



Original article

Big Five personality traits and medically unexplained symptoms in later life

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ABSTRACT

Background: Personality dysfunction has been postulated as the most clinically salient problem of persons suffering from medically unexplained symptoms (MUS) but empirical studies are scarce. This study aims to compare the personality profile of older patients suffering from MUS with two comparison groups and a control group.

Methods: Ninety-six older patients with MUS were compared with 153 frequent attenders in primary care suffering from medically explained symptoms (MES), 255 patients with a past-month depressive disorder (DSM-IV-TR), and a control group of 125 older persons. The Big Five personality domains (NEO-Five-Factor Inventory) were compared between groups by multiple ANCOVAs adjusted for age, sex, education, partner status and cognitive functioning. Linear regression analyses were applied to examine the association between health anxiety (Whitley Index) and somatization (Brief Symptom Inventory). **Results:** The four groups differed with respect to neuroticism ($P < 0.001$), extraversion ($P < 0.001$), and agreeableness ($P = 0.045$). Post hoc analyses, showed that MUS patients compared to controls scored higher on neuroticism and agreeableness, and compared to depressed patients lower on neuroticism and higher on extraversion as well agreeableness. Interestingly, MUS and MES patients had a similar personality profile. Health anxiety and somatization were associated with a higher level of neuroticism and a lower level of extraversion and conscientiousness, irrespective whether the physical symptom was explained or not.

Conclusions: Older patients with MUS have a specific personality profile, comparable to MES patients. Health anxiety and somatization may be better indicators of psychopathology than whether a physical symptom is medically explained or not.

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1. Introduction

Medically unexplained symptoms (MUS) are physical symptoms that cannot be entirely explained by somatic disease [1]. Patients with persistent MUS report significant decreases in quality of life, impairment in daily functioning, increased high health care utilization and often undergo medical examinations and treatments unnecessarily [2–4]. This is especially relevant for frail older persons being most vulnerable for iatrogenic damage. Persistent MUS are classified within the section of somatoform

disorders in the DSM-IV-TR if a psychological origin can be assumed. This section has been replaced by somatic symptom disorders in the DSM-5 [5]. A somatic symptom disorder can be classified when physical symptoms are accompanied by maladaptive cognitions, emotions or behavior irrespective of whether the physical symptom is medically explained or not [5]. Personality dysfunction has been hypothesized to be the most clinically salient problem of patients with a somatoform disorder. The largest study on comorbidity rates hitherto showed that 50.6% of patients suffering from MUS or somatoform disorders has a comorbid personality disorder when assessed systematically with the SCID-II [6]. Smaller studies that have assessed systematically comorbidity rates with personality disorders have reported even higher rates,

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i.e. 48.0% [7], 60.6% [8], 62.9% [9], and 72.0% [10]. This contrasts sharply with clinical data of 283 patients (mean age 41 years) suffering from a somatoform disorder in which only 4.2% were considered to have axis II disorders [11]. This huge difference can most likely be explained by both referral bias in the first studies as well as under-detection of personality disorders in routine clinical care in the last study. A bit more data is available on the relationship between personality dimensions and somatization. Somatization, the tendency to experience and communicate psychological distress in the form of physical symptoms, is considered an important psychological mechanism underlying MUS. Somatization has been examined in relation to the Big Five personality profile and is, among adults, associated with a higher level of neuroticism and a lower level of agreeableness [12,13]. The only study conducted in an older sample found that a higher level of somatization was associated with a lower level of emotional stability, dominance and vigilance in 126 community-dwelling healthy older persons [14].

In later life, MUS frequently co-occurs with medically explained symptoms (MES) [15] and with affective disorders, primarily depression [16–18]. Therefore, from a clinical point of view, discrimination between patients with MUS and patients with either MES or depression seems to be more relevant than a scientifically considered healthy control group of community-dwelling elderly. Therefore, we have included two comparison groups in addition to a formal control group.

The prevalence of MES increases with ageing. This contrasts with prevalence rates for MUS and somatoform disorders, which decreases after the age of 65 [19]. These lower prevalence rates of MUS and somatoform disorders in later life as compared to younger cohorts may be an artifact: physicians might be reluctant to classify symptoms as unexplained out of fear of missing a somatic explanation [19]. Interpretation of the personality profile of older persons with MUS against a sample of older patients with MES who frequently visit their general practitioner is thus relevant (being an important differential diagnosis in clinical care). A comparison group suffering from depression can be relevant as a depressive disorder amplifies the subjective severity of somatic symptoms and is associated with functional impairment [9,20,21]. Moreover, depression in later life often has a more somatic presentation [22] and a depressed state may contaminate the personality profile [23] due to an increase in neuroticism scores and decrease of scores on extraversion, openness, and conscientiousness [24]. In other words, actual depressive symptoms seem to amplify the personality profile somewhat.

The primary aim of this study is to explore the Big Five personality traits in older patients suffering from MUS with a control group and two comparison groups, the first being frequent attenders in primary care who suffered from MES and the second being depressed older persons. The secondary aim was to explore the association between the Big Five personality traits and indices of somatization in older patients with MUS and MES and whether this differed in the two patients groups.

2. Methods

2.1. Study design and participants

Using a case-control design, we compared 118 older patients with MUS (cases) with 132 controls and with two comparison groups. The first comparison group consisted of older patients suffering from MES who frequently attend their general practitioner ($n = 154$). The second group consisted of patients suffering from a past-month major depressive disorder ($n = 275$).

Data for the present study were extracted from the Older Persons with medically Unexplained Symptoms (OPUS) study (patients with MUS and MES) and the Netherlands Study of

Depression in Older Persons (NESDO) (depressed older patients and controls). Both studies will be summarized below.

2.2. OPUS study

OPUS is a case-control study aimed to explore determinants of MUS in later life. The recruitment process was designed to compose a sample of older patients with MUS in various developmental and severity stages in order to overcome setting-specific findings. Therefore, possible participants with MUS and MES were recruited in the community by advertisements in local newspapers, in primary care, and in secondary health care. Inclusion criteria were:

- age of 60 years or above;
- MUS for at least three months according to their general practitioner (GP);
- met the definition for MUS of the Dutch College of General Practitioners, i.e. physical symptoms that have existed for more than several weeks and for which adequate medical examination has not revealed any condition that sufficiently explains the symptoms [1].

We operationalized 'several weeks' as at least three months. Also, patients were included if a so-called functional syndrome was present, i.e. fibromyalgia, chronic fatigue syndrome, irritable bowel syndrome or a whiplash syndrome [25]. Furthermore, as part of the study protocol, the unexplained nature of the patient's symptoms was checked by either a comprehensive geriatric assessment conducted by geriatrician ($n = 70$) or an additional chart review of the GP for patients refused a geriatric assessment ($n = 48$).

Exclusion criteria were:

- presence of primary psychotic disorder;
- established or suspected diagnosis of dementia;
- suffering from terminal illness;
- not sufficiently speaking the Dutch language;
- severe auditory and/or visual limitations hindering reliable data collection.

For the MES patient group (comparison group 1), we selected patients frequently consulting their primary care physician (top 20% of frequent attenders aged 60 years or above based on the medical records) for medically explained symptoms. We chose for frequent attenders for two reasons. First, we strive for a comparison group with actual severity of the primary physical complaint. This is more likely among MES who frequently visit their GP, as patients with stable chronic diseases or multimorbidity do not necessarily have actual physical symptoms. Secondly, the discrimination between MUS and MES in frequent attenders is most difficult in primary care, resulting in direct clinical relevance of differences identified in the OPUS study.

This resulted in 118 patients with MUS (12 recruited in the community, 77 in primary care, 29 in specialized health care) and 154 with MES (11 recruited in the community, 134 in primary care, 9 in specialized health care). After obtaining informed consent, data on socio-demographic, medical, psychological and social characteristics were collected in two study interviews. The Mini-International Neuropsychiatric Interview version 5.1 (MINI) [26], a semi-structured interview, was used to assess psychopathology conform DSM-IV criteria. The local Medical Ethics Committee approved the OPUS study.

2.3. NESDO study

NESDO is a multi-site naturalistic cohort study that includes 378 depressed and 132 non-depressed subjects aged 60 through

93 years [27]. Persons with a clinical diagnosis of dementia or who were suspected of dementia, persons with a psychotic or bipolar disorder and insufficient command of the Dutch language were excluded. Psychiatric diagnoses were assessed with the Composite International Diagnostic Interview (CIDI – version 2.1) [28] according to DSM-IV-R criteria. The CIDI is a fully structured psychiatric interview assessment with adequate test–retest reliability and validity [29]. From the NESDO, we identified 275 depressed older patients (36 recruited in primary care, 239 recruited in specialized mental health care) who met the criteria for a past-month major depressive episode based on the Composite International Diagnostic Interview (comparison group 2). Within the NESDO, depressed patients in primary care were recruited by a screening program. All patients who visited the GP who had a score of 4 or more on than 4 on the Geriatric Depression Scale (GDS) were considered potentially eligible patients (comparison group 2) and further examined on the presence of depression. A random selection ($n = 198$) of screened-negative patients (score below 4 points on the GDS) were approached for a phone-screen and those who met the criteria for a control (no (history of) depression, mastering the Dutch language) were asked for consent. A total of 132 controls agreed to participate (for more details, see [27]).

2.4. Personality

We assessed the Big Five personality domains, i.e. neuroticism, extraversion, conscientiousness, agreeableness and openness to experience with the 60-item NEO-Five-Factor Inventory (NEO-FFI) [30]. The internal consistencies of all domains range from acceptable to good, and are comparable to those of the American version [31]. In the present study, Cronbach's alpha was 0.87 for neuroticism, 0.79 for extraversion, 0.65 for openness, 0.71 for agreeableness, and finally 0.77 for conscientiousness.

2.5. Covariates

We included age, sex, level of education, partnership (yes/no), global cognitive functioning assessed with the Mini Mental State Examination (MMSE) [32], and depressive symptom severity assessed with the 28-item version of the Inventory of Depressive Symptomatology Self Report questionnaire (IDS-SR) [33] as covariates in all analyses.

2.6. MUS (and MES) severity indicators

Among MUS patients participating in the OPUS study, the severity of MUS was quantified with different parameters. First, a somatoform disorder according to DSM-IV-TR criteria (as assessed with the MINI). Also the duration of the primary complaint (in years) and the severity of the primary complaint over the past month (10 cm Visual Analogue Scale [VAS]) were explored.

For both MUS and MES patients, we assessed the severity of health anxiety with the Whiteley Index (WI) and the severity of somatization with the somatization subscale of the Brief Symptom Inventory (BSI-53). The Whiteley Index (WI) has 14 items to be rated as yes or no and generally exhibits excellent and robust psychometric properties for internal consistency, test–retest reliability, convergent validity, and concurrent validity [34,35]. The Cronbach's alpha in our sample was 0.71. The Brief Symptom Inventory (BSI-53) is an abbreviated version of the Symptom Checklist 90-item version [36] and assesses seven domains of psychopathology without loss of information [37] with good internal consistency and test–retest reliability [38–40]. The somatization subscale (Cronbach's alpha is 0.77 in our sample) consists of seven items referring to the severity of physical

symptoms, i.e. dizziness, chest pain/discomfort, nauseous, shortness of breath, hot flushes, paresthesia's, and faintness/general weakness. The numbers of such physical symptoms have been proven a valid and reliable correlate of somatization in younger persons [41].

2.7. Analyses

First, we compared the Big Five personality domains (dependent variable) across the four groups (independent variables) with separate analyses of covariance (ANCOVA), adjusted for age, sex, level of education, partnership (yes/no), depressive symptom severity (IDS sum score), presence of comorbid psychiatric disorder (yes/no) and global cognition (MMSE score). Since we tested five personality dimensions separately, we applied a Bonferroni correction for the group effect, which means that P -values < 0.01 ($0.05/5$) are considered significant. In case of significant findings, LSD-post hoc tests were conducted in order to compare patients suffering from MUS with either patients suffering from MES, depression or with control patients. Since results may be driven by comorbid psychiatric disorders other than somatoform disorders (in the MUS group) and depressive disorder (in the depressed group), we performed a sensitivity analyses restricted to patients in either group without any psychiatric comorbidity.

Next, multiple linear regression analyses were applied to the OPUS sample to examine the association of the Big Five personality domains (dependent variables) with MUS (and MES) severity indicators (see above) as independent variables adjusted for age, sex, level of education, partnership and global cognitive functioning. Since health anxiety (WI) and somatization (BSI somatization scale) are available for both MUS and MES patients, interaction of group with health anxiety (WI) as well as interaction of group with somatization (BSI) were explored to examine whether the associations with personality dimensions differ between patients with MUS and MES. Also these results were considered statistically significant if P -values < 0.01 . All analyses were conducted in SPSS version 22 [42].

3. Results

3.1. Patient characteristics

Data on the NEO-FFI were missing for 22/118 (18.6%) MUS patients, 1/154 (0.6%) MES patients, 20/275 (7.3%) depressed patients, and 7/132 (5.3%) controls ($X^2 = 33.0$; $df = 3$, $P < 0.001$). In and excluded study participants did not differ significantly with respect to any of the covariates under study.

The mean age of the included patients was 70.1 (SD 6.4) years for the MUS patients, 73.4 (SD 7.8) years for the MES patients, 70.5 (SD 7.2) years for the depressed patients and 70.1 (SD 7.0) years for the control group. The severity of the primary complaint over the past month did not differ between patients with MUS and patients with MES 5.0 (1.9) versus 4.6 (2.6) ($t = 1.1$, $df = 223$, $P = 0.222$). In all groups, two-thirds of the participants were female, except in the MES group where only 43.1% were females ($X^2 = 21.6$, $df = 3$, $P < 0.001$). Table 1 presents the characteristics of the study population. Also the other demographic variables as well as covariates differed significantly across the four groups (see Table 1).

3.2. Personality profiles from the four groups

Of the five personality dimensions tested, significant group differences were only found for neuroticism ($F = 11.6$, $df = 3,596$, $P < 0.001$) and extraversion ($F = 9.6$, $df = 3,595$, $P < 0.001$), but not

Table 1
Characteristics of study population.

Characteristics		MUS (n=96)	MES (n=153)	Depressed (n=255)	Control (n=125)	Statistics
Socio-demographics						
Age (years)	Mean (SD)	70.1 (6.4)	73.4 (7.8)	70.5 (7.2)	70.1 (7.0)	F = 7.2, df = 3,625, $P < 0.001$
Female sex	n (%)	64 (66.7)	66 (43.1)	164 (64.3)	77 (61.6)	$X^2 = 21.6$, df = 3, $P < 0.001$
Level of education						
Basic	n (%)	24 (26.7)	26 (17.2)	57 (22.4)	8 (6.4)	$X^2 = 36.0$, df = 6, $P < 0.001$
Intermediate	n (%)	48 (53.3)	96 (63.3)	148 (58.0)	66 (52.8)	
High	n (%)	18 (20.0)	29 (19.2)	50 (19.6)	51 (40.8)	
Partner, yes	n (%)	55 (60.4)	91 (60.3)	128 (50.2)	95 (76.0)	$X^2 = 23.3$, df = 3, $P < 0.001$
Cognition (MMSE)	Mean (SD)	28.0 (2.4)	28.2 (1.9)	27.6 (2.1)	28.4 (1.4)	F = 4.9, df = 3,611, $P = 0.002$
Depression (IDS)	Mean (SD)	21.0 (12.0)	15.2 (9.2)	32.8 (12.4)	7.7 (6.4)	F = 183.6, df = 3,621, $P < 0.001$
Health anxiety (WI)	Mean (SD)	4.0 (2.8)	2.1 (2.4)	n.a.	n.a.	F = 30.2, df = 1,241, $P < 0.001$
Somatization (BSI-53)	Mean (SD)	0.82 (0.65)	0.52 (0.50)	n.a.	n.a.	F = 16.4, df = 1,244, $P < 0.001$
Personality traits						
Neuroticism	Mean (SD)	32.9 (8.8)	29.6 (7.8)	39.9 (6.9)	24.9 (6.7)	F = 135.5, df = 3,623, $P < 0.001$
Extraversion	Mean (SD)	37.7 (6.1)	38.7 (5.9)	33.1 (6.6)	42.0 (5.6)	F = 65.2, df = 3,623, $P < 0.001$
Openness	Mean (SD)	28.9 (5.3)	28.1 (4.7)	29.1 (5.5)	30.6 (4.8)	F = 5.2, df = 3,616, $P = 0.002$
Agreeableness	Mean (SD)	45.5 (5.2)	44.5 (5.1)	44.2 (5.1)	45.6 (5.6)	F = 2.7, df = 3,620, $P = 0.045$
Conscientiousness	Mean (SD)	38.2 (5.9)	40.3 (5.2)	36.1 (5.6)	41.8 (4.9)	F = 36.7, df = 3,622, $P < 0.001$

n.a.: not available; MUS: medically unexplained symptoms; MES: medically explained symptoms; SD: standard deviation; MMSE: Mini Mental State Examination; IDS: inventory of depressive symptoms; WI: Whiteley Index.

for openness ($f = 1.7$, $df = 3,590$, $P = 0.161$), agreeableness ($F = 2.7$; $df = 3,593$; $P = 0.045$), or conscientiousness ($F = 1.6$; $df = 3,594$; $P = 0.193$). Interestingly, no differences were found between older patients with MUS and MES on any personality trait (see Fig. 1). Please note that the difference with respect to agreeableness (LSD-post hoc test: $P = 0.035$) cannot be interpreted as the overall group difference did not achieve the Bonferroni-adjusted statistical significance level ($P = 0.045$).

As shown on Fig. 1, patients with MUS exhibited only significantly higher levels of neuroticism compared to the control group. When compared to depressed older persons, MUS patients had a significantly lower level of neuroticism and a significantly higher level of extraversion.

For the sensitivity analysis, we excluded 184 patients with a psychiatric disorder other than a somatoform disorder, i.e. 39 MUS patients, 38 MES patients, 106 depressed patients and finally 1 control person who suffered from a generalized anxiety disorder. Results with respect to neuroticism, extraversion, openness and conscientiousness did not substantially differ with the findings reported on Fig. 1, except that the group difference with respect to agreeableness achieve significance ($F = 3.9$, $df = 3,417$, $P = 0.009$). Post hoc tests, showed that MUS patients had a significantly higher

level of agreeableness compared to MES patients ($P = 0.003$) and control patients ($P = 0.005$).

3.3. Associations between personality dimensions and MUS severity indices

Table 2 presents the associations between the different severity indices of MUS and the Big Five personality traits. The Big Five personality traits were neither associated with the presence of a somatoform disorder according to DSM-IV-TR criteria, nor with the severity and duration of the primary complaint (except for an association between duration of the complaint and the level of agreeableness).

3.4. Associations of personality dimensions with health anxiety and somatization

We also examined the association between health anxiety (Whiteley Index) and somatization (subscale BSI-53) with personality traits within the whole study population of the OPUS study. Higher levels of health anxiety as well as somatization were associated with a higher level of neuroticism

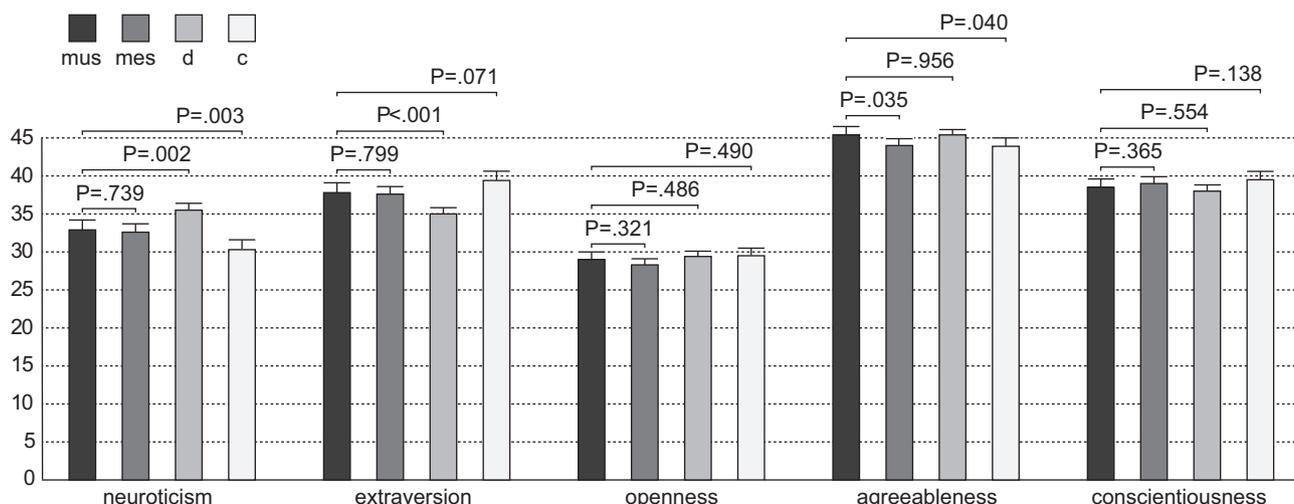


Fig. 1.

Table 2

Multiple linear regression analyses exploring the association between indices for the severity of MUS ($n=96$) and personality traits, as well as indices of health anxiety (MUS, $n=96$ and MES, $n=153$) with personality traits^a.

	Neuroticism		Extraversion		Openness		Agreeableness		Conscientiousness	
	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>
MUS patients										
MUS severity indicators										
Somatoform disorder (yes)	0.08	0.496	-0.18	0.109	-0.09	0.410	-0.17	0.150	-0.03	0.785
Duration of MUS (years)	-0.07	0.586	-0.03	0.784	-0.03	0.780	0.30	0.009	0.17	0.146
Severity of primary complaint	0.03	0.771	0.20	0.101	0.19	0.100	-0.02	0.835	0.17	0.148
Indicators of health anxiety										
Hypochondriacal beliefs (WI)	0.40	< 0.001	-0.33	0.004	-0.13	0.249	-0.17	0.150	-0.27	0.022
Level of somatisation (BSI)	0.32	0.005	-0.14	0.233	-0.07	0.558	-0.13	0.233	-0.17	0.139
MUS and MES patients combined										
Indicators of health anxiety										
Hypochondriacal beliefs (WI)	0.48	< 0.001	-0.17	0.010	-0.04	0.507	-0.12	0.067	-0.24	< 0.001
Level of somatisation (BSI)	0.36	< 0.001	-0.17	0.014	-0.02	0.820	-0.09	0.161	-0.23	< 0.001

MUS: medically unexplained symptoms; MES: medically explained symptoms; WI: Whitley Index; BSI: Brief Symptom Inventory.

^a Adjusted for age, sex, level of education (dummies), partner status, and cognition (MMSE).

Table 3

Personality characteristics [estimated marginal mean scores (standard error of the mean)] of study population restricted to patients without psychiatric comorbidity (sensitivity analyses), fully adjusted for covariates.

Personality dimensions		MUS ($n=51$)	MES ($n=109$)	Depressed ($n=147$)	Control ($n=123$)	Statistics	LSD-post hoc test of MUS with		
							Main group effect	MES	Depressed
Neuroticism	Mean (SD)	29.7 (0.8)	30.2 (0.6)	33.9 (0.6)	28.5 (0.6)	$F=135.2, df=3,419, P<0.001$	$P=0.610$	$P<0.001$	$P=0.253$
Extraversion	Mean (SD)	40.0 (0.8)	38.5 (0.6)	35.7 (0.6)	40.3 (0.6)	$F=7.6, df=3,419, P<0.001$	$P=0.585$	$P=0.001$	$P=0.166$
Openness	Mean (SD)	29.1 (0.7)	28.7 (0.5)	29.5 (0.5)	29.8 (0.5)	$F=1.0, df=3,414, P=0.374$	$P=0.561$	$P=0.727$	$P=0.431$
Agreeableness	Mean (SD)	46.5 (0.7)	43.9 (0.5)	45.7 (0.5)	44.0 (0.5)	$F=3.9, df=3,417, P=0.009$	$P=0.003$	$P=0.376$	$P=0.005$
Conscientiousness	Mean (SD)	40.0 (0.7)	39.7 (0.5)	38.1 (0.6)	40.6 (0.6)	$F=2.8, df=3,419, P=0.041$	$P=0.076$	$P=0.036$	$P=0.492$

MUS: medically unexplained symptoms; MES: medically explained symptoms; LSD: least square difference.

and a lower level of extraversion and conscientiousness (see Table 3). These associations did not significantly differ in strength among MUS versus MES patients (as indicated by non-significant interaction terms with group status; all *P*-values between 0.104 and 0.685).

4. Discussion

4.1. Main findings

Our findings suggest a specific personality profile for older somatizing patients. With respect to neuroticism MUS patients scored in between our control group and depressed comparison group. Moreover, MUS patients score significantly higher on extraversion compared to depressed patients. Findings with respect to agreeableness were less clear as the main overall statistics did not achieve the Bonferroni-adjusted level of significance. Of most interest, however, was the finding that the personality profile did not differ between patients with MUS or MES. Since previous studies have shown that personality traits are stable traits, which are independent of underlying physical illnesses [43], the lack of any differences between MUS and MES patients implies that personality traits are no predisposing factors for the development of MUS in later life. Below we will discuss all findings in more detail.

4.2. Comparison with controls

In line with findings in younger age groups [12], our study shows that older persons suffering from MUS have a higher level of neuroticism compared to controls. This might be important as neuroticism itself is consistently identified as an independent predictor of health status and even mortality [44,45]. Nonetheless,

restricting the analyses to patients without psychiatric comorbidity, we did not find any differences anymore. This implies that the higher level of neuroticism can be fully explained by comorbid psychiatric disorders and depressive symptoms.

Studies in younger MUS patients suggest that higher neuroticism and lower agreeableness contribute to somatization by increased symptom reporting and care-seeking behavior [46]. Among older MUS patients, we did not find a lower level of agreeableness, which may point to an age-effect. Our data even points to an opposite effect in older MUS patients. The main analyses with respect to agreeableness lost significance after Bonferroni correction, while the sensitivity analyses restricted to patients without psychiatric comorbidity remained highly significant. Whether this finding points to a higher level of adaptive functioning in older patients with MUS can be debated. On the one hand, research on partly unexplained chronic pain [47] has showed that older patients tend to expect and accept pain, and compared to younger patients are more hesitant to complain and have a stronger will to 'keep on going' [48]. Studies have shown that similar levels of somatization are associated with significantly less psychological distress in older compared to younger patients [49], indicating that older patients may experience illness as a consequence of aging and/or be more resilient regarding the presence of somatic symptoms. This might suggest that MUS may open up positive personality dimensions in older patients. On the other hand, it may be maladaptive as it fits with our clinical experience that older patients with MUS are generally very pleasing (agreeing) to other people at the cost of their own health.

4.3. Comparison with MES

We did not find any difference between patients suffering from MUS and patients suffering from MES, except for the level of

agreeableness similarly to the comparison with the control group. Although one might hypothesize that personality characteristics change in the presence of a somatic disease, this is not grounded by empirical evidence [50] and thus cannot explain the lack of differences we found. Neuroticism, for example, is a stable personality trait that can be measured reliably across the life-span and is not significantly affected by physical health variables in later life [43].

Interestingly, among patients suffering from MUS, the presence of a somatoform disorder according to DSM-IV-TR criteria was not associated with any of the personality dimensions. The lack of any difference between MUS and MES patients, supports the new classification in DSM-5 where the distinction between unexplained versus explained physical symptoms is not a criterion anymore. This decision is, among others, made on studies showing that the number of physical symptoms is more important for quality of life or the presence of comorbid psychiatric disorders than the fact whether symptoms can be medically explained [51–53]. Furthermore, it is increasingly recognized that medically unexplained symptoms are often accompanied by somatic symptoms that are directly attributable to general medical illnesses, blurring the line between disorders characterized by medically unexplained or explained symptoms [21].

We also found similar associations between all personality dimensions and either health anxiety or somatization in patients with MUS and in patients with MES. Comparable to findings in younger age samples [12] we found an association between a higher level of somatization and a higher level of neuroticism, but not with a lower level of agreeableness. In our study, somatization was measured by the somatization subscale of the Brief Symptom Inventory [based on the symptom checklist (SCL) 90-item version], which uses ‘simple’ symptom counting. The number of physical symptoms, irrespective whether this symptom is medically explained, can be considered as an index of somatization [54,55]. Moreover, the SCL-90 somatization score correlates significantly with physical quality of life in several long-term conditions [56]. Consistent with these literatures, our data shows that personality dimensions are associated with this measure of somatization, while not with group status.

Health anxiety was highly associated with increased levels of neuroticism and decreased levels of extraversion and conscientiousness. In line with the new perspective of the DSM-5, the fear of being ill may be more relevant to personality traits than whether a physical symptom is medically explained or not.

4.4. Comparison with depression

Despite high levels of comorbidity between depression and MUS, the personality profile differs between both groups. Depressed patients scored significantly higher on neuroticism and lower on extraversion. It is known that the presence of a concurrent depressive disorder amplifies the personality profile of people prone to depression [24,57]. Nonetheless, after recovery of depression, the overall shape of the personality profile did not change [24,58]. Furthermore, the relationship between change in personality and change in depressive symptoms is at most moderate [24,57–59]. Since mood disorders, anxiety disorders and somatoform disorders partly overlap and are often comorbid to each other, it is often assumed that personality characteristics act in the same direction for these disorders [60]. Our findings, however, confirm this, often implicit, idea.

4.5. Methodological considerations

Important strengths of our study are the two comparison groups in addition to a traditional control group as well as the large

number of older persons with MUS, recruited within different echelons of the health care system. In clinical practice, patients with MUS and/or somatoform disorders are present in different settings in the health care system. Studies on clinical samples of patients with somatization are therefore even more difficult to generalize [61].

For proper interpretation, some methodological issues should be taken into account. Firstly, due to the complex recruitment strategy, we do not have data on the number of eligible patients who refused study participation. Secondly, the pooling of data from two studies. Because the OPUS study have been a priori matched with the NESDO study, measures of health anxiety were not available for participants of the NESDO study. On the one hand, selection bias aggravating differences cannot be fully excluded. Our results might be partly biased if indeed we have missed some MUS patients who did not consult a doctor, because they see pain or physical complaints as an inevitable part of ageing. Furthermore, depressed patients were more often recruited in specialized mental health care, which may also have resulted in larger differences. On the other hand, within NESDO we did not explicitly measure MUS within the depressed group and the control group, which might result in conservative estimates of our group differences. Thirdly, analyses were adjusted for depressive symptom severity since depressive symptoms may amplify the personality profile as assessed with the NEO-FFI as already mentioned in the introduction [62,63]. Therefore, this adjustment results in a more valid comparison of patients with MUS and MES. Nonetheless, the IDS sum score might reflect different constructs in patients suffering from depression and patients suffering from MUS, resulting in more conservative estimates of the differences between these groups.

5. Conclusion

Despite the findings of a specific personality profile for older patients suffering from MUS compared to depressed older patients and healthy controls, we could not demonstrate any difference with patients suffering from MES. In contrast, personality dimensions were significantly associated with health anxiety and somatization. This stresses the importance that, in line with the DSM-5, these measures may be more relevant to maladaptive personality traits in later life than whether a physical symptom is medically explained or not [5]. We argue that personality pathology should receive more attention in research as well as routine medical care outside the scope of mental health, as health anxiety and somatization are dimensional constructs potentially relevant for all persons with physical symptoms.

Disclosure of interest

The authors declare that they have no competing interest.

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