

Evaluation of the Norwegian version of the Mini Nutritional Assessment (MNA[®]) among older nursing home patients

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ABSTRACT

Background: The Mini Nutritional Assessment (MNA[®]) is a well-known clinical scale that is often used for nutritional screening of older people in different settings recommended by several international clinical and scientific organizations.

Aims: The aims of this article were: 1) to translate the MNA[®] from English to Norwegian and 2) to test the Norwegian version of the instrument for reliability and validity in a small sample of older nursing home patients.

Methods: The English version of the MNA[®] was translated according to recommended procedures. A convenience sample of 26 older nursing home patients was screened with the MNA[®] by 10 registered nurses. Reliability and validity of the instrument were assessed.

Results: Support for reliability and validity was shown in the study group.

Conclusion: Positive support for sufficient quality of the Norwegian version of the MNA[®] was shown, but further testing of the instrument is needed.

KEY WORDS: aged, nutrition, reliability, validity

Background

Older and disabled people are particularly exposed to undernutrition, where the prevalence, which varies between about 15 to 60 percent in hospitals, may depend on the clinical screening instrument used (1–3). Few studies have screened patients in nursing homes, but the results are similar to the prevalence in hospitals (4,5). Because of differences in how it is defined and measured, it is difficult to accurately determine the prevalence of undernutrition. Undernutrition is common in older individuals with poor general condition and serious illness, implying needs for support in meal situations, special food requirements and thorough knowledge among caregivers regarding the clinical signs and symptoms associated with reduced nutritional intake. Undernutrition is associated with serious negative consequences for an older person's overall health (1,3). Older persons with poor nutritional status living in institutions or staying in hospital are at risk of having their institutional stay prolonged, of having extended illness recovery periods, lower quality of life and in requiring extensive assistance in managing their daily lives. Furthermore, undernutrition is associated with a higher prevalence of morbidity and mortality among older people (6).

Nutritional risk assessment is seldom performed on older patients as a routine in hospitals (1) and nursing homes (7). As a diagnosis, undernutrition is seldom explicit, and expected loss in weight that is caused by advanced age could be difficult to separate from undesirable and preventable loss in weight (8). Therefore, there are many reasons for nurses and other health care providers to screen older patients for nutritional status and try to treat and correct undernutrition. Several systematic reviews present a number of different tools for nutritional screening and assessment (2,3). Nutritional screening and assessment are of considerable importance and should be routine in identifying at-risk patients. The Mini Nutritional Assessment (MNA[®]) instrument, which does not require biochemical testing in order to detect undernutrition or risk for undernutrition, is one widely used clinical tool that has been developed and validated for use among older people (3,9). The European Society of Clinical Nutrition and Metabolism (ESPEN) has recommended the use of the MNA[®] for nutritional

screening and assessment of older persons (10). There is a great need for reliable and valid tools in Norway, because many Norwegian health institutions do not have any standards for defining, screening and assessing nutritional status in older patients (11). This article presents the Norwegian version of the MNA[®] and results from testing it for reliability and validity in a small study group of older nursing home patients.

Aims

The aims of this article were: 1) to translate the MNA[®] from English to Norwegian and 2) to test the Norwegian version of the instrument for reliability and validity in a small sample of older nursing home patients.

Methods

The instrument

The MNA[®], which is recommended by many international clinical and scientific organizations, is a clinical scale for nutritional screening and assessment of older people in different settings. The instrument was originally developed at the University of Toulouse in France. It is a summated scale and contains 18 items in its full form. It has been translated into more than 20 languages and has been validated in Europe and the United States. The MNA[®] has been shown to be useful in screening older people and has proven to be a simple, noninvasive, well-validated clinical screening instrument. The total MNA score distinguishes between the following groups of individuals: persons with adequate nutritional status (MNA \geq 24), those at risk for undernutrition (MNA=17–23.5) and those with undernutrition (MNA<17). It takes 10–15 minutes to administer the full form (3,9,10).

Translation

The procedure used to produce a culturally adapted Norwegian version of MNA[®] was recommended by Swaine-Verdier and co-authors in 2004 (12). One licensed translator and one Norwegian nurse with proficient skills in English translated the questionnaire independently

of each other into Norwegian. The two versions were discussed and merged into a consensus version. This Norwegian version underwent a back-translation into English by a licensed translator, which resulted in a few small linguistic changes. A group of five registered nurses (RNs) with different educational background and experiences scrutinized this version individually and in group. Furthermore, all the RNs had previously been informed about the instrument and about studies where it had been used. One of the participating nurses had English as his native tongue. The scrutiny procedure took place twice before consensus was reached. In the final step of the translation and cultural adaptation process, four RNs from different nursing homes were asked to give comments on the last version, which was then adapted accordingly.

Testing the Norwegian version of the MNA®

The study was conducted during one month in the spring of 2008 at two nursing homes in two different counties in southern Norway. Data were collected from a convenience sample of 26 older patients by 10 RNs, who had been taught how to use MNA®. Twenty females and six males with a mean age of 86.2 years (SD=7.3 years) were screened by the RNs. Inclusion criteria were that the RNs were to have at least two years experience of work in nursing homes and be identified by their head nurses as particularly experienced and skilled in caring for older patients.

Reliability was assessed as homogeneity or internal consistency using the Cronbach's alpha coefficient (13). Reliability was also assessed as interrater reliability, where a total of two groups (Group 1 and Group 2) with five RNs in each screened the patients independently of each other with the MNA® in the same day. Pearson's correlation between the two measurements was computed. Differences between the total score for the MNA® were also tested with *t*-test for two related samples.

Validity of the instrument was assessed as construct validity and criterion validity (14). Construct validity was assessed with the known-groups technique. Patients expected to be well-nourished, i.e. having higher scores, were compared with patients expected to be at risk for undernutrition or actually were undernourished, i.e. having lower scores. Differences were tested with *t*-test for independent samples. Individuals with 1) pressure sores or skin ulcers (expected lower scores) were compared with individuals without such sores or ulcers; 2) individuals with a body mass index (BMI) <23 kg/m² were compared with individuals with higher BMI and expected higher scores; and 3) individuals with severe problems to eat without assistance (expected lower scores) were compared with individuals managing their food intake without assistance.

Criterion validity was evaluated as concurrent validity by correlating total MNA® scores with total scores of the Risk assessment pressure sore (RAPS) scale (15), which is an established instrument that measures physical activity, mobility, moisture, food intake, fluid intake, sensory perception, friction and shear, body temperature and serum albumin level. The scale is a summative rating scale with a

maximum score of 39, where a lower score indicates a higher risk for pressure sore development. Because this instrument largely measures nutritional variables, the hypothesis was that a significant high correlation should be obtained between it and the MNA® in the study group. Pearson's correlation was used to determine concurrent validity. All statistical tests performed were two-tailed.

Ethical considerations

All participants were recruited with help of the head nurse at the nursing homes. A cooperation contract exists with the municipalities involved in the project. The project has been approved by the Regional Committee for Medical Research Ethics in southern Norway (REK Sør, reference number S-07212b) and by the Norwegian Social Science Data Services (project number 16822). The rights of the patients were safeguarded through informed consent and confidentiality. Written consent about the project was obtained from both the patients and their proxies.

Results

The Norwegian version of the MNA®

The Norwegian version of the MNA® is available at ©Société des Produits Nestlé S.A., Vevey, Switzerland, Trademark Owners, which holds the copyright of the instrument:

http://www.mna-elderly.com/forms/MNA_norwegian.pdf

Reliability

Internal consistency as measured by the Cronbach's alpha coefficient was 0.77 in Group 1 and 0.83 in Group 2. Interrater reliability was reflected in a correlation of $r=0.88$ ($p<0.001$) between the total MNA® scores for the screenings in Groups 1 and 2. There was no significant difference between mean scores in the two groups, 18.8 in Group 1 and 18.6 in Group 2.

Validity

Construct validity of the MNA® was reflected in significant differences between patients with expected higher MNA® scores and patients with expected lower scores. Values for the two groups are displayed in Table 1.

Criterion validity assessed as concurrent validity between MNA® and RAPS showed a correlation of $r=0.68$ ($p<0.001$) in Group 1 and $r=0.79$ ($p<0.001$) in Group 2.

Discussion

In the Norwegian context there is a strong need for a reliable and valid instrument for nutritional screening of older persons. Because the MNA® has been considered a valid tool for identifying patients at risk for undernutrition internationally (3,4,10,11), the translation of the instrument and its initial testing of reliability and validity are important tasks.

Table 1. Construct validity of MNA® reflected in differences between total scores among patients (N=26) with expected higher or lower nutritional status screened by two groups of registered nurses (n=10)

RNs (n=10)	Patients with expected higher nutritional status	n	MNA score M (SD)	Patients with expected lower nutritional status	n	MNA score M (SD)	P-value
Group 1	No pressure sores or skin ulcers	19	20.1 (4.5)	Pressures sores or skin ulcers	7	14.4 (8.6)	0.036
	BMI \geq 23 kg/m ²	12	21.4 (2.5)	BMI<23 kg/m ²	14	16.6 (6.4)	0.025
	Unassisted food intake	24	19.9 (4.1)	Assisted food intake	2	6.3 (4.6)	0.001
Group 2	No pressure sores or skin ulcers	23	19.9 (3.9)	Pressures sores or skin ulcers	3	10.5 (9.4)	0.003
	BMI \geq 23 kg/m ²	12	21.8 (3.5)	BMI<23 kg/m ²	14	15.9 (6.9)	0.013
	Unassisted food intake	23	20.0 (5.1)	Assisted food intake	3	8.2 (4.5)	0.001

The Norwegian translation showed good reliability for group level comparisons with sufficient values of Cronbach's alpha coefficients. Moreover, the values that measured interrater reliability in this study were satisfactory for further use of this version (14).

Validity was clearly supported as construct validity in the tests between known groups. Criterion validity was also supported when concurrent validity was assessed with the RAPS instrument (15) as criterion. The highly significant correlations between the two instruments showed that they measured similar but not identical constructs. This was expected because not all items in the RAPS are related to nutritional issues. Translated versions of the MNA[®] have been tested in older patients in different contexts, and despite this, similar results have been found (3). In conclusion, clearly positive support for reliability and validity of the Norwegian version of the MNA[®] was shown in this study among older nursing home patients. However, further testing of the instrument is necessary and desirable in other older populations in different settings.

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References

1. Mowé M, Bosaeus I, Rasmussen HH, Kondrup J, Unosson M, Irtun O. Nutritional routines and attitudes among doctors and nurses in Scandinavia: a questionnaire based survey. *Clinical Nutrition* 2006; 25(3): 524–532.
2. Green SM, Watson R. Nutritional screening and assessment tools for older adults: literature review. *Journal of Advanced Nursing* 2006; 54(4): 477–490.
3. Guigoz Y. The Mini Nutritional Assessment (MNA) review of the literature—What does it tell us? *Journal of Nutrition, Health & Aging* 2006; 10(6): 466–487.
4. Wikby K, Ek A-C, Christensson L. Nutritional status in elderly people admitted to community residential homes: comparisons between two cohorts. *Journal of Nutrition, Health & Aging* 2006; 10(3): 232–238.
5. Thomas DR, Ashmen W, Morley JE, Evans WJ. Nutritional management in long-term care: development of a clinical guideline. *Council for Nutritional Strategies in Long-Term Care. The Journals of Gerontology* 2000; 55(12): M725–734.
6. Visvanathan R. Under-nutrition in older people: A serious and growing global problem! *Journal of Postgraduate Medicine* 2003; 49(4): 352–360.
7. Langkamp-Henken B. Usefulness of the MNA in the long-term and acute-care settings within the United States. *Journal of Nutrition, Health & Aging* 2006; 10(6): 502–509.
8. Brownie S. Why are elderly individuals at risk of nutritional deficiency? *International Journal of Nursing Practice* 2006; 12(2): 110–118.
9. Guigoz Y, Vellas B, Garry P. Assessing the nutritional status of the elderly: The Mini Nutritional Assessment as part of the geriatric evaluation. *Nutrition Reviews* 1996; 54(1): S59–S65.
10. Kondrup J, Allison SP, Elia M, Vellas B, Plauth M. ESPEN guidelines for nutrition screening 2002. *Clinical Nutrition* 2003; 22(4): 415–421.
11. Beck AM, Balknäs UN, Camilo ME, Fürst P, Gentile MG, Hasunen K, Jones LIZ, Jonkers-Schuitema C, Keller U, Melchior J-C, Mikkelsen BE, Pavcic M, Schauder P, Sivonen L, Zinck O, Øien H, Ovesen L. Practices in relation to nutritional care and support-report from the Council of Europe. *Clinical Nutrition* 2002; 21(4): 351–354.

12. Swaine-Verdier A, Doward LC, Hagell P, Thorsen H, McKenna SP. Adapting quality of life instruments. *Value Health*, 2004; 7: Supplement.1 p.27–30.
13. Cronbach L J. Coefficient alpha and the internal structure of tests. *Psychometrika* 1951; 16: 297–334.
14. Streiner DL, Norman GR. *Health measurement scales. A practical guide to their development and use.* 3rd ed. Oxford: Oxford University Press, 2003.
15. Lindgren M. *Pressure sores. Risk assessment and prevention.* Doctoral dissertation. Department of Medicine and Care, Division of Nursing Science, Faculty of Health Sciences, Linköpings universitet. Linköping: Linköpings universitet, 2003.