all aging adults. All of our participants were community-dwelling, and we cannot generalize the results to centenarians who reside in long-term care facilities. The study is also cross-sectional, so the age differences obtained may be due to cohort differences rather than age-related changes. Finally, we only used one measure of depression to detect age differences in subdimensions and specific items. Item-response theory should also be applied in future studies so that the responses to each item of the scale can be modeled.

Despite this limitation, this research has shown the importance of examining specific items measuring depression. Overall, the summary score indicates that very old adults are more depressed than younger-old adults. Although this may be true in some cases, the GDS may not be as effective in measuring depression in the very old because some of the questions are associated with fatigue, mild cognitive decline, and decline in physical functioning which increase with aging. Future research should revisit the concept of depression in very late life. This may include examining specific items on the GDS when using the scale to measure depression among the oldest old or conducting qualitative studies to gain insight on better indicators of depression in a very old population. Based on information from the qualitative studies, researchers may want to begin developing a new scale to measure depression among this special population.

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Table 1

Participant Demographics

Category	Sexagenarians n (% of total sample)	Octogenarians n (% of total sample)	Centenarians n (% of total sample)	Total n (% of total sample)
Gender				
1. Male	38 (41.8%)	31 (33.3%)	35 (25.5%)	104 (32.4%)
2. Female	53 (58.2%)	62 (66.7%)	102 (74.5%)	217 (67.7%)
Total	91 (100.0%)	93 (100.0%)	137 (100.0%)	321 (100.0%)
Age	91 (28.3%)	93 (29.0%)	137 (42.7%)	321 (100.0%)
Ethnicity				
1. Caucasian	61 (67.0%)	72 (77.4%)	99 (72.3%)	232 (72.3%)
2. African American	30 (33.0%)	21 (22.6%)	38 (27.7%)	89 (27.7%)
Total	91 (100.0%)	93 (100.0%)	137 (100.0%)	321 (100.0%)
Highest Level of Education Completed				
1. Less than high school	24 (26.4%)	39 (41.9%)	74 (54.8%)	137 (42.9%)
2. High school Graduate	16 (17.6%)	8 (8.6%)	13 (9.6%)	37 (11.6%)
3. At least some college or trade school	51(56.0%)	46 (49.5%)	48 (35.6%)	145 (45.5%)
Total	91 (100.0%)	93 (100.0%)	135 (100.0%)	319 (100.0%

Table 2

Geriatric Depression Scale Single-Item Comparisons

Age Group	Sexagenarians		Octogenarians		Centenarians		
Variable	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	χ^2
Dropped activities and interests	24.4%	75.6%	43.3%	56.7%	79.1%	20.9%	69.52***
Prefer to stay home	32.6%	67.4%	44.4%	55.6%	69.7%	30.3%	32.05***
(Do Not) Feel full of energy	36.4%	63.6%	47.2%	52.8%	57.1%	42.9%	9.23**
(Do Not Think) Mind as clear as it used to be	50.0%	50.0%	67.0%	33.0%	54.9%	45.1%	5.74
Hard to get started on new projects	27.3%	72.7%	46.1%	53.9%	47.8%	52.2%	10.27**
Avoid social gatherings	23.9%	76.1%	33.3%	66.7%	41.4%	58.6%	7.24*
Feel worthless	10.0%	90.0%	14.3%	85.7%	39.8%	60.2%	32.80***
(Do Not)Find life exciting	14.8%	85.2%	20.0%	80.0%	37.1%	62.9%	16.01***
Feel helpless	15.6%	84.4%	19.8%	80.2%	36.6%	63.4%	14.80***
(Do Not think it's) Easy to make decisions	23.9%	76.1%	30.0%	70.0%	31.1%	68.9%	1.44
Trouble concentrating	14.6%	85.4%	30.0%	70.0%	29.9%	70.1%	7.84*
Get restless and fidgety	15.6%	84.4%	20.7%	79.3%	27.6%	72.4%	4.7
(Do Not think) Better off than most	12.4%	87.6%	6.7%	93.3%	22.1%	77.9%	10.71**
More memory problems than most	10.0%	90.0%	18.5%	81.5%	21.4%	78.6%	4.97
Bothered by thoughts	18.9%	81.1%	16.5%	83.5%	20.9%	79.1%	.69
Often get bored	11.2%	88.8%	15.2%	84.8%	19.4%	80.6%	2.71
Frequently feel like crying	18.0%	82.0%	14.3%	85.7%	19.4%	80.6%	1.00
(Do Not) Enjoy getting up in the morning	19.3%	80.7%	22.0%	78.0%	18.8%	81.2%	.37
Feel your situation is hopeless	5.7%	94.3%	6.6%	93.4%	17.3%	82.7%	9.81**
Worry about the future	18.0%	82.0%	20.7%	79.3%	15.7%	84.3%	.93
Feel life is empty	10.0%	90.0%	5.6%	94.4%	13.5%	86.5%	3.73
Frequently get upset over little things	22.5%	77.5%	18.7%	81.3%	11.9%	88.1%	4.53
(Not)Hopeful about the future	7.9%	92.1%	13.2%	86.8%	11.5%	88.5%	1.37
Feel downhearted	14.4%	85.6%	12.0%	88.0%	11.2%	88.8%	.54
Worry about the past	3.3%	96.7%	5.5%	94.5%	7.5%	92.5%	1.72

Age Group	Sexagenarians		Octogenarians		Centenarians		
Variable	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	χ^2
Afraid of something bad	10.1%	89.9%	8.7%	91.3%	6.7%	93.3%	.85
(Do Not) Think it's wonderful to be alive	4.4%	95.6%	5.5%	94.5%	6.0%	94.0%	.26
(Not)Satisfied with life	4.4%	95.6%	4.3%	95.7%	3.0%	97.0%	.42
(Do Not) Feel happy	6.7%	93.3%	6.7%	93.3%	2.2%	97.8%	3.31
(Not) In good spirits	4.4%	95.6%	4.3%	95.7%	0.0%	100.0%	6.05*

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Geriatric Depression Subscales and Summary Score in 60, 80, and 100 Year Old Age Groups

Age Group		Sexagenarians			Octogenarians			Centenarians		
Variable	***n***	***M* (*SD*)**	**95% CI**	***n***	***M* (*SD*)**	**95% CI**	***n***	***M* (*SD*)**	**95% CI**	***F***
Dysphoria	88	0.85 (±1.64)	[0.51, 0.20]	86	0.73 (±1.43)	[0.43, 1.04]	131	0.98 (±1.37)	[0.75, 1.22]	0.78
WAV	84	1.57^{a} (±1.70)	[1.20, 1.94]	84	2.30^{b} (±1.17)	[1.93, 2.67]	128	3.34^{c} (±1.47)	[3.09, 3.60]	32.21^{***}
Anxiety	88	0.49 (±0.86)	[0.31, 0.67]	90	0.52 (±1.00)	[0.31, 0.73]	134	0.51 (±0.92)	[0.35, 0.66]	0.03
Mental Impairment	87	1.00^{a} (±1.10)	[0.77, 1.23]	89	1.46^{b} (±1.23)	[1.20, 1.72]	128	$1.34^{a,b}$ (±1.15)	[1.14, 1.54]	3.81^{*}
Hopelessness	87	0.39^{a} (±0.87)	[0.21, 0.58]	88	0.55^{a} (±0.90)	[0.36, 0.74]	139	1.04^{b} (±1.14)	[0.84, 1.24]	12.58^{***}
Summary Score	80	11.10^{a} (±2.91)	[10.45, 11.75]	79	11.52^{a} (±2.59)	[10.94, 12.10]	117	13.40^{b} (±3.58)	[12.75, 14.06]	15.43^{***}

Note. WAV – Withdrawal-Apathy-Vigor. Means with different superscripts are significantly different from each other.

* $p < .05$.

** $p < .01$.

*** $p < .001$.