

Development and validation of the DomusVi Competence Scale

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Abstract

Background: New tools are needed to enable the combined influence of cognitive and non-cognitive variables to be assessed and to gauge an individual's competence to make decisions. Method: The first version of the DomusVi Scale includes 22 dichotomous items grouped under six dimensions. In the validation process, 25 care homes were involved and 93 individuals were assessed. Results: The results seem to indicate that there is high inter-rater reliability for all items. Two items were discarded, thereby giving a Cronbach alpha of 0.824. The factorial analysis confirms the existence of 4 factors: Discernment, Information, Constraints and Expectations. We propose a preliminary rating for the DomusVi Scale so that an individual's competence is classified as one of four possible levels. Conclusion: The DomusVi Scale may be a suitable measure for assessing an individual's competence to make decisions that affect their lives.

Key-words: Competence. Decision-making. Care ethics. Autonomy.

Desarrollo y validación de la Escala DomusVi de Competencia

Resumen

Justificación: Se necesitan nuevos instrumentos de evaluación que permitan valorar la influencia conjunta de los factores cognitivos y no cognitivos en la competencia de una persona para tomar decisiones. Método: La primera versión de la Escala DomusVi incluye 22 ítems dicotómicos agrupados en seis dimensiones. En el proceso de validación del instrumento participaron 25 centros y se evaluó a 93 personas. Resultados: Los resultados parecen indicar que existe una alta fiabilidad inter-jueces para todos los ítems. Se descartaron dos ítems, obteniéndose un alfa de Cronbach de 0.824. El análisis factorial confirma la existencia de 4 factores: discernimiento, información, coacciones y expectativas. Se propone una baremación preliminar de la Escala DomusVi que clasifica la competencia de una persona en cuatro niveles. Conclusión: La Escala DomusVi parece ser un instrumento adecuado para evaluar la competencia para la toma de decisiones que afectan a su vida.

Palabras clave: Competencia. Toma de decisiones. Ética del cuidar. Autonomía.

Introduction

A variety of ethical issues may arise in health and social care provision, which may affect decision-making and can lead to conflict in care settings. In this context, considering the increasing clinical complexity in nursing homes, a need is identified to develop a tool that allows professionals assessing a resident's level of competence, in order to determine what kind of decisions they are or they are not capable of making.

Frequently, the concepts of competence and capacity are used interchangeably in clinical and technical fields, although they have different connotations and, therefore, it is necessary to define them. *Capacity* refers to the cognitive abilities and functions related to information processing. It reflects a professional clinical or legal judgement as to whether an individual has minimal ability to successfully carry out a

specific task (Moye, Marson and Edelstein, 2013). On the other hand, *competence* is understood as the ability to make decisions freely and responsibly with regard to one's own life. In a health care setting, this presumes that the individual has clear and concise information on the range of options available to them, understands the information conveyed to them, is capable of identifying the (positive or negative) consequences of their decision for themselves and others and that there are no external or internal constraints that prevent them from taking free and responsible decisions.

Competence is not a fixed state but may vary according to circumstances and stages in life or as a result of physical, psychological and social changes. Therefore, it should be assessed every time the individual is required to make a relevant decision, in order to formulate an adequate clinical opinion of the individual's competence.

It seems widely accepted that decisions of different levels of seriousness would entail different levels of competence using different criteria for each of the decisions (Hermann, Trachsel, Mitchell & Biller-Andorno, 2014). On this basis, sliding scales have been proposed, such as Drane's (1999), which recognizes three levels of competence with different requirements in increasing levels of importance according to the decision to be taken. However, this approach to competence assessment is not without controversy and its implementation represents a serious challenge (Brock, 1991; Wicclair, 1991).

Other tools developed for assessing competence focus on the skills or capacity to receive, understand and process the information. They then analyse the capacity of making a decision in a reasoned manner and consistent with the information available and conclude with an analysis of the capacity of expressing the decision in an understandable form (Alvaro, 2012; Cox White, 1994). Doubt has been cast on whether these criteria are appropriate, since they are primarily focused on cognitive aspects of decision-making (Charland, 1998). With regard to the type of instruments used, it needs to be taken into account that the majority of those used in clinical practice to assess competence were originally designed for the assessment of cognitive impairment due to dementia (Hermann et al., 2014).

The scale considered to have greater proven validity for the assessment of the decision-making capacity is the *Mac Arthur Competence Assessment Tool or Mac-CAT* (Grisso & Appelbaum, 1998; Appelbaum, 2007; Bernat, 2008; Dunn, Nowrangi, Palmer, Jeste & Saks, 2006). This scale analyses the understanding of the relevant information, appreciation of the significance of the information concerning their individual situation, reasoning about the different alternatives and, finally, the expression of the decision taken.

Another widely used instrument is the *Silberfeld's Competence Tool*, a semi-structured interview, patient-centred, for the assessment of competence to complete advance directives of people with dementia (Fazel, Hope & Jacoby, 1999).

Furthermore, the *ACE (Aid to Capacity Evaluation) Guide* or *Guide for the Assessment of Capacity* of the University of Toronto (Etchells et al., 1999) includes a number of key aspects when defining competence for decision-making. It details eight groups of questions that must be asked systematically.

A more detailed description of different instruments to assess competence for decision-making is available in *Assessment of older adults with diminished capacity: a handbook for psychologist* (ABA Commission on Law and Aging & APA, 2008). This Handbook along with the ones for attorneys (ABA Commission on Law and Aging & APA, 2005) and judges (ABA Commission on Law and Aging & APA, 2006) represent an important interdisciplinary effort to promote sound conceptual understanding and skilled clinical assessment of civil capacities in older adults (Moye, Marson & Edelstein, 2013).

The ABA-APA Group (2005, 2006, 2008) proposes a nine-step model for assessing capacity: legal, functional, diagnostics, cognitive, psychiatric/emotional, values, risks,

means to enhance capacity and clinical judgment.

It seems clear that exogenous factors, resulting from the environment and endogenous factors, resulting from the individual's physical, mental and spiritual state needed to be taken into account when assessing the competence of an individual. Therefore, a need was identified for a standardised tool with clear indications (Hermann et al., 2014) for care professionals to assess users' level of competence at a particular time and determine what decisions they are and are not competent to make.

New tools must be developed to assess the combined influence of cognitive and non-cognitive variables and to gauge an individual's competence to make a specific decision. In this paper, the preliminary results obtained in the development and validation process of the DomusVi Competence Scale are presented. This Scale is designed to provide care professionals with a new tool to assess competence in decision-making.

Design and Methods

Development of the DomusVi Competence Scale

After an intensive process of literature review, the following dimensions were defined: *Information* or exploration of the individual's knowledge on the subject of the decision, their level of *understanding* of the situation, discernment of the possible *consequences* of the decision to be made, *external and internal constraints* and an exploration of the individual's *expectations*.

22 dichotomous items were selected from a 70-item bank produced initially to finally develop a preliminary version of the DomusVi Scale of Competence, after a consensus process involving external experts, members of the DomusVi Healthcare Ethics Committee and other professionals from the organisation (see table 1). Finally, the score range of the Scale was from 0 to 22 points.

General Considerations for Applying the DomusVi Scale

The DomusVi Scale was elaborated to be simultaneously applied by two qualified professionals (social worker, psychologist, nurse or doctor). Moreover, it must be applied in a private and quiet setting, free from any possible external constraints, such as the presence of relatives who could influence the individual's decision-making process. For the same reason, it should not be used in end-of-life situations or acute crises.

The DomusVi Scale should only be applied when care professionals doubt about an individual's level of competence. The information required to answer each of the items shall be obtained from the argumentation of the person assessed. The scores are inverted for items 6, 13, 14, 15, 16, 17, 18 and 19.

Individuals to be assessed are those who retain a minimum level of autonomy to lead their lives. Thus, people with severe cognitive impairment (MMSE<12) should be excluded. Additionally, due to the methodology used in the DomusVi Scale, individuals not able to analyse and express complex real or hypothetical issues concerning everyday and family topics should also be excluded.

Table 1. DomusVi Scale for Assessing Competence in Decision-Making

| | |
|---|---|
| Information: Investigation of level of knowledge | |
| 1. | Have they received the right information? |
| 2. | Have they been informed by the right person? |
| 3. | Does the person who has informed them inspire confidence in them? |
| 4. | Are they satisfied with the information received? |
| Understanding: Investigation of level of understanding | |
| 5. | Can they explain what they understand in their own words? |
| 6. | Do they have any doubts as to whether they require any additional information? |
| 7. | Can they identify the choices they have made? |
| 8. | Does the individual consider that they have understood all the process? |
| Consequences: Discernment of the consequences of the decision | |
| 9. | Is the individual able to understand the consequences their decision may have for their life? |
| 10. | Is the individual able to understand the consequences their decision may have for others? |
| 11. | Is the individual able to anticipate the consequences of their decision? |
| 12. | Is the individual able to take on board the consequences of their decision? |
| External constraints: Investigation of possible external constraints | |
| 13. | Is the individual constrained by their family's point of view? |
| 14. | Is the individual constrained by financial issues? |
| 15. | Is the individual constrained by the opinion of others? |
| Internal constraints: Investigation of possible internal constraints | |
| 16. | Does the individual show any feelings or emotions that may constrain decision-making? |
| 17. | Are there any past experiences or decisions that could constrain decision-making? |
| 18. | Does the individual show any psychopathological issues that could affect their decision-making? |
| 19. | Does the individual show any physiopathological issues that could affect their decision-making? |
| Expectations: Investigation of the user's expectations | |
| 20. | Does the individual show any expectations regarding their decision? |
| 21. | Does the individual show expectations consistent with the decision they have made? |
| 22. | Is the individual aware that their expectations may fail to be met? |
| Total Score: | |

Pilot Phase

The objective in this phase is to ensure the inter-rater reliability of the DomusVi Scale. It was administered to 25 people, five from each participating centre. 76% were women, with an average age of 82.40 (SD=9.32) and ages ranging from 61 to 97. In terms of the participants' cognitive state measured by the Mini-Mental State Examination (MMSE) (Blesa et al., 2001; Folstein, Folstein & McHugh 1975), the average was 24.08 (SD=4.33). 36% of participants had no cognitive impairment, 20% had suspected impairment, 20% showed mild impairment and 24% moderate impairment. The average score for the participants' functional ability, as measured by the Barthel Index (Mahoney & Barthel, 1965), was 70.20 (SD=24.68): 16% of participants had no functional dependency, 60% showed slight dependency, 8% moderate, 12% severe and 4% were totally dependent.

In analysing the inter-rater reliability of the DomusVi Scale, no statistically significant differences were identified in the responses given by the two professionals for the same case.

The Mann-Whitney U test was used to compare professionals' answers to each item. No differences were found, therefore the scores of both professionals are assumed to be equal.

In the light of the results obtained, it can be concluded that the original structure of the DomusVi Scale has sufficient psychometric guarantees to continue with the preliminary validation process without amendments.

Preliminary Validation

The preliminary validation was carried out in 25 DomusVi care homes across all the Spanish regions in which the com-

pany operates. As in the previous phase, specific training was provided.

Sample of the Preliminary Validation

The sample in this study consisted of 93 subjects, 52 women (55.91%) and 41 men (44.09%), with an average age of 79.63 (SD=10.48) and an age range between 52 and 101.

The participants' mean cognitive status, measured by the MMSE (Blesa et al., 2001; Folstein et al., 1975) was 25.16 points (SD=4.29). More specifically 49.46% of the sample had a normal cognitive state, 27.96% obtained scores indicating mild impairment, 12.90% moderate impairment and 9.68% suspected impairment, for which a more thorough neuropsychological examination would be required. The participants' mean functional status measured by the Barthel Index (Mahoney & Barthel, 1965) was 74.03 points (SD=23.93); 19.35% of participants were totally independent, 54.84% had mild functional dependency, 15.05% moderate and 10.75% severe.

Regarding the global deterioration state measured by the GDS (Reisberg, Ferris, de León & Crook, 1982), 34.41% had no deficit (GDS=1), 30.11% very mild cognitive decline (GDS=2), 27.96% mild cognitive decline (GDS=3) and 7.53% moderate (GDS=4).

Finally, the participants' average score in the Goldberg Anxiety and Depression Scales (de la Gándara, 1997; Golberg, Bridges, Duncan-Jones, & Grayson, 1988) was 2.44 (SD=2.64) for the subscale of anxiety and 2.35 (SD=2.61) in depression. More specifically, 28.57% of the sample showed symptoms of anxiety and 48.35% of depression.

Results of the Preliminary Validation

The preliminary analysis of internal consistency (Cronbach's Alpha) yielded the following results: 0.793 for the Information dimension; 0.565 for Understanding; 0.894 for Consequences; 0.608 for External Constraints; 0.509 for Internal Constraints; 0.641 for Expectations; and 0.679 for the Total Scale. The Cronbach's Alpha for the qualitative questions was 0.737.

Exploratory Factorial Analysis

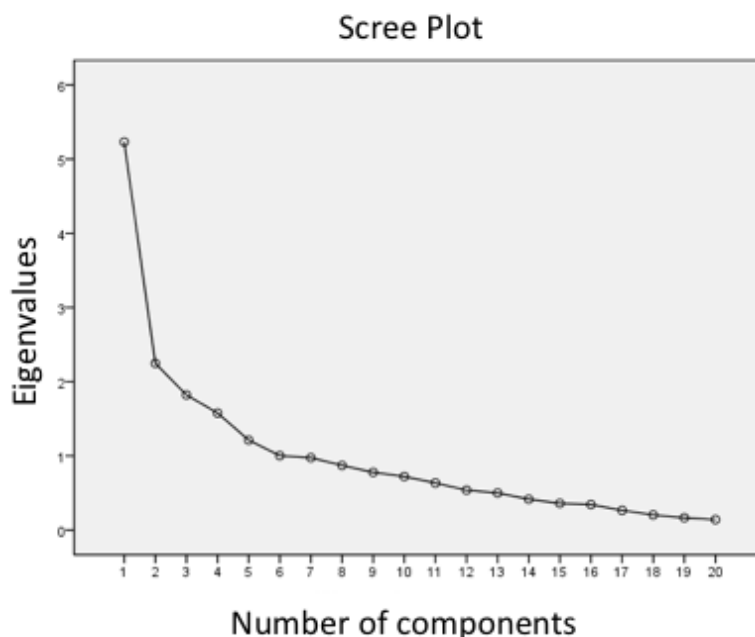
The sample adequacy was analysed using the Kaiser-Meyer-Olkin test (KMO = 0.725) and the Bartlett Sphericity Test ($p < 0.01$).

Using a principal components analysis with Varimax orthogonal rotation, factorial solutions were tested according to the number of factors with eigenvalues over the unit (7), to the number of dimensions initially included in the DomusVi Scale (6) and to the visual examination of the scree plot (4-5) (see Figure 1).

It was concluded that the most consistent and economical factorial solution was made up of four factors which, taken together, explained 54.39% of the total variance (see Table 2). The analysis of the factor loadings led to the deletion of items 16 and 17, with the following distribution:

- Factor 1, "Discernment", accounts for 21.49% of the variance. The items with the biggest factor loadings are 5, 6, 7, 8, 9, 10, 11, 12 and 18. All these items belong to the areas of Understanding, Consequences and one of Internal Constraints.
- Factor 2, "Information", accounts for 12.99% of the variance. It has the greatest factor loadings on items 1, 2, 3 and 4, all of which are included in the Information area of the scale.
- Factor 3, "Constraints" accounts for 10.25% of the variance and has the highest factor loadings on items 13, 14, 15, 19. All of them are part of the areas External Constraints and one of Internal Constraints.
- Factor 4, "Expectations" accounts for 9.66% of the variance and the items with the highest factor loadings are in the "Expectations" area of the scale i.e. 20, 21 and 22.

Figura 1. Scree plot



Analysis of internal consistency

After eliminating items 16 and 17, the final version of the DomusVi Scale consisted of 20 items, with a Cronbach's Alpha of 0.824. The four factors resulting from the factorial analysis showed an internal consistency coefficient of 0.846 for *Discernment*; 0.793 for *Information*, 0.562 for *Constraints* and 0.641 for *Expectations*.

Correlations

No significant correlations were obtained between the DomusVi Scale total score and the rest of the variables (age, gender, global deterioration, cognitive and functional conditions, symptoms of anxiety and depression).

Only the first factor (Discernment) shows a positive and significant correlation with the participants' age ($p < 0.05$).

Preliminary Gauging of the DomusVi Scale

The total score of the DomusVi Scale was calculated without items 16 and 17. The distribution of the scores was analysed to check normality. Both the results of the visual inspection of the histogram, which had a normal curve, as well as the Kolmogorov-Smirnov Test ($p > 0.05$), confirmed the normal distribution of scores. Therefore, a new variable was calculated with the values of the standard scores.

The average of the standard scores corresponds to the direct score 15 (Z score = 0.07). Considering the above data, the proposed preliminary scale included the following groups:

- No competence: scores less than or equal to 10 (-1 standard deviation).
- Limited competence: scores between 11 and 16, inclusive (-1 standard deviation and +0.5 standard deviation).
- Moderate competence: scores between 17 and 18, inclusive (between +0.5 standard deviation and +1 standard deviation).
- Total competence: scores greater than or equal to 19 (greater than +1 standard deviation).

People who have *no competence* or *limited competence* are considered competent to make decisions that affect their lives slightly or have not serious consequences. For example,

choosing whether or not to participate in a recreational activity or choosing between two menus equally suitable for their health.

People who have *moderate competence* would be competent to make decisions that have long-term consequences for their lives and others'. For example, managing their own financial affairs or deciding on moving from a care home to their own place.

Lastly, people who have *total competence* are considered to be competent to make decisions of an irreversible nature and assume responsibility for the consequences, for example, stop a healthcare treatment.

Table 2. Total variance explained by the most coherent factorial solution

| Component | Initial eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|-----------|---------------------|---------------|---------------|-------------------------------------|---------------|---------------|-----------------------------------|---------------|---------------|
| | Total | % of variance | % accumulated | Total | % of variance | % accumulated | Total | % of variance | % accumulated |
| 1 | 5,232 | 26,161 | 26,161 | 5,232 | 26,161 | 26,161 | 4,299 | 21,494 | 21,494 |
| 2 | 2,248 | 11,239 | 37,400 | 2,248 | 11,239 | 37,400 | 2,599 | 12,993 | 34,487 |
| 3 | 1,821 | 9,105 | 46,505 | 1,821 | 9,105 | 46,505 | 2,049 | 10,247 | 44,733 |
| 4 | 1,577 | 7,886 | 54,391 | 1,577 | 7,886 | 54,391 | 1,931 | 9,657 | 54,391 |
| 5 | 1,212 | 6,061 | 60,452 | | | | | | |
| 6 | 1,003 | 5,013 | 65,465 | | | | | | |
| 7 | ,975 | 4,873 | 70,338 | | | | | | |
| 8 | ,871 | 4,354 | 74,692 | | | | | | |
| 9 | ,778 | 3,889 | 78,580 | | | | | | |
| 10 | ,721 | 3,606 | 82,186 | | | | | | |
| 11 | ,634 | 3,170 | 85,356 | | | | | | |
| 12 | ,538 | 2,688 | 88,044 | | | | | | |
| 13 | ,499 | 2,495 | 90,540 | | | | | | |
| 14 | ,415 | 2,075 | 92,615 | | | | | | |
| 15 | ,360 | 1,799 | 94,414 | | | | | | |
| 16 | ,344 | 1,718 | 96,132 | | | | | | |
| 17 | ,265 | 1,324 | 97,456 | | | | | | |
| 18 | ,203 | 1,017 | 98,472 | | | | | | |
| 19 | ,165 | ,824 | 99,297 | | | | | | |
| 20 | ,141 | ,703 | 100,000 | | | | | | |

Extraction method: Principal component analysis

Discussion

As expected, no significant correlations were found between several socio-demographic and clinical variables normally used in nursing home contexts and the DomusVi Scale total score or its factors, except from the relation between “discernment” and individual’s age. As has been underlined by other authors (ABA Commission on Law and Aging & APA, 2008; Mata, Josef, Samanez-Larking & Hertwig, 2011; Álvaro, 2012), this lack of relation makes the case that other variables beyond the cognitive ones are to be used in order to correctly assess the individual’s competence for decision-making.

The assessment of competence has traditionally focused on appraising the cognitive level of an individual. On this basis, the results obtained in neuropsychological assessments, which are almost always designed for the assessment of individuals who have some kind of dementia, are often used as an indicator of their decision-making capacity (Boada & Robles, 2009).

This approach to the assessment of competence, while remaining appropriate, does not take into account, or at least not with the importance it deserves, the influence of non-cognitive variables that may affect the decision-making process in any way.

Various authors have pointed out that competence may vary according to personal circumstances as well as the indi-

vidual’s emotional state or the quality of their social relationships and how that individual is treated (Kitwood, 1997; Sabat, 2005). The DomusVi Scale has been created as an attempt to complement the neuropsychological assessment and consider the role of social and personal variables when taking a particular decision at a particular moment in time.

The results obtained in the pilot show that the DomusVi Scale can be used by different professionals in care settings, provided that prior training is provided. In general, given the characteristics of the DomusVi Scale, the number of items and the response format, the results obtained in the preliminary validation process can be considered acceptable.

In light of these results, the DomusVi Scale could be considered as an appropriate approach to the assessment of a person’s competence for decision-making in a context of daily care. In addition, it enables the level of competence of an individual to be graded according to the type and relevance of the decisions to be made. This has been widely requested by professionals providing care to individuals whose level of competence has not been established (Smeybe, Kirkevold & Engedal, 2012).

This study has its limitations, such as the small size of the sample that, in addition, has been obtained from a single organisation with the same care model and a strong ethical culture. Moreover, the need for professionals to receive specific

training in the use of the DomusVi Scale is a possible source of uncontrolled bias.

In future research, a definitive version of the scale with a larger sample to ensure the validity of the instrument will be developed. Furthermore, analysis should be carried out to check that the four factors are stable and can be replicated in

other studies. The convergent validity of the DomusVi Scale construct will have to be analysed and compared with the results obtained in in-depth neuropsychological assessments. Finally, future studies should deepen the analysis of the sensitivity and specificity of DomusVi Scale in assessing a person's competence in decision-making.

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