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Personality assessment in nursing home residents with mental and physical multimorbidity: two informant perspectives

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ABSTRACT

Objectives: In older patients with mental and physical multimorbidity (MPM), personality assessment is highly complex. Our aim was to examine personality traits in this population using the Hetero-Anamnestic Personality questionnaire (HAP), and to compare the premorbid perspective of patients' relatives (HAP) with the present-time perspective of nursing staff (HAP-t).

Design: Cross-sectional.

Setting: Dutch gerontopsychiatric nursing home (GP-NH) units.

Participants: Totally, 142 GP-NH residents with MPM (excluding dementia).

Measurements: NH norm data of the HAP were used to identify clinically relevant premorbid traits. Linear mixed models estimated the differences between HAP and HAP-t trait scores (0–10). Agreement was quantified by intraclass correlation coefficients (ICCs). All HAP-HAP-t analyses were corrected for response tendency (RT) scores (− 10–10).

Results: 78.4% of the patients had at least one premorbid maladaptive trait, and 62.2% had two or more. Most prevalent were: "disorderly" (30.3%), "unpredictable/impulsive" (29.1%) and "vulnerable" (27.3%) behavior. The RT of relatives appeared significantly more positive than that of nursing staff (+ 1.8, 95% CI 0.6–2.9, $p = 0.002$). After RT correction, the traits "vulnerable", "perfectionist" and "unpredictable/impulsive" behavior scored higher on the HAP than HAP-t (respectively + 1.2, 95% CI 0.6–1.7, $p < 0.001$; + 2.1, 95% CI 1.3–2.8, $p < 0.001$; + 0.6, 95% CI 0.1–1.1, $p = 0.013$), while "rigid" behavior scored lower (− 0.7, 95% CI − 1.3 to − 0.03, $p = 0.042$). Adjusted ICCs ranged from 0.15 to 0.58.

Conclusions: Our study shows high percentages of premorbid maladaptive personality traits, which calls for attention on personality assessment in MPM NH residents. Results also indicate that the HAP and HAP-t questionnaires should not be used interchangeably for this patient group in clinical practice.

Key words: personality assessment, personality traits, mental-physical multimorbidity, geriatric psychiatry, nursing home, long-term care

Introduction

Personality disorders (PDs) in older adults are highly relevant and require attention in both research and care (Penders *et al.*, 2020). Also at an advanced age, personality pathology is associated with impaired social functioning (Romirowsky *et al.*, 2021), poorer treatment outcomes of other physical and psychiatric disorders (Morse *et al.*, 2005; Stek *et al.*, 2002; Stevenson *et al.*, 2011; Veerbeek *et al.*, 2014) and lower perceived quality of life (Botter *et al.*, 2021; Condello *et al.*, 2003). Meanwhile, there are still potential treatment options, as first results show

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feasibility and positive effects of (mediative) cognitive behavioral therapies on PDs in older patients (Botter *et al.*, 2022; Ekiz *et al.*, 2022; Penders *et al.*, 2020).

One of the major challenges is the diagnostic complexity of PDs in later life. It is known that the current Diagnostic and Statistical Manual of Mental Disorders (DSM-V) (American Psychiatric Association, 2013) aims at a younger social and occupational context, containing several PD criteria that lack validity in older age groups (Balsis *et al.*, 2007; van Alphen *et al.*, 2014). This may be one of the reasons for lower PD prevalence rates in older adults, with potential underdiagnosis (Balsis *et al.*, 2007). Diagnosing PDs at a higher age is even more complex in the (co)existence of cognitive deficits, other psychiatric diseases, physical conditions or polypharmacy, as its symptoms and consequences can be difficult to differentiate (Mordekar and Spence, 2008; van Alphen *et al.*, 2018). Cognitive and communicative impairments could also bias self-report (Eleveld *et al.*, 2019; Knauper *et al.*, 2016), in addition to the age-unrelated factors that are associated with personality pathology (e.g., limited self-awareness, distorted self-perceptions or reluctance to disclose problems) (Ganellen, 2007).

These diagnostic issues are eminently present in the long-term care (LTC) setting, concerning older patients with mental and physical multimorbidity (MPM) (Gibson and Ferrini, 2012). Data on PDs in this growing patient group are scarce (Penders *et al.*, 2020; van den Brink *et al.*, 2013). However, it is known that LTC (nursing) staff experiences PD-associated behavior as particularly challenging (Collet *et al.*, 2019; Gibson and Ferrini, 2012). Also, two independent Dutch studies suggest a high prevalence of (probable) PD comorbidity in MPM LTC patients, both of 44% (Collet *et al.*, 2018; van den Brink *et al.*, 2017). These findings were not further specified into PD types, when and how the diagnoses were established or how they evolved over time.

The Dutch Hetero-Anamnestic Personality questionnaire (HAP) was specifically developed for personality assessment in older adults, including LTC residents. The HAP is completed by relatives to avoid self-report difficulties, based on age-neutral items, and focused on *premorbid* personality traits to prevent bias from comorbidities (Barendse *et al.*, 2014; Barendse *et al.*, 2013). Complementary, a "present time" version (HAP-t) was developed, which can be filled out by healthcare professionals of LTC facilities to assess *current* personality traits (Barendse and Thissen, 2019). To date, knowledge on how these two perspectives interrelate is limited. Understanding this relationship seems especially relevant in case of MPM complexity, which would enhance the applicability and interpretation of both questionnaires in clinical practice.

In this study, we used the HAP to gain more insight into the premorbid personality traits of LTC residents with MPM. Secondly, we studied agreement between the informant perspectives of patients' relatives and nursing staff, i.e., between the HAP and HAP-t. Third, we explored age, sex, somatic and psychiatric diseases and cognitive impairments as potential determinants of the extent to which HAP and HAP-t scores differ.

Methods

We used the cross-sectional data from the MAPPING study, that assessed MPM residents of Dutch gerontopsychiatric (GP) nursing home (NH) units (van den Brink *et al.*, 2017).

Participants

Participants of the MAPPING study were recruited from seventeen NHs with a GP care unit in different parts of the Netherlands. Eligibility of the patients was assessed by their elderly care physician (Koopmans *et al.*, 2010) and residents were included if 1) they needed both physical and psychiatric care, also shown in their medical history and 2) psychiatric or behavioral problems were present for at least two years, without the prospect of substantial recovery. The following exclusion criteria were applied: 1) an established diagnosis of dementia, 2) inability or decline to give informed consent, and 3) too severe physical or mental illness for reliable data collection (van den Brink, 2019).

Data collection

The MAPPING data were collected between April 2012 and September 2015, by means of chart reviews, (brief) neuropsychological testing, and structured interviews and questionnaires of both patients, their relatives and their nursing staff. Data collection was partly longitudinal; a prospective cohort study including patients who were newly admitted, performing baseline measurements (6–10 weeks after admission) (T0) and a follow-up assessment after six months (T1). In addition, cross-sectional data were collected of patients who had been residing on the GP-NH unit for at least six months (Tc). This led to the inclusion of 142 MPM patients (63 longitudinal, 79 cross-sectional) (van den Brink, 2019). For our study, we only used the T1 data of the double assessments, ruling out confounding by admission distress.

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Personality assessment

Personality traits were assessed with the HAP, which was filled out by a close relative of the participants (when available). It provides the instruction to consider the patient's life span before significant illness arose, including mental illness and brain damage. This questionnaire has been validated as a screening instrument for PDs in older adults, with available norm scores for old-age psychiatric patients as well as NH residents (including dementia and somatic patients). Its psychometric properties have shown to be sufficient, with adequate inter-item correlations, inter-rater and test-retest reliability, and demonstrated construct, concurrent and criterion validity (Barendse *et al.*, 2013; Barendse and Thissen, 2006). The HAP consists of 62 questions, that can be answered with "yes", "more or less" or "no". These items comprise ten different personality traits, derivative of the DSM and Millon PD criteria (Millon, 1985), namely: socially avoidant (SOC), uncertain (UNC), socially vulnerable (VUL), somatization (SOM), disorderly (DIS), rigid (RIG), perfectionist (PERF), antagonistic (ANT), self-satisfied (SELF) and unpredictable and impulsive (UNP) behavior. A positive (POS) and negative (NEG) response tendency scale were constructed to correct for possible confounding of sympathy or antipathy feelings in the respondent–patient relationship. Each question scores 0, 1 or 2 points, depending on the level of trait confirmation. The number of items per scale differs from 4 to 9, leading to maximum scale scores ranging from 8 to 18 (Barendse and Thissen, 2006).

Furthermore, the HAP-t version of the questionnaire was applied, based on behavioral observations of the last six months by a member of the participant's nursing staff. This questionnaire contains the same items and outcomes as the HAP, but its questions are formulated in the present instead of past tense, with minor adjustments for the NH setting (e.g., "tasks" instead of "work") (Barendse and Thissen, 2019). Both personality questionnaires were administered once, the HAP at T0 and HAP-t at T1 in the longitudinal cohort.

Secondary outcome measures

Additional measurements were used to explore potential determinants of HAP-HAP-t outcome differences. Age, sex and the medical history were extracted from patients' medical records. Psychiatric and chronic physical disorders were listed as International Statistical Classification of Diseases and Related Health Problems (ICD-10) codes (van den Brink, 2019). Current psychiatric disorders were assessed in semi-structured patient interviews, by means of a validated shorter version of the Schedules for Clinical Assessment in Neuropsychiatry (mini-SCAN) (Nienhuis *et al.*, 2010). We used the data on whether the DSM criteria were met for mood, anxiety, psychotic and substance abuse disorders. Patients' cognitive status was tested using the Standardized Mini Mental State Examination (S-MMSE) and Frontal Assessment Battery (FAB). The S-MMSE (standardized with more specific instructions) scores correct responses on 11 small cognitive tests, from 0 to 30 points, with a total score ≤ 23 indicating cognitive deficits (Molloy *et al.*, 1991). The FAB consists of 6 subtests, exploring frontal executive functioning, with a total score ranging from 0 to 18 and scores ≤ 12 pointing at frontal impairment (Dubois *et al.*, 2000; Slachevsky *et al.*, 2004).

Procedure

All data of the MAPPING study were collected by two experienced elderly care physicians, who were well trained in performing the assessments. Questionnaires and tests were conducted in face-to-face interviews with patients and the nursing staff. The HAP was sent by post to the patient's relative, after patients gave their informed consent. After two and four weeks, relatives were contacted by phone as a reminder and telephonic participation was offered (van den Brink, 2019).

Data analysis

The MPM sample was characterized using descriptive statistics. Differences between patients with a completed and a missing HAP were tested using independent t-tests (or Mann–Whitney *U* test in case of non-normality) and chi-square tests (or Fisher's exact when expected cell counts were <5) on, respectively, continuous and categorical data.

For the HAP and HAP-t outcomes, *relative scores* were calculated ((scale score/maximum scale score) *10) to facilitate interpretability and intercomparability of the different traits. Missing scale items, with a maximum of 2/9 (22%), were corrected by imputing the individual mean of the answered scale items (Barendse and Thissen, 2006). *Corrected scale scores* of the HAP, adjusted for POS and NEG according to the correction formulas in the questionnaire manual, were interpreted against the available NH norm scores (of somatic and psychogeriatric residents combined). This resulted in six benchmark categories (low to very high), with "high" and "very high" (>85th percentile) indicating clinically relevant maladaptive traits (Barendse and Thissen, 2006).

Pairwise differences between HAP and HAP-t scores were visualized in Bland and Altman

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(BA)-plots (y = HAP minus HAP-t, x = mean of HAP and HAP-t), with display of the mean difference and its 95% limits of agreement (LoA) (±1.96*standard deviation), with 95% confidence intervals (CIs). Next to a sense of agreement, this allows for identification of proportional bias and outliers (Bland and Altman, 1986; Giavarina, 2015).

Linear mixed models (LMMs) were used to estimate mean differences between HAP and HAP-t. Log-likelihood ratio tests compared the goodness-of-fit of different models, with maximum likelihood estimations. For parameter estimates, the restricted maximum likelihood (REML) method was used (Snijders and Bosker, 2011). The LMM regression coefficients reflect an estimation of the mean HAP-HAP-t gap (Δ). Intraclass correlation coefficients (ICCs) were calculated as a measure of HAP-HAP-t agreement, with the formula $\sigma^2_\alpha/(\sigma^2_\alpha + \sigma^2_\varepsilon)$; σ^2_α representing the between-subject and σ^2_ε the within-subject variance. Applying LMM for ICC estimates allowed us to adjust for covariates (Nakagawa and Schielzeth, 2010; Pleil *et al.*, 2018).

First, for each personality trait, a basic model was designed: with the type of questionnaire nested in patients. HAP-t was assigned as reference category. Random slopes were added and tested on model improvement, with different covariance structures (Snijders and Bosker, 2011). Since missing data may be *not missing at random*, a dummy variable for a missing questionnaire was created at the patient level, and added as fixed effect to the LMM (model 1) (Bennett, 2001; Son *et al.*, 2012).

Second, we extended the models by taking possible differences in response tendency (RT) between patients' relatives (HAP) and professional caregivers (HAP-t) into account. For both questionnaires, RT was calculated as: POS − NEG, potentially ranging from −10 to +10 (Barendse and Thissen, 2019). Next, RT was group-mean-centered: computed as the deviation of the mean of both RTs (for HAP and HAP-t) in each patient. This transformed RT was added as fixed effect to model 1, correcting the HAP-HAP-t outcome differences for *within*-patient RT differences (model 2) (Bell *et al.*, 2018).

Third, we explored the influence of potential moderating variables on the HAP-HAP-t gap, including age, sex, number of somatic and psychiatric diagnoses in the medical history, and current psychiatric diagnoses (mini-SCAN) and cognitive status (MMSE, FAB). The effect of each potential determinant was analyzed in separate models. The covariables and their interaction with the type of questionnaire were added as fixed effects to model 2 (corrected for the missing data pattern and RT). In case of a significant effect of the missing pattern in model 1, this dummy variable was also added in an interaction term with the potential moderator (Son *et al.*, 2012). For each determinant, the variance explained *on the questionnaire level* (between HAP and HAP-t), i.e., the proportion change in variance (PCV), was determined by comparing the estimated within-subject variance (σ^2_ε) to that of model 2 ($\sigma^2_{\varepsilon 2} - \sigma^2_{\varepsilon 3})/\sigma^2_{\varepsilon 2}$) (Nakagawa and Schielzeth, 2013).

P-values <0.05 were considered significant. HAP-HAP-t differences >1.4 were defined as clinically relevant, being below average consensus (corrected for RT) (Barendse and Thissen, 2019). Post hoc analysis showed that our sample size was sufficient for all traits, with a power of 0.85–0.95 ($\alpha = 0.05$), to identify this 1.4 difference. ICC values <0.5 were indicated as poor, 0.5–0.75 as moderate, 0.75–0.9 as good, and >0.90 as excellent agreement (Koo and Li, 2016). All statistical analyses were performed using SPSS 27.0 software.

Ethical considerations

Data collection of the MAPPING study was approved by the Medical Research Ethics Committee Arnhem-Nijmegen, which also declared that it did not fall within the remit of the Medical Research Involving Human Subjects Act. The database was re-used in a pseudonymized version, without access to patients' personal information. All of this was covered by participant informed consent.

Results

Patient characteristics

Of the 142 participants, the HAP was completed by a close relative in 111 patients (78.2%) and the HAP-t by a nursing staff member for all patients (100%). Patient characteristics are presented in Table 1, including the comparison of cases with and without a filled out HAP. These groups did not significantly differ in demographic and MPM features. However, patients with a missing HAP were slightly younger, less educated and more frequently unmarried. Clinically, this group had more (previous and current) PDs and other psychiatric diagnoses and showed little less cognitive impairments. Overall, 62 patients (43.7%) already had a PD diagnosis in their medical history, and for 48 patients (33.8%) this was the primary reason for NH admission.

HAP personality profiles

Table 2 shows the results on the ten different personality traits of the HAP. Based on the mean relative scores, the highest scoring traits were: "rigid" (5.64), "perfectionist" (5.13) and "vulnerable" (4.98) behavior. Meanwhile, the most prevalent

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Table 1. Demographic and clinical characteristics: comparing participants with a completed versus a missing HAP questionnaire

		HAP						
		PRESENT ($N = 111$)		MISSING ($N = 31$)		*P*-VALUE	TOTAL ($N = 142$)	
Age (Mean, SD)		70.55	12.02	67.65	9.21	0.215[1]	69.92	11.50
Sex	Male	48	43.2%	14	45.2%	0.849[2]	62	43.7%
(*N*, %)	Female	63	56.8%	17	54.8%		80	56.3%
Level of education[a]	Low	35	32.1%	13	41.9%	0.624[4]	48	34.3%
(*N*, %)	Medium	60	55.0%	15	48.4%		75	53.6%
	High	14	12.8%	3	9.7%		17	12.1%
Marital status	Married	19	17.1%	3	9.7%	0.407[4]	22	15.5%
(*N*, %)	Single	92	82.9%	28	90.3%		120	84.5%
Primary reason for admission	Organic mental disorder	31	27.9%	6	19.4%	0.452[2]	37	26.1%
(*N*, %)	Personality disorder	35	31.5%	13	41.9%		48	33.8%
	Other psychiatric disorder	45	40.5%	12	38.7%		57	40.1%
Number of chronic somatic diagnoses in medical history (mean, SD)		7.31	2.99	7.42	3.04	0.853[1]	7.33	2.99
Number of psychiatric axis I diagnoses in medical history (mean, SD)		1.26	0.91	1.61	0.76	0.052[1]	1.34	0.89
Diagnosis of personality disorder in medical history (*N*, %)		46	41.4%	16	51.6%	0.313[2]	62	43.7%
Number of current psychiatric axis I diagnoses (mini-SCAN) (mean, SD)		0.99	0.83	1.23	0.96	0.179[1]	1.04	0.86
Neuropsychiatric symptoms (NPI-NH total score) (mean, SD)		28.14	16.28	27.39	16.15	0.819[1]	27.98	16.20
Cognitive status (S-MMSE total score)[b] (mean, SD)		22.74	5.14	23.61	4.06	0.607[3]	22.92	4.94
Frontal impairment (FAB total score)[c] (mean, SD)		9.44	4.46	10.57	4.22	0.229[1]	9.67	4.42

Note: N = number, SD = standard deviation, mini-SCAN (shorter version of the Schedules for Clinical Assessment in Neuropsychiatry); NPI-NH (Neuropsychiatric Inventory Nursing Home version, 0–144); S-MMSE (Standardized Mini Mental State Examination, 0–30); FAB (Frontal Assessment Battery, 0–18); a) missing data: $n = 2$ (1.4%) in "present" group; b) missing data: $n = 5$ (3.5%), 3 in "missing" group; c) missing data: $n = 7$ (4.9%), 3 in "missing" group; 1) independent *t*-test (2-tailed); 2) chi-square test; 3) Mann–Whitney *U* test; 4) Fisher's exact test.

maladaptive traits (norm-referenced as "high" or "very high") were: "disorderly" (30.3%), "unpredictable/impulsive" (29.1%) and "vulnerable" (27.3%) behavior (Figure 1). The proportion of patients with at least one maladaptive trait was 78.4% (87/111). In 62.2% of the patients (69/111), two or more maladaptive traits were seen. The number of maladaptive traits per patient had a median of 2, with an interquartile range of 1–4.

Of the patients with a PD diagnosis in their medical history, 82.6% (38/46) had at least one maladaptive trait on the HAP versus 75.4% (49/65) of the patients without a previous diagnosis ($p = 0.362$). Of the patients with and without a PD as primary reason for admission, the HAP showed one or more maladaptive traits in 88.6% (31/35) and 73.7% (56/76) ($p = 0.077$), respectively.

Plotted differences of HAP and HAP-t

The BA-plots of the paired HAP and HAP-t results ($n = 111$) show similar graphics for all ten personality traits: a "rhombus shape", with relatively flat regression lines close to the mean difference (little proportional bias) and few outliers. However, the identified differences and their limits of agreement are substantially scattered, indicating little absolute agreement or consistency between the two questionnaires. The width of the 95% LoA ranged from 12.16 to 16.12 points. Figure 2 shows the BA-plots of the personality traits with the largest (PERF) and smallest (UNC) mean difference of 2.18 and 0.25 points, respectively, with −5.36 to 9.73 and −5.83 to 6.33 as 95% LoA.

Mean differences and agreement of HAP and HAP-t

The LMM results are shown in Table 3. Adding random slopes did not significantly improve the models, therefore only random intercepts were used.

The RT of close relatives (HAP) was on average positive (mean +1.72, SD 4.69), where the RT of professional caregivers (HAP-t) was slightly negative (mean −0.06, SD 4.50). This difference appeared

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Table 2. HAP results: trait scores and frequencies of maladaptive traits

	RAW SCORES		RELATIVE SCORES (RANGE 0–10)		NORM-REFERENCED "HIGH" OR "VERY HIGH"	
PERSONALITY TRAIT	MEAN	N SCALE ITEMS	MEAN	SD	N/N TOTAL	%
Socially avoidant behavior	4.04	5	4.04	3.21	25/110	22.7
Uncertain behavior	3.67	5	3.67	2.97	27/110	24.5
Vulnerability in interpersonal relationships	5.97	6	4.98	2.86	30/110	27.3
Somatizing behavior	2.59	4	3.23	3.31	24/109	22.0
Disorderly behavior	2.75	4	3.44	3.36	33/109	30.3
Rigid behavior	4.51	4	5.64	2.70	21/110	19.1
Perfectionist behavior	4.10	4	5.13	2.84	15/107	14.0
Antagonistic behavior	8.21	9	4.56	2.87	23/110	20.9
Self-satisfied behavior	3.67	5	3.67	3.12	28/110	25.5
Unpredictable and impulsive behavior	5.32	6	4.44	3.08	32/110	29.1

Note: N = number; SD = standard deviation; relative score = ((raw scale score/maximum scale score)*10), maximum scale score = number of scale items*2; norm-referenced = compared to norm scores of somatic and psychogeriatric nursing home patients, as provided by the HAP questionnaire manual; "high" or "very high" = percentile score >85th.

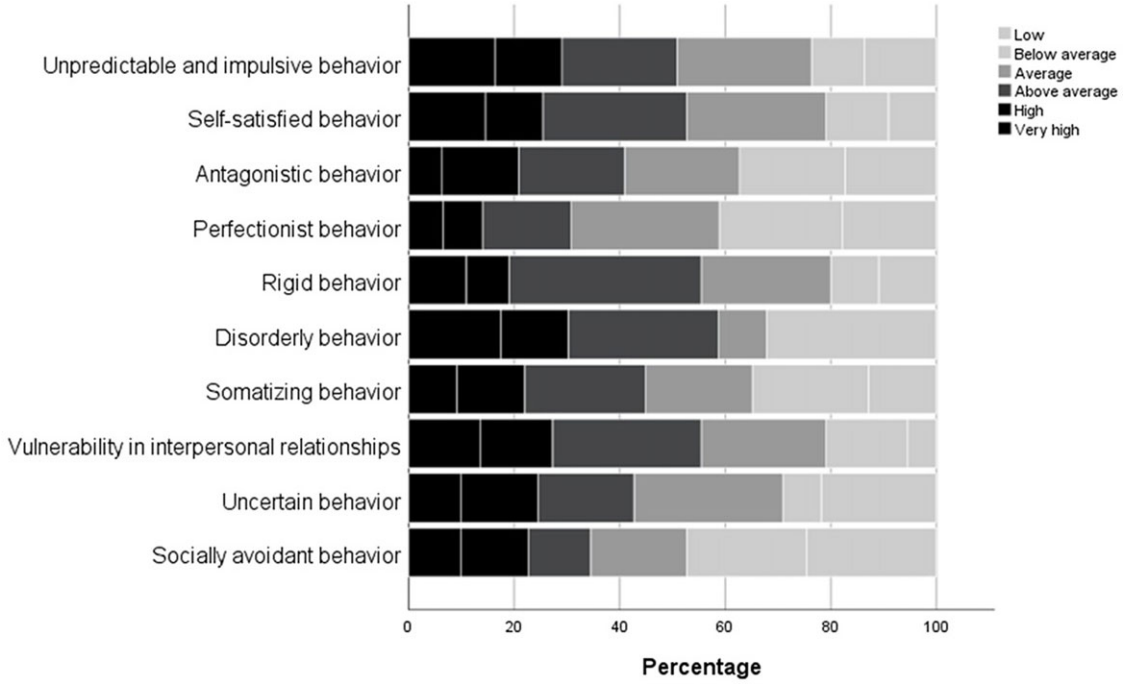

Figure 1. Stacked histogram: norm referenced HAP results.
Note: norm referenced = compared to norm scores of somatic and psychogeriatric nursing home residents, as provided by the HAP questionnaire manual; "very high" = percentile score ≥ 96th; "high" = percentile score 86th–95th; "above average" = percentile score 66th–85th; "average" = percentile score 36th–65th; "below average" = percentile score 16th–35th; "low" = percentile score ≤ 15th.

statistically significant (95% CI 0.63–2.86, $p = 0.002$). Correction for the within-patient RT differences (model 2) led to a significant change of outcomes and better model fit in nine out of ten personality traits (excluding "perfectionist" behavior). These models showed higher scores of the HAP compared to the HAP-t for "vulnerable" (+1.19, $p < 0.001$), "perfectionist" (+2.07, $p < 0.001$) and "unpredictable/impulsive" (+0.63, $p = 0.013$) behavior. Lower HAP than HAP-t scores were shown for "rigid" behavior (−0.67, $p = 0.042$). For the other six personality traits, no significant differences between HAP and HAP-t were found. Correction for RT differences improved the HAP-HAP-t

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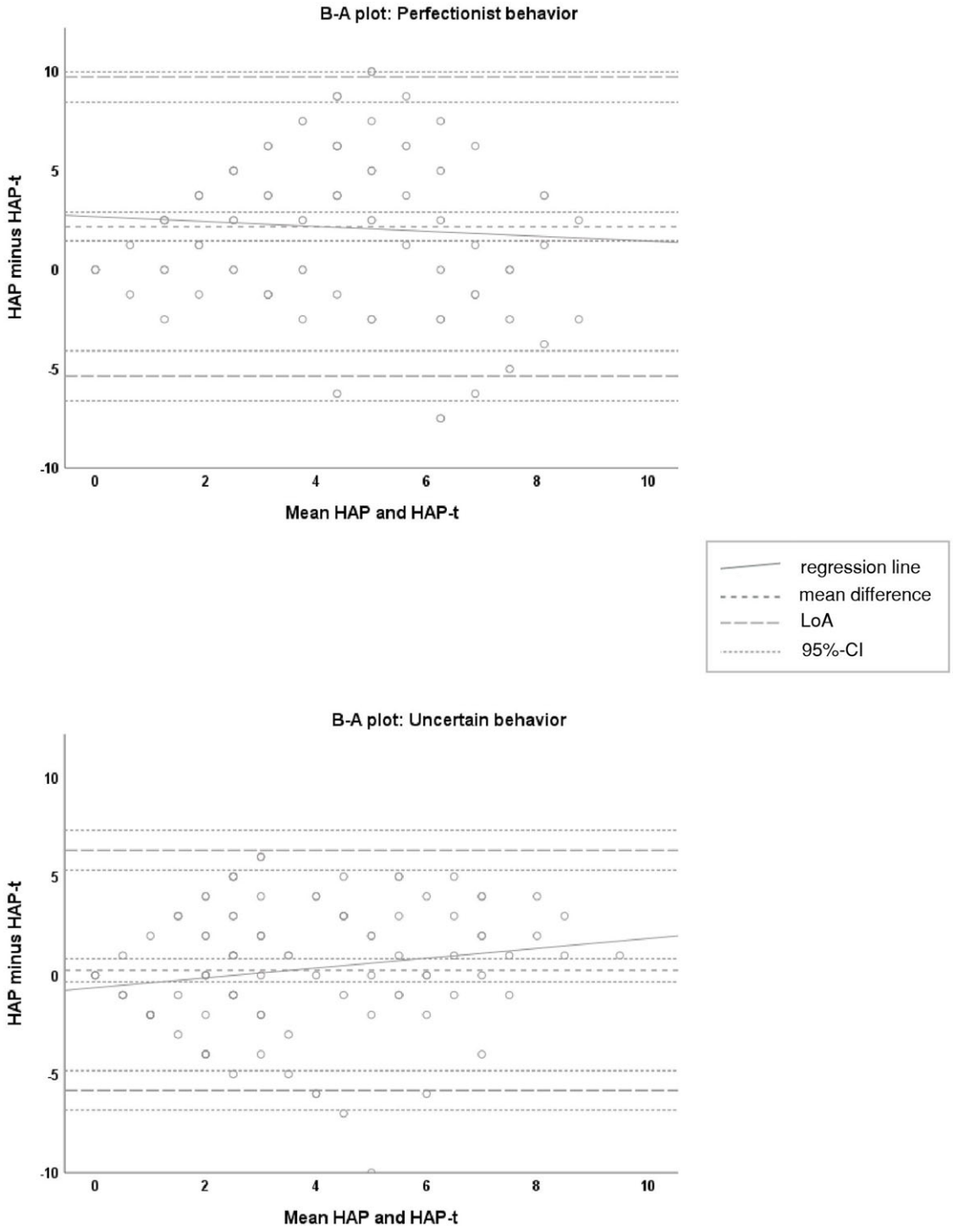

Figure 2. Bland and Altman plots: HAP-HAP-t differences for PERF and UNC.
Note: relative scores (0–10); $x = (\text{HAP} + \text{HAP-t})/2$, $y = \text{HAP} - \text{HAP-t}$; LoA (limits of agreement) = mean difference ± (1.96*standard deviation); 95% CI (95% confidence intervals) = ± (standard error*t value for degrees of freedom).

agreement, with ICCs ranging from 0.12 to 0.41 in model 1, versus 0.15 to 0.58 in model 2.

Moderating variables

Age was only significantly associated with the HAP-HAP-t gap of "socially avoidant" behavior ($b = 0.05$, 95% CI 0.00 – 0.10), while sex showed no association for any of the ten personality traits. The number of somatic diagnoses was associated with the gaps of "socially avoidant" and "uncertain" behavior, with $b = 0.22$ (95% CI 0.03 – 0.42) and $b = 0.23$ (95% CI 0.04 – 0.42), respectively. The number of psychiatric diagnoses was not associated with the HAP-HAP-t gap for any of the personality

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Table 3. Linear mixed model results: estimated differences and ICCs of HAP and HAP-t traits

	MODEL 1				MODEL 2 CORRECTED FOR RT			
PERSONALITY TRAIT	ESTIMATED Δ HAP-HAP-T	95% CI	*P*-VALUE	ICC	ESTIMATED Δ HAP-HAP-T	95% CI	*P*-VALUE	ICC
SOC	−1.11	−1.88 to −0.33	**0.005***	0.12	−0.41	−1.05 to 0.24	0.216	0.35
UNC	0.25	−0.35 to 0.84	0.414	0.38	0.43	−0.18 to 1.04	0.167	0.39
VUL	0.54	−0.14 to 1.22	0.117	0.25	1.19	0.64 to 1.74	**<0.001***	0.48
SOM	−0.24	−0.95 to 0.47	0.500	0.40	0.06	−0.66 to 0.77	0.875	0.43
DIS	−0.64	−1.34 to 0.05	0.069	0.40	−0.27	−0.94 to 0.41	0.440	0.45
RIG	−1.02	−1.69 to −0.36	**0.003***	0.24	−0.67	−1.32 to −0.03	**0.042***	0.31
PERF	2.17	1.44 to 2.90	**<0.001***	0.15	2.07	1.31 to 2.83	**<0.001***	0.15
ANT	−0.61	−1.28 to 0.06	0.073	0.24	0.10	−0.37 to 0.58	0.664	0.57
SELF	−0.16	−0.81 to 0.49	0.620	0.41	0.33	−0.26 to 0.92	0.273	0.52
UNP	−0.10	−0.80 to 0.60	0.782	0.24	0.63	0.14 to 1.13	**0.013***	0.58

Note: using restricted maximum likelihood, model 1 = random intercept, with a missing-HAP dummy, model 2 = model 1 + group-mean-centered response tendency.
Δ = estimated gap between HAP and HAP-t relative scores (0–10), with HAP-t as a reference; 95% CI = 95% confidence interval; *P*-value: for the difference between HAP and HAP-t; *significant difference, *p*-value <0.05; ICC = intraclass correlation coefficient, calculated with the variance estimate outcomes.
RT (response tendency) = positive – negative scale score (−10 – 10); SOC (socially avoidant); UNC (uncertain); VUL (vulnerable); SOM (somatizing); DIS (disorderly); RIG (rigid); PERF (perfectionist); ANT (antagonistic); SELF (self-satisfied); UNP (unpredictable and impulsive).

traits, neither when based on the medical history nor when assessed with the mini-SCAN. Nonetheless, examining specific current psychiatric diagnoses (mini-SCAN) showed associations of mood disorders with the gap for "antagonistic" behavior ($b = -0.92$, 95% CI −1.82 to −0.02), anxiety disorders with the gap for "unpredictable" behavior ($b = 1.21$, 95% CI 0.09–2.32) and substance abuse with the gap for "disorderly" behavior ($b = -3.73$, 95% CI −6.69 to −0.76). Cognitive performance was associated with the HAP-HAP-t gap for "perfectionist" behavior (MMSE: $b = -0.17$, 95% CI −0.31 to −0.04; FAB: $b = -0.21$, 95% CI −0.36 to −0.05). The MMSE score was also a determinant of the gap for "disorderly" behavior ($b = 0.13$, 95% CI 0.01–0.25). These significant moderating effects individually explained 1.8% to 9.8% of the variance between HAP and HAP-t (PCV), with the largest effect of cognitive impairments on the "perfectionist" gap. All results can be viewed in Table S1, published as supplementary material (online attached to the electronic version of this paper at https://www.cambridge.org/core/journals/international-psychogeriatrics).

Discussion

This study aimed to examine maladaptive personality traits – and the informant perspectives of close relatives and nursing staff – in MPM NH residents, using the HAP and HAP-t questionnaire.

Results showed that almost four in five patients had a premorbid maladaptive personality trait, with a vast majority having two or more, according to ratings of close relatives. This indicates that the prevalence of personality pathology in MPM NH residents is (very) high. When comparing the HAP and HAP-t questionnaires, it was found that patients' relatives tended to answer the questions more positively than members of the nursing staff. Accounting for this different rating tendency, the traits of "vulnerable", "perfectionist" and "unpredictable/impulsive" behavior scored higher on the HAP (premorbid), while "rigid" behavior scored higher on the HAP-t (present). Nonetheless, only "perfectionist" behavior showed a difference that could be considered clinically relevant, which was partly explained by cognitive decline. While these mean differences between HAP and HAP-t can be seen as minor, BA-plots showed substantial paired differences for all traits. This was confirmed by ICCs that were poor to moderate at best, even after RT correction. These findings imply little agreement of the two questionnaires within individuals. Overall, age, sex and physical and mental comorbidities appeared to minimally explain the HAP-HAP-t differences.

Interpretation

First, our HAP results showed that the highest trait scores were not equivalent to those with the highest norm-referenced labels. This underlines the importance of looking at behavior in a sociocultural

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context, as stated in the DSM PD criteria (American Psychiatric Association, 2013). In this light, our results can be interpreted as high rates of maladaptive personality traits in the history of GP-NH patients *in comparison to* NH patients on a somatic or psychogeriatric ward. The HAP provides no benchmark data of "healthy" controls (Barendse and Thissen, 2006). Since it could be argued that NH patients in general have more personality pathology than community-dwelling older adults (i.e., impaired social functioning increases the risk of LTC admission) (Jamieson *et al.*, 2019), our results might even be an underestimation relative to the age-matched general population. This would be in line with previous meta-analyses (Friborg *et al.*, 2014; Friborg *et al.*, 2013), showing that PDs are much more common in patients with other psychiatric diseases (mood and anxiety disorders) compared to the overall population.

Meanwhile, the risk of underdiagnosis of PDs in older patients seems to be reflected in our results, with 78% having (a) HAP maladaptive trait(s) versus 44% with a reported PD in their medical history, and no significantly less maladaptive traits in patients without a previous diagnosis. It should, however, be mentioned that the HAP is developed as a screening instrument. It does not establish a PD diagnosis, but only gives an indication, interpreting the whole 10-trait profile (Barendse and Thissen, 2006). The frequency of full-criteria PDs is therefore likely to be lower than that of maladaptive traits. Nevertheless, only 16% of the patients had one maladaptive trait, while 62% had two or more, which remains highly aberrant. Also, a HAP maladaptive trait is considered clinically relevant in itself (Barendse and Thissen, 2006), and accounting for traits and "subthreshold" PDs in older patients is recommended in literature (Botter *et al.*, 2021; Oltmanns and Balsis, 2011).

Another interesting finding was the generally more positive rating tendency of close relatives compared to nursing staff. To our knowledge, our study is the first to compare those two perspectives. The tendency of informants to rate personality in an overly positive, socially desirable manner has been described before. This mostly concerned family and friends, who – like in our study – were appointed or approved by the subjects themselves, creating a selection bias known as the "letter of recommendation" effect (Leising *et al.*, 2010). Our results suggest that this is less applicable to ratings of professional caregivers. The level of relationship intimacy might play a role in this. Previous research indicates that a more intimate relationship (i.e., partnership) leads to a higher concordance between informant- and self-ratings of personality (Eleveld *et al.*, 2019). For the HAP, no significant effect of the relationship type (e.g., spouse, child, other relative) on the inter-rater reliability was identified (Barendse and Thissen, 2019). The HAP showed ICCs of 0.67 to 0.85 for the different personality traits, and respectively 0.84 and 0.65 for POS and NEG (Barendse *et al.*, 2013). These are much higher ICCs than found in our study, suggesting that the perspectives of relatives and nurses differ much more than those of relatives amongst each other.

After RT correction, differences between HAP and HAP-t scores could be interpreted as personality changes over time. Alterations of personality in time and its stability into old age have been studied with the Five Factor-model (FFM) (Debast *et al.*, 2014). Looking at correlations between the HAP and FFM (in a NH setting) (Barendse and Thissen, 2006), conclusions in the review of Debast *et al.* show notable overlap with our results. The decrease of "vulnerable", "perfectionist" and "unpredictable/impulsive" behavior correlates with a general decrease of neuroticism with age. The increase of "rigid" behavior with a decrease in openness and extraversion. The mean HAP-HAP-t differences that we found might thus be partially explained by aging itself. This was confirmed by the relatively small effects in our moderation analyses, by which we aimed to disentangle behavioral changes due to illness from "real" personality changes in time.

Lastly, the "perfectionist" trait appeared to differ from the other traits in several ways. It showed the largest and only clinically relevant HAP-HAP-t difference, solely not being confounded by RT variation. Also, the decrease of "perfectionist" behavior in our results did not match the general increase of FFM consciousness with age (Debast *et al.*, 2014). This discrepancy seems partly explained by cognitive decline (moderating effects of MMSE and FAB) in our study population, which makes clinical sense. Additionally, we hypothesize that the "perfectionist" trait might lose criterion validity in translation of the HAP to the present time (HAP-t), since three out of four questions are related to "tasks" (Barendse and Thissen, 2019), which can be limited in a NH setting.

Strengths and limitations

Our study has several strengths, such as a thorough statistical approach. HAP and HAP-t trait scores were compared by considering means on the group-level, and by analyzing agreement *within* individuals (BA-plots, ICCs) (Watson and Petrie, 2010). Both mean differences and ICCs were corrected for the missing HAP questionnaires and RT differences between HAP and HAP-t. This makes our results

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directly translatable to clinical practice. In addition, the HAP seems a suitable questionnaire for our study population, overcoming several age-related assessment difficulties. Personality results were displayed as trait spectra (Figure 1) instead of dichotomous PD outcomes, as preferred in older populations (Penders *et al.*, 2020).

Next, some limitations of the study should be mentioned. First, we only norm-referenced the results of the HAP and not the HAP-t. We chose to focus on the premorbid traits, since chronic psychiatric diseases can bias the HAP-t interpretation (Barendse and Thissen, 2019). Furthermore, different norm populations are available for the HAP-t, not including somatic and psychogeriatric NH residents (Barendse and Thissen, 2019), making the categorized results of HAP and HAP-t not directly comparable. By solely comparing the numerical scores, it remains unclear whether the HAP-HAP-t differences that we found are adaptive ("normal") or maladaptive, in the changing context of aging, illness and NH admission. Second, the perspective of MPM patients themselves is missing. The HAP was specifically designed for LTC patients with brain damage and/or severe mental illness, for whom self-report is not considered reliable (Barendse and Thissen, 2006). Looking at the characteristics of the MAPPING participants, the choice for this informant questionnaire seems valid. Informant reporting also appears better than self-report in the assessment of externalizing personality traits and interpersonal functioning, and as a predictor of adaptability and health (Eleveld *et al.*, 2019). However, self-report better reflects intrapsychic characteristics, which form an important aspect of "personality" too. Agreement of self- and informant reports on personality (in older adults) is shown to be low to moderate, so both seem to offer unique information (Eleveld *et al.*, 2019). Third, the HAP was administered at different timepoints for the longitudinal and cross-sectional cohorts, respectively 6–10 weeks and ≥ 6 months after NH admission. Because it explores the *premorbid* situation, we consider the risk of bias to be low, i.e., the time interval to the premorbid situation is not determined by these timepoints. Recall bias might be present in all cases. Also, reviews of the premorbid situation could be biased by current behavior. The same goes for present-time reviews and awareness of the patient's history. This, however, is expected to increase HAP-HAP-t agreement, so does not explain the low ICCs in our study. The HAP-t was applied at least six months after NH admission for all patients, corresponding to the recommended minimal observation period (Barendse and Thissen, 2019). Fourth, the HAP results are not directly translatable to the presence or absence of a PD, according to the current DSM criteria. While correlations with the DSM have been studied (Barendse *et al.*, 2014; Barendse and Thissen, 2019), this creates challenges for the comparability of our results. Fifth, our moderation analyses should be considered exploratory, with relatively small sample sizes and no correction for multiple testing. Nevertheless, the significant effects that were found seem clinically reasonable, and adopting lower *p*-values would strengthen our conclusion that the tested covariates poorly explain the low ICCs.

Implications and recommendations

Our study sample consists of "gerontopsychiatric" NH residents. In the Netherlands, separate GP-NH units were created for MPM patients who need specialized care due to behavioral problems. This is part of a Dutch development of unique LTC expertise networks (Koopmans *et al.*, 2022). In addition, our study used a Dutch personality instrument. Yet, we believe that our findings have broader and international relevance, since older patients with MPM are found worldwide and, although cultural norms may differ, personality traits are more universally recognizable.

Several implications can be drawn from our results. 1) The high rates of maladaptive traits stress the need for specific attention on personality pathology in MPM NH patients. Implementation of standard personality assessments is strongly recommended in this group, to prevent underdiagnosis and undertreatment. Preferably, normative HAP(-t) results become available of an age-matched population without mental disorders. Insight into patients' maladaptive personality traits could provide guidance in dealing with behavioral problems, with a potential win-win for patients and their nursing staff (Penders *et al.*, 2020). Future studies into the effects of maladaptive personality traits on patient well-being and caregiver burden in MPM patients, and intervention effects in this regard, are required. 2) Both researchers and practitioners should be aware that relatives may have a more positive view on patients' personality than professional caregivers. Further research needs to confirm whether this is a general phenomenon in MPM NH residents, other (older) patient groups and with other personality instruments. 3) Poor agreement implies that the HAP and HAP-t should not be used interchangeably in individual patients. In our study, the HAP was missing in a considerable proportion of cases (22%). Most important reasons for this were the lack of close relatives and participant's refusal of engaging them (van den Brink *et al.*, 2018). In our experience, this is a realistic reflection of the GP

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practice. It therefore would have been convenient if the HAP-t could be used to replace or predict HAP outcomes. Based on our results, however, this does not seem valid. The HAP-t was also designed to provide unique information, complementary to the HAP (Barendse and Thissen, 2019). We looked into this from a psychometric approach. Additional research is needed to establish how (premorbid) personality traits relate to the (challenging) behavior that is observed on GP-NH wards (Collet *et al.*, 2018; van den Brink *et al.*, 2017).

Conclusion

Our study suggests a (very) high prevalence of premorbid maladaptive personality traits in MPM NH residents, which requires attention in both research and clinical practice. When using informant perspectives for personality assessment in this patient group, a more positive rating tendency of patients' relatives compared to nursing staff should be taken into account. Despite relatively small mean differences between HAP and HAP-t results, low paired agreement indicates that these questionnaires are not directly interchangeable on an individual level.

Supplementary material

The supplementary material for this article can be found at https://doi.org/10.1017/S1041610224000474.

Conflicts of interest

None.

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Description of authors' roles

A. Suntjens developed the statistical design of the study, carried out the analyses and wrote the paper. R. Leontjevas was also responsible for the statistical design and analysis, supervised the writing process, and reviewed the paper multiple times. A. van den Brink collected the original MAPPING data, supported the use and interpretation of the data, and reviewed the paper. R. Oude Voshaar, R. Koopmans, and D. Gerritsen formulated the research questions and basic study design, supervised the research process, assisted in the interpretation of the results, and reviewed the paper.

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References

American Psychiatric Association (APA) (2013). *Diagnostic and statistical manual of mental disorders*, 5th edn. American Psychiatric Association.

Balsis, S., Gleason, M. E., Woods, C. M., & Oltmanns, T. F. (2007). An item response theory analysis of DSM-IV personality disorder criteria across younger and older age groups. *Psychology and Aging*, 22(1), 171–185. https://doi.org/10.1037/0882-7974.22.1.171

Barendse, H. P., Rossi, G., & Van Alphen, S. P. (2014). Personality disorders in older adults: expert opinion as a first step toward evaluating the criterion validity of an informant questionnaire (HAP). *International Psychogeriatrics*, 26(1), 173–174. https://doi.org/10.1017/S1041610213001312

Barendse, H. P., & Thissen, A. J. (2006). *Handleiding van de Hetero-Anamnestische Persoonlijkheidsvragenlijst H.A.P.* HAP Uitgeverij Nijmegen.

Barendse, H. P., & Thissen, A. J. (2019). *Handleiding van de Hetero-Anamnestische Persoonlijkheidsvragenlijst HAP en HAP-t versie 2.0*. HAP Uitgeverij Nijmegen.

Barendse, H. P. J., Thissen, A. J. C., Rossi, G., Oei, T. I., & Van Alphen, S. P. J. (2013). Psychometric properties of an informant personality questionnaire (the HAP) in a sample of older adults in the Netherlands and Belgium. *Aging & Mental Health*, 17, 623–629. https://doi.org/10.1080/13607863.2012.756458

Bell, A., Jones, K., & Fairbrother, M. (2018). Understanding and misunderstanding group mean centering: a commentary on Kelley *et al.*'s dangerous practice. *Quality & Quantity*, 52, 2031–2036. https://doi.org/10.1007/s11135-017-0593-5

Bennett, D. A. (2001). How can I deal with missing data in my study? *Australian and New Zealand Journal of Public Health*, 25, 464–469.

Bland, J. M., & Altman, D. G. (1986). Statistical methods for assessing agreement between two methods of clinical measurement. *Lancet*, 1(8476), 307–310.

Botter, L., Gerritsen, D. L., & Oude Voshaar, R. C. (2022). Schema therapy in the nursing home setting: a case study of a cognitively impaired patient. *Clinical Case Studies*, 21, 552–570. https://doi.org/10.1177/15346501221091790

Botter, L., Ten Have, M., Gerritsen, D., de Graaf, R., van Dijk, S. D. M., van den Brink, R. H. S., Oude

Voshaar, R. C. (2021). Impact of borderline personality disorder traits on the association between age and health-related quality of life: a cohort study in the general population. *European Psychiatry*, 64(1), e33. https://doi.org/10.1192/j.eurpsy.2021.27

Collet, J., De Vugt, M. E., Ackermans, D. F. G. V., Engelen, N.J.J.A, & Schols, J. M. G. A. (2019). Experiences and needs of nursing staff caring for double care demanding patients: a qualitative study. *Journal of Gerontology & Geriatric Research*, 8(2), Article 1000501. https://doi.org/10.4172/2167-7182.1000501

Collet, J., De Vugt, M. E., Verhey, F. R. J., Engelen, N., & Schols, J. (2018). Characteristics of double care demanding patients in a mental health care setting and a nursing home setting: results from the SpeCIMeN study. *Aging & Mental Health*, 22, 33–39. https://doi.org/10.1080/13607863.2016.1202891

Condello, C., Padoani, W., Uguzzoni, U., Caon, F., & De Leo, D. (2003). Personality disorders and self-perceived quality of life in an elderly psychiatric outpatient population. *Psychopathology*, 36(2), 78–83. https://doi.org/10.1159/000070362

Debast, I., van Alphen, S. P. J(Bas), Rossi, G., Tummers, J. H. A., Bolwerk, N., Derksen, J. J. L., Rosowsky, E. (2014). Personality traits and personality disorders in late middle and old age: do they remain stable? A literature review *Clinical Gerontologist*, 37(3), 253–271. https://doi.org/10.1080/07317115.2014.885917

Dubois, B., Slachevsky, A., Litvan, I., & Pillon, B. (2000). The FAB: a frontal assessment battery at bedside. *Neurology*, 55(11), 1621–1626. https://doi.org/10.1212/wnl.55.11.1621

Ekiz, E., Videler, A. C., & Van Alphen, S. P. J. (2022). Feasibility of the cognitive model for behavioral interventions in older adults with behavioral and psychological symptoms of dementia. *Clinical Gerontologist*, 45(4), 903–914. https://doi.org/10.1080/07317115.2020.1740904

Eleveld, M., Debast, I., Rossi, G. M. P., Dierckx, E., & Van Alphen, S. P. J. (2019). [Concordance and added value of informant- versus self-report in personality assessment: a systematic review]. *Tijdschrift voor Gerontologie en Geriatrie*, 50(4), 1–11. https://doi.org/10.36613/tgg.1875-6832/2019.04.01

Friborg, O., Martinsen, E. W., Martinussen, M., Kaiser, S., Overgård, K. T., Rosenvinge, J. H. (2014). Comorbidity of personality disorders in mood disorders: a meta-analytic review of 122 studies from 1988 to 2010. *Journal of Affective Disorders*, 152–154, 1–11. https://doi.org/10.1016/j.jad.2013.08.023

Friborg, O., Martinussen, M., Kaiser, S., Overgard, K. T., & Rosenvinge, J. H. (2013). Comorbidity of personality disorders in anxiety disorders: a meta-analysis of 30 years of research. *Journal of Affective Disorders*, 145(2), 143–155. https://doi.org/10.1016/j.jad.2012.07.004

Ganellen, R. J. (2007). Assessing normal and abnormal personality functioning: strengths and weaknesses of self-report, observer, and performance-based methods. *Journal of Personality Assessment*, 89(1), 30–40. https://doi.org/10.1080/00223890701356987

Giavarina, D. (2015). Understanding Bland Altman analysis. *Biochemical Medicine*, 25, 141–151. https://doi.org/10.11613/BM.2015.015

Gibson, R., & Ferrini, R. (2012). Difficult resident or personality disorder? A long-term care perspective. *Annals of Long-Term Care: Clinical Care and Aging*, 20, 20–28.

Jamieson, H., Abey-Nesbit, R., Bergler, U., Keeling, S., Schluter, P. J., Scrase, R., Lacey, C. (2019). Evaluating the influence of social factors on aged residential care admission in a national home care assessment database of older adults. *Journal of The American Medical Directors Association*, 20(11), 1419–1424. https://doi.org/10.1016/j.jamda.2019.02.005

Knäuper, Bärbel, Carrière, K., Chamandy, M., Xu, Z., Schwarz, N., Rosen, N. O. (2016). How aging affects self-reports. *European Journal of Ageing*, 13(2), 185–193. https://doi.org/10.1007/s10433-016-0369-0

Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine*, 15(2), 155–163. https://doi.org/10.1016/j.jcm.2016.02.012

Koopmans, R., Leerink, B., & Festen, D.A.M. (2022). Dutch long-term care in transition: a guide for other countries. *Journal of The American Medical Directors Association*, 23(2), 204–206. https://doi.org/10.1016/j.jamda.2021.09.013

Koopmans, R. T., Lavrijsen, J. C., Hoek, J. F., Went, P. B., & Schols, J. M. (2010). Dutch elderly care physician: a new generation of nursing home physician specialists. *Journal of The American Geriatrics Society*, 58(9), 1807–1809. https://doi.org/10.1111/j.1532-5415.2010.03043.x

Leising, D., Erbs, J., & Fritz, U. (2010). The letter of recommendation effect in informant ratings of personality. *Journal of Personality and Social Psychology*, 98(4), 668–682. https://doi.org/10.1037/a0018771

Millon, T. E., & GS 1985). *Personality and its disorders: a biosocial learning approach*. John Wiley & Sons.

Molloy, D. W., Alemayehu, E., & Roberts, R. (1991). Reliability of a Standardized Mini-Mental State Examination compared with the traditional Mini-Mental State Examination. *American Journal of Psychiatry*, 148(1), 102–105. https://doi.org/10.1176/ajp.148.1.102

Mordekar, A., & Spence, S. A. (2008). Personality disorder in older people: how common is it and what can be done? *Advances in Psychiatric Treatment*, 14(1), 71–77. https://doi.org/10.1192/apt.bp.107.003897

Morse, J. Q., Pilkonis, P. A., Houck, P. R., Frank, E., & Reynolds, C. F. (2005). Impact of cluster C personality disorders on outcomes of acute and maintenance treatment in late-life depression. *American Journal of Geriatric Psychiatry*, 13(9), 808–814. https://doi.org/10.1176/appi.ajgp.13.9.808

Nakagawa, S., & Schielzeth, H. (2010). Repeatability for Gaussian and non-Gaussian data: a practical guide for biologists. *Biological Reviews: Cambridge Philosophical Society*, 85(4), 935–956. https://doi.org/10.1111/j.1469-185X.2010.00141.x

Nakagawa, S., & Schielzeth, H. (2013). A general and simple method for obtaining R2 from generalized linear mixed-effects models. *Methods in Ecology and Evolution*,

4(2), 133–142. https://doi.org/10.1111/j.2041-210x.2012.00261.x

Nienhuis, F. J., Van De Willige, G., Rijnders, C. A., De Jonge, P., & Wiersma, D. (2010). Validity of a short clinical interview for psychiatric diagnosis: the mini-SCAN. *British Journal of Psychiatry*, 196(1), 64–68. https://doi.org/10.1192/bjp.bp.109.066563

Oltmanns, T. F., & Balsis, S. (2011). Personality disorders in later life: questions about the measurement, course, and impact of disorders. *Annual Review of Clinical Psychology*, 7(1), 321–349. https://doi.org/10.1146/annurev-clinpsy-090310-120435

Penders, K.a P., Peeters, I. G. P., Metsemakers, J. F. M., & Van Alphen, S. P. J. (2020). Personality disorders in older adults: a review of epidemiology, assessment, and treatment. *Current Psychiatry Reports*, 22(3), 14. https://doi.org/10.1007/s11920-020-1133-x

Pleil, J. D., Wallace, M.a G., Stiegel, M. A., & Funk, W. E. (2018). Human biomarker interpretation: the importance of intra-class correlation coefficients (ICC) and their calculations based on mixed models, ANOVA, and variance estimates. *Journal of Toxicology and Environmental Health, Part B*, 21(3), 161–180. https://doi.org/10.1080/10937404.2018.1490128

Romirowsky, A., Zweig, R., Glick Baker, L., & Sirey, J. A. (2021). The relationship between maladaptive personality and social role impairment in depressed older adults in primary care. *Clinical Gerontologist*, 44(2), 192–205. https://doi.org/10.1080/07317115.2018.1536687

Slachevsky, A., Villalpando, J. M., Sarazin, M., Hahn-Barma, V., Pillon, B., Dubois, B. (2004). Frontal assessment battery and differential diagnosis of frontotemporal dementia and Alzheimer disease. *Archives of Neurology*, 61(7), 1104–1107. https://doi.org/10.1001/archneur.61.7.1104

Snijders, T.a B., & Bosker, R. J. (2011). *Multilevel analysis: an introduction to basic and advanced multilevel modeling*. Sage.

Son, H., Friedmann, E., & Thomas, S. A. (2012). Application of pattern mixture models to address missing data in longitudinal data analysis using SPSS. *Nursing Research*, 61(3), 195–203. https://doi.org/10.1097/NNR.0b013e3182541d8c

Stek, M. L., Van Exel, E., Van Tilburg, W., Westendorp, R. G., & Beekman, A. T. (2002). The prognosis of depression in old age: outcome six to eight years after clinical treatment. *Aging & Mental Health*, 6(3), 282–285. https://doi.org/10.1080/13607860220142413

Stevenson, J., Brodaty, H., Boyce, P., & Byth, K. (2011). Personality disorder comorbidity and outcome: comparison of three age groups. *Australian & New Zealand Journal of Psychiatry*, 45(9), 771–779. https://doi.org/10.3109/00048674.2011.595685

Van Alphen, S. P., Rossi, G., Dierckx, E., & Oude Voshaar, R. C. (2014). [DSM-5 classification of personality disorders in older persons]. *Tijdschrift voor Psychiatrie*, 56(12), 816–820.

Van Alphen, S. P. J., Oude Voshaar, R. C., Bouckaert, F., & Videler, A. C. (2018). *Handboek persoonlijkheidsstoornissen bij ouderen*. De Tijdstroom.

Van Den Brink, A. (2019). *Design of the MAPPING study (chapter 4). Thesis 'Nursing home residents with mental and physical multimorbidity - characteristics, neuropsychiatric symptoms and needs'* (pp. 57–72). Radboud University. https://www.ukonnetwerk.nl/media/1142/anne-vd-brink-proefschrift.pdf.

Van Den Brink, A. M., Gerritsen, D. L., Oude Voshaar, R. C., & Koopmans, R. T. (2013). Residents with mental-physical multimorbidity living in long-term care facilities: prevalence and characteristics. A systematic review. *International Psychogeriatrics*, 25(4), 531–548. https://doi.org/10.1017/S1041610212002025

Van Den Brink, A. M. A., Gerritsen, D. L., de Valk, M. M. H., Mulder, A. T., Oude Voshaar, R. C., Koopmans, R. T. C. M. (2018). What do nursing home residents with mental-physical multimorbidity need and who actually knows this? A cross-sectional cohort study. *International Journal of Nursing Studies*, 81, 89–97. https://doi.org/10.1016/j.ijnurstu.2018.02.008

Van Den Brink, A. M. A., Gerritsen, D. L., De Valk, M. M. H., Oude Voshaar, R. C., & Koopmans, R. (2017). Characteristics and health conditions of a group of nursing home patients with mental-physical multimorbidity - the MAPPING study. *International Psychogeriatrics*, 29(6), 1037–1047. https://doi.org/10.1017/S1041610217000230

Veerbeek, M. A., Oude Voshaar, R. C., & Pot, A. M. (2014). Effectiveness and predictors of outcome in routine out-patient mental health care for older adults. *International Psychogeriatrics*, 26, 1565–1574. https://doi.org/10.1017/S1041610214000647

Watson, P. F., & Petrie, A. (2010). Method agreement analysis: a review of correct methodology. *Theriogenology*, 73(9), 1167–1179. https://doi.org/10.1016/j.theriogenology.2010.01.003

https://doi.org/10.1017/S1041610224000474 Published online by Cambridge University Press