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ORIGINAL RESEARCH

Needs of older adults living in long-term care institutions: an observational study using Camberwell Assessment of Need for the Elderly

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Introduction: No comprehensive needs assessment is performed routinely in Poland.

Purpose: The goal of the study was to investigate the patterns of needs in older individuals living in long-term care institutions (LTCIs) using the Camberwell Assessment of Need for the Elderly (CANE) questionnaire, based on a previously published study protocol.

Participants and methods: The study included 306 LTCI residents (age: ≥75 years) with the a Mini-Mental State Examination (MMSE) score of at least 10 points. The dependence in basic activities of daily living was measured using the Barthel index (BI). A screening for depression was performed using the Geriatric Depression Scale (GDS) in subjects with an MMSE score of ≥15 points. Thereafter, CANE was used to analyze needs receiving adequate support (met needs) and those without appropriate interventions (unmet needs).

Results: The mean age of studied individuals was 83.2±6.0 years. They had 10.4±3.2 met needs and 0.8±1.2 unmet needs. Unmet needs were reported most commonly in the following areas: company (15.9%), psychological distress (14.0%), intimate relationship (11.4%), eyesight/hearing/communication (11.4%), and daytime activities (11.0%). The OR of having a large number of met needs (ie, above the median) was almost eight times higher in residents with a BI score of 0–49 points versus those with ≥80 points. The group between (with 50–79 points) had this parameter almost four times higher. The OR of having a large number of unmet needs depended neither on BI nor on GDS and was more than four times higher in the group of 10–19 MMSE points (ie, with symptoms of moderate dementia) versus subjects with 24–30 MMSE points (ie, without symptoms of dementia).

Conclusion: We defined the target group with high probability of unmet needs and the areas in which resources and efforts should be concentrated. We believe that the results can be used to optimize care in LTCIs.

Keywords: met needs, unmet needs, determinants, aged 75 and older, long-term care, optimization, CANE

Introduction

Continuous aging of societies results in the increase in proportion of older and less robust individuals, many of whom need assistance in everyday activities. It is thus necessary to rethink the means and methods of care, in order to deliver appropriate care that accurately addresses the needs of the recipients and subsequently improves their quality of life. Optimized care means "personalized" care tailored to the individual.[1–3] In the care institutions, well-targeted care delivery offers two important benefits: better serving the client (satisfying their needs, improving their quality of life) and engaging less resources, thanks to concentration on areas in which improvement is desired and

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possible. To achieve these goals, it is vital to have a standardized instrument at disposal to investigate the various areas of residents' needs and assess the degree of their fulfillment.

The Camberwell Assessment of Need for the Elderly (CANE) questionnaire can be used for such assessment.[4] It interprets a need as a remediable deficit that can be viewed as an advantage of this tool over other instruments assessing only the level of disability or dependency. Another essential advantage of CANE is its ability to separate needs that receive adequate support (met needs) from those for which appropriate interventions are missing (unmet needs).

CANE includes both health and socioeconomic needs, thus providing a foundation for the holistic approach to the residents. The comprehensiveness of this instrument is its important feature, as it is often difficult to disentangle the socioeconomic dimension from the clinical dimension of older adults' conditions.[5] CANE was primarily dedicated to older subjects with mental disorders[6] and is still successfully used in this group.[7–9] Its usefulness has been demonstrated not only for mental health services users in various settings[10–12] but also for older adults living both in the community[13,14] and in long-term care (LTC) facilities.[15,16]

The goal of the study was to investigate whether there exist distinct subpopulations of LTC units' residents for whom specific patterns of needs (and their determinants) can be expected, based on the scores of simple screening tools. All variables selected for the analysis are easily accessible from the residents' sociodemographic data and assessments performed in everyday practice.

Participants and methods

The project was approved by the Bioethical Committee of Poznan University of Medical Sciences, Poznan, Poland (No 906/16). The study protocol has been described in detail elsewhere.[16] The current analysis is based on its database, owned by Poznan University of Medical Sciences. The major methodological points are given below.

Participants

A total of 400 older individuals aged ≥75 years, living in LTC institutions in Poland, were included in the study. The randomization of the study sample was conducted as follows: in each of four Polish cities (Poznan, Wroclaw, Bialystok, and Lublin), one institution was randomly selected. Next, the number of its residents aged ≥75 years was verified: if ≥100, then 100 of them were randomly selected for the analysis. If it was <100, another institution was chosen and the procedure was recommenced.

For the current analysis, only subjects who scored at least 10 points in the Mini-Mental State Examination (MMSE) after correction for age and education[17] were included. Individuals with lower results were excluded from the study due to severe problems with verbal communication.[18] Consequently, 306 persons were selected. All subjects gave their consent after receiving a full explanation of the nature of the study.

Geriatric assessment

The assessment was performed by trained researchers (qualified health staff). First of all, a screening for cognitive impairment with MMSE was performed.[19] MMSE is a concise assessment tool, consisting of 30 tasks, used for detecting subjects with an increased risk of dementia. The scores range from 0 (the lowest result) to 30 points (the highest result): 27–30 points are classified as normal, 24–26 points indicate mild cognitive impairment without dementia, 20–23 points indicate symptoms of mild dementia, 10–19 points indicate symptoms of moderate dementia, and 0–9 points indicate symptoms of severe dementia.[18] Importantly, MMSE does not provide a diagnosis of dementia; we thus use the term symptoms of dementia for subjects with lower scores.

Subsequently, dependence in basic activities of daily living was measured with the Barthel index (BI). BI is a 10-item scale with lower scores indicating greater dependency.[20] Possible scores are between 0 and 100, with 5-point increments; ≥80 points are categorized as no dependence.[21]

Finally, a screening for depression was conducted by means of the Geriatric Depression Scale (GDS).[22] GDS is a self-assessment screening tool for the risk of depression; the short version of GDS, composed of 15 questions, was used. Individuals with at least 6 points in the GDS (out of the maximum of 15) were considered as having symptoms of depression. Subjects with an MMSE score <15 points were not screened, due to limited validity of GDS results in this range. This cutoff value was agreed in an expert discussion round before the study, as there exists no single recommendation in this regard.

CANE questionnaire

The CANE questionnaire is a comprehensive tool intended for the assessment of needs, with proven psychometric properties.[6] It was used in structured interviews with the older individuals, performed face-to-face by a researcher. The Polish version of the questionnaire (used throughout the study) had been proven, in a pilot study, to have good psychometric properties.[23] The researchers were trained using the CANE manual.[4]

CANE covers a total of 24 areas of social, medical, psychological, and environmental needs and two additional domains for caring individuals. For each area, a simple question is posed about a particular need. Responses are rated on a scale where 0 means no need, 1 means met need (problem receiving proper intervention), 2 means unmet need (problem left without optimal intervention), and 9 means not known (eg, when the participant was not able to provide a reliable answer). Based on the results for each individual, the numbers of met and unmet needs were calculated, as well as the number of all needs as a sum of met and unmet needs. In this article, the domains related to caregivers were not evaluated.

Statistical analysis

Normality in the data distribution was examined using the Shapiro-Wilk test. For all characteristics analyzed, mean, SD, and median values were calculated (due to the lack of normality).

The comparison between two groups was made using the Mann–Whitney *U* test and that between more than two groups using the Kruskal–Wallis test. In the case of significant differences detected by the Kruskal–Wallis test, a posthoc Dunn test was performed. Relationships between categorical variables were analyzed with the Chi-squared test. Correlation between two variables was assessed using the Spearman's coefficient.

To assess simultaneous independence between variables, multiple logistic regression was used, specifying the OR and the CI with the confidence limit of 95%. This analysis was performed by relating the subjects with number of needs above the median to those at or below the median. In the case of unmet needs, the median equaled 0, which means that subjects with needs were compared with those without needs.

$P<0.05$ was considered to indicate statistical significance.

Results

The mean age of studied individuals was 83.2±6.0 years (median: 83.0 years; range: 75–108 years). Among them 230 were females (75.2%). The mean time of institutionalization was 63.1±61.0 months (median: 45.0 months; range 1–303 months).

The mean BI of studied individuals was 62.5±31.5 points (median: 70.0 points; range: 0–100 points), MMSE was 22.9±5.7 points (median: 24.0 points; range: 10–30 points), and GDS was 6.5±3.5 points (median: 7 points, range: 0–15 points).

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

Table 1 Characteristics of studied subjects (N=306)

Parameter	Characteristic	n (%)
Age (years)	75–79	92 (30.1)
	80–84	101 (33.0)
	85+	113 (36.9)
Gender	Female	230 (75.2)
	Male	76 (24.8)
Education	Primary	149 (48.7)
	More than primary	144 (47.1)
	Missing data	13 (4.2)
Time of institutionalization	<1 year	59 (19.3)
	1–5 years	116 (37.9)
	>5 years	128 (41.8)
	Missing data	3 (1.0)
BI	0–49 points	91 (29.7)
	50–79 points	91 (29.7)
	80–100 points	124 (40.5)
MMSE	10–19 points	104 (34.0)
	20–23 points	44 (14.4)
	24–30 points	158 (51.6)
GDS	0–5 points	93 (30.4)
	6–15 points	174 (56.9)
	Not screened (MMSE<15 points)	39 (12.7)

Abbreviations: BI, Barthel index; MMSE, Mini-Mental State Examination; GDS, Geriatric Depression Scale.

Analysis of needs

The mean number of all needs in the studied group was 11.2±3.2 (median: 12; range: 2–21). Among them, 10.4±3.2 (median: 10; range 1–18) were met and 0.8±1.2 (median: 0; range: 0–6) were unmet.

In three areas, met needs were noted in almost all subjects: looking after the home (97.1%), food (96.8%), and physical health (93.5%). Moreover, in the area of accommodation, met needs were also recognized in more than four subjects out of five (88.0%) subjects.

Unmet needs (Table 2) were reported most commonly in the following areas: company (15.9%), psychological distress (14.0%), intimate relationship (11.4%), eyesight/hearing/communication (11.4%), and daytime activities (11.0%).

Based on bivariate analysis (Table 3), the number of met, unmet, and all needs did not differ across the groups of age, gender, education, and time of institutionalization. The number of met needs was higher in the groups with lower BI (ie, 0–49 and 50–79 points) in comparison with those having BI of ≥80 points ($P<0.001$). In addition, it was higher in those with symptoms of moderate and mild

Table 2 Number of subjects with reported needs (met and unmet; N=306)

Area	Met needs, n (%)	Unmet needs, n (%)
Accommodation	271 (88.0)	0
Looking after the home	299 (97.1)	0
Food	298 (96.8)	1 (0.3)
Self-care	242 (78.6)	1 (0.3)
Caring for someone else	4 (1.3)	2 (0.6)
Daytime activities	158 (51.3)	34 (11.0)
Memory	164 (53.2)	2 (0.6)
Eyesight/hearing/communication	183 (59.4)	35 (11.4)
Mobility/falls	195 (63.3)	9 (2.9)
Continence	204 (66.2)	1 (0.3)
Physical health	288 (93.5)	4 (1.3)
Drugs	92 (29.9)	2 (0.6)
Psychotic symptoms	73 (23.7)	1 (0.3)
Psychological distress	117 (38.0)	43 (14.0)
Information	108 (35.1)	17 (5.5)
Deliberate self-harm	27 (8.8)	2 (0.6)
Inadvertent self-harm	24 (7.8)	1 (0.3)
Abuse/neglect	8 (2.6)	0
Behavior	40 (13.0)	1 (0.3)
Alcohol	11 (3.6)	3 (1.0)
Company	95 (30.8)	49 (15.9)
Intimate relationships	7 (2.3)	35 (11.4)
Money/budgeting	196 (63.6)	3 (1.0)
Benefits	86 (27.9)	5 (1.6)

dementia (MMSE of 10–19 points and 20–23 points) versus those with an MMSE score of 24–30 points ($P<0.001$). The number of all needs was higher in subjects with symptoms of depression (GDS score of ≥6), $P<0.001$.

The number of unmet needs was higher in subjects with BI of 0–49 points versus those with BI of ≥80 points, $P<0.01$.

The number of all needs followed the same pattern as for met needs except that it changed gradually with BI: it was additionally higher in subjects with BI of 0–49 points versus those with BI of 50–79 points ($P<0.05$).

Multiple logistic regression analysis

All parameters that had shown relevance in the bivariate analysis were selected for the multivariable analysis (Table 4).

The OR of having a large number of met needs (defined as above the median) was almost eight times higher in residents with a BI score of 0–49 points versus those with ≥80 points. The group placed between (with 50–79 points) had this parameter almost four times higher.

The odds of having a large number of unmet needs did not depend on BI and GDS, and the OR was more than four times higher in the group of 10–19 points (ie, with symptoms of moderate dementia) versus subjects with an MMSE score of 24–30 points (ie, without symptoms of dementia).

The OR of having a large number of all needs was almost 14 times higher in residents with a BI score of 0–49 points versus those with ≥80 points. The group with 50–79 points had this parameter more than three times higher.

Discussion

We noted that older adults living in LTC units had a high number of needs – above 11 – which signals a necessity of support in many areas. As most of these needs were met, one may assume that they had been properly addressed. Similar data were presented by other authors.[24–26] The mean number of unmet needs in our study was low (<1). Van der Ploeg et al[27] observed an even lower number of unmet needs in residential care facilities in the Netherlands. A low number of unmet needs may indicate that the subjects receive adequate care,[24] as care institutions are designed to satisfy their residents' needs.[15]

An important observation in our study was the fact that unmet needs were most frequently reported in five areas: company, psychological distress, intimate relationship, eyesight/hearing/communication, and daytime activities. Other authors made similar observations in LTC settings in various countries.[26,28,29] Since these areas are consistently indicated across the care homes' populations, it would be of benefit to turn special attention to the assessment of needs in these specific fields.

In our study, the patterns of met needs and all needs were similar. The numbers of met and all needs were higher in groups with lower BI, similar to other studies' results.[26,29] Furthermore, the numbers of met and all needs were also higher in groups with symptoms of depression, which is regarded as a condition associated with increased number of needs.[9,26,30] The groups with lower BI and symptoms of depression did not present more unmet needs, which seems to indicate that the staff was aware of their need profiles and was attentive in this field.

As for the cognitive status, in the multivariable analysis, the highest probability of a large number of needs was noted in the group with an MMSE score of 20–23 points for met and all needs and in the group with an MMSE score of 10–19 points for unmet needs. Moreover, it must be

Table 3 Determinants of met, unmet, and total needs (the results of bivariate analysis): mean (SD; range); N=306

Determinant	Met needs	Unmet needs	Total needs
Age, years			
75–79 (I)	10.2±3.0 (10; 3–18)	0.9±1.2 (1; 0–5)	11.1±2.9 (11; 5–18)
80–84 (II)	10.1±3.2 (10; 1–17)	0.7±1.1 (0; 0–6)	10.9±3.3 (11; 2–21)
85+	10.9±3.3 (11; 3–18)	0.8±1.2 (0; 0–5)	11.7±3.2 (12; 3–18)
Gender			
Female	10.4±3.1 (11; 1–18)	0.9±1.2 (0; 0–6)	11.3±3.1 (12; 2–21)
Male	10.4±3.3 (10; 3–17)	0.6±1.1 (0; 0–5)	11.0±3.3 (12; 3–17)
Education			
Primary	10.4±3.2 (11; 1–17)	0.8±1.1 (0; 0–5)	11.2±3.1 (12; 2–17)
Above primary	10.6±3.2 (10.5; 3–18)	0.7±1.2 (0; 0–6)	11.4±3.3 (12; 3–21)
Time of institutionalization, years			
<1	10.6±3.4 (11; 1–17)	0.7±1.1 (0; 0–5)	11.2±3.2 (11; 2–17)
Between 1 and 5	10.1±3.5 (10; 3–18)	0.8±1.2 (0; 0–6)	10.9±3.6 (11; 3–21)
>5	10.6±2.8 (10; 3–18)	0.9±1.2 (0; 0–5)	11.5±2.8 (12; 5–18)
BI			
0–49 points (I)	12.0±2.5 (12; 7–18)	1.2±1.5 (1; 0–6)	13.3±2.1 (13; 8–21)
50–79 points (II)	11.3±2.6 (8; 5–18)	0.8±1.1 (0; 0–5)	12.1±2.4 (12; 7–18), $P<0.05$ versus I
>80 points (III)	8.6±3.1 (10; 1–17), $P<0.001$ versus I and II	0.5±0.9 (0; 0–5), $P<0.01$ versus I	9.1±3.0 (9; 2–17), $P<0.001$ versus I and II
MMSE			
10–19 points (I)	11.0±2.6 (11; 6–18)	1.3±1.4 (1; 0–6)	12.3±2.6 (12; 7–21)
20–23 points (II)	11.8±3.0 (12; 4–17)	0.8±1.2 (0; 0–5), $P=0.08$ versus I	12.6±2.9 (13; 5–17)
24–30 points (III)	9.7±3.3 (10; 1–18), $P<0.001$ versus I and II	0.8±1.2 (0; 0–5), $P=0.08$ versus I	10.2±3.2 (10; 2–18), $P<0.001$ versus I and II
GDS			
0–5 points	8.8±2.8 (9; 1–14)	0.9±1.2 (0; 0–5)	9.6±3.0 (10; 2–15)
6–15 points	11.0±3.1 (11; 3–18), $P<0.001$	0.8±1.2 (0; 0–6)	11.8±3.1 (12; 3–21), $P<0.001$

Abbreviations: BI, Barthel index; MMSE, Mini-Mental State Examination; GDS, Geriatric Depression Scale.

stressed that belonging to the group with an MMSE score of 10–19 points was the only independent determinant of presence of unmet needs. This phenomenon has not been pointed before and seems to indicate that this group is the most challenging one to the staff, requiring the most time and resources. As this group appears to be insufficiently monitored, it is likely to benefit from more frequent assessment and subsequent implementation of tailored interventions.

Table 4 Multiple logistic regression determinants of met, unmet, and total needs[a] (N=306)

Determinant	Versus	Met needs, OR (95% CI)[b]	Unmet needs, OR (95% CI)[b]	All needs, OR (95% CI)[b]
BI				
80–100	0–49	7.7 (3.71–16.27), $P<0.001$	1.4 (0.69–2.71)	13.6 (6.20–29.91), $P<0.001$
MMSE	50–79	3.7 (1.95–6.98), $P<0.001$	1.2 (0.64–2.21)	3.3 (1.56–6.37), $P<0.001$
24–30	10–19	0.7 (0.40–1.46)	4.5 (2.36–8.59), $P<0.001$	1.2 (0.58–2.37)
GDS	20–23	2.5 (1.10–5.51), $P<0.05$	1.6 (0.80–3.30)	2.3 (1.03–5.28), $P<0.05$
0–5	6–15	1.8 (1.02–3.24), $P<0.05$	0.7 (0.40–1.22)	2.5 (1.29–4.89), $P<0.01$

Notes: [a]Presented as odds of having a large number of needs (defined as above the median). [b]OR and 95% CI.
Abbreviations: BI, Barthel index; MMSE, Mini-Mental State Examination; GDS, Geriatric Depression Scale.

Since Martin et al[25] showed that it is the number of unmet needs that translates into the quality of life, it can be expected that interventions aimed at unmet needs would improve the quality of life of the residents. It was demonstrated that the use of CANE questionnaire in interventional studies might lead to unmet needs being reduced at follow-up.[31] As unmet needs were concentrated in the five areas mentioned earlier, the interventions should address needs in these areas in the first place. It is, however, important to monitor the needs periodically after an institutionalization in an LTC unit, due to potential dynamics of the patient's status.[15]

Limitations of our study result from its cross-sectional design, which means findings that may point toward important relations but cannot imply causality. Additionally, we studied subjects who either were cognitively well functioning or had symptoms of mild-to-moderate dementia. Exclusion of individuals with symptoms of severe dementia may potentially influence the results because needs may be expressed differently by subjects with more advanced stages of the condition. In addition, the selection of explanatory variables for the analysis can be viewed as a limitation; however, it should be stressed that all of them (either sociodemographic data or scores of routinely used screening tools) are easy to access in the analyzed settings.

An important strength of the study is its sample size, which is >300.

Conclusion

As far as we know, this is the first study employing a multivariable analysis of met/unmet needs assessed with CANE. Consequently, relationships between individual factors could be uncovered and compared. It is also worth underlining that we analyzed needs in the context of the stages of functional dependence, dementia, and depression and not the correlations alone. Based on this approach, the most sensitive group of LTC clients (the one with an MMSE score between 10 and 19 points) was identified. We also recognized five areas in which unmet needs are most likely to occur (company, psychological distress, intimate relationship, eyesight/hearing/communication, and daytime activities). We believe that the identification of the target group and of the areas in which resources and efforts should be concentrated can be useful in optimizing the care in LTC units.

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Disclosure

The authors report no conflicts of interest in this work.

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