Validation of the Spanish version of the Edinburgh feeding evaluation in dementia scale applied to institutionalized older persons with dementia: a study protocol

Maria Carmen Saucedo Figueredo, Juan Carlos Morilla Herrera, Roberto Ramos Gil, Maria Nieves Arjona Gómez, Felicisima García Dillana, Javier Martínez Blanco & Jose Miguel Morales Asencio

Abstract

Aim
The aim of this study was to obtain a Spanish version of the Edinburgh Feeding Evaluation in Dementia Scale version, to assess its reliability for use by medical staff and caregivers at residential care homes, to evaluate by confirmatory methods its construct validity. A further aim was to determine the criterion validity with respect to biochemical markers of malnutrition such as serum albumin, transferrin, cholesterol and lymphocytes, the body mass index and the mini nutritional assessment.

Design
Clinimetric cross-validation study.

Methods
Institutionalized subjects with dementia will be observed while consuming meals and evaluated with the instrument independently by nurses and caregivers.

Introduction
By 2050, people aged 60 years and over will account for 22% of the world’s population (OMS, 2012). Spain will have the oldest population in the world after Japan (Clavé et al. 2007, Clavé 2012) and one in three Spaniards will be over 65 years old. Among those aged over 65 years, the fastest growing group will be those over 80 (INE, 2013). Dementia is the third most common disease among older people, after cardiovascular and osteoarticular disease, with an incidence of 5-10 cases per 1000 persons/year and this percentage rises with age, especially after the age of 85 (Sosa et al. 2005). Nutrition appears to be a predictor of satisfactory ageing and malnutrition continues to be a major geriatric syndrome and a risk indicator for morbidity and mortality (Ruiperez Cantera 2003). Among older persons, only 45% consume a healthy diet (Albert Cuñat et al. 2000). Even when they are healthy, older persons often have difficulty in feeding themselves, due to the natural consequences of the ageing process. Dysphagia is estimated to affect 7-22% of the ‘healthy’ over 65s, rising to 25-50% among those who also have dementia (Clavé et al. 2007, Palmer & Metheny 2008, Clavé 2012). Feeding difficulty is defined as any condition that may cause reduced food intake Watson, 1993a. It may appear in one or more of the following areas (Chang & Roberts 2011): initiating feeding independently, maintaining attention, taking food to the mouth and maintaining it there, chewing and swallowing. Dementia can cause feeding difficulties due to cognitive impairments as well as the physical disabilities that occur with the progression of the disease (Lin et al. 2010).
Background

According to Durnbaugh et al. (1993), 70% of patients with advanced dementia have feeding difficulty. In general, it is accepted that dementia affects nutrition almost from the outset, producing anorexia, weight loss and eating/swallowing difficulties Gómez-Busto et al. (2009). Proper nutrition is also affected by depression, which appears in 45% of cases (Morley & Kraenzle 1994). Malnutrition affects physical health and increases morbidity and mortality; consequently, the quality of life decreases (WHO, 2006, 2014, Zenon & Villalobos Silva 2012). The outcome may be even worse if the older person with dementia is institutionalized (Sandman 2007, Bermejo et al. among such institutionalized persons, 40% present dysphagia (García de Lorenzo y Mateos & Ruipérez Cantero 2007, Bermejo et al. 2014). It has been reported that among such institutionalized persons, 40% present dysphagia (García de Lorenzo y Mateos et al. 2012) and that more than half lose some ability to feed themselves (Leclerc et al. 2004). It is important to detect and identify the presence of feeding difficulty as soon as possible, however, over half of the feeding difficulties that affect older persons with dementia are due to factors unrelated to dementia itself, such as poor appetite, fatigue, depression, use of neuroleptics, oesophageal reflux or distraction environmental factors (Slaughter et al. 2011).

To identify feeding problems, some instruments have been proposed such as the Edinburgh Feeding Evaluation in Dementia Scale (EdFED) (Watson 1993a), the Feeding Behavior Inventory (Durnbaugh et al. 1993), the Aversive Feeding Behavior Inventory (Reyes Ortega 1996), the Eating Behavior Scale (Tully et al. 1998) and the Feeding Abilities Assessment (Leclerc et al. 2004). Of these, the EdFED is the most commonly used (Watson 1994, Watson & Deary 1994, Lin & Chang 2003, Aselage 2010, Aselage et al. 2011). This 11 items instrument informs not only of the presence of feeding difficulty but also of changes in the level of difficulty, thus guiding clinical intervention (Watson 1993b, 1997, Watson & Deary 1994) and the scale has also sensitivity to detect small changes in advanced dementia patients (Watson & Deary 1994, Watson et al. 2012). The first four items are related to patient assistance needs, six of them correspond to behaviours (initiating feeding independently, maintaining attention, taking food to the mouth and maintaining it there, chewing and swallowing) and the 11th to the intensity of help needed.

It has good internal consistency (Cronbach’s alpha 0.87) (Watson 1996), reasonable interobserver reliability (r = 0.59) and good test-retest reliability (r = 0.95) (Watson et al. 2001). Based on confirmatory factor analysis, two, three and four-factor models have been constructed (Watson & Deary 1997), although these have not been tested in different contexts to determine their invariance. It has been adapted for use in the Chinese language (Lin & Chang 2003, Lin et al. 2008, Liu et al. 2014).

Data can be collected by direct observation of the patients as they eat and/or by questioning the formal caregivers or family members (Amella 2002, Chang & Lin 2005, Stockdell & Amella 2008). The pattern that is deduced is cumulative and hierarchic (Watson & Deary 1994, Watson et al. 2012).

In Spanish, available instruments applied to people with dementia are focused mainly on nutritional status, mostly applied in hospitals and they are not specifically designed for people with dementia. Examples include Subjective Global Assessment (Detsky et al. 1987), Nutritional Risk Screening (Kondrup et al. 2003), the Malnutrition Universal Screening Tool (Todorovic et al. 2003, Stratton et al. 2004, 2006) and the mini nutritional assessment (MNA) instrument (Guigoz et al. 1994).

Feeding difficulties in patients with dementia could lead to impairments on nutritional status and they may be associated with weight loss in long-term care facilities. Due to eating behaviour disturbances, poor dietary intake and suboptimal diet can be found in people with dementia, so that it is necessary to evaluate whether eating difficulties could be related with changes in markers of nutritional status (Shatenstein et al. 2007, Sadamori et al. 2008).

At present, there are no instruments, validated in Spain, for use with institutionalized older persons to detect feeding difficulty, despite the increasing significance of this issue among a residential population that has tripled in recent years (INE, 2013). Moreover, no analysis has been carried out to explore the relation among feeding difficulties with EdFED and biochemical nutritional markers.

First, we aim to perform a cross-cultural adaptation and validation of a Spanish version of the EdFED, among a residential population of older persons with dementia, for use not only by nurses but also by professional caregivers (staff in residential care homes). Second, we aim to determine the criterion validity of the scale with respect to biochemical markers such as serum albumin, transferrin, cholesterol and lymphocytes, the body mass index (BMI) and the MNA.

The study

Design

For the cross-cultural adaptation and validation of the EdFED into Spanish language, we will develop a cross-sectional psychometric validation study. Confirmatory methods will be used to evaluate the construct validity of
the two, three and four-factor structures of the EdFED and to determine the criterion validity regarding parameters such as: biochemical markers of malnutrition (albumin, cholesterol, transferrin and lymphocytes), BMI and MNA.

Methods

The study will be conducted in residential care homes in the Costa del Sol healthcare district (Spain) in 2015. The study subjects will be aged over 65 years, institutionalized for at least 3 months and diagnosed with dementia. Exclusion criteria include terminal illness or other diseases that hinder feeding (stroke, Amyotrophic Lateral Sclerosis (ALS), motor neuron disease, maxillary fractures and paralysis), the use of a gastrostomy tube, nasogastric tube, nasojejunal tube, enteral nutrition, refusal to participate in the study or the absence of consent by the legal guardians or reference relative/carers.

Sample

The sample size was calculated taking into account the capacity to detect older subjects with dementia and malnutrition (or the risk of it). Thus, assuming a prevalence of 21% of older people at risk of malnutrition (Camina Martín et al. 2012) among a total population of 1500 older institutionalized persons in the Costa del Sol Healthcare District, with an accuracy of 5% and an alpha of 0.05, 218 subjects would be required. With the same estimation parameters, assuming a prevalence of 10.8% of older persons with dementia and malnutrition (Dosil et al. 2013), 135 subjects would be required. To test the hypothesis for each of the two, three and four-factor structural models, assuming a root mean square error of approximation (RMSEA) of 0.05, with an alpha value of 0.05 and a maximum of 66 d.f., a sample size of 175 subjects would be required. To meet all these sampling requirements and assuming a potential dropout rate of 15%, 251 subjects should be included. The sample size statistical calculations were carried out using Statistica 12 (StatSoft Inc., 2012) and Epidat 4.1 (Conselleria de Sanidade and Xunta de Galicia, 2014) software. The study will consist of the following phases.

Transcultural adaptation

With the permission of the original authors, the process of cultural adaptation will be addressed following the steps proposed by the International Test Commission for the adaptation of a scale (International Test Commission, 2005). The translation into Spanish will be performed by six independent translators, with Spanish as their native language, three of whom will be aware of the study goals and the others will not, to facilitate conceptual and literary translation simultaneously. The resulting texts will be evaluated by 20 healthcare professionals who routinely work with this type of patients and the best-considered text will be chosen as the final Spanish version (SPV), following the recommendations from Merenda and Spielberger (2005).

It will be back-translated into English by three translators, who have not participated in the first phase and working independently of each other. These translators will be bilingual, with English as their first language and will be unaware of the purpose of the study. Each of those three will give a version; their versions will be compared with each other and with the SPV to identify possible differences. The Spanish resulting version SPV will be evaluated by a group of 10 experts, including bilingual persons and professionals who routinely provide health care to persons with dementia and feeding difficulties (professional caregivers at residential care homes, general practitioners, community nurses and nutritionists). These persons will evaluate the semantic and cultural equivalence of the text and also the comprehensibility of the items and of the instructions for scoring the results. These evaluators will be different individuals to the first and they will award a score of 1 to each such item if the equivalence is semantic and cultural, 2 if it is only semantic and 3 if there is no equivalence. In addition, the committee (a group of experts) integrated by health care professionals with experience in the care of people with dementia will evaluate the conceptual relevance of each item, using Lynn’s content validity index (Lynn 1986), on a four-stage scale: 1: irrelevant, 2: somewhat relevant, 3: relevant, 4: highly relevant. The minimum ratio for content validity to be accepted will be 0.8. Finally, the items will be tested against the Flesch-Szigriszt readability index (Szigriszt Pazos 1993).

Finally, a pilot test will be conducted with the resulting version to test its comprehensibility. In this pilot test, the instrument will be administered to 20 subjects in residential care homes by nurses and professional caregivers at these centres. Both type of professionals will be asked to report any difficulty in managing the instrument, or the understanding of any item.

Data collection

Before using EdFED to evaluate feeding difficulties, the persons who will administer the scale (nurses and caregivers) will be trained in its use. The following data will be obtained from the subjects: Barthel index, Pfeiffer Test, Global Deterioration Scale (GDS-Fast), MNA, weight and height (when this is impossible, it will be
estimated from the triceps skinfold), BMI and blood analysis results (albumin, transferrin, total lymphocytes and cholesterol). Observations will be made of the patient eating, either alone or helped by the caregiver, with an observation period of 10-15 minutes per meal (Watson 1994). A nurse and a professional caregiver (observers) will make independent observations of the two meals (lunch and dinner) for each subject, to apply the EdFED scale.

Analysis

Inter-rater reliability (among nurses, professional caregivers and family caregivers) will be tested by the Pearson correlation coefficient and the intraclass correlation coefficient. To evaluate possible variations in patient’s behaviour between meals, two different meals will be observed by the same evaluator and compared with these correlation coefficients. Internal consistency will be assessed by Cronbach’s alpha. Construct validity will be determined by confirmatory factor analysis, to confirm the validity of the proposed two, three and four-factor proposals (as reported elsewhere). The fit of the models will be evaluated according to the following indices: the penalizing function ($\chi^2/df$), which is indicative of a good fit with values below 3; root mean square error of approximation (RMSEA) and 90% confidence intervals, taking the cutoff value of 0.05 as representing a good fit; the normed fit index (NFI), the comparative fit index (CFI) and the goodness of fit index (GFI), with a 0-1 range and for which the minimum value reflecting good fit is taken as 0.90; and the standardised residual root mean square index, indicating a good fit with values below 0.08 (Hu & Bentler 1999). Criterion validity will be analysed, by reference to the values for albumin, transferrin, cholesterol, lymphocytes, BMI, MNA and weight of food left on the plate, by the Pearson correlation.

Ethics

The study has been authorized by the Primary Healthcare Management District where it will be carried out on 17 February 2015. Permission from the original author of the instrument was obtained by mail on 19 November 2014. The study was also approved the Costa del Sol Hospital Research Ethics Committee on 1 December 2014. Informed consent will be requested of the guardian or responsible family member.

The standards of good clinical practice and the ethical principles for research on human beings, as stated in the Helsinki Declaration and its subsequent revisions, will be observed at all times.

Discussion

As the disease progresses in older people with advanced dementia, feeding behaviours appear that promote nutritional deterioration. It is necessary to identify and remedy the eating problems early. The EdFED is not only capable of identifying these feeding difficulties but also provides guidance for potential interventions in clinical practice (Watson 1993b, 1997, Watson & Deary 1994).

An understanding of the characteristics and performance of the instrument, depending on the type of caregiver who uses it, is of particular importance because in many cases, it will not be administered by registered nurses, but by nursing assistants, who are among the most common caregivers in residential environments. The varying levels of autonomy and professional competence of nursing assistants could affect the reliability of the scale (Liu et al. 2011).

In most cases, the tools used to assess nutritional aspects of patients with dementia are generic and focus on assessing malnutrition or dysphagia, rather than eating difficulty. Thus, the approach taken is partial and possibly delayed (Detsky et al. 1987, Kondrup et al. 2003, Todorovic et al. 2003, Stratton et al. 2004, 2006).

In addition, evaluation of the convergent validity with biochemical markers of malnutrition will enable us to investigate the extent to which the values of the instrument reflect possible changes in levels of albumin, ferritin, cholesterol or lymphocytes, which among older people are more sensitive to nutritional fluctuations (Walrand et al. 2001). This is a question that to date has received very little research attention.

Limitations

In patients with low levels of awareness or hyperactivity, the use of this instrument may be more problematic. Moreover, if different caregivers provide feeding assistance, this might affect the study results, since their interaction with the subjects or the type of assistance provided could affect the subjects’ behaviour during the meal (Chang & Lin 2005, Ullrich & McCutcheon 2008, Lin et al. 2010, Aselage et al. 2011).

Finally, it will not be possible to evaluate the instrument’s sensitivity to change with the proposed study design. This would require a longitudinal approach.

Conclusions

The creation of an assessment instrument that has been rigorously cross-culturally adapted and validated to assess feeding difficulties among institutionalized older persons with dementia will reveal its construct validity for use in
a cultural environment other than that for which it was originally designed. We will also be able to test the reliability of the instrument when it is used by different types of caregivers, as well as its correlation with other biochemical markers of malnutrition. This adapted instrument will facilitate the assessment of feeding difficulty by nurses and nursing assistants at residential care homes and may improve the organizational culture with respect to the feeding of older persons with dementia, guiding the development of interventions for this problem.

Author contributions
All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (http://www.icmje.org/recommendations/)]:
• substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
• drafting the article or revising it critically for important intellectual content.

References
Albert Cuñat V., Castelblanque M.E.M., Pérez M.A.J., Santos Altozano C. & Monge Jodra V. (2000) Hábitos alimentarios en personas mayores de 65 años del Área Sanitaria de Guadalajara, sin deterioro cognitivo y residentes en la comunidad. Revista Española de Geriatría y Gerontología 35, 197–204.
Amella E.J. (2002) Resistance at mealtimes for persons with dementia. Journal of Nutrition, Health, and Aging 6, 117–122.
Aselage M.B. (2010) Measuring mealtime difficulties: eating, feeding and meal behaviours in older adults with dementia. Journal of Clinical Nursing 19, 621–631.
Aselage M.B., Amella E.J. & Watson R. (2011) State of the science: alleviating mealtime difficulties in nursing home residents with dementia. Nursing Outlook 59, 210–214.
Bermejo R.V., García I.A., Galera D.M., Rodríguez M., de las H. & Torramadé J.P. (2014) Prevalencia de desnutrición en personas mayores institucionalizadas en españa: un análisis multicéntrico nacional. Nutrición Hospitalaria 31, 1205–1216.
Camina Martín M.A., Barrera Ortega S., Domínguez Rodríguez L., Couceiro Muñoz C., de Mateo Silleras B. & Redondo del Río M.P. (2012) Presencia de malnutrición y riesgo de malnutrición en ancianos institucionalizados con demencia en función del tipo y estadio evolutivo. Nutrición Hospitalaria 27, 434–440.
Chang C.C. & Lin L.C. (2005) Effects of a feeding skills training programme on nursing assistants and dementia patients. Journal of Clinical Nursing 14, 1185–1192.
Chang C.C. & Roberts B.L. (2011) Strategies for feeding patients with dementia. American Journal of Nursing 111, 36–44; author reply 45–46.
Clavé P. (2012) Disfagia orofaringea en el anciano. Revista Española de Geriatría y Gerontología 47, 139–140.
Clavé P., Arreola V., Velasco M., Quer M., Maria Castellví J., Almirall I., García Peris P. & Carrau R. (2007) Diagnóstico y tratamiento de la disfagia orofaringea funcional. Aspectos de interés para el cirujano digestivo. Cirugía Española 82, 62–76.
Conselleria de Sanidade, Xunta de Galicia (2014) Epidemiado programa para análise epidemiolóxico de datos. Versión 4.1. Xunta de Galicia, Spain.
Detsky A.S., McLaughlin J.R., Baker J.P., Johnston N., Whittaker S., Mendelson R.A. & Jejeebhoy K.N. (1987) What is subjective global assessment of nutritional status? JPEN. Journal of Parenteral and Enteral Nutrition 11, 8–13.
Dosil A., Dosil C., Leal C. & Neto S. (2013) Estado nutricional de ancianos con deterioro cognitivo. International Journal of Educational and Psychology 2, 297–310.
Durnbaugh T., Haley B. & Roberts S. (1993) Feeding behaviors in mid-stage Alzheimer’s disease: a review. American Journal of Alzheimer’s Disease and Other Dementias 8, 22–27.
García de Lorenzo y Mateos A. & Ruípériz Cantera I. (2007) Valoración Nutricional en el anciano. SENPE y SEGG, Bilbao, Spain.
García de Lorenzo y Mateos A., Álvarez I. & De Man F. (2012) Envejecimiento y desnutrición: un reto para la sostenibilidad del SNS; conclusiones del IX Foro de Debate Abbott-SENPE. Nutricion Hospitalaria 27, 1060–1064.
Gómez-Busto F., Andia V., Ruiz de Alegría L. & Francès I. (2009) Abordaje de la disfagia en la demencia avanzada. Revista Española de Geriatría y Gerontología 44, 29–36.
Guigoz Y., Vellas B. & Garry P.J. (1994) Mini Nutritional Assessment: a practical assesment tool for grading the nutricional state of elderly patients. Facts and Research in Gerontology 12, 15–59.
Hu L. & Bentler P.M. (1999) Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal. 6, 1–55.
INE (2013) Proyección de la Población de España a Corto Plazo 2013–2023. Instituto Nacional de Estadística, Spain.
International Test Commission (2005) ITC Guidelines for Translating and Adapting Tests, Versión 1.0. Available at: www.intestcom.org [accessed 12.09.2015].
Kondrup J., Rasmussen H.H., Hamberg O. & Stanga Z., Ad Hoc ESPEN Working Group (2003) Nutritional risk screening (NRS 2002): a new method based on an analysis of controlled clinical trials. Clinical Nutrition (Edinburgh, Scotland) 22, 321–336.
Leclerc C.M., Wells D.L., Sidani S., Dawson P. & Fay J. (2004) A feeding abilities assessment for persons with dementia: Alzheimer’s care today. Alzheimers Care Today 5, 123–133.
Lin L.C. & Chang C.C. (2003) A Chinese translation of the EdFED-Q and assessment of equivalence. Alzheimer Disease and Associated Disorders 17, 230–235.
Lin L.C., Watson R., Lee Y.C., Chou Y.C. & Wu S.C. (2008) Edinburgh Feeding Evaluation in Dementia (EdFED) scale: cross-cultural validation of the Chinese version. *Journal of Advanced Nursing* 62, 116–123.

Lin L.C., Watson R. & Wu S.C. (2010) What is associated with low food intake in older people with dementia? *Journal of Clinical Nursing* 19, 53–59.

Liu L.F., Liu W.P. & Wang J.Y. (2011) Work autonomy of Slaughter S.E., Eliasziw M., Morgan D. & Drummond N. (1994) Causes of weight loss in a OMS (2012) 10 datos sobre el envejecimiento de la población. Retrieved from http://www.who.int/features/factfiles/ageing/es/ on 12 September 2014.

Palmer J.L. & Metheny N.A. (2008) Preventing aspiration in older adults with dysphagia. *American Journal of Nursing* 108, 40–48; quiz 49.

Reyes Ortega G. (1996) Estudio de los trastornos del comportamiento alimentario en la enfermedad de Alzheimer: Escala de Blandford. *Año Gerontológico* 10-N, 353–356.

Ruizner Cantera I. (2003) ¿Se nutren bien las personas mayores? *Med. Clínica* 120, 175–6.

Sadamori S., Hayashi S. & Hamada T. (2008) The relationships between oral status, physical and mental health, nutritional status and diet type in elderly Japanese women with dementia. *Gerodontology* 25, 205–9.

Sandman P.O., Adolfsen R., Nygren C., Hallmans G. & Winblad B. (1987) Nutritional status and dietary intake in institutionalized patients with Alzheimer's disease and multiinart dementia. *Journal of the American Geriatrics Society* 35, 31–38.

Shatenstein B., Kergoat M.J. & Reid I. (2007) Poor nutrient intakes during 1-year follow-up with community-dwelling older adults with early-stage Alzheimer dementia compared to cognitively intact matched controls. *Journal of the American Dietetic Association* 107, 2091–9.

Slaughter S.E., Eliasziw M., Morgan D. & Drummond N. (2011) Incidence and predictors of eating disability among nursing home residents with middle-stage dementia. *Clinical Nutrition (Edinburgh, Scotland)* 30, 172–177.

Sosa A.L., Orozco B., Becerra M., Ugalde O. & García N. (2005) Manual de trastornos mentales. Trastornos Mentales Cognoscitivos: las demencias. Asociación Psiquiátrica Mexicana, Mexico D.F.

Stockdell R. & Amella E.J. (2008) The Edinburgh Feeding Evaluation in Dementia Scale: determining how much help people with dementia need at mealtime. *American Journal of Nursing* 108, 46–54; quiz 55.

Stratton R.J., Hackston A., Longmore D., Dixon R., Price S., Stroud M., King C. & Elia M. (2006) Malnutrition in hospital outpatients and inpatients: prevalence, concurrent validity and ease of use of the ‘malnutrition universal screening tool’ (‘MUST’) for adults. *British Journal of Nutrition* 92, 799–808.

Stratton R.J., King C.L., Stroud M.A., Jackson A.A. & Elia M. (2004) Malnutrition Universal Screening Tool predicts mortality and length of hospital stay in acutely ill elderly. *British Journal of Nutrition* 95, 325–330.

Szigriszt Pazos F. (1993) Sistemas predictivos de legibilidad del mensaje escrito: fórmula de perspicuidad. Universidad Complutense, Madrid.

Todorovic V., Russell C., Stratton R., Ward J. & Elia M. (2003) The ‘MUST’ Explanatory Booklet. BAPEN, Redditch.

Tully M.W., Lambros Matrakas K. & Musallam K. (1998) The eating behavior scale: a simple method of assessing functional ability in patients with Alzheimer’s disease. *Journal of Nutrition, Health, and Aging* 2, 119–121.

Ullrich S. & McCutcheon H. (2008) Nursing practice and oral fluid intake of older people with dementia. *Journal of Clinical Nursing* 17, 2910–2919.

Walrand S., Moreau K., Caldefe F., Tridon A., Chassagne J., Portefaix G., Cynober L., Beaufrère B., Vasson M.P. & Boirie Y. (2001) Specific and nonspecific immune responses to fasting and refeeding differ in healthy young adult and elderly persons. *American Journal of Clinical Nutrition* 74, 670–678.

Watson R. (1993a) Measuring feeding difficulty in patients with dementia: perspectives and problems. *Journal of Advanced Nursing* 18, 25–31.

Watson R. (1993b) Estimating the Relative Level of Feeding Difficulty in Elderly Patients with Dementia. University of Sussex Brighton, United Kingdom.

Watson R. (1994) Measuring feeding difficulty in patients with dementia: replication and validation of the EdFED Scale #1. *Journal of Advanced Nursing* 19, 850–855.

Watson R. (1996) The Mokken scaling procedure (MSP) applied to the measurement of feeding difficulty in elderly people with dementia. *International Journal of Nursing Studies* 33, 385–393.
Watson R. (1997) Undernutrition, weight loss and feeding difficulty in elderly patients with dementia: a nursing perspective. *Reviews in Clinical Gerontology* 7, 317–326.

Watson R. & Deary I.J. (1994) Measuring feeding difficulty in patients with dementia: multivariate analysis of feeding problems, nursing intervention and indicators of feeding difficulty. *Journal of Advanced Nursing* 20, 283–287.

Watson R. & Deary I.J. (1997) Feeding difficulty in elderly patients with dementia: confirmatory factor analysis. *International Journal of Nursing Studies* 34, 405–414.

Watson R., MacDonald J. & McReady T. (2001) The Edinburgh Feeding Evaluation in Dementia Scale #2 (EdFED #2): inter- and intra-rater reliability. *Clinical Effectiveness in Nursing* 5, 184–186.

Watson R., van der Ark L.A., Lin L.-C., Fieo R., Deary I.J. & Meijer R.R. (2012) Item response theory: how Mokken scaling can be used in clinical practice. *Journal of Clinical Nursing* 21, 2736–2746.

WHO (2006) Trastornos Neurológicos. Desafíos para la salud pública. World Health Organization. Geneva, Switzerland.

WHO (2014) Determinantes e inequidades en salud. Retrieved from http://www.paho.org/SaludenlasAmericas/index.php?id=58&option=com_content on 27 May 2015.

Zenon T.G. & Villalobos Silva J.A. (2012) Malnutricion en el anciano. Parte I: Desnutricion, el viejo enemigo. *Medicina Interna de México* 28, 57–64.