Predicting Diagnosed Depression and Anti-depressant Treatment in Institutionalized Older Adults by Symptom Profiles: A Closer Look at Anhedonia and Dysphoria*

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RÉSUMÉ

L'objectif de cette étude est d'analyser les liens qui existent entre le diagnostic et le traitement de la dépression dysphorique-anhédonique, au moyen du *Minimum Data Set 2.0*. Les participants provenaient de deux secteurs des soins de longue durée : 70 vivaient en maison de retraite et 92 dans un centre de soins pour anciens combattants. Les échantillons étaient différents pour ce qui est de la distribution sexuelle et la cognition. Une série de régressions logistiques mesurant les données démographiques, le type d'infrastructure et la cognition montrent que les symptômes dysphoriques permettent de prédire la dépression diagnostiquée, tandis que les symptômes anhédoniques permettent de prédire l'utilisation d'antidépresseurs sans diagnostic concomitant. Les résultats sont compatibles avec l'hypothèse que, dans des contextes de soins de longue durée, les symptômes anhédoniques contribuent dans une moindre mesure au diagnostic de la dépression que les symptômes dysphoriques. Cependant, les résultats qui indiquent que les symptômes anhédoniques sont liés au traitement ont une incidence sur les protocoles de programmation des soins.

ABSTRACT

The purpose of this study was to examine the relationships of diagnosis and treatment of depression with anhedonic and dysphoric symptom presentation, using the Minimum Data Set 2.0. Participants were from two sectors of long-term care: 70 nursing home residents and 92 residents in a Veterans' Care Service. The samples differed in their sex distribution and in cognition. A series of logistic regressions that controlled for demographics, type of facility, and cognition showed that dysphoric symptoms predicted diagnosed depression, whereas anhedonic symptoms predicted anti-depressant medication use without a concomitant diagnosis. The findings are consistent with a hypothesis that, in long-term care settings, anhedonic symptoms contribute less to a diagnosis of depression than do dysphoric symptoms. However, findings that anhedonic symptoms relate to treatment have implications for care-planning protocols.

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Many authors have commented on problems concerning the diagnosis and treatment of depression in long-term care settings (Rovner et al., 1991; Unutzer et al., 1997; Mulsant & Ganguli, 1999; Geiselmann & Bauer, 2000). Under-diagnosis includes a failure of formal diagnostic criteria to classify persons with potentially treatable symptoms (Heston et al., 1992; Bagley et al., 2000; Teresi, Abrams, Holmes, Ramirez, & Eimicke, 2001; Brown, Lapane, & Luisi, 2002). The findings include large-scale studies in the United States and Canada, where fewer than half of cases with frequent depressive symptoms had an active diagnosis of depression (Canadian Institute of Health Information, 1998; Hirdes et al., 2000; Jones, Marcantonio, & Rabinowitz, 2003). Under-treatment includes a failure to treat depression aggressively or effectively in long-term care. The standard form of treatment for depression in such settings is antidepressant medication (Lasser & Sunderland, 1998), with other types of treatment used infrequently (Smyer, Shea, & Streit, 1994). Despite reports that geriatric depression responds well to pharmacotherapy (Alexopoulos et al., 1996; Rosen, Mulsant, & Pollock, 2000), several studies suggest that antidepressants are under-utilized and inadequately prescribed (Brown et al., 2002; Datto et al., 2002). Phillips, Zimmerman, Bernabei, and Jonsson (1997) provide examples from countries like Denmark, Italy, and the United States, where 40 per cent to 55 per cent of long-term care residents with frequent depressive symptoms were without treatment.

Although co-morbidity adds to the complexity of diagnosis and pharmacotherapy in long-term care (Brown et al., 2002; Blazer, 2003; Jones et al., 2003), an important issue concerns the presentation of depression in older people (i.e., 65 years and over). Gallo, Anthony, and Muthén (1994) suggest that many older people display *depression without sadness*, characterized by anhedonia and somatic complaints rather than by the dysphoric symptoms that are common in younger depressed people. A threat to diagnosis and subsequent treatment may occur if persons showing depression without sadness fail to exhibit enough other symptoms for a formal diagnosis of depression (Gallo, Rabins, & Anthony, 1999; Stones & Kirkpatrick, 2002).

The symptom pattern documented by Gallo et al. (1994) and Gallo et al. (1999) raises questions about how well current diagnostic systems map onto the clinical profile of depression among older adults. *The Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (American Psychiatric Association, 1994) refers to anhedonia and dysphoria as axes of major depression, with diagnosis based on the presence of disorder on either or both axes, in addition to other symptoms. The U.S. Surgeon General's (1999) report on mental health considered depression without sadness to be an under-diagnosed but treatable form of late-life depression. Although the report recommended the inclusion of minor depression in diagnostic practices, the American Psychiatric Association (1994) lists minor depression among ''Criteria Sets and Axes Provided for Further Study''. Consequently, the status of minor depression (including depression without sadness) within diagnostic practice remains promising but uncertain.

The aims of the present research were to examine the contributions of anhedonia and dysphoria—measured by the Minimum Data Set 2.0 (MDS 2.0)—to the diagnosis and treatment of depression in different long-term care settings (Morris, Hawes, Murphy, & Nonemaker, 1995). The MDS 2.0 is a comprehensive assessment tool mandated for use in all licensed nursing homes in the United States since 1991 and administered with generally high inter-rater reliabilities by trained assessors (Hawes et al., 1995). The use of the MDS 2.0 has spread to over 20 countries since its introduction, with the first mandated Canadian implementation in Ontario complex continuing care facilities in 1996. The initial purpose of the MDS 2.0 was for care planning, with the breadth of its use evidenced by rates of over 17,000 annual assessments in Ontario's complex continuing care facilities.

Care planning based on the MDS 2.0 links behaviours, symptoms, and problems with subsequent intervention. It differs from medical care planning that aims to link diagnosis with treatment, despite evidence of frequent anomalous combinations in long-term care (e.g., diagnosis without treatment; treatment without diagnosis) (Weintraub, Datto, Streim, & Katz, 2002). Although the protocol for mood states in the 1995 MDS 2.0 manual (Morris et al., 1995) included

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symptoms of both anhedonia and dysphoria, subsequent development of the Depression Rating Scale (Burrows, Morris, Simon, Hirdes, & Phillips, 2000) omitted the inclusion of anhedonic content.

The hypotheses of the present research have relevance to care planning protocols based on traditional medical practice and on the MDS 2.0. From a medical perspective, a hypothesis that follows from claims of a neglect of anhedonic symptoms in the diagnosis of late-life depression (Gallo & Rabins, 1999; U.S. Surgeon General, 1999; Stones & Kirkpatrick, 2002) is that anhedonic symptoms contribute less to diagnosis than dysphoric symptoms. However, if long-term care residents with predominantly anhedonic symptoms *do receive* treatment for depression, it follows that anhedonic symptoms should relate to an anomalous combination of treatment without diagnosis. From the MDS 2.0 perspective, evidence that anhedonic symptoms significantly add to the prediction of diagnosis or treatment beyond levels afforded by the Depression Rating Scale should prompt a reappraisal of recommendations for care planning.

The settings for the research included two of the major sectors within long-term care. *Nursing homes* (or homes for the aged) provide 24-hour nursing care. *Complex continuing care facilities* offer higher levels of medical care (e.g., long-term complex medical care, geriatric assessment and rehabilitation, psychogeriatric care, palliative care, respite care) (Teare et al., 2004). The inclusion of residents from both sectors should augment the generality of findings across the long-term care spectrum.

Method

The Sample

The participants were 162 nursing home residents from three nursing homes in Thunder Bay, Ontario ($n = 70$; 16 men, 54 women) and a veterans' care service in a chronic care hospital in London, Ontario ($n = 92$; 89 men, 3 women), included in a larger study of depression. Nurse managers selected participants for the Thunder Bay sample, based on clinical judgement that the residents had the cognitive capability to answer questionnaire items appropriately (i.e., because other questions addressed by the larger study required the completion of self-report scales). All 70 participants from Thunder Bay were able to provide informed consent. For the London sample, participants were randomly selected from the program census ($n = 279$ on the first day of the study), regardless of their cognitive functioning. This process enabled the selection of 129 residents for sequential approach, with 14 deemed ineligible (e.g., deceased; unable to contact substitute decision maker [SDM] for consent). Of the 115 remaining residents or SDMs approached for consent, 16 refused (e.g., due to hearing problems; disinterest). The number of residents with completed staff-rated assessments was 92, with assessments for the remaining seven residents not completed (e.g., for reasons of resident death, scheduling challenges).

Assessment Procedures

The administrators of all the facilities gave permission for nurses to use work time to complete sections of the MDS 2.0 and other measures not reported in the present research. A staff member (RN or RPN) having experience with the MDS 2.0 and the care of specific residents was responsible for completing the assessments. Data collection procedures included direct questioning of residents, questioning of other staff members with direct knowledge about the care of particular residents, and chart examination.

There were two indexes from the MDS 2.0 used to measure mood. The first measure was the MDS Depression Rating Scale (MDS-DRS; Burrows et al., 2000) that includes seven items (i.e., *negative statements*, *persistent anger*, *unrealistic fears*, *repetitive health complaints*, *repetitive anxious complaints*, *sad facial expression*, and *tearfulness*). The second measure, termed here the *Anhedonia Index*, included two items from the MDS 2.0 on withdrawal (i.e., from *activities of interest* and *social interaction*) and an item on anhedonia from the mental health version of the Minimum Data Set (i.e., *statements by a resident indicating a general lack of pleasure*). The scoring of the MDS 2.0 items was on a 3-point scale, such that the highest score indicated a daily occurrence of the behaviour. Other measures used in data analysis included demographics (age, sex, type of facility), diagnosis (depression), use of anti-depressant medication, other mood intervention (psychotherapy, group therapy, behavioural evaluation, evaluation by mental health specialist), and the MDS Cognitive Performance Scale (Morris et al., 1994).

The primary means to evaluate the reliability of MDS responses is inter-rater reliability, with internal consistency also used with multi-item scales. The items included in this study met or exceeded minimal criteria for inter-rater reliability from the earliest time of evaluation (Morris et al., 1990). The internal consistency for responses on the Depression Rating Scale exceeded 0.7 in previous research, with its validity established against the Hamilton Depression Scale (i.e., sensitivity of 0.94 and specificity of 0.72) and the Cornell Scale (i.e., sensitivity of 0.78 and specificity of 0.77) using the recommended cut-point

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Table 1: Distributions of frequencies, means, and standard deviations (*SD*) by type of facility

Measure	Nursing Homes	Veterans' Service
Number (%) of Females	54 (77.1%)	3 (3.3%)
Mean Age (*SD*)	82.22 (9.16)	82.22 (4.47)
Number (%) with Diagnosed Depression	22 (31.4%)	27 (29.3%)
Number (%) receiving Anti-depressant Medication	25 (35.7%)	40 (43.5%)
Mean Score (*SD*) on Cognitive Performance Scale	1.03 (1.08)	2.63 (2.05)
Mean Score (*SD*) on MDS 2.0 Depression Rating Scale	1.46 (2.01)	2.34 (2.26)
Mean Score (*SD*) on Anhedonia Index	0.73 (1.32)	0.99 (1.34)

score of 3 on the Minimum Data Set Depression Rating Scale. Against psychiatric diagnosis of major depression the sensitivity was 0.91 and the specificity was 0.69 (Burrows et al., 2000). The Cognitive Performance Scale items included *comatose status*, *short-term memory, ability to make one's self understood*, *cognitive skills for daily decision making*, and *independence in eating*. The Cognitive Performance Scale uses hierarchical scoring, with its validity established against the mini-mental measure (Morris et al., 1994). Recent findings show an internal consistency of 0.7 and validity against the Mini-Mental State Examination of 0.65 (Gruber-Baldini, Zimmerman, Mortimore, & Magaziner, 2000).

Results

Using data from the study, coefficient alpha reliabilities for responses on the multi-item scales were 0.7 for the Depression Rating Scale and 0.75 for the Anhedonia Index. Although the Cognitive Performance Scale uses a hierarchical scoring scheme, the coefficient alpha reliability was 0.79. Consequently, all the reliabilities met or exceeded the minimum of 0.7 set as a criterion of reliability.

The correlations between the three scales were moderate but significant. The Depression Rating Scale correlated with the Anhedonia Index at $r[161] = 0.302$ ($p < 0.001$) and with the Cognitive Performance Scale at $r[161] = 0.275$ ($p < 0.001$). The Anhedonia Index correlated with the Cognitive Performance Scale at $r[161] = 0.237$ ($p < 0.001$). These moderate correlations suggest that, although the scales have moderate inter-relationships, they measure substantially different constructs.

Comparisons across Facilities

Table 1 shows the distributions across type of facility for the main measures analysed in the study. Only two measures differed significantly at the $p < 0.05$ level, after Bonferonni correction for the number of comparisons. First, females were more prevalent in the nursing homes than in the veterans' facility ($\chi^2[1] = 91.94$, $p < 0.001$). This difference is in an expected direction because most veterans from that cohort were male. Second, residents of the veterans' facility showed higher scores (i.e., greater impairment) on the Cognitive Performance Scale ($t[160] = 5.95$, $p < 0.001$). This finding probably reflects a sampling artefact rather than a population difference because of selective sampling of residents with higher cognitive performance (only) in the nursing homes. The use of non-pharmacological treatments was infrequent and did not differ across type of facility; consequently, there was no further analysis of these measures.

Table 2: Frequencies of residents by diagnosed depression and anti-depressant use

Anti-depressants Used	Diagnosed Depression	
	No	Yes
No	87	10
Yes	26	39

Subsequent multivariate analysis included control for cognition, demographics, and type of facility, because the only differences found between types of facility were sex (i.e., a population difference) and cognition (i.e., probably a sampling artefact).

Relationships with Diagnosis and Treatment

Table 2 shows the relationship of diagnosed depression with anti-depressant medication. As expected, the use of anti-depressants was higher in residents with a diagnosis of depression than in those without ($\chi^2[1] = 43.22$, $p < 0.001$).

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Table 3: Odds ratios and 95 per cent confidence intervals for significant predictors of diagnosed depression and anti-depressant use

Predictor Variables	Predicted Variables		
	Depression Diagnosis	Anti-depressant Use	Anti-depressant Use
Age	0.989 (0.939–1.041)	0.979 (0.932–1.028)	00.977 (0.921–1.037)
Sex	1.662 (0.494–5.499)	0.910 (0.299–2.774)	0.624 (0.170–2.292)
Type of Facility	0.998 (0.277–3.593)	1.389 (0.445–4.339)	1.616 (0.438–5.963)
Cognitive Performance	1.014 (0.816–1.061)	0.840 (0.683–1.033)	0.781 (0.609–1.000)
Anhedonia Index	1.117 (0.898–1.031)	1.279 (1.026–1.595)*	1.287 (1.003–1.652)*
Depression Rating Scale	1.224 (1.031–1.453)*	1.145 (0.973–1.349)	1.047 (0.860–1.274)
Diagnosed Depression	—	—	15.172 (6.110–37.62)**

* $p < 0.05$
** $p < 0.01$

The analyses to evaluate predictors of diagnosed depression and anti-depressant use were by logistic regression. Interpretation of an odds ratio derived from such a regression may refer to the significance of the Wald statistic or to the confidence intervals for the odds ratio. Although a Wald statistic is usually accompanied by confidence intervals that are either fully above or fully below 1 at the same level of significance, most publications refer to confidence intervals rather than to the Wald statistic. This report follows that practice and interprets the odds ratios by reference to 95 per cent confidence intervals.

Separate analyses to predict diagnosed depression and anti-depressant use included the Depression Rating Scale and the Anhedonia Index as predictors, with control for the demographics of age, sex, type of facility, and the Cognitive Performance Scale. A further analysis to predict anti-depressant use added diagnosed depression to the preceding array in order to estimate the prediction *anti-depressant use* in the absence of diagnosed depression.

The findings in Table 3 show significant prediction of diagnosed depression only by the Depression Rating Scale and significant prediction of treatment (i.e., without inclusion of diagnosis as a predictor) only by the Anhedonia Index. Non-significant contributions by demographics, type of facility, and cognitive performance provided no evidence that these variables added to the predictions. The prediction of treatment after inclusion of diagnosed depression in the predictor array showed significant prediction by diagnosis and the Anhedonia Index, with prediction by the Cognitive Performance Scale nearing significance ($p = 0.05$). The significant finding with the Anhedonia Index suggests that anhedonic symptoms contribute to the prediction of undiagnosed but treated depression.

Discussion

This research examined relationships of depressive symptoms with diagnosed depression, the use of anti-depressants, and other treatments. In most respects, the sample studied showed consistency with other reports on long-term care residents. Although the prevalence of diagnosed depression of approximately 30 per cent is higher than in earlier large-scale studies (Canadian Institute of Health Information, 1998; Hirdes et al., 2000; Jones et al., 2003), it is consistent with some other findings (Anderson, Buckwalter, Buchanan, Maas, & Imhof, 2003). Anti-depressant medication is the usual treatment for depression in long-term care, with approximately 40 per cent of residents using anti-depressants in the study sample and only a few receiving other mood interventions. Although the mean age of residents was within a usual range, the sex distribution of approximately two thirds males was atypical but expected in this research because the study included a veterans' care service as well as nursing homes. Any difference in cognition between the two types of facilities was likely due to differences in sampling, which was random across all units of the veterans' care service but biased toward the selection of residents with higher cognition in the nursing homes. Other than sex and cognition, the distributions were comparable across the nursing home and veterans'-service sectors of long-term care.

After controlling for demographics, type of facility, and cognition, the findings show that the Depression Rating Scale predicted diagnosed depression, whereas

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the Anhedonia Index predicted the use of anti-depressant medication. The finding that the symptoms of dysphoria measured by the Depression Rating Scale predicted diagnosed depression but not its treatment is surprising but may reflect a limitation of the cross-sectional methodology. If medical care planning protocols aim to link diagnosis with treatment, and dysphoric symptoms contribute to diagnosis, effective treatment should alleviate those symptoms. If treatment is successful in alleviating symptoms, the relationship between diagnosis and treatment should be stronger than that between symptoms and treatment in cross-sectional research. The finding that diagnosed depression was the strongest predictor of anti-depressant use supports this interpretation.

The failure of the Anhedonia Index to predict diagnosis is consistent with the hypothesis of a neglect of anhedonic symptoms in the diagnosis of depression in long-term care facilities. However, findings that the Anhedonia Index predicted anti-depressant use with or without the inclusion of diagnosed depression in the predictor array suggest awareness that anhedonic symptoms may be amenable to anti-depressant treatment. The most likely interpretation is that residents with predominantly anhedonic symptoms received a provisional (but unrecorded) diagnosis of minor depression and subsequent treatment. This interpretation supports the concerns about diagnosis expressed by Gallo et al. (1994) and Gallo et al. (1999) but alleviates to some extent anxieties from earlier research that residents with anhedonic symptoms are at risk of under-treatment (Stones & Kirkpatrick, 2002).

Finally, the findings on anhedonia have implications for the MDS 2.0 care planning protocol for depression. The care planning protocol before the development of the Depression Rating Scale was the Resident Assessment Protocol for Mood State (Morris et al., 1995). This protocol included items on withdrawal from activities of interest and reduced social interaction, in addition to items on the Depression Rating Scale. Findings that anhedonic symptoms relate to treated but undiagnosed depression should be grounds to reconsider the merits of the former Mood State protocol, which included anhedonic symptoms among the indicators of mood disorder.

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