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What do nursing home residents with mental-physical multimorbidity need and who actually knows this? A cross-sectional cohort study

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ABSTRACT

Objective: Aging societies will bring an increase in the number of long-term care residents with mental-physical multimorbidity. To optimize care for these residents, it is important to study their care needs, since unmet needs lower quality of life. To date, knowledge about care needs of residents with mental-physical multimorbidity is limited. The aim of this study was to explore (un)met care needs of residents with mental-physical multimorbidity and determinants of unmet needs.

Methods: Cross-sectional cohort study among 141 residents with mental-physical multimorbidity without dementia living in 17 geronto-psychiatric nursing home units across the Netherlands. Data collection consisted of chart review, semi-structured interviews, (brief) neuropsychological testing, and self-report questionnaires. The Camberwell Assessment of Need for the Elderly (CANE) was used to rate (un)met care needs from residents' and nursing staff's perceptions. Descriptive and multivariate regression analyses were conducted.

Results: Residents reported a mean number of 11.89 needs (SD 2.88) of which 24.2% (n = 2.88, SD 2.48) were unmet. Nursing staff indicated a mean number of 14.73 needs (SD 2.32) of which 10.8% (n = 1.59, SD 1.61) were unmet. According to the residents, most unmet needs were found in the social domain as opposed to the psychological domain as reported by the nursing staff. Different opinions between resident and nursing staff about unmet needs was most common in the areas accommodation, company, and daytime activities. Further, nearly half of the residents indicated 'no need' regarding behavior while the nursing staff supposed that the resident did require some kind of support. Depression, anxiety and less care dependency were the most important determinants of unmet needs.

Conclusions: Systematic assessment of care needs showed differences between the perspectives of resident and nursing staff. These should be the starting point of a dialogue between them about needs, wishes and expectations regarding care. This dialogue can subsequently lead to the most optimal individually tailored care plan. To achieve this, nurses with effective communication and negotiation skills, are indispensable.

What is already known about the topic?

- Mental-physical multimorbidity is common in older people.
- The presence of unmet needs is a strong predictor of less favorable health perceptions and a lower quality of life.

What this paper adds

- On average, nursing home residents with mental-physical multimorbidity reported having a care need on 12 of 23 items of the Camberwell Assessment of Need for the Elderly (CANE), of which almost a quarter were unmet.
- Residents rated a significantly lower total number of needs, but a

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significantly higher number of unmet needs than the nursing staff.
- Both the residents and the nursing staff reported 'household activities', 'money', and 'medication' as the most frequently met needs.
- Residents rated the most frequently unmet needs on 'accommodation', 'company', and 'psychological distress'; the nursing staff rated these on the domains 'company', 'physical health', and 'behavior'.
- To achieve an individually tailored care plan, a proper dialogue must be conducted in which the different views on needs are addressed. This requires nurses having effective communication and negotiation skills. Furthermore, to discuss and implement interventions that are acceptable to both the resident and the caregivers, the nursing staff must show leadership and coaching skills, such as skills to collaborate, to ensure shared decision making and to empower others.

1. Introduction

Mental-physical multimorbidity is common in older people. Of this group, the number that is dependent on residential long-term care is increasing. Approximately one-fourth of newly admitted nursing home residents has a mental illness such as schizophrenia, bipolar disorder, depression, or anxiety disorder (Fullerton et al., 2009). These residents differ from other resident groups residing in nursing homes. They are younger, have more chronic psychiatric disorders, more severe frontal impairment, and more clinically relevant neuropsychiatric symptoms (van den Brink et al., 2017). As a result, it is very likely that residents with mental-physical multimorbidity will have specific care needs. Therefore, in some nursing homes so-called geronto-psychiatric units have been set up for residents with mental-physical multimorbidity.

As in all residential care facilities, person-centeredness should be the basis of care in these units, because this contributes to a better quality of life (Bruus et al., 2012; Li and Porock, 2014; Poey et al., 2017). Taking into account a resident's need is one of the key elements in providing person-centered care, which implies that the resident's needs should be clear.

Yet, although several studies have focused on care needs in populations of patients with varying mental illnesses, including dementia, (Bakker et al., 2014; Dautzenberg et al., 2016; Stein et al., 2016a,b) there are no publications concerning care needs of nursing home residents with mental-physical multimorbidity without dementia (van den Brink et al., 2013).

Perceived needs can be subdivided into met and unmet needs (Phelan et al., 1995). A met need refers to a situation in which individuals have had difficulties in a particular area, but these are being adequately taken care of. An unmet need exists when the individual believes that he or she does not receive the right care or the appropriate level of care. The presence of unmet needs is a strong predictor of less favorable health perceptions and a lower quality of life (Wiersma, 2006). Research shows that unmet needs lead to more behavioral problems and an increased caregiver burden, (Kovach et al., 2005) both of which adversely affect quality of life (Kovach et al., 2005) and increase the risk of institutionalization (Gaugler et al., 2005).

Studies in older patients found various determinants of unmet needs. A higher number of unmet needs was associated with more severe psychiatric symptoms, (Houtjes et al., 2010; Stein et al., 2016a,b; Wiersma, 2006) less social participation, (Dautzenberg et al., 2016) and a lower number of medications (Black et al., 2013). Inconsistent and even opposite results have been found with respect to age, (Hancock et al., 2006; Hoogendijk et al., 2014; Meaney et al., 2005) sex, (Wiersma, 2006) education, (Black et al., 2013; Hoogendijk et al., 2014) level of functional dependency (Black et al., 2013; Hoogendijk et al., 2014; Wiersma, 2006) and cognitive functioning (Black et al., 2013; Meaney et al., 2005). In studies of younger psychiatric patients, personality disorder was found to be independently associated with more (un)met needs, (Hayward et al., 2006; Lasalvia et al., 2000) but no studies have examined these associations in elderly patients. However, based on our clinical experience, we also expect associations between personality traits and unmet care needs.

In addition to resident-related determinants, barriers in the organization and delivery of healthcare may contribute to unmet needs. In their conceptual framework for identifying unmet health care needs, Diwan and Moriarty described five potential barriers: availability, accessibility, affordability, acceptability of interventions, and recognition of need/knowledge of interventions (Diwan and Moriarty, 1995).

Residents and nursing staff form their opinions on care needs from their own frames of reference. Previous research in which care needs were assessed both from the perspective of the resident as well as from that of the professional shows that they differ significantly in their view on the presence of needs and the extent to which these are fulfilled (Dautzenberg et al., 2016; Hancock et al., 2003; Orrell et al., 2008). Disagreement between residents and staff on needs may influence therapy compliance (Stobbe et al., 2013) and hence the experience of the quality of treatment (Hancock et al., 2003). This may be challenging, especially if the resident is convinced that he has no care need but the staff believes he has one, or if the resident has an unmet care need that is not perceived as such by the staff.

To achieve an individually tailored approach, knowledge about the needs of residents with mental-physical multimorbidity living in nursing homes is required. Therefore, the aim of this study is to gain insight into (1) the residents' and nursing staff's view of (un)met care needs of residents with mental-physical multimorbidity without dementia living in geronto-psychiatric nursing home units, (2) the differences between these views, and (3) determinants of unmet needs experienced by the resident.

2. Methods

The MAPPING study (residents with both **M**ental **A**nd **P**hysical **P**roblems residing **I**n Dutch **N**ursin**G** homes) is a cohort study. The design of the MAPPING study has been described extensively, (van den Brink et al., 2017) but will be summarized below.

2.1. Participants

Participants were recruited from 17 Dutch nursing homes with a geronto-psychiatric unit.

The MAPPING study included two groups of participants. The first group consisted of residents who were newly admitted to a geronto-psychiatric nursing home unit. In this group two measurements were performed: a baseline measurement and a follow-up after 6 months. Since the admission rate of new residents on the participating units proceeded less rapidly than expected, a second group of participants was included to enlarge the power of the study. This group consisted of residents who had been residing for at least 6 months on the geronto-psychiatric nursing home unit and who met all the inclusion criteria. In this group a single measurement was performed. The resident characteristics in both groups were found not to differ significantly from each other in respect of age, sex, marital status, level of education, and cognitive functioning (van den Brink et al., 2017).

Residents were included if (1) they needed both physical and psychiatric care, as shown in the medical history, and (2) the psychiatric or behavioral problems had been present for 2 years or longer without prospect of substantial recovery. Exclusion criteria were: (1) dementia, (2) inability to give informed consent, (3) a too severe mental or physical illness for reliable data collection, and (4) refusal to participate. The physician of the geronto-psychiatric nursing home unit determined whether a resident was eligible for participating in the study. If so, written informed consent was requested from the resident.

In this paper, we present a cross-sectional overview of the data collected from all participants. For the group of newly admitted residents data of the follow-up measurement were used.

2.2. Ethical considerations

Formal approval according to the Medical Research Involving Human Subjects Act was not necessary, as established by the local Medical Ethics Review Committee 'CMO Regio Arnhem-Nijmegen', that has reviewed the study protocol (number 2011/171). Nursing home management boards gave permission for the study, which was conducted in accordance with the Declaration of Helsinki and the Code of Conduct for Health Research (2004) as well as the rules applicable in the Netherlands.

2.3. Data collection

Data collection took place between April 2012 and September 2015 and was carried out by the researcher (Anne van den Brink) and a research assistant (Miranda de Valk). Both are certified elderly care physicians, a medical specialty in nursing home and primary geriatric care in the Netherlands (Koopmans et al., 2017). Beforehand they were trained in administering the assessment instruments. Data collection consisted of chart review, semi-structured interviews, (brief) neuropsychological testing, and self-report questionnaires.

Medical and demographic data were collected from the residents' medical file. Demographic characteristics were the resident's age, sex, ethnicity, marital status, level of education and residence prior to admission to the nursing home. All known chronic conditions were classified in a list of 56 diagnosis groups of chronic diseases based on ICD-10 codes (International Statistical Classification of Diseases and Related Health Problems, 10th Revision) (WHO, 1992).

2.4. Primary outcome: (un)met needs

Care needs were assessed with the Camberwell Assessment of Need for the Elderly (CANE) (Reynolds et al., 2000) by interviewing both the resident and a licensed practical nurse who knew the resident well. The CANE is designed as a comprehensive instrument for measuring a broad range of needs of older people with mental health problems. It covers 24 areas targeting physical, psychological, social, and environmental needs. Each item can be assessed as 0 = no need (no problem), 1 = met need (the care provided can be considered as appropriate and potentially of benefit), and 2 = unmet need (the interviewee experiences a significant problem requiring intervention or assessment, for which currently no assistance or the wrong kind of help is received). The validity and reliability of the original scale are good (Reynolds et al., 2000) and acceptable for the Dutch version (van der Roest et al., 2008). The CANE is applicable in elderly patients with different levels of cognitive functioning (Reynolds et al., 2000; van der Roest et al., 2008).

2.5. Determinants of unmet needs

Cognition was assessed with the Standardized Mini Mental State Examination (S-MMSE) (Molloy et al., 1991) and the Frontal Assessment Battery (FAB) (Dubois et al., 2000). The MMSE (Folstein et al., 1975) is a widely used assessment instrument for screening cognitive impairment. Scoring consists of a sum of correct responses on 11 items, resulting in a continuous scale from 0 to 30 points. The standardized version with explicit detailed guidelines for its administration and scoring was applied. The S-MMSE has been shown to have a better interrater and intrarater reliability than the MMSE (Molloy and Standish, 1997). The MMSE is more specific and sensitive in detecting cognitive deficits related to language and memory than in detecting deficits in frontal executive functions (Woodford and George, 2007). For this purpose, the FAB is administered. This test consists of 6 subtests, each exploring one of the following functions related to the frontal lobes: conceptualization, mental flexibility, motor programming, sensitivity to interferences, inhibitory control, and environmental autonomy. For each subtest, 3 points can be achieved, which add up to a score ranging from 0 to 18. The interrater reliability, internal consistency, and concurrent validity were found to be good (Dubois et al., 2000).

Social participation was assessed with the Revised Index for Social Engagement (RISE). The RISE is the revised version of the Index for Social Engagement (ISE), (Mor et al., 1995) an observational scale that measures positive features of long-term care residents' social behaviour through six dichotomous items. In comparison with the ISE, the RISE is an improved index by including additional dimensions of social engagement. The RISE has also been shown to have higher interrater item reliability and scale reliability in residents with moderate to severe cognitive impairment (Gerritsen et al., 2008).

Care dependency was assessed with the Care Dependency Scale (CDS)(Dijkstra et al., 2012). The CDS consists of 15 items on basic functional care demands that are scored on a 5-point Likert scale; the total score ranges from 15 (completely dependent on care) to 75 (almost independent of care). The nursing home version of the CDS was found to be reliable and valid for use in both physically disabled nursing home residents and those with dementia (Dijkstra et al., 2002).

Depression was assessed with the 8-item version of the Geriatric Depression Scale (GDS-8).

The original GDS (Yesavage et al., 1982) is a questionnaire with 30 dichotomous items, specifically developed for the elderly. Although the GDS-30 was designed for older people, some of the items are not well received by elderly nursing home residents. Since its introduction, several shortened versions of the GDS-30 have been constructed. The GDS-8 is a shorter version, in which the items that are not suitable for nursing home residents have been deleted. It shows good psychometric properties (Jongenelis et al., 2007).

Anxiety was assessed with the anxiety section of the Hospital Anxiety and Depression Scale (HADS-A). The Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983) is a questionnaire comprising 14 items with a four-point Likert-scale: 7 items for anxiety (HADS-A) and 7 items for depression (HADS-D) during the past week. The items on anxiety cover mainly generalized anxiety and panic attacks.

The HADS was found to perform well in assessing the symptom severity and caseness of anxiety disorders and depression (Burger and Neeleman, 2007) in both somatic and psychiatric patients (Bjelland et al., 2002); the basic psychometric properties of the HADS were considered as quite good to very good (Bjelland et al., 2002; Mykletun et al., 2001).

Personality traits were assessed with the Dutch informant personality questionnaire (the HAP).

The HAP (Barendse and Thissen, 2006) is especially developed for clinical practitioners in Dutch nursing homes who need a tool using informant information in order to assess 10 premorbid personality traits of older adults (i.e. socially avoidant behaviour, uncertain behaviour, vulnerability in interpersonal relationships, somatizing behaviour, disorderly behaviour, rigid behaviour, perfectionist behaviour, antagonistic behaviour, self-satisfied behaviour, unpredictable and impulsive behaviour). The HAP has 62 age-neutral items, which have to be assessed by the informant as 'yes', 'more or less', or 'no'. The psychometric properties of the HAP, applied in nursing home and elderly psychiatric patient populations, are described as generally reasonable to excellent (Barendse et al., 2013).

2.6. Analysis

The CANE item 'benefits' (getting all the money that the patient is entitled to) was excluded from the analyses because this information was usually not known to residents and the nursing staff. It is valid to leave out items, because individual CANE items have been separately evaluated on content validity and reliability (Reynolds et al., 2000; van der Roest et al., 2008).

Consistent with previous studies, we assumed cognitive impairment

if the MMSE-score was ≤23 (Jongenelis et al., 2004; Schaller et al., 2012). The MMSE was considered as 'missing' if 8 or more tasks were not carried out.

The presence of frontal impairment was defined as a FAB-score ≤12 (Van Loo et al., 2007). The FAB was regarded as 'missing' if more than half of the tasks were not carried out.

Missing answers on the HAP questionnaire were applied in accordance with the manual, (Barendse and Thissen, 2006) and the 10 HAP scales were corrected for positive and negative rating trends. Finally, based on the standard tables for nursing home residents as described in this manual, we have dichotomized the personality traits in present or not present. If a score was classed as high or very high in the standard table, we rated the personality trait as present.

In order to describe the characteristics of the resident sample, categorical variables were summarized as percentages (number) and continuous variables were summarized as means (Standard Deviation; minimum-maximum) or medians (InterQuartile Range). The frequency distributions of met and unmet needs in the different areas of the CANE were calculated. Comparisons between the mean total numbers of (unmet) needs as reported by the resident and nursing staff were conducted using the paired samples *t*-test.

Bivariate analyses (Pearson correlations, analysis of variance, *t*-tests) were used to investigate relationships between the total number of unmet needs and the potential determinants as based on the literature: age, sex, level of education, number of medications, number of chronic conditions, social participation, care dependency, depression, anxiety, and cognitive functioning.

Subsequently, variables that were statistically significant at a $p < 0.25$ level in the bivariate analyses were included in the multivariate regression model (Hosmer and Lemeshow, 2000). A backward stepwise regression was carried out by removing the least significant variables one at a time until all contributed significantly ($p < 0.05$) (Field, 2013). Regression diagnostics were performed to investigate any violation of the assumptions of normality, linearity, multicollinearity and homoskedasticity. Any missing scales were excluded pair-wise.

A complete HAP-questionnaire was available in 75.2% (n = 106) of the study population. Refusal of consent by the resident to send the HAP-questionnaire to a relative or the lack of relatives were the most important reasons for missing HAP-questionnaires. This may create selection bias. Therefore, we did not include personality traits in the main model. Instead, we conducted a sensitivity analysis in order to study the impact of personality traits on the total number of unmet needs in the subgroup of 106 residents. The bivariate analyses for this sensitivity analysis were carried out with Mann-Whitney *U* tests. The regression analysis has been carried out in the same manner as described above, this time by also including personality traits that appeared to be statistically significant at a $p < 0.25$ level in the bivariate analyses.

Statistical analysis was carried out using SPSS version 22.

3. Results

One hundred and forty-two residents were included and data of these residents were collected. One resident (female, 71 years) had to be excluded because of her refusal to submit to the CANE.

3.1. Demographic and clinical characteristics

The resident characteristics are presented in Table 1, showing slightly more women than men, with a mean age of 70 years. Almost all participants were born in the Netherlands. The majority of the residents included had no partner. The average number of chronic conditions was 9.6 (SD 3.1, range 3–20). The median score of the MMSE was 24 (IQR 20–27) and the mean score of the FAB was 9.7 (SD 4.4, range 1–18).

Table 1
Characteristics of the resident sample (N = 141).

Characteristic	% (n)
Age, y[a]	69.9 (11.5; 36–92)
Sex (% female)	56.0% (79)
Country of origin	
The Netherlands	95.0% (134)
Marital status	
Unmarried	27.0% (38)
Married	15.6% (22)
Divorced	27.7% (39)
Widow(er)	29.8% (42)
Level of education[b]	
Low	33.8% (47)
Medium	54.0% (75)
High	12.2% (17)
Residence prior to admission to the geronto-psychiatric NH-unit	
Psychiatric hospital	41.1% (58)
Nursing home	26.6% (37)
Care home	11.3% (16)
Home	13.5% (19)
Other	7.8% (11)
Length of stay (months)[a]	8.6 (29.2; 3–137)
Number of chronic medical disorders[a]	7.4 (3.0; 2–18)
Number of chronic psychiatric disorders[a]	2.2 (0.9; 1–5)
MMSE[c,d]	24 (20–27)
FAB[a,e]	9.7 (4.4; 1–18)

[a] Mean (SD; min-max).
[b] Missing data n = 2.
[c] Median (IQR).
[d] Missing data n = 5.
[e] Missing data n = 6.

3.2. Care needs

Residents reported a mean number of 11.89 needs (SD 2.88, range 1–18) of which 24.2% (mean number = 2.88, SD 2.48, range 0–11) were unmet. The nursing staff reported a mean number of 14.73 resident needs (SD 2.32, range 7–20) of which 10.8% (mean number = 1.59, SD 1.61, range 0–9) were unmet.

Residents rated a significantly lower number of needs ($t = -10.76$, CI = −3.36 to −2.32, $p = 0.001$) than nurses did. Moreover, the number of unmet needs from the resident's perspective was significantly higher than when rated by the nursing staff ($t = 6.72$, CI = 0.90–1.65, $p = 0.001$).

With regard to individual needs (Table 2), 'household activities', 'money', 'medication', 'food', and 'self-care' were the most frequently rated met needs, both by residents and nursing staff. The most frequently reported unmet needs rated by both residents and nursing staff were 'accommodation', 'company', 'physical health', and 'psychological distress'. Additionally, 'daytime activities' and 'eyesight/hearing' were frequently rated as an unmet need by residents as was 'behavior' by nursing staff.

3.3. Differences in scores on needs between residents and nursing staff

The median number of domains in which residents reported 'no need' whereas the nursing staff rated a care need, was 3 (IQR 2–5). In only 1.6% (n = 2) of the cases residents and nursing staff had the same scores regarding 'no need'. The median number of domains in which the resident rated 'unmet need' and the nursing staff did otherwise, was 2 (IQR 1–3). In 19.5% of the cases (n = 24) residents and nursing staff had no different scores regarding 'unmet needs'.

Fig. 1 shows per needs domain the proportion of residents that had different scores than the nursing staff on 'no need' and 'unmet need'. Nearly half of the residents (49.3%, n = 69) reported that they had no care need regarding 'behavior' while the nursing staff's scores indicated

Table 2
Ratings of (un)met needs in 23 individual CANE areas, according to resident and nursing staff (N = 141).

Needs domains	Resident: met needs, % (n)	Nursing staff: met needs, % (n)	Resident: unmet needs, % (n)	Nursing staff: unmet needs, % (n)
Environmental				
Accommodation	62,4% (88)	85,1% (120)	37,6% (53)	14,9% (21)
Household activities	90,8% (128)	98,6% (139)	2,1% (3)	1,4% (2)
Food	81,6% (115)	94,3% (133)	10,6% (15)	5,7% (8)
Money	88,7% (125)	95,0% (134)	2,1% (3)	2,1% (3)
Caring for others	2,8% (4)	2,1% (3)	0,7% (1)	0% (0)
Physical				
Physical health	62,4% (88)	73,8% (104)	22,0% (31)	18,4% (26)
Medication	87,9% (124)	95,7% (135)	5,7% (8)	4,3% (6)
Eyesight/hearing	17,7% (25)	25, % (36)[a]	21,3% (30)	5,7% (8)[a]
Mobility	67,4% (95)	78,7% (111)	16,3% (23)	7,8% (11)
Self-care	79,4% (112)	92,9% (131)	2,1% (3)	2,1% (3)
Continence	36,9% (52)	56,7% (80)	9,9% (14)	6,4% (9)
Psychological				
Psychological distress	30,5% (43)	56,7% (80)	26,2% (37)	14,9% (21)
Memory	22,7% (32)	51,1% (72)	5,7% (8)	2,1% (3)
Behavior	17,1% (24)[a]	58,9% (83)	10,0% (14)[a]	15,6% (22)
Alcohol	2,8% (4)	17,7% (25)	0,7% (1)	1,4% (2)
Deliberate self-harm	5,7% (8)	5,7% (8)[a]	4,3% (6)	0% (0)[a]
Accidental self-harm	8,5% (12)	46,1% (65)	2,8% (4)	6,4% (9)
Psychotic symptoms	20,9% (29)[b]	34,8% (49)	9,4% (13)[b]	6,4% (9)
Social				
Company	26,2% (37)	55,7% (78)[a]	36,9% (52)	18,6% (26)[a]
Intimate relationships	1,4% (2)	5,2% (7)[c]	17,7% (25)	10,4% (14)[c]
Daytime activities	44,7% (63)	79,4% (112)	24,8% (35)	12,8% (18)
Information	21,4% (30)[a]	42,4% (59)[b]	12,1% (17)[a]	2,9% (4)[b]
Abuse/neglect	15,8% (22)[b]	53,2% (75)	7,2% (10)[b]	0,7% (1)

[a] missing data n = 1.
[b] missing data n = 2.
[c] missing data n = 6.

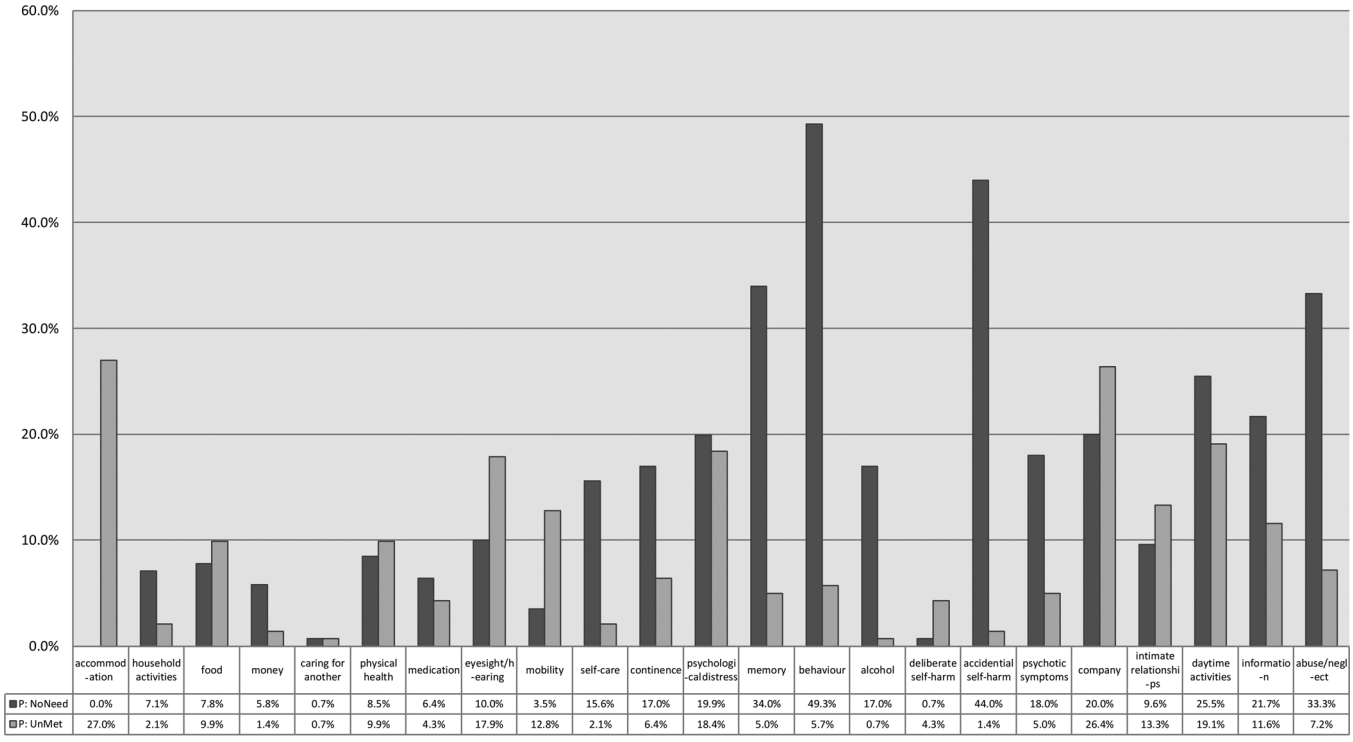

Fig. 1. Proportion of residents with another view on the care needs than the nursing staff.

Table 3a
Bivariate relationships between potential determinants and total number of unmet needs.

	Pearson's r (95% CI)	Sig (2-tailed)	N
Age	−0.014 (-0.183 to 0.151)	0.870	141
Number of medications	0.033 (−0.119 to 0.193)	0.700	141
Number of chronic conditions	0.154 (−0.026 to 0.327)	**0.069**	141
Social Participation (RISE)	−0.224 (−0.384 to −0.076)	**0.008**	141
Care Dependency (CDS)[a]	−0.212 (−0.350 to −0.055)	**0.012**	141
Cognitive functioning (MMSE)	−0.016 (−0.191 to 0.173)	0.852	136
Cognitive functioning (FAB)	0.024 (−0.144 to 0.199)	0.778	135
Depression (GDS-8)	0.551 (0.407 to 0.681)	< **0.001**	141
Anxiety (HADS-a)	0.595 (0.457 to 0.718)	< **0.001**	141
	Student's t (95% CI)		
Gender	−2.119 (−1.643 to −0.057)	**0.036**	141
	ANOVA F		
Level of education	0.254	0.776	139

that the resident did require some kind of care. In 84.1% (n = 58) of these cases, the nursing staff rated 'behavior' as a met need, in 15.9% (n = 11) as an unmet need. In the same way, the scores on needs of resident and nursing staff differed frequently in the needs areas 'accidental self-harm' (44.0%, n = 62), 'memory' (34.0%, n = 48), and 'abuse/neglect' (33.3%, n = 47). In the vast majority of these cases, the nursing staff rated the care need as a met need (88.7% (n = 55), 97.9% (n = 47) and 97.9% (n = 46) respectively). Residents' unmet care needs were most often not assessed as such by the nursing staff on the areas 'accommodation' (27.0%, n = 38), 'company' (26.4%, n = 37), and 'daytime activities' (19.1%, n = 27). These care needs were reported by the nursing staff as met needs in 100% (n = 38), 70.3% (n = 26) and 88.9% (n = 24) respectively.

3.4. Associations between the total number of unmet needs and resident characteristics

The total number of unmet needs showed a significant positive association with depression (r = 0.55, CI = 0.41-0.68, p < 0.001) and anxiety (r = 0.60, CI = 0.46–0.72, p < 0.001) and a significant negative association with social participation (r = −0.22, CI = −0.38 to −0.08, p = 0.008) and the care dependency scale (r = −0.21, CI = −0.35 to −0.06, p = 0.012) (Table 3a), the latter meaning that more unmet needs were related to higher care dependency. Also sex was significantly associated with the total number of unmet needs: men showed less unmet needs than women (t = −2.12, CI = −0.64 to −0.06, p = 0.036).

These variables were entered, along with the number of chronic conditions (r = 0.15, CI = −0.03 to 0.33, p = 0.069 (not significant, but p < 0.25)), into a linear regression model. We found that three variables remained statistically significant in the multiple regression analysis: depression, anxiety, and care dependency, which explained 47.5% of the variance in the total number of unmet needs (R^2 = 0.48, df = 3, F = 41.31, p < 0.001) (Table 3b).

Table 3b
Multiple linear regression 6 predictors (method: backward stepwise).

	B	Std. Error	Beta	t	Sig
Constant	2.386	0.796		2.997	0.003
GDS-8	0.347	0.069	0.351	5.060	0.000
HADS-a	0.233	0.039	0.421	6.049	0.000
CDS	−0.036	0.015	−0.147	−2.360	0.020
R Square	0.475				
Adjusted R Square	0.463				
Std Error of the Estimate	1.817				
F	41.305				
Sig	0.000				

Table 3c
Bivariate relationships between personality traits and total number of unmet needs.

	Personality trait was present% (n/N)	Mann-Whitney *U* test Z-value	Sig (2-tailed)
Socially avoidant behavior	22.6% (24/106)	−0.585	0.558
Uncertain behavior	24.8% (27/109)	−1.534	**0.125**
Vulnerability in interpersonal relationships	26.9% (29/109)	−0.559	0.576
Somatizing behavior	21.3% (23/108)	−0.374	0.708
Disorderly behavior	31.2% (34/109)	−2.180	**0.029**
Rigid behavior	18.5% (20/108)	−1.330	**0.183**
Perfectionist behavior	14.0% (15/107)	−0.226	0.821
Antagonistic behavior	21.1% (23/109)	−0.972	0.331
Self-satisfied behavior	25.7% (28/109)	−0.569	0.569
Unpredictable and impulsive behavior	29.4% (32/109)	−1.099	0.272

Table 3d
Multiple linear regression 9 predictors (method: backward stepwise).

	B	Std. Error	Beta	t	Sig
Constant	0.975	0.307		3.170	0.002
GDS-8	0.363	0.076	0.368	4.772	0.000
HADS-a	0.225	0.043	0.407	5.255	0.000
HAP-uncertain	−1.312	0.396	−0.229	−3.313	0.001
R Square	0.505				
Adjusted R Square	0.491				
Std Error of the Estimate	1.769				
F	35.747				
Sig	0.000				

3.4.1. Sensitivity analysis

The prevalence of ten premorbid, maladaptive personality traits ranged between 14.0% (perfectionist behavior) and 31.2% (disorderly behavior) (Table 3c). When personality traits were included in the analyses as independent variables (Table 3d), the regression analysis showed that three variables (depression, anxiety and the personality trait 'uncertain behavior') were associated with the total number of unmet needs. This model explains 50.5% of the variance in the total number of unmet needs (R^2 = 0.51, df = 3, F = 35.75, p < 0.001).

4. Discussion

To our knowledge, this is the first study to examine the prevalence of met and unmet needs of nursing home residents with mental-physical multimorbidity without dementia from the residents' and nursing staff's perspectives while also focusing on the differences between their opinions.

We found that residents rated a lower total number of needs, but a higher number of unmet needs than the nursing staff. The highest numbers of met care needs were reported in the physical and environmental domains. According to the residents, most unmet needs pertained to the social domain. The nursing staff reported most unmet needs in the psychological domain. Discrepancy between residents and nursing staff about unmet needs was most common in the areas accommodation, company, and daytime activities. Nearly half of the residents indicated 'no need' regarding behavior while the nursing staff supposed that the resident did require some kind of support. Depression, anxiety and care dependency were the most important determinants of residents' unmet needs.

Lasalvia et al. (2000) described two main approaches to needs

assessment: a normative model, based on the judgement of an expert, and a negotiated model, assuming that needs are not a fixed concept that can be objectively measured, but are best viewed as a dynamic and relative concept that can be influenced by a range of contextual factors and on which there is no single correct perspective (Lasalvia et al., 2000). Given the negotiated model, it is not surprising that the visions of residents and nursing staff are different. They form their opinions based on different frames of reference.

Our study shows that the average number of needs reported by the nursing staff was higher than in the residents' opinion, but the proportion of unmet needs was higher in the residents' view. This is in agreement with other studies among long-term care residents (Orrell et al., 2008; Wieczorowska-Tobis et al., 2016). On the one hand, residents may underestimate their needs for several reasons, such as (1) desire for independence, (Boggatz and Dassen, 2011) (2) lack of knowledge of health care services, (Walters et al., 2000) (3) cognitive problems such as lack of insight (Hancock et al., 2003) or (4) current neuropsychiatric symptoms (e.g. positive bias due to a manic episode) (Dautzenberg et al., 2016). On the other hand, the nursing staff may report more care needs on the basis of professional training and background (Slade, 1994). Yet, there is also the risk that they provide more care than necessary. Additionally, the nursing staff may underestimate the unmet needs, because of (1) lack of knowledge or skills to identify unmet needs in this particular group of residents (Orrell et al., 2008; Slade et al., 1998) or (2) a need to feel effective in the jobs they do (Orrell et al., 2008).

The resident's perspective on needs must be central to the process of planning and providing care, (Slade et al., 1999) but adding interventions initiated on the basis of the nursing staff's expertise can be valuable, since the expert professional may have a more informed opinion about the probable outcome than the resident (Slade et al., 1996). Nurses play an important role in bridging the different perspectives. In long-term care facilities, this should be done by a team of workers with different education levels and competences. Nurse assistants, licensed practical nurses and vocationally trained registered nurses, collect data about residents and implement components of residents' care plans. To this end, they should be able to employ different skills and personal qualities, such as effective communication and negotiation skills, empathy, compassion, and humor (Chu et al., 2016; McGilton et al., 2016a,b; Oeseburg et al., 2015). In addition, baccalaureate-educated registered nurses and/or advanced nurse practitioners are needed because they have the clinical assessment and care management expertise that facilitates integration and synthesis of data to accomplish quality care (Abumaria et al., 2015; Backhaus et al., 2015; McGilton et al., 2016a,b). They also have a role as supervisor of other nursing personnel (Chu et al., 2016; McGilton et al., 2016a,b; Wong et al., 2013). They can facilitate them in influencing resident outcomes through their leadership and coaching skills, such as team-building, collaboration, negotiation, empowering others, shared decision making, and conflict management (Dwyer, 2011; Vogelsmeier et al., 2010; Wong et al., 2013).

Our finding that company (C) and daytime activities (DA) were frequently reported as unmet needs in the view of residents, is of great importance. It would be expected that these care needs were met as professional support for these needs is part of the basic care. However, the ratio of unmet needs to the total number of needs in these areas was comparable with community-dwelling elderly people (i.e. C: 58.4% and DA: 35.7% (our study), C: 46.9% and DA: 42.2%, (Houtjes et al., 2010) C: 55.6% and DA: 27.8% (Dautzenberg et al., 2016)).

Possibly, lack of resources in the field of elderly care plays a role. Rationing of care and shortage of personnel could reduce the time nursing staff spend together with nursing home residents and can also reduce the time for supporting nursing home residents in performing activities of daily living. Furthermore, the nursing staff might have a stronger focus on physical care than on social support (van Beek and Gerritsen, 2010).

In the areas company (C) and daytime activities (DA) the nursing staff did not perceive residents' unmet needs as such in 26.4% (C) and 19.1% (DA). In addition, we found that almost all residents had a different opinion than the nursing staff regarding 'no need'. Differences were mainly reported in the areas behavior, accidental self-harm, memory, and abuse/neglect. Possibly, a resident's impaired insight in his situation due to the mental-physical multimorbidity may play a role. Our results suggest that the support offered does not meet individual wishes and preferences

Our finding that depression and anxiety were the determinants that were most strongly associated with the number of unmet needs, is in accordance with the studies of Hancock et al. (2006) and Houtjes et al. (2010). Unfortunately, these three studies do not allow us to conclude on a causal relationship between these variables. It is likely that depression and anxiety will affect the residents' receptiveness for and perception of meeting needs, resulting in more unmet needs. On the other hand, unmet needs can contribute to the onset or increase of depression and anxiety.

In addition, our results could indicate that the different frames of reference of residents and staff might have played a role. From their professional background, nurses usually are focused on outcomes (i.e. depression, anxiety, behavioral issues, care dependency), whereas residents may "translate" such outcomes into external circumstances that can cause them and experience needs in these areas (e.g. lack of company and/or daytime activities, and dissatisfaction about the accommodation).

Although personality problems are associated with the presence of unmet needs in younger psychiatric patients (Hayward et al., 2006; Seekles et al., 2012), in our sample hardly any association between personality traits and unmet care needs was found. In the multivariate model, only uncertain behavior was associated with unmet care needs pointing to more uncertain behavior resulting in less unmet care needs. Several explanations can be put forward for this counterintuitive finding. Firstly, inpatient care is specifically suitable for meeting the needs of patients with dependent personality styles because of provision of a safe environment and the continued presence of trusted carers (Renkema et al., 2008). Secondly, maladaptive personality traits primarily result in interpersonal dysfunctioning, which put a significant burden on their relationship with family and close friends. In long-term care facilities, new relationships can be build. Especially professional carers (primarily nurses) may be much better in containing this behavior as well as correcting deviant behavior more empathically and consistently. Finally, the association between personality traits and care needs may partially be masked by the presence of multimorbidity as the HAP measures premorbid personality traits. For example, premorbid rigid or perfectionistic personality traits can be masked by impulsivity due to frontal brain damage and premorbid impulsive or disorderly behavior can be masked by apathy due to physical multimorbidity. Although this latter explanation is less likely (in view of our multivariate analyses), it can only be fully rejected in much larger studies powered for testing multiple interaction effects.

4.1. Strengths and limitations

Since the interviews were conducted by two elderly-care physicians who were familiar with this resident group and their professional carers, the data are of high quality and there were few missing data. Care needs were assessed both from the residents' and nursing staff's perspective. Residents generally spoke candidly about their views on needs, since the interviewers had no professional relationship with them nor with nursing staff members.

However, some limitations must be mentioned. First, the cross-sectional design limits causal interpretation. Second, as the CANE has been developed for geriatric psychiatry, not all items are equally applicable for the nursing home setting, e.g. benefits. Moreover, some showed floor- or ceiling effects, e.g. caring for another or household

activities. Finally, albeit our sample is likely to be representative for residents with mental-physical multimorbidity admitted to Dutch nursing homes, the sample size is modest and representativeness for other countries remains unknown. Nonetheless, our data provide important new insights on the met and unmet care needs of nursing home residents with mental-physical multimorbidity.

4.2. Conclusion and recommendations

Systematic assessment of care needs showed differences between the perspectives of resident and nursing staff. These differences should not be the subject of a discussion on who knows what is best for the resident. They are all valuable for individualized care. Nursing staff must be aware of these different perspectives, which should be the starting point of the dialogue between resident and nursing staff about needs, wishes and expectations regarding care. In order to draw up an individually tailored care plan, based on a well-conducted dialogue, nurses with effective communication and negotiation skills are indispensable. The gap between residents' and nurses' views on needs must be interpreted in daily practice and bridged appropriately. Therefore, the nursing staff should have a broad knowledge of medical and psychiatric conditions and their mutual influence and should be able to apply this knowledge in their work. In order to discuss and implement interventions that are acceptable to both the resident and the caregivers, the nursing staff must show leadership and coaching skills, such as skills to collaborate, to ensure shared decision making and to empower others. We recommend strengthening the nursing staff in long-term care facilities by regularly training these skills.

Additionally, we recommend systematic screening for depression and anxiety, since these may be critical factors in the process of reducing unmet needs. Nevertheless, the relationship may have another direction, which brings us to another recommendation, namely that future studies on determinants of (un)met care needs should be conducted with longitudinal designs. Longitudinal data are necessary to clarify the causality and direction of the association between various variables and (un)met needs.

Finally, our study has shown that the CANE was feasible for use in a research setting as a needs assessment tool that can yield important new information. However, we recommend the development of a nursing home version of the CANE that is useful in the systematic assessment of needs in elderly nursing home residents in daily practice.

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Conflict of interest

The authors declare no conflict of interest.

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