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The Camberwell Assessment of Need for the Elderly questionnaire as a tool for the assessment of needs in elderly individuals living in long-term care institutions

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ABSTRACT

Objectives: The aim of the study was to evaluate the Camberwell Assessment of Need for the Elderly questionnaire (CANE) in assessing the needs of elderly individuals living in long-term care institutions (LTCI) in Poland.
Setting and Participants: The needs of 173 residents were assessed. The inclusion criteria were age (at least 75 years of age) and the lack of severe cognitive impairment (Mini Mental Scale Examination score of at least 15 points).
Measurements: In all participants, met and unmet needs were assessed by themselves and by the nursing staff involved in care activities.
Results: The number of met needs assessed by the staff was higher than in the users' opinions ($p < 0.0001$), whereas the number of unmet needs was lower ($p < 0.001$). However, the average percentage of the agreement between the user and the staff was as high as 86.2%. The areas characterized by the lowest agreement were *Company* (65.3%), *Memory* (75.7%), *Eyesight/hearing/communication* (70.5%) and *Psychological distress* (70.5%).
Conclusions: Despite a high percentage of agreement reached between the staff and user assessments of needs in our study, we were able to identify the areas of discrepancies between these two perceptions of needs. These can be treated as signals pointing to those aspects of care that should be addressed.

1. Introduction

Demographic changes occurring all over the word are causing an increase in elderly populations, among which there are individuals requiring assistance (Who, 2011). This, in turn, forces changes in care systems so that optimal use is made of the available resources. In order to secure the appropriate distribution and utilization of services aimed at elderly service users, a comprehensive assessment of needs is required, including physical, psychological and social aspects.

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For such an assessment there are several tools available. The Camberwell Assessment of Need for the Elderly (CANE) is one of them. It was developed using a modified Delphi consensus method (Reynolds et al., 2000). Its good psychometric properties were proven in assessments of individuals from various mental health services in the UK, Sweden and USA (Hancock, Reynolds, Woods, Thornicroft, & Orrell, 2003). Although the CANE questionnaire was originally developed as a tool for assessing the needs of patients with mental disorders (Fahy & Livingston, 2001; Paton, Johnston, Katona, & Livingston, 2004), its usefulness has also been verified regarding health problems of elderly individuals (Iliffe, Lenihan, & Orrell, 2004; Smith, & Orrell, 2007; Walters, Iliffe, & Orrell, 2001). It was found that the questionnaire both provided an individual clinical needs assessment and identified the possible gaps or shortcomings in the provision of services (Reynolds et al., 2000).

CANE gives the possibility to distinguish between the those needs which receive sufficient support from either informal sources or services (met needs) and those for which optimal interventions are missing (unmet needs). The main advantage of CANE is that it gives the opportunity to analyse the needs from different perspectives e.g. of the interviewed elderly subject (user), informal carers (a relative, friend, neighbour) and/or health professional involved in everyday care of the analysed subject (staff). The comparison of these perspectives allows service providers to cater to a wide and detailed description of remediable problems. The study pointed out that older people reported much fewer needs in comparison to carers and staff (Fernandes et al., 2009; Orrell et al., 2008). Moreover, individuals with dementia reported both fewer met and unmet needs (Miranda-Castillo, Woods, & Orrell, 2013). However, they identified needs in areas unnoticed by health professionals (Walters, Iliffe, Tai, & Orrell, 2000).

Based on Hoe, Hanock, Livingston, and Orrell (2006) the quality of life in patients with Alzheimer's disease correlated significantly with the number of both met and unmet needs according to user perception, and with only unmet ones according to staff perception. Thus, as the perception of needs can be different in users themselves and staff members, it is important to include all points of view when making care plans (Hoe et al., 2006).

In Poland the Barthel index (Mahoney & Barthel, 1965) is the only tool routinely used to detect needs of the elderly. The assessment is based on the level of independence in carrying out basic activities of daily living and it only allows for definition of the needs in this area. However, in 2008 CANE was translated into Polish and the Polish version of the questionnaire was proven, in a pilot study, to have good psychometric assessment properties (Rymaszewska, Kłak, & Synak, 2008).

The aim of the present study was to evaluate CANE in assessing the needs of elderly individuals living in long-term care institutions in Poland, taking into consideration their own perspective vs. the perspective of health professionals (nursing staff) involved in routine care activities.

2. Material and method

The project was approved by the National Committee for Scientific Research (No. N N404 520738).

2.1. Participants

Three long-term care institutions were randomly selected for the study—one in each of the following three big Polish cities: Poznan, Wroclaw and Lublin. In each unit 100 inhabitants were analysed. The inclusion criterion was age 75 years and more. Individuals with severe and moderately severe dementia were excluded from the study due to potential problems with the verbal communications (Rousseaux, Sève, Vallet, Pasquier, & Mackowiak-Cordoliani, 2010). Thus, at the beginning, a screening for cognitive impairment was performed with the Mini Mental State Examination (Folstein, Folstein, & McHugh, 1975). Only subjects who scored at least 15 points, after the Mungas adjustment for age and education (Mungas, Marshall, Weldon, Haan, & Reed, 1996), were included in the study.

Accordingly, 173 individuals were selected for the analysis. An informed consent was obtained from each of them prior to the study.

2.2. Procedure

The assessment was performed by trained researchers (qualified health staff). After the screening for cognitive impairment with MMSE, the level of dependence in basic activities of daily living was measured with the Barthel index (Mahoney & Barthel, 1965). Additionally, screening for depression was conducted by means of the Geriatric Depression Scale (Sheikh & Yesavage, 1986).

The Mini Mental State Examination (MMSE) is a brief screening assessment tool, consisting of 30 tasks, used to detect dementia. Possible scores range from 0 (the lowest result) to 30 points (the highest result), and 23 points is the cut-off value for dementia (Folstein et al., 1975).

The Barthel index is a 10-item scale measuring the level of dependence in basic activities of daily living, with lower scores indicating grater dependency (Mahoney & Barthel, 1965). The scores are between 0 and 100, with 5-point increments. The score of more than 80 was referred as no dependency (Chindaprasirt et al., 2013).

The Geriatric Depression Scale (GDS) is a screening tool for the self-assessment of the risk of depression. The short version of GDS, composed of 15 questions, was used. Subjects with at least 6 points in the GDS scale were classified as having symptoms of depression (Sheikh & Yesavage, 1986).

2.3. CANE questionnaire

The CANE questionnaire is a comprehensive tool for the assessment of needs. It was used in a structured interview setting, administered face-to-face by a researcher, with the elderly individuals and staff members (qualified nurses) separately.

The Polish version of the questionnaire was used which was proven, in a pilot study, to have good psychometric assessment properties (Rymaszewska et al., 2008). Researchers were trained using the CANE manual (Orrell & Hancock, 2004).

CANE covers 24 areas of social, medical, psychological and environmental needs and 2 domains for care providers. In this article domains related to caregivers were not analysed as we compare different perspective of needs and care providers' perspectives (nursing staff) is also included.

For each area, there is a question about a particular need. Responses are rated on a three point scale where 0 means no need, 1—met need (problem receiving proper intervention) and 2—unmet need (problem left without optimal intervention). Based on the results for each individual, the number of met and unmet needs were calculated, as well as the number of all needs as a sum of met and unmet needs.

2.4. Statistical analysis

Mean and standard deviations were calculated for all the analysed characteristics. Normality in the data distribution was examined with the Shapiro–Wilk's test. Due to the lack of normality, median was also calculated for each variable.

For each area of the CANE questionnaire the agreement between the user and staff perceptions of needs was calculated. This agreement represents the number of identical assessments made by the two raters, expressed as percentages. The average percentage of agreement was defined as the mean percentage of agreement in all 24 areas covered by CANE. Additionally, the Cohen's kappa coefficient was calculated for the assessment of the staff-user agreement regarding the presence of needs. The kappa value of 0.20 or less indicates poor agreement, between 0.21 and 0.40: fair agreement, 0.41 and 0.60: moderate, 0.61 and 0.80: good and 0.81 and 1.00: very good agreement (Altman, 1991).

Comparison between the two groups was made with the Mann–Whitney test, and between more than two groups—with the Kruskal–Wallis test. In the case of significant differences detected by the Kruskal–Wallis test, a post hoc Dunn test was performed. Relationships between categorical variables were analysed with the χ^2 test. Correlation between two variables was assessed with the Spearman's coefficient. $p < 0.05$ was considered to indicate statistical significance.

3. Results

The mean age of the studied subjects was 82.7 ± 5.8 years (median: 82.5 years; range: 75–102 years). Among the individuals studied, 138 were female (79.8%). The mean time of institutionalization was 70.0 ± 67.3 months (median: 45.0 months; range 1–303 months).

The mean Barthel index among the subjects was 67.8 ± 28.4 points (median: 75.0 points; range: 0–100 points); MMSE—21.4 ± 4.4 points (median: 21.0 points; range: 15–30 points) and GDS—6.8 ± 3.4 points (median: 7 points, range: 0–14 points).

The detailed characteristics of the group studied are presented in Table 1.

3.1. Analysis of needs: users' perception

Almost all subjects reported their needs met in the following areas: *Food* (*n* = 165), *Looking after the home* (*n* = 163) and *Physical health* (*n* = 164). Unmet needs were reported by users most commonly in the areas of *Company* (*n* = 48) and *Psychological distress* (*n* = 43). However, more than 10% of interviewed individuals also reported unmet needs in the following areas: *Daytime activities* (*n* = 23), *Eyesight/hearing/communication* (*n* = 28), *Information* (*n* = 22) and *Intimate relationship* (*n* = 23).

Table 1
Characteristics of studied subjects. Table includes characteristics (*n*; %) of age, education, time of institutionalization, Barthel index, MMSE (Mini Mental State Examination), GDS (Geriatric Depression Scale).

Parameter		*n* (%)
Age	75–79 years	55 (31.8)
	80–84 years	56 (32.4)
	85–89 years	43 (24.9)
	90+	19 (10.9)
Education	Primary	89 (51.4)
	Secondary	64 (37.0)
	Higher (at least bachelor degree)	10 (5.8)
	Lack of data	10 (5.8)
Time in care	Less than 1 year	18 (10.4)
	Between 1 and 5 years	80 (46.3)
	Between 5 and 10 years	39 (22.5)
	More than 10 years	36 (20.8)
Barthel index	0–80 points	110 (63.6)
	Above 80 points	63 (36.4)
MMSE	15–23 points	113 (65.3)
	24–30 points	60 (34.7)
GDS	0–5 points	67 (38.7)
	6–15 points	100 (57.8)
	Lack of data	6 (3.5)

3.2. Analysis of needs: staff perception

Met needs were most frequently reported by the staff in the areas: *Looking after the home* (*n* = 169), *Food* (164) and *Physical health* (165). As far as unmet needs were concerned, the staff most commonly reported them in the same areas as the users themselves (*Psychological distress*—*n* = 28 and *Company*—*n* = 24). In the remaining areas, unmet needs were recognized by the staff in less than 10% of individuals.

3.3. Comparison of the number of needs reported by the user vs. staff

The mean number of all needs from the user perspective was 9.1 ± 3.4 (median: 9; range: 2–16), most of which were met needs (7.8 ± 3.2; median: 8.0; range: 1–16). The mean number of unmet needs was only1.3 ± 1.4 (median: 1.0; range: 0–7).

The mean number of all needs assessed by the staff was 9.9 ± 3.2 (median: 10; range: 2–16). It was higher than in the users' opinions ($p < 0.0001$) due to the higher number of met needs identified by staff (9.3 ± 3.0, median 10.0; range: 2–16; $p < 0.0001$). The number of unmet needs was even lower than when rated by users (0.6 ± 0.9; median: 0.0; range: 0–4; $p < 0.001$). There were 104 individuals with no unmet needs based on staff perception and only 63 according to the users themselves ($p < 0.001$). The number of subjects with unmet needs in both perspectives is presented in Fig. 1. We found one subject who had 7 unmet needs according to himself (areas: *Self-care*, *Daytime activities*,*Eyesight*/*hearing*/*communication*,*Physical health*, *Information*,*Deliberate self-harm*,*Company*), for whom the staff recorded only one unmet need in the area of *Eyesight/hearing/communication*.

When the difference between the number of unmet needs, rated by the users and staff, was calculated, the result was negative in only 17 individuals (9.8%). In these individuals, the number of needs from the staff perspective was higher ([−1.1] ± 0.3; median: [−1]; range: [−1] to [−2]). In 78 subjects (45.1%), the number of unmet needs, taken from both perspectives, was the same. The other 78 individuals (45.1%) recognized more unmet needs than the staff (1.7 ± 0.9; median: 1; range: 1–6).

The difference between the number of unmet needs rated by the users and staff correlates negatively with the Barthel index ($r = -0.1751$; $p < 0.05$). The gap between the two perspectives

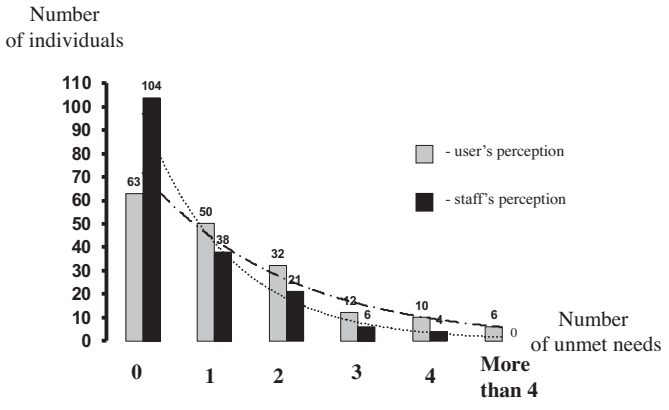

Fig. 1. Number of subjects with unmet needs as rated by staff and user.

increased with the lower Barthel index (i.e. with higher dependence). No other parameters influenced the difference significantly (age, gender, time of institutionalization, MMSE sore, GDS score).

3.4. Comparison of individual areas of needs from the user's and the rater's perspective

The number of subjects with needs in individual areas and the kappa values for the inter-group agreement are presented in Table 2. Based on the kappa value, the only area with poor agreement was *Deliberate self-harm*. However, in this area only 25 individuals rated their needs differently from the staff. On the other hand, in 3 areas (*Accommodation*,*Mobility/falls*,*Benefits*), the agreement was very good (kappa value above 0.80). The mean kappa value was 0.52, which represents moderate agreement.

The average percentage of agreement between the user and the staff was 86,2%. The rating in individual areas is shown in Table 3. The lowest percentage of agreement was found for the area of *Company* (65.3%)—60 individuals assessed their needs differently to the staff in this area (25 reported unmet needs by themselves, while the staff—lack of any needs). There were 3 more areas with an agreement below 80%—*Memory* (75.7%), *Eyesight/hearing/communication* (70.5%) and *Psychological distress* (70.5%). In the first two, in 34 out of 42 and 26 out of 51, respectively—the user did not recognize the needs, whereas the staff reported met needs. In the area of *Psychological distress*, in 17 out of 51 cases the user did not recognize the needs but the staff recognized it as a met need; in 13 cases unmet needs were reported by the users, while in the same cases the staff rated the needs as met.

4. Discussion

Fahy and Livingston (2001), who performed a study in long-term care facilities, found that a large number of the residents' needs justified their stay in such institutions. The usefulness of CANE for the assessment of needs in residents of long-term care institutions was proven by Martin et al. (2002). It was decided to use it as it identifies both met and unmet needs from different perspectives. In our study, the perspectives of the elderly individuals and the staff who cared for them were analysed. Only those subjects who were at least 75 years old, were included, as the dependency rate and the need for assistance is increased in this age group. What is more, the number of people aged 75 or more is predicted to rise in the near future. Thus, the effectiveness of care services targeted at this age group is particularly worthy of attention.

In our study both elderly individuals and the staff responsible for their care mainly reported met needs. However, it is believed that unmet needs provide for the most relevant information about the desired improvement in the daily care for elderly individuals (Orrell et al., 2008). For this reason, in a detailed analysis, we focused mainly on the differences in various respondents' opinions about the presence of unmet needs. The most common unmet needs were spotted in the area of *Company* and *Psychological distress* by both the users and staff. Additionally, users frequently reported unmet needs in the area of *Daytime activities*, *Eyesight/hearing/communication*, *Information* and *Intimate relationships*. Similar areas of unmet needs were reported by Orrell et al. (2008) in patients of care homes. According to the authors, both the users themselves and the staff perceived a lack of stimulating activities in the daily routine and an absence of opportunities for the elderly to make social contacts.

In our study the average number of all needs assessed by the staff was higher than in the users' opinion. This is in agreement with the study of Fernandes et al. (2009), performed in different settings, who observed that the number of needs reported by the elderly themselves was by 20% lower when compared to those of the staff. Other researchers (Hancock et al., 2003; Miranda-Castillo et al., 2013; van der Roest et al., 2009), who analysed separately the number of met and unmet needs in subjects with dementia, found that both met and unmet needs were lower in service user perception than in the staff's one. For individuals with no dementia, numbers of both met and unmet needs were comparable (Hancock et al., 2003). In our study the number of unmet needs was higher when rated by the users. Similar results were obtained by Houtjes, van Meijel, Deeg, & Beekman (2011) in subjects with late-life depression. Importantly, we analysed all subjects regardless of their medical condition. Nevertheless, more than 50% of

Table 2
Comparison of subjects with the presence of needs (met and unmet together) rated by the staff and the user; the kappa coefficient represents the agreement between their ratings.

Area	Agreement kappa value	Number of patients staff (*N*)	with needs user (*N*)
Accommodation	.96	143	143
Looking after the home	.29	169	164
Food	.65	165	165
Self-care	.72	125	103
Caring for someone else	.49	5	2
Daytime activities	.69	75	82
Memory	.52	84	47
Eyesight/hearing/communication	.58	109	91
Mobility/falls	.83	111	106
Continence	.72	107	89
Physical health	.60	164	166
Drugs	.45	16	16
Psychotic symptoms	.32	36	14
Psychological distress	.52	91	83
Information	.59	52	59
Deliberate self-harm	.08	14	13
Inadvertent self-harm	.26	8	6
Abuse/neglect	.24	2	6
Behavior	.27	20	6
Alcohol	.56	10	4
Company	.38	51	70
Intimate relationships	.31	21	24
Money/budgeting	.64	87	65
Benefits	.83	50	45

Table 3
User and staff perception of needs rated with CANE in elderly individuals living in long-term care institutions in Poland ($n = 173$).

Area	% Agreement	Met needs		Unmet needs	
		Staff (*N*)	User (*N*)	Staff (*N*)	User (*N*)
Memory	75.7	84	43	0	4
Eyesight/hearing/communication	70.5	104	63	6	28
Mobility/falls	86.1	105	105	6	8
Continence	87.3	107	89	0	0
Physical health	96.0	165	164	2	2
Drugs	91.3	16	16	0	0
Psychotic symptoms	82.1	36	11	0	2
Psychological distress	70.5	63	40	28	43
Information	81.5	48	37	4	22
Deliberate self-harm	85.5	13	6	1	7
Inadvertent self-harm	94.2	8	6	0	0
Abuse/neglect	96.5	2	6	0	0
Behaviour	89.0	19	6	1	0
Alcohol	96.0	7	4	3	0
Company	65.3	27	22	24	48
Intimate relationships	80.9	8	1	13	23
Money/budgeting	80.9	86	64	1	1
Benefits	83.8	49	39	2	6

them had symptoms of depression based on GDS. On the other hand, depression was not found to influence the differences observed between unmet needs rated by services users and staff.

In our study, the overall percentage of agreement in the assessments of needs by the user and staff was very good (above 80%). This fact reflects a strong relationship between the answers obtained from different informants. *Company*,*Memory*,*Eyesight/hearing/communication* and *Psychological distress* were the only areas characterized by a poorer agreement. A poor agreement in these areas was also observed by Orrell et al. (2008) in a study on subjects with dementia.

Interestingly, in our study the mean kappa value was 0.52, showing moderate agreement. Based on the kappa values, the only area marked by a poor agreement was *Deliberate self-harm*, with kappa coefficient of 0.08. Orrell et al. (2008), who also compared both the percentage of agreement and kappa values for individual areas of CANE, stated that kappa coefficients should be interpreted with caution. They point out that low coefficients may not always indicate a disagreement, but they also occur when CANE item frequencies are relatively low, or in the case of skewed distribution of ratings.

Additionally, we wanted to define the determinants of the differences between the number of needs assessed by the user and staff. To the best of our knowledge, such an analysis has never been carried out before. We discovered that the only significant determinant of this difference was the dependence in ADL, evaluated with the Barthel index. The difference was higher in the case of more dependent subjects. In a study on subjects with dementia, Hoe et al. (2006) showed that the number of unmet needs measured by CANE and rated both by the users and staff correlated negatively with the quality of life. Thus, our study points out the necessity of devoting special attention to, and monitoring the demand for assistance in more dependent subjects. Such activities would facilitate improving the quality of care.

Given that results obtained with the Dutch (Roest, Meiland, van Hout, Jonker, & Dröes, 2008) and German (Stein, Luppa, König, & Riedel-Heller, 2014) versions of CANE questionnaire among community-dwelling people with dementia were recently published, it would be of interest to undertake a similar study in Poland in the future.

As for the limitations, our studied group was heterogeneous. We included all available subjects with MMSE results not lower than 15 points (after the adjustment for age and education). We thus analysed individuals who were cognitively well functioning and those with moderate dementia together. This may potentially influence the results because needs may be interpreted by those subjects differently.

5. Conclusions

Despite a high percentage of agreement reached between the staff and user assessments of needs with CANE questionnaire in our study, we were able to identify the areas of discrepancies between these two perceptions of needs. They can be treated as signals pointing to these aspects of care that should be addressed.

Conflict of interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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