The neuropsychiatry of dementia : psychometrics, clinical implications and outcome

Kat, M.G.

CHAPTER 3

Neuropsychiatric Inventory Questionnaire (NPI-Q): A validity study of the Dutch form

Jos F.M. de Jonghe
Martin G. Kat
Kees J. Kalisvaart
Leo Boelaarts

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ABSTRACT

The Neuropsychiatric Inventory (NPI) is a clinical instrument for evaluating behavioural and psychological symptoms of dementia. It is based on an interview with a primary caregiver. A brief questionnaire form of the NPI, intended for use in routine, clinical practice (NPI-Q), has been developed. This study evaluates the validity of the Dutch NPI-Q form, comparing it to other questionnaires, i.e., the Revised Memory and Behavioural Problems Checklist (RMBPC), the short form Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE-N), the 15-item Geriatric Depression Scale (GDS-15) and the Cognitive Screening Test (CST-20). A data set of geriatric outpatients, referred for neuropsychological assessment (n=29), was used.
Correlations between the NPI-Q and the RMBPC's Depression- and Disruptive behaviour subscales were relatively high. No relationship was found between the NPI-Q and the RMBPC's Memory related behavioural changes subscale, nor with the IQCODE-N and the CST-20. Informant ratings on the NPI-Q depression-item were related to patient ratings on the GDS-15, especially when patients were relatively mildly, cognitively impaired. Caregiver distress was highly associated with NPI-Q symptom assessment.
Conclusion: the Dutch NPI-Q form seems promising as a valid, informant-based assessment of neuropsychiatric symptoms of dementia and associated caregiver distress in routine clinical practice.

Key words: Neuropsychiatric Inventory (NPI), NPI-Q, dementia, clinical assessment, validity

INTRODUCTION

The Neuropsychiatric Inventory (NPI)[1] is a frequently used clinical instrument in scientific studies of behavioural and psychological symptoms in dementia. Twelve symptom domains are assessed, based on interviews with patients' primary caregivers. A report on the Dutch version was published recently.[2] Meanwhile, the NPI has been adjusted for routine assessments in clinical practice; the so-called NPI-Questionnaire (NPI-Q).[3] This version comprises the same symptoms as the NPI. However, the questionnaire is filled out by patients' primary caregivers, which can save time. The NPI-Q's[3,4] reliability and validity were positively assessed in two foreign studies. Here, we will discuss some validity aspects of the Dutch version.

METHODS

This study regards correlations between the NPI-Q and other clinical instruments used in routine dementia assessments, specifically the Revised behavioural problems Checklist (RMBPC),[5,6] Cognitive Screening Test (CST-20),[7] the short form Informants' Questionnaire for Cognitive decline in the elderly (IQCODE-N)[8] and the 15-item geriatric Depression Scale (GDS)[9-11]. The hypothesis is that, in dementia study groups of elderly patients, the NPI-Q correlates more with the 'non-cognitive' items of the RMBPC and GDS than with the cognitive (sub)scales or tests.

The data were gathered from patients of the geriatric outpatient clinic of the Medisch Centrum Alkmaar, referred for neuropsychological assessment in the period of January – June 2001. Accompanying relatives filled out the NPI-Q and other questionnaires, while patients were neuropsychologically assessed and filled out the GDS elsewhere. Seriously cognitively impaired patients were assisted in filling out the GDS, i.e., when in doubt, assistance was offered by reading questions together and if necessary their essence was clarified. This happened in approximately one third of all cases. Only full protocols were analysed (n=29). Reasons to divert from standard testing protocols were, among others; patients of young age, patients coming in for re-assessment and only completing essential tasks again, patients with visual and hearing impairments or the occasional patient who was 'too ill'/'badly motivated'/'emotionally unsettled'. In these cases assessments were stopped.

In approximately 5 – 10% of all cases, the primary caregivers did not understand (one of the) questionnaires full well or we noticed too late that items had been skipped. Very rarely, primary caregivers found the questionnaires too big a burden. The average

age of the 17 male and 12 female patients was 74.8 years (sd 6.1, range 64-89).

Clinical instruments

The NPI-Q is a questionnaire completed by primary caregivers of dementia patients. It regards an assessment of the behaviour over the past month. The 12 NPI-Q items are similar to the screening questions of the NPI. The latter was translated by the authors (JdJ, MK) and, as a check, (independently) translated back into English.[2]

The symptoms to be assessed are shown in table 1.

Possible NPI-Q answers are; 'yes/no' (screening questions) and 'mild'' = score 1, 'moderate'= 2 and 'severe'= 3 (severity assessment). The minimum score is 0, the maximum 36. Unlike the NPI (maximum score 144), the NPI-Q does not assess symptom incidence. Furthermore, the NPI-Q includes the same emotional stress scale for primary caregivers as the NPI (6-point scale; 'not emotionally stressful – extremely stressful'). Completing the twelve NPI-Q questions takes about ten minutes. Foreign studies have shown that the NPI-Q is likely to produce reliable results and correlate strongly with the NPI.[3,4] Kaufer et al.[3] compared the NPI-Q and the NPI among 60 patients with dementia of the Alzheimer type. Fifteen primary caregivers filled out the NPI-Q a second time, shortly after the first time; the test-retest correlation was 0.80 for the NPI-Q total score and 0.94 for the emotional stress scale. The correlation between the NPI-Q and NPI total scores was 0.91 and it was 0.92 for the emotional stress scales of both versions. Correlations of the separate symptoms varied between 0.71 – 0.93. The differences in percentages of patients showing certain symptoms according to the NPI-Q or NPI ranged from 0% for 'Anxiety' to 10% for 'Appetite/eating behaviour' (average absolute difference was 5%).

The RMBPC is a questionnaire for relatives of dementia outpatients[6], which has been validated for the Dutch situation. It consists of 24 items (five-point scale), allocated to three subscales, based on factor analysis: Depressive behaviour, Disruptive behaviour and Memory related behavioural changes. With each question, the RMBPC also has a 4-point scale to assess primary caregivers' emotional stress.

The CST is a succinct, cognitive screening test for dementia, comprising 20 questions regarding orientation, recent memory and knowledge of historical events (score range 0-20).

Administering the CST yields accurate and valid results.[12]

The short form IQCODE-N is a self rating questionnaire for patients' primary caregivers, with which they compare patients' cognitive functioning to what it was 10 years ago. The list consists of 16 items (5-point scale). The study into the IQCODE showed close correlations between the informants' assessments, other measures

of cognitive decline and the clinical diagnosis of dementia.[13-15] The average item score internationally considered the limit value for dementia is 3.6. Considering the psychometric aspects, the Dutch short version strongly correlates with the long one, which differentiates between dementia and psychiatric patients.[8,16]

The GDS is a self-rating scale for patients, of which several (short) versions have been developed,[11] including a Dutch one.[10] The 15-item version strongly correlates with the original GDS (30 items, 'yes/no'-answers). A limit value > 4 on the 15-item version is a sensitive and rather specific reading for depression. The GDS validity among dementia patients is not undisputed.[17,18.]

The ranking correlations between the different questionnaires and cognitive tests were determined. SPSS software (version 10) was used in the analyses.

RESULTS

The NPI-Q total score averaged 7.6 (sd 7.1, range 0-28), the NPI-Q depression item 1.0 (sd 0.9, range 0-3) and the NPI-Q emotional stress scale 7.7 (sd 7.9, range 0-28). Two patients showed no neuropsychiatric symptoms on the NPI-Q (score 0) and twelve showed no depressiveness (table 1 shows a survey of all symptoms). Only 4 primary caregivers felt no emotional stress at all (score 0).

The average CST score was 15.3 (sd 3.6, range 4.5–20) and thirteen patients (41.4%) scored over 16.5, which turned out to be the optimum limit value for dementia.[19] The average GDS score was 4.1 (sd 3.2, range 0-11) and for the short form IQCODE-N it was 4.2 (sd 0.5, range 3-5). The score for the RMBPC Memory related behavioural changes scale was 11.1 (sd 4.0, range 0-18) and for the Depressed behaviour and Disruptive behaviour subscales it was 6.9 (sd 5.9, range 0-22) and 3.2 (sd 3.7, range 0-14) respectively.

Table 1. Patients with NPI-Q symptoms (n=29)

	N	%
1. Delusions	5	17
2. Hallucinations	2	7
3. Agitation/Agression	8	28
4. Depression/Dysphoria	17	59
5. Anxiety	9	31
6. Euphoria	4	14
7. Apathy	12	41
8. Disinhibition	9	31
9. Irritability	18	62
10. Aberrant motor behavior	7	24
11. Nighttime behavior disturbances	11	38
12. Appetite and eating abnormalities	14	48

Table 2. 'Spearman rank correlations NPI-Q and CST, GDS, IQCODE-N and RMBPC in elderly outpatients referred for neuropsychological assessment (n=29).'

	NPI-Q total	NPI-Q depression	NPI-Q emotional stress
CST	-0,23	-0,16	-0,08
GDS-15	0,38*	0,39*	0,36*
IQCODE-N 16	0,12	0,11	0,02
RMBPC-total	0,57**	0,46**	0,58**
RMBPC-'Cognition' (1)	0,10	0,09	0,10
RMBPC-'Depression' (2)	0,51**	0,63**	0,56**
RMBPC-'Disruptive behaviour' (3)	0,79**	0,36*	0,72**
RMBPC (2+3)	0,68**	0,60**	0,69**
NPI-Q total		0,66**	0,88**
NPI-Q depression			0,68**

**: Correlation is significant at 0.05 level, **: at 0.01 level (unilateral check).*

The biographical variables sex and age were not associated with the NPI-Q total- and depression scores, nor with the score on the emotional stress scale. The emotional stress as experienced by primary caregivers strongly correlates with their assessments of the severity of the neuropsychiatric symptoms. The NPI-Q shows a moderate to strong correlation with the RMBPC Depressed and Disruptive behaviour subscales (table 2). Of the three RMBPC subscales, the NPI-Q depression item correlates the strongest with the Depressed behaviour subscale. No correlation was found between the NPI-Q and the assessments of cognitive disorders, nor with the results of cognitive testing. A moderate, yet statistically relevant correlation was found between primary caregivers' assessments of depressive symptoms and patients' self-reporting (GDS). As GDS validity is considered to be decreasing as dementia severity increases, the correlations for two different groups were calculated: patients with a CST score under 14 ('more severe, cognitive disorders', n=12) and those scoring 14 or higher ('cognitively, relatively intact', n=17). The score matched the classic MMSE limit score 23/24 for cognitive disorders.[19] The ranking correlations between the GDS and the NPI-Q Depression in both groups were 0 (n.s.) and 0.48 (p=0.02) respectively.

DISCUSSION

This study was aimed at some validity aspects of the Dutch version of the NPI-Q, a new, succinct questionnaire for assessing neuropsychiatric symptoms in dementia. Nearly all outpatients assessed in this random sample survey showed neuropsychiatric symptoms. The correlations with other scales found support NPI-Q validity. Where the NPI-Q specifically correlates with the Depressed and Disruptive behaviour subscales of the RMBPC, it does not with the Memory related, behavioural changes subscale, nor with the short form IQCODE or the CST. These findings are an indication that, during routine outpatient assessments, valid impressions of neuropsychiatric symptoms possibly present can be obtained with the NPI-Q. One advantage over other assessment scales is that the NPI-Q might also register symptoms like hallucinations, delusions and euphoria.

The NPI-Q depression-item correlated moderately with patients' assessments on the GDS. The following explanations may play a role. It is conceivable that the two questionnaires measure something different, e.g., different aspects of depression (like 'mood' versus 'hopelessness'). Secondly, the relatively narrow scoring range (only one patient was assessed as severely depressed and 40% as not depressed) may have kept the maximum correlation low. A third explanation is that the GDS is less suitable for

measuring depressive symptoms in dementia patients.[17,18] The data seem to support this explanation: significant correlation between the NPI-Q Depression-item and the GDS was found in the patient group with relatively mild, cognitive disorders, but not in the group with severer, cognitive disorders. The patients first mentioned are probably more capable of understanding questionnaires and/or assessing how they have been feeling over the past few days. This may lead to a closer correlation with primary caregivers' assessments, compared to patients with severer, cognitive disorders. In this study, patients with severer, cognitive disorders were helped with reading and understanding the GDS questions, in an attempt to avoid comprehension problems. However, it is yet unclear whether this procedure actually boosts GDS- reliability and validity among patients cognitively more severely disturbed.

It should be noted that some psychometric aspects of the NPI-Q were assessed in a relatively small sample survey. Important other aspects, like the differentiation potential, reliability or correlation between the NPI-Q and NPI were not evaluated. Foreign studies have shown twice that the NPI-Q and NPI largely produce the same results. Ideally, the Dutch version of the NPI-Q should be compared to the NPI too. We collected data during the diagnostic phase of outpatient treatment. Repeatedly filling out several questionnaires at that moment was considered a burden. Studies for the English and Spanish versions have produced data indicating this method is likely to be reliable.[3,4.]

The NPI-Q is a new version of the NPI. Contrary to the latter, it requires no interview. The preliminary results of this study of the Dutch version indicate it is a practical, clinical instrument in getting a first impression of neuropsychiatric symptoms in dementia and the related emotional stress for primary caregivers. The NPI-Q can be obtained via the first author.

Reference List

1. Cummings JL, Mega M, Gray K, Rosenberg-Thompson S, Carusi DA, Gornbein J. The Neuropsychiatric Inventory: comprehensive assessment of psychopathology in dementia. Neurology 1994; 44(12):2308-2314.
2. Kat MG, de Jonghe JF, Aalten P, Kalisvaart CJ, Droes RM, Verhey FR. Neuropsychiatrische symptomen bij dementie: psychometrische aspecten van de Neuropsychiatric Inventory (NPI) Nederlandse versie. Tijdschr Gerontol Geriatr 2002; 33(4):150-155.
3. Kaufer DI, Cummings JL, Ketchel P, Smith V, MacMillan A, Shelley T et al. Validation of the NPI-Q, a brief clinical form of the neuropsychiatric inventory [In Process Citation]. J Neuropsychiatry Clin Neurosci 2000; 12(2):233-239.
4. Cejudo JC, Boada M, Tarraga L, Lopez OL, Kaufer D. Neuropsychiatric inventory questionnaire (NPI-Q): Spanish validation of an abridged form of the Neuropsychiatric Inventory (NPI) Neurologia 2002; 17(6):317-323.
5. Teri L, Truax P, Logsdon R, Uomoto J, Zarit S, Vitaliano PP. Assessment of behavioral problems in dementia: the revised memory and behavior problems checklist. Psychol Aging 1992; 7(4):622-631.
6. Teunisse S. Clinimetrics in dementia. Universiteit van Amsterdam, 1997.
7. de Graaf A, Deelman BG. Handleiding Cognitieve Screening Test. Lisse: Swets & Zeitlinger, 1991.
8. de Jonghe JF, Schmand B, Ooms ME, Ribbe MW. Abbreviated form of the Informant Questionnaire on cognitive decline in the elderly. Tijdschr Gerontol Geriatr 1997; 28(5):224-229.
9. Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, Adey M et al. Development and validation of a geriatric depression screening scale: a preliminary report. J Psychiatr Res 1982; 17(1):37-49.
10. Kok RM. Self-evaluation scales for depression in the elderly. Tijdschr Gerontol Geriatr 1994; 25(4):150-156.
11. Almeida OP, Almeida SA. Short versions of the geriatric depression scale: a study of their validity for the diagnosis of a major depressive episode according to ICD-10 and DSM-IV. Int J Geriatr Psychiatry 1999; 14(10):858-865.
12. Dautzenberg PL, Schmand B, Vriens MT, Deelman BG, Hooijer C. Validity of the cognitive screening tests and the mini-mental status examination in a group of elderly hospital patients. Ned Tijdschr Geneeskd 1991; 135(19):850-855.
13. Jorm AF, Jacomb PA. The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE): socio-demographic correlates, reliability, validity and some norms. Psychol Med 1989; 19(4):1015-1022.
14. Jorm AF, Scott R, Cullen JS, Mackinnon AJ. Performance of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) as a screening test for dementia. Psychol Med 1991; 21(3):785-790.
15. Jorm AF. A short form of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE): development and cross-validation published erratum appears in Psychol Med 1995 Mar;25(2):437. Psychol Med 1994; 24(1):145-153.
16. de Jonghe JF. Differentiating between demented and psychiatric patients with the Dutch version of the IQCODE. Int J Geriatr Psychiatry 1997; 12(4):462-465.
17. Burke WJ, Houston MJ, Boust SJ, Roccaforte WH. Use of the Geriatric Depression Scale in dementia of the Alzheimer type [see comments]. J Am Geriatr Soc 1989; 37(9):856-860.
18. Burke WJ, Roccaforte WH, Wengel SP. The short form of the Geriatric Depression Scale: a comparison with the 30-item form. J Geriatr Psychiatry Neurol 1991; 4(3):173-178.
19. Schmand B, Deelman BG, Hooijer C, Jonker C, Lindeboom J. Item series of the cognitive screening test compared to those of the mini-mental status examination. Tijdschr Gerontol Geriatr 1996; 27(1):29-33.