FEASIBILITY AND RELIABILITY OF THE MINI NUTRITIONAL ASSESSMENT (MNA) IN OLDER ADULTS WITH INTELLECTUAL DISABILITIES

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Abstract: Objective: Feasibility and reliability of the Mini Nutritional Assessment (MNA) in older adults with intellectual disabilities (ID). Design: Instrument development. Setting: Three care providers with people with ID. Participants: 48 persons aged 50 years and over with borderline to profound ID and their professional caregivers. Measurements: The MNA was performed by means of interviews with participants (N = 12) and caregivers (N = 48) and physical assessments of participants (N = 47). Aspects of feasibility: completion of interview, difficulty of answering interview items, duration of interview and completion of physical assessment. Aspects of reliability: inter-observer reliability between caregivers and between participants and caregivers, test-retest reliability and internal consistency. For inter-observer and test-retest reliability, intra-class correlation coefficients (ICCs) were calculated, and for internal consistency Cronbach’s alpha. Results: All participants and caregivers completed the interview part. For 7 out of 12 personally interviewed participants and none of the caregivers, at least 3 out of 15 questions were difficult to answer. Mean duration of the interview was 7 minutes in participants and 4 minutes in caregivers. Physical assessment was successfully performed in 40 participants (85.1%). In the remaining 7 participants (14.9%) missing values were retrieved from the medical records. ICCs (95% confidence interval) for test-retest and inter-observer reliability between caregivers were good, 0.85 (0.72 – 0.92) and 0.86 (0.74 – 0.92) respectively, but ICC for inter-observer reliability between caregivers and persons with ID was low, 0.03 (-0.51 – 0.59). Internal consistency was 0.61. Conclusion: The MNA is feasible and reliable for older people with ID. Interview data can be reliably obtained through caregivers, but not through people with ID.

Key words: Malnutrition, MNA, intellectual disabilities, older people.

Introduction

Malnutrition negatively influences quality of life (1) and is associated with social isolation, increased morbidity and increased mortality (2-4). It is frequent in the general Dutch older population with prevalences of 21.7% in home-care organisations and 19.2% in nursing homes (3). Malnutrition is also a common disorder in people with intellectual disabilities (ID) of all ages (5). Specific risk factors in this population are impaired mobility, swallowing disorders, gastro-oesophageal reflux disease and polypharmacy (6-8). Although evidence is required based on two observers with a criterion coefficient power of 80% (β=0.20), a sample of at least 46 cases was required based on two observers with a criterion coefficient value of 0.8 and a true value of 0.9.

Apart from clinical diagnostic tests, such as anthropometry, bioelectrical impedance analysis or biochemical markers, several screening instruments are used for detecting malnutrition. The Mini Nutritional Assessment (MNA), developed by Guigoz et al. in 1994 (9) is internationally widely used and validated for use in healthy and frail older adults (10). It is considered to be a “gold standard” for ambulatory living ageing people and those living in long-term care facilities (11). It may be suitable for ageing people with ID as well. However, the psychometric properties of the MNA have not been evaluated for this population. Therefore the feasibility and the reliability of the MNA in older clients of ID care providers were investigated.

Methods

Participants

This study was part of a large-scale cross-sectional study among older adults with ID, called “Healthy ageing in people with ID” (12). In this study 1050 adults with ID, aged 50 to 93 years, were investigated. All participants were allied to a care provider for people with ID. Both people living in the community (low or medium care and support) and people living in central locations (high care and support) were included.

This study was approved by the Medical Ethics Committee of Erasmus Medical Center, Rotterdam, the Netherlands (MECnr. 2008-234). Informed consent for participation was obtained from the participants themselves or their legal representatives.

Sample size for the present feasibility and reliability study was established according to estimates provided by Walter et al. for reliability studies using intraclass correlation coefficients (ICCs) (13). To test reliability at a 95% significance level and a power of 80% (β=0.20), a sample of at least 46 cases was required based on two observers with a criterion coefficient value of 0.8 and a true value of 0.9.

MNA

The full Mini Nutritional Assessment (MNA) involves 6 general (about residential status, psychological problems, mobility, medication and skin ulcers), 4 anthropometric (about weight and height to calculate BMI, arm and calf...
carnifaces, and weight loss). 6 dietary (about number of meals, food and fluid intake, and autonomy of feeding) and 2 subjective (about self-perception of health and nutrition) items. In the general population it can be administered in less than 15 minutes. Three items (Body Mass Index, arm circumference and calf circumference) are assessed by means of a physical assessment. The 15 other items are assessed by means of an interview. If data can not be obtained through a physical assessment or an interview, it is allowed according to the user guide (14) to use the medical record of the participant for most of the items. The total score (0-30 points) categorizes the results as follows: (1) well-nourished (24 points or more); (2) at risk for malnutrition (17-23.5 points); and (3) malnourished (< 17 points). For persons who are labeled ‘at risk’ or ‘malnourished’, referral to a dietitian is recommended for further assessments and nutritional intervention (10).

In the present study, one trained researcher performed the physical assessment in all participants and interviewed both the participants (if possible) and the professional caregivers. Only participants with a borderline, mild or mild-to-moderate level of ID were interviewed. They had to be able to answer questions about their nutritional status and their health status over the last three months before the interview. For these participants, items were simplified according to the user guide of the MNA (14). One question (about neuropsychological stress) was excluded from the participant interview because it was not possible to simplify this question without changing its meaning. The interviewed caregivers were required to have been working with the participant for at least three months.

Weight, height and calf and arm circumferences were measured according to the user guide of the MNA (14). If participants were unable to stand upright, knee height was measured and equations developed by Chumlea et al. were used to calculate body height (15). For immobile participants, recent weight was retrieved from the medical records.

**Feasibility**

The following aspects of feasibility were studied: completion of the interview, difficulty of the items of the interview, duration of the interview and completion of the physical assessment. Feasibility for participants and feasibility for caregivers were separately studied. Criteria for judgment of feasibility for participants were: (1) all interview items answered; (2) at least 13 out of 15 (85%) items understood; (3) maximum duration of interview 15 minutes and (4) physical assessment successfully performed or required information successfully retrieved from medical files. For professional caregivers these criteria were: (1) all interview items answered; (2) at least 13 out of 15 (85%) items easily answered and (3) maximum duration of interview 15 minutes.

To meet the second criterion for participants, after administration of the interview the researcher asked them if they understood all questions, whereas during the interview, the researcher judged whether the questions were understandable by observing non-verbal signs, such as hesitations during replying and facial expressions of uncertainty. If the participant answered ‘no’ and/ or the researcher judged negatively, this criterion was not met. To meet the second criterion for caregivers the researcher asked them if it was easy to answer the questions about someone else.

Participants as well as caregivers had to meet all criteria to consider the MNA feasible for each individual. The MNA was considered to be feasible for participants with ID and their caregivers if at least 90% of them met all criteria.

**Reliability**

Test-retest reliability of the interview part completed by caregivers, inter-observer reliability between two different caregivers, respectively between participants and their caregivers, and internal consistency were studied.

For test-retest reliability, two weeks following the initial administration of the MNA, the same caregiver was interviewed again. If, according to the caregiver, the clinical status of the participant had changed during this period, data were excluded from the analysis for test-retest reliability.

For inter-observer reliability between caregivers, two caregivers of the same participant were interviewed independently at the same day. For inter-observer reliability between participants and their caregivers the scores of the participants were compared to the scores of the caregivers’ first interview.

**Statistical analysis**

Statistical analysis was performed with SPSS 15.0. Descriptive statistics were used to express feasibility. For inter-observer and test-retest reliability intraclass correlation coefficients (ICC) including 95% confidence intervals were calculated. For the internal consistency Cronbach’s Alpha was calculated.

The reliability of the interview was categorized as poor (ICC/ alpha ≤ 0.40), moderate (0.41 ≤ ICC/ alpha ≤ 0.60), substantial (0.61 ≤ ICC/ alpha ≤ 0.79), or excellent (ICC/ alpha ≥ 0.80) (16).

**Results**

**Population**

The first 48 participants, aged 50 to 89 (mean 64.6 years (SD 9.7)) of the “Healthy ageing in people with ID” study were included in the present study. Sex, residential status and level of ID are described in table 1.

47 out of 48 participants underwent the physical assessment, for one participant there was no permission for this. 12 participants with borderline or mild ID were eligible for the interview. Because most caregivers were responsible for two or more included participants, 16 different caregivers for 48 participants were interviewed as well.
Research on validity of the MNA in this population has to be studied right now, because the authors expect that some items are not well comprehensible. This is confirmed in a previous study of Bleda et al. (15). Possible explanations for the poor reliability are (1) comprehensibility of the interview for non-english speaking people, (2) socially accepted answers by participants, and (3) the quality of the participant’s health care as perceived by the caregiver (16).

In conclusion, the interview part of the MNA is feasible and reliable for older people with ID, if the interview is completed by caregivers. In that case, test-retest and inter-observer reliability are both excellent and comparable to the findings of Bleda et al. in institutionalized elderly people (17). In this study according to caregivers and personally interviewed people with ID are poor (0.03). This outcome is in line with the study of Kaiser et al. (18). In that study the MNA results of interviewed nursing home residents were compared with the MNA results when administered by nursing staff. Possible explanations of the poor inter-observer reliability between people with ID and their caregivers result in 1) the comprehensibility of the interview items for participants and 2) the socially accepted answers by participants on items about lifestyle and consumption of food. For example 6 out of 12 participants answered positive on the item about weight loss during the last three months, whereas only one caregiver confirmed this. In addition, the small group of participants may be the most probable reason. Therefore inter-observer reliability between people with ID and their caregivers needs to be further studied on a larger scale.

A group of people with ID living in small group homes or in a central location were assessed. A large group of independently living older people with borderline and mild ID is missing from the study. This group may be well capable to complete the interview with reliable answers (19).

The internal consistency in this study is substantial, but lower than findings in a previous study from Bleda et al. (17). In both studies populations were not very large. This may be a possible reason for a natural variability. 

Although the MNA is feasible for older people with ID, if the interview is completed by caregivers, it was sometimes difficult to answer the questions about mealtimes of the participants because of day-time activities of the participants at other places. For a correct assessment of nutritional intake caregivers should try to obtain additional information from other caregivers or relatives of the participant.

Discussion

This study has shown that the MNA is feasible and reliable for older people with ID, if the interview is completed by caregivers. In that case, test-retest and inter-observer reliability are both excellent and comparable to the findings of Bleda et al. in institutionalized elderly people (17). In this study according to caregivers and personally interviewed people with ID are poor (0.03). This outcome is in line with the study of Kaiser et al. (18). In that study the MNA results of interviewed nursing home residents were compared with the MNA results when administered by nursing staff. Possible explanations of the poor inter-observer reliability between people with ID and their caregivers result may be (1) the comprehensibility of the interview items for participants and (2) the socially accepted answers by participants on items about lifestyle and consumption of food. For example 6 out of 12 participants answered positive on the item about weight loss during the last three months, whereas only one caregiver confirmed this. In addition, the small group of participants may be the most probable reason. Therefore inter-observer reliability between people with ID and their caregivers needs to be further studied on a larger scale.

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### Table 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
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<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>13</td>
<td>27.1</td>
</tr>
<tr>
<td>Women</td>
<td>35</td>
<td>72.9</td>
</tr>
<tr>
<td><strong>Level of ID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borderline (IQ 70-85)</td>
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<td>12.5</td>
</tr>
<tr>
<td>Mild (IQ 55-70)</td>
<td>10</td>
<td>20.8</td>
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<tr>
<td>Moderate (IQ 40-55)</td>
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</tr>
<tr>
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<td>0</td>
</tr>
<tr>
<td>Group home</td>
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</tr>
<tr>
<td>Central location</td>
<td>34</td>
<td>70.8</td>
</tr>
</tbody>
</table>

N = number of participants.

### Table 2

<table>
<thead>
<tr>
<th>Reliability</th>
<th>ICC (95% CI)</th>
</tr>
</thead>
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<tr>
<td>Test-retest (n = 46)</td>
<td>0.85 (0.72 – 0.92)</td>
</tr>
<tr>
<td>Inter-observer caregiver 1 – caregiver 2 (n = 48)</td>
<td>0.86 (0.74 – 0.92)</td>
</tr>
<tr>
<td>Inter-observer caregiver 1 – participant (n = 12)</td>
<td>0.03 (-0.51 – 0.59)</td>
</tr>
</tbody>
</table>

n = number of participants; 95% CI = 95% confidence intervals
FEASIBILITY AND RELIABILITY OF THE MNA IN OLDER ADULTS WITH INTELLECTUAL DISABILITIES

The authors conclude that the MNA is feasible and reliable for older people with ID and recommend that the MNA should be applied by caregivers. The authors advise to implement the MNA as soon as possible into clinical practice for people with ID to identify malnutrition and to give professionals the opportunity to intervene at an early stage.

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References