ORIGINAL ARTICLE

The influence of somatic symptoms on the performance of elders in the Beck Depression Inventory (BDI)

A influência dos sintomas somáticos no desempenho dos idosos no Inventário de Depressão de Beck (BDI)

Clarissa Marceli Trentini,[1] Flávio Merino de Freitas Xavier,[2] Eduardo Chachamovich,[1] Neusa Sica da Rocha,[1] Vânia N Hirakata,[3] Marcelo Pio de Almeida Fleck[1]

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Abstract

Background: *The Beck Depression Inventory (BDI) has been widely used to assess the prevalence of depressive symptomatology in clinical and non-clinical samples. On elders, however, the Beck Depression Inventory total score can be influenced by the increased scores on somatic and performance subscale due to the impact of ageing process itself and clinical diseases.* ***Purpose:*** *To verify if there are differences between answers of adults and elders for the BDI Somatic and Performance subscale. Methods: Five hundred and fifty six subjects were interviewed. Two hundred and seventeen were adults (between 18 and 59 years old) and 339 were elders (≥ 60 years). Adults and elders with terminal diseases or dementia were excluded. The convenience sampling method was used.* ***Results:*** *Elders answered significantly with higher scores in the Somatic and Performance subscale compared to adults ($p < 0.001$). Female gender and educational level were also associated to higher scores in the Somatic subscale. No differences between both age groups were found in the Cognitive-Affective subscale ($p = 0.332$).* ***Conclusions:*** *Positive answers in the BDI Somatic and Performance subscale must be carefully assessed among elder subjects. The age factor, either by aging or due to several diseases, can bring signs that are not necessarily symptoms of major depression. Further studies are suggested.*

Keywords: *Depression/diagnosis; Aged*

Resumo

Introdução: *O Inventário de Depressão Beck (BDI) tem sido amplamente utilizado para demonstrar a prevalência da sintomatologia depressiva em amostras clínicas e não-clínicas. No idoso, entretanto, o escore total do Inventário de Depressão Beck pode estar influenciado pela maior pontuação na subescala de queixas somáticas e de desempenho em decorrência do impacto do processo de envelhecimento e das doenças clínicas.* ***Objetivos:*** *Verificar se existem diferenças entre as respostas dos adultos e dos idosos na subescala Queixas Somáticas e Desempenho. Métodos: Quinhentos e cinqüenta e seis indivíduos foram entrevistados. Duzentos e dezessete eram adultos (entre 18 e 59 anos de idade) e 339 eram idosos (≥ 60 anos). Os adultos e idosos com doenças terminais ou demência foram excluídos. Foi utilizado o método de amostragem por conveniência.* ***Resultados:*** *Os idosos tiverem respostas com escores significativamente mais elevados na subescala Somática e Desempenho em comparação aos adultos ($p < 0,001$). Sexo feminino e nível de escolaridade foram também associados a escores mais altos na subescala Queixas Somáticas. Não houve diferenças entre ambos os grupos etários na subescala Cognitivo-Afetiva ($p = 0,332$).* ***Conclusões:*** *Respostas positivas na subescala Queixas Somáticas e Desempenho do BDI devem ser cuidadosamente avaliadas entre sujeitos idosos. O fator idade, seja pelo envelhecimento ou devido a várias doenças, pode trazer sinais que não são necessariamente sintomas de depressão maior. Sugerem-se mais estudos.*

Descritores: *Depressão/diagnóstico; Idoso*

[1] Universidade Federal do Rio Grande do Sul (UFRGS, Federal University of Rio Grande do Sul)
[2] Universidade do Extremo Sul Catarinense (UNESC)
[3] Hospital de Clínicas de Porto Alegre (HCPA, Clinical Hospital of Porto Alegre)

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Correspondence
Clarissa Marceli Trentini
Rua Duque de Caxias, 888 ap. 303
90010-280 Porto Alegre, RS, Brasil
Fone: (51) 3316-5624
E-mail: clarissatrentini@aol.com

Introduction

The Beck Depression Inventory (BDI) is one among the most commonly used instruments to measure depression intensity. Originally created by Beck et al[1] at the University of Philadelphia, in 1961 (English version), the BDI is now available in a Portuguese version developed by Cunha et al[2] BDI was originally developed for use with psychiatric patients. However, its use was later widened to other research contexts and the general population.

The Beck Depression Inventory (BDI) is a scale for measuring depression intensity and is not a diagnostic instrument. In its structure, the BDI has a subgroup of cognitive-affective items (Cognitive-Affective subscale) and another that includes somatic and performance complaints (Somatic and Performance subscale). The study of the BDI subscales can be of interest in certain subpopulations of patients. For example, in a study designed to verify if both BDI subscales would show a difference between psychiatric and non-psychiatric patients (those with medical diseases) as well as subjects from the community, Cunha et al[3] found that both subscales (Cognitive-Affective and Somatic and Performance), showed the difference between the three subsamples.

Depression is considered as one of the most common mental problems among elders. It is found in one out of six medical patients and has high prevalence among elders in hospitals and in institutions.[4-5] Though prevalent, depression among the elderly is not often diagnosed, and consequently not frequently treated.[6] In general, differently from adults, elders seek help for their psychological pain with general physicians instead of mental health professionals.[7-8] Studies suggest differences in the pattern of the depressive symptoms between adults and elders, which are also present in their complaints.[9-10] Such differences should be taken into account by the measuring scales which assess depressive symptomatology in different samples and in different age groups.[11-14]

According to BDI manuals, it is recommended for subjects up to the age of 80, since studies on psychometric properties have suggested that the reliability and validity of BDI with elders is quite satisfactory.[15-17] On the other hand, age can be considered an impact factor on the instrument: studies point to bias in the item body image among elderly widows.[12] Cappeliez[18] shows that certain groups of elders might minimize depressive symptoms by providing answers which attempt to obtain greater social acceptance.

There is no apparent reason for elders to mention more somatic symptoms. It is possible that aging itself is accompanied by a higher number of physical complaints or that elders are more subjected to medical diseases in general, therefore reporting more somatic items.[11,19-23] Although several studies point to the perception of higher somatic suffering, no studies were found about the performance of BDI subscales in a sample of Brazilian elders.

The aim of this study is to examine whether there are differences in the answers of adults and elders for the Somatic and Performance subscales in a Brazilian sample.

Methods

1. Sample

The sample was composed of 556 subjects. Two hundred and seventeen were adults over 18 years old and 339 were elders over 60 years old. Subjects with terminal diseases and elders with dementia were excluded. Subjects were identified in clinics, hospitals, community groups and at their homes. The Convenience sampling method was used.

2. Instruments

A sociodemographic data form and the Beck Depression Inventory - BDI were used.[1] BDI is an instrument to measure the intensity of depression. The total BDI score is obtained from the sum of the scores of the answers marked by examinees in the 21 items. The highest score possible is 63. The authors of the BDI refer to two item subgroups in the inventory: 1) the 13 first items constitute the Cognitive-Affective subscale, and 2) the last eight which constitute the Somatic and Performance subscale. Cunha et al[2] highlight the importance of using subscales to identify clinical, psychiatric or community patients. The Portuguese version of the instrument was used.

3. Data collection procedure

Adults and elders were interviewed in clinics, hospitals, community groups and at their homes. All of them gave the Informed Consent to participate and were then asked to provide sociodemographic and depressive symptomatology information (BDI).

The project was approved by the Ethics Committee of the Hospitalde Clínicas de Porto Alegre, RS, Brazil (nr. 01.374).

4. Data analysis procedure

Variables were described through absolute and relative frequencies, as well as median, mean and standard deviation.

The means obtained in the Cognitive-Affective and Somatic and Performance subscales were compared by using the Student t-Test for dependent samples.

In order to compare Total BDI scores, Cognitive-Affective BDI and Somatic and Performance BDI according to sociodemographic variables, the Student t-Test and Variance Analysis were used, followed by the Tukey multiple comparison test. The variables that showed association with p values lower than 0.20 were included in the Multiple Linear Regression Analysis which was performed for Total BDI and for the respective subscales. The goal was to identify the variables that showed a statistically significant association independently of the others.

Associations with p values lower than 0.05 were deemed significant.

All data analyses were performed with SPSS version 10.0 for Windows.

Results

Table 1 shows the sociodemographic characteristics of the sample studied. In accordance with data from the general population, in our sample there are more elderly widowers. Elders also had a lower educational level than adults.

Table 2 shows the means and standard deviation values of the Cognitive-Affective and the Somatic and Performance subscales, as well as Total BDI, according to gender, age group, marital status and educational level variables.

The Cognitive-Affective subscale had significantly higher values only for the educational level variable ($p = 0.029$), in which those with elementary school differed only from those with higher education. On the other hand, in the Somatic and Performance subscale statistically significant differences were observed for all the variables studied: women and elders had, respectively, higher scores than men and adults had ($p = 0.017$ and $p < 0.001$, respectively). Widowers had more somatic symptoms than subjects in the other marital status groups ($p < 0.001$). Subjects with elementary education had more somatic symptoms than subjects from different educational levels ($p < 0.001$).

Table 1 – Sociodemographic characteristics of the sample studied (n = 556)

Variables	Adults (n = 217)		Elderly (n = 339)		p
	n	%	n	%	
Gender					0.058*
Male	114	53	149	44	
Female	103	47	190	56	
Age (mean; sd)	38.1 (± 12.5)		73.4 (± 8.3)		
Marital status					< 0.001#
Single	92	42		54	
Married/with a companion	117	54		169	
Widowed	8	4		116	
Level of education					< 0.001#
Elementary school	75	35	226	67	
High school	59	27	64	19	
College degree	83	38	49	14	

** χ^2 test with Yates's correction*
 # Pearson's χ^2 test

There was a significant difference in the BDI score for all factors except for marital status, which was not significantly different between the different groups analyzed. Depression intensity was highest among women ($p = 0.030$), followed by elders ($p < 0.001$) and by those with elementary school level ($p < 0.001$).

In order to identify whether elders - when compared to adults - had different scores in the BDI subscales, weighted means of both subscales (Cognitive-Affective subscale = 13 items; Somatic and Performance subscale = 8 items) were calculated. For the adult age group, the Cognitive-Affective subscale showed a mean of 0.35 per question (± 0.38) and for the Somatic and Performance subscale it was 0.42 (± 0.44), a difference which was statistically significant ($p = 0.016$). Among elders, the Cognitive-Affective subscale showed a weighted mean of 0.35 (± 0.39) and the Somatic and that of the Performance subscale was 0.72 (± 0.53), which is a statistically significant difference ($p < 0.001$). Therefore, in both for adults and elders, the scores were significantly higher in the Somatic and Performance subscale. However, among elders, the difference between the scores in both subscales was even higher, almost twice as much as the adult mean.

Table 3 shows the results of the Multiple Linear Regression Analysis. For the Cognitive-Affective subscale, it was found that higher education was the only factor that was significantly associated after controlling for variables included in the model ($\beta = -0.133$). We may thus conclude that higher education is associated with a lower level of cognitive-affective symptoms.

Differently, for the Somatic and Performance subscale, factors such as gender, age group and education remained associated, showing that women, elders and those with a lower educational level showed higher scores in this subscale. Through β calculations, it was possible to verify that, among the variables included in the model, the higher education factor also showed the greatest influence on the Somatic and Performance subscale ($\beta = -0.257$).

Regarding Total BDI scores, gender and education remained significantly associated with the total score when controlled for age and marital status group variables. The age group reached a borderline significance. Female gender and those with lower education obtained the highest Total BDI score. Again, higher education was the variable with the greatest influence ($\beta = -0.218$).

Table 2 – Description (mean ± sd) of the values of the Cognitive-Affective and Somatic and Performance subscales and Total BDI, according to sociodemographic variables (n = 556)

Variables	Subscale Cognitive-Affective	Subscale Somatic and Performance	Total BDI
Gender			
M	4.2 ± 4.6	4.4 ± 4.2	8.5 ± 7.4
F	4.9 ± 5.3	5.2 ± 4.1	9.9 ± 8.1
p*	0.108	**0.017**	**0.030**
Age group#			
Adults	4.5 ± 4.9/3	3.3 ± 3.5/2	7.6 ± 7.1/5
Elderly	4.6 ± 5.0/3	5.8 ± 4.2/5	10.3 ± 8.1/8
p*	0.919	**< 0.001**	**< 0.001**
Marital status			
Single (G1)	4.6 ± 5.2	3.9 ± 3.7	8.4 ± 7.4
Married/with a companion (G2)	4.6 ± 5.1	4.7 ± 4.3	9.4 ± 8.1
Widowed (G3)	4.4 ± 4.3	6.3 ± 3.9[A]	10.6 ± 7.4
p**	0.901	**< 0.001**	0.062
Level of education			
Elementary School (G1)	5.0 ± 5.2[C]	6.0 ± 4.3[B]	10.9 ± 8.2[B]
High School (G2)	4.5 ± 4.8	4.0 ± 3.7	8.1 ± 7.0
College (G3)	3.6 ± 4.4	2.9 ± 3.1	6.5 ± 6.5
p**	**0.029**	**< 0.001**	**< 0.001**

** t student test*
*** ANOVA*
[A] group 3 different from others groups, according to the Tukey's Test for Multiple Comparisons
[B] group 1 different from other groups, according to the Tukey's Test for Multiple Comparisons
[C] group 1 different from group 3, according to the Tukey's Test for Multiple Comparisons
 # mean ± sd/median

Table 3 – Results of the Multiple Linear Regression between BDI Cognitive-Affective, BDI Somatic and Performance and Total BDI, and the sociodemographic variables (n = 556)

Variables	Subscale Cognitive-Affective			Subscale Somatic and Performance			Total BDI		
	b($IC_{95\%}$)	β	p	b($IC_{95\%}$)	β	p	b($IC_{95\%}$)	β	p
Gender Male	-0.7(-1.6;.09)	-.074	0.230	-0.7(-1.3;-.003)	-.081	0.049	-1.4(-2.8;-0.1)	-.092	0.033

** Both marital status categories were compared to the single group*
*** Both levels of education were compared to elementary school*
 # Although the age group variable has attained the significance to enter the Multiple Linear Regression Analysis, when related to the Cognitive-Affective BDI, it was done because it was the main factor being studied

Discussion

The most important finding of this study is that the highest score intensity in Total BDI for elders takes place due to higher points in the Somatic and Performance subscale.

The explanation for this finding may lie in the fact that elders differ in their appearance, they present a natural decline of vitality and are frequently affected by physical diseases. As a result, elders show more fatigability as well as a higher number of somatic concerns. In accordance with this result, studies with samples of non-Brazilian elders have found higher scores in somatic items among elders.[11,19,23] A higher number of medical comorbidities, as well as a higher number of medications used by the elderly group, even in community samples, may suggest an interference in the elders' answers. According to Talbott,[12] there can be an even greater difference in the answers of elderly widows, especially in the "self image change" item. Studies using the BDI with patients in chronic pain also suggest a bias in depression assessment as a result of pain.

A second possible explanation for this finding may lie in the sociodemographic characteristics of the sample studied. Our sample was formed by a larger number of women and subjects with low educational level in the elderly group. At first, this distribution could explain the higher score in the Somatic and Performance subscale among elders. All scores (total score and scores in both subscales) could be higher for the elderly group due to the larger number of women and subjects with low educational level and not by the fact of being elderly (confusion bias). On a second instance, in order to test this hypothesis, a multiple linear regression analysis was performed showing that, despite the sample's sociodemographic characteristics, the age factor for the Somatic and Performance subscale does not interfere with the Cognitive-Affective subscale and is at the significance limit of Total BDI ($p = 0.051$).

A second finding of this study was the interference of gender and educational level in the answers of the BDI instrument. Level of education was the variable that was most consistently associated with depression intensity. The highest level of education was present as the variable of greatest impact, both on the partial results of the BDI subscales and the total score. Both variables were inversely associated: the higher the education, the lower the intensity of psychological symptoms (cognitive) or physical symptoms (somatic). Therefore, education would play a protecting role for depressive symptoms, or for their manifestation. According to Koenig et al,[24] the level of education is associated with the intensity of depressive symptoms. The gender factor is second in importance, according to the multiple linear regression, regarding its influence on BDI scores, except for the Cognitive-Affective subscale.This result is in accordance with the highest prevalence of depression among women of all ages.[25]

Distribution of different sociodemographic variables among adults and elders, as well the fact that ours was a convenience sample were considered limitations to this study. However, we understand that the relatively low BDI means has not become a restriction to our study.

The results of this study suggest caution, even considering that the sample comes from different contexts, to measure the depression intensity using the BDI with elders in our context. Differently from adults, elders scored higher in Somatic and Performance items. Further studies will be necessary to determine the correct and specific cut off point for the elders group.

The findings are in accordance with the impression that elders - as compared to adults - have a specific depression pattern. However, the nature of the association of age and higher scores in the Somatic and Performance subscale is unknown: whether 1) the real presence of more somatic symptoms as a result of aging would lead the elder to a higher symptomatology in the Somatic and Performance subscale (not necessarily meaning depression), or 2) elders, when depressed, by a specific age-related pattern, tend to express their depression more through somatic perceptions, differently from adults. In accordance with the second alternative, some authors consider that elders, in fact, have a more "somatic" type of depression when compared to adults.[11-13,18,23,26]

Conclusions

Biological aging as well as diseases that come along with it bring along a higher number of somatic symptoms. Therefore, in the Somatic and Performance subscale of the BDI, elderly subjects are expected to have higher scores. According to the results of this study, elders scored almost twice as much as the adults' mean for this subscale. Positive answers in somatic items must be interpreted with caution in elders, since they can be positive due to age (or the presence of other diseases) and not to major depression. Further studies are suggested in order to understand the real nature of this finding.

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