ORIGINAL ARTICLE

Prevalence and correlates of somatoform disorders in the elderly: Results of a European study

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Abstract

Somatoform disorders have rarely been addressed in epidemiological and health care services studies of the elderly. The few existing studies vary considerably in their methodologies limiting comparability of findings. Data come from the MentDis_ICF65+ study, in which a total of 3142 community-dwelling respondents aged 65–84 years from six different countries were assessed by the Composite International Diagnostic Interview adapted to the needs of the elderly (CIDI65+). The 12-month prevalence rate for any somatoform disorders was found to be 3.8, whereby the prevalence for somatization disorder according to DSM-IV was 0%, the prevalence for abridged somatization was 1.7% and the rate for 12-months somatoform pain disorder was 2.6%. We found a significant variation by study centre ($p < 0.005$). There was a significant gender difference for pain disorder, but not for abridged somatization. Significant age-related effects revealed for both disorder groups. Somatoform disorders were found to be associated with other mental disorders [odds ratio (OR) anxiety = 4.8, OR affective disorders 3.6], as well as with several impairments and disabilities. Somatoform disorders are prevalent, highly impairing conditions in older adults, which are often associated with other mental disorders and should receive more research and clinical attention.

KEYWORDS

elderly, epidemiology, somatoform disorders

1 | INTRODUCTION

Knowledge about mental health in the elderly becomes increasingly relevant against the background of demographic change (Lanzieri, 2011). Compared to other mental disorders, such as depression or

dementia, somatoform disorders appear to be a neglected topic in old age psychiatry and health care research (Wijeratne, Brodaty, & Hickie, 2003). A lack of systematic research has been pointed out in a review by Sheehan and Banerjee (1999). More than 10 years later Hilderink, Collard, Rosmalen, and OudeVoshaar (2013) come to a quite

similar conclusion: more systematic research with special focus on the older population is needed, as current data are not sufficient to reveal the clinical relevance and natural course of somatoform disorders in the elderly. One important reason for the limited empirical data might be a general conceptual confusion accompanying the phenomenon of somatization, as one core disorder of the somatoform group. Diagnostic criteria for somatization disorder according to the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders [DSM-IV, American Psychiatric Association (APA, 1994)] have frequently been criticized for being too restrictive. This criticism primarily concerns the precisely defined number and nature of symptoms as well as the need to judge a symptom as medically explained or not. It is not much surprising, that in the few epidemiological studies which assessed somatoform disorders in the elderly, prevalence rates are found to be marginal for somatization disorder with rates varying between 0.0% and 1.0% (Bland, Newman, & Thorn, 1988; Hessel, Geyer, Gunzelmann, Schumacher, & Brähler, 2003; Regier et al., 1988) and that they increase when less restrictive criteria are applied. For instance Leikens, Finset, Monum, and Sandanger (2007) report six-month prevalence rates for "multisomatoform disorder" (at least three clinical relevant medically unexplained symptoms) of 9.8%, as well as somatoform disorder not otherwise specified (at least one clinical relevant medically unexplained symptom) of 13.5% in the elderly Norwegian population assessed by the Composite International Diagnostic Interview (CIDI). Hardy (1995) found a 12-month prevalence of 13% for at least one "somatoform symptom" for participants aged over 65 in a French community sample assessed by a semi-structured telephone interview. Those findings indicate that a large group of a subsyndromal form of somatoform disorders might exist in the elderly.

A common way to identify a clinical significant somatoform syndrome is by the use of the Somatic Symptom Index (SSI) introduced by Escobar, Burnam, Karno, Forsythe, and Golding (1987). To fulfil criteria for the SSI or abridged somatization disorder at least four unexplained somatic complaints need to be present in men and six in women. The SSI has been validated in a number of studies and can be considered as a valuable operationalization of somatization for research purposes (De Gucht & Fischler, 2002; Escobar et al., 2010; Hiller, Rief, & Fichter, 1995, 1997; Kirmayer & Robbins, 1996; Mak & Zane, 2004; Portegijs et al., 1996; Rief et al., 1996). This is also reflected by the widespread use of the SSI in a number of primary care studies (Gureje, Simon, Ustun, & Goldberg, 1997; Kirmayer & Robbins, 1991; Kroenke & Spitzer, 1998; Lobo, Garcia-Campayo, Campos, Marcos, & Perez-Echeverria, 1996), as well as several large epidemiological studies (Jacobi et al., 2004; Ritsner, Ponizovsky, Kurs, & Modai, 2000; Robins et al., 1984; Wittchen, Nelson, & Lachner, 1998).

As known from studies with younger individuals, somatoform disorders frequently co-occur with other mental disorders and often go along with significant impairments for example in quality of life or activities and participation (Kroenke & Spitzer, 1998; Ladwig, Marten-Mittag, Erazo, & Gündel, 2001; Ritsner et al., 2000; Spitzer et al., 1995). This might also be true for the elderly, as corresponding results could have been shown in several studies. Regarding comorbid mental disorders, somatoform disorders appear to be related to anxiety in the elderly (Rubio & Lopez-Ibor, 2007; Sheikh, Swales, King, Sazima, & Bail, 1999) as well as depressive disorders. Hilderink et al. (2009)

found a current comorbid depressive disorder for 56% of their sample of elderly patients suffering from "medically unexplained symptoms". Depression was also found to be significantly associated with "medically unexplained somatic symptoms" in an elderly population-based Chinese sample, after adjusting for the effects of socio-demographic and medical characteristics (Yu & Lee, 2012). With regard to impairment Cheng (1992) found a significant negative correlation between somatization and activities of daily living, and positive ones with experienced stress, chronic illness and loneliness-distress in a community-based sample of elderly women.

2 | AIMS OF THE STUDY

Up to now empirical data on the prevalence of somatoform disorders in the elderly are rare and therefore valid estimations of the size and burden of this mental health problem are lacking. As most of the limited knowledge about somatoform disorders in the elderly comes from clinical settings, generalizability of results to the general population remains questionable. In fact the validity of results is narrowed to older treatment-seeking samples, which can be considered to differ from community-based samples in several ways. Hence, the aim of the current study is to provide knowledge about the prevalence and manifestation of somatoform disorders, in an elderly population-based sample, including analysis of comorbidity patterns, as well as the relation to general physical and mental health status, disability and functional impairment. More specifically we examined the following research questions in a population based sample of 65 to 85-year-old participants from different European countries:

1. How frequent are somatoform symptoms and what is the lifetime and 12-month prevalence of somatization disorder, pain disorder and abridged somatization disorder (SSI)?
2. How frequently are somatoform conditions associated with other mental disorders and general medical conditions?
3. How impairing are somatoform conditions?
4. How is help-seeking behaviour associated with somatoform conditions?

3 | METHODS

Findings are based on the MentDis_ICF65+ study on "Prevalence, 1-year incidence and symptom severity of mental disorders in the elderly: Relationship to impairment, functioning (ICF) and service utilization" funded by the European Commission within the seventh framework programme. Aims, design, and methods have been described in greater detail elsewhere (Andreas et al., 2013) and are only briefly described here.

3.1 | Study design

The MentDis_ICF65+ study is a multicentre study which aims to first develop a reliable diagnostic assessment battery appropriate and valid

in the elderly and second collect data on the prevalence, the incidence and on the natural course and prognosis of mental disorders in sufficiently powered representative samples of older people (65–84 years) living in the community across different countries of the European Union (Spain, Italy, UK, Germany) and associated states (Switzerland, Israel). This study is designed as a prospective epidemiological study. For estimating the prevalence of mental disorders a cross-sectional study design was deployed.

3.2 | Sampling

In each of the six study centres approximately 500 respondents were selected to be interviewed within a defined catchment area. To achieve comparability of samples between the study centres and a similar power in all age and gender groups, two strata for age and gender were defined. Therefore over-sampling of the older age group, especially the older male, was implemented. Inclusion criteria for the participants were the ability to provide informed consent, living in the predefined catchment area and being between 65 and 84 years old. Exclusion criteria were severe cognitive impairment as assessed with the MMSE (Mini-Mental State Examination, cutoff score > 18) and insufficient level of language in which the interview was conducted. A random sample of the resulting cohort has been drawn according to the stratification criteria in each study centre from population registries or postal addresses from market research companies. Participants were approached by a written invitation letter followed by a telephone call. Response rates varied between 11% and 33% across countries. Responder analyses showed no gender effect, but a significant age effect, indicating a higher response rate for younger participants (for more details see Volkert et al., under review).

3.3 | Sample

The final sample is composed of 3142 elderly people. Of which, 555 (17.7%) participants were from Spain, 542 (17.3%) from Israel, 521 (16.6%) from Switzerland, 517 (16.5%) from Italy, 511 (16.3%) from Germany, and 496 (15.8%) from the UK. The mean age was 73.7 years and 1550 (49.3%) participants were male. The majority of people interviewed were married (61.0%) or widowed/divorced (34.5%) and 62.2% lived together with their spouse/partner. The participants attended school for 10.3 years on average and most graduated from the last school they attended (77.2%). At the time of the interview the vast majority of participants were retired (84.6%).

3.4 | Measures

3.4.1 | Assessment of mental disorders

Data were collected using computer-assisted personal interviewing (CAPI). Interviewers received extensive training prior to the start of the study and were monitored and supervised continuously during the course of data collection. The interviews took place in the participants' homes. The Composite International Diagnostic Interview for the Elderly (CIDI65+) was developed by the study group and has been adapted to the particular social, cognitive and psychological abilities and needs of the elderly. The interview covers several

mental health problems such as anxiety disorders, affective disorders and substance abuse. Somatic morbidity is assessed by asking participants for the existence of any medical condition (e.g. heart disease, cancer, and musculoskeletal disease). Moreover participants are asked to report their use of medication and contacts with the health care system. Preliminary evidence of satisfactory test–retest reliability and the feasibility of this extended and modified CIDI approach is provided by Wittchen et al. (2015). Test–retest reliability was good for most core diagnostic categories however, agreement for the somatoform disorders was less satisfactory. The authors report limited specificity for the somatoform disorders, while sensitivity was found to be good. This can be explained by time lapse effects and the rather small sample size.

3.4.2 | Assessment of somatoform disorders

The CIDI65+ section on somatoform disorders includes a list of somatoform symptoms which is presented to the participants at the beginning of the section to obtain a fairly comprehensive account about all potential somatoform symptoms the respondents might have had in their lifetime. To reduce the burden for elderly participants to run through an extensive list of 46 items covering all somatoform symptoms according to the DSM-IV and the International Classification of Diseases, 10th revision (ICD-10) the list was reduced to 26 items in the CIDI65+ still covering all relevant symptom clusters (i.e. pain, gastrointestinal, pseudo-neurological, and sexual; see Appendix Table A1). The traditional classification of abridged somatization disorder requires four symptoms in men and six in women out of the lengthy 46-item list (SSI4/6). As most gender-specific items were left out in the new somatoform symptom list, we decided to use the four symptom criterion for both sexes. To assess the psychometric property of the shortened list, we examined sensitivity and specificity on the basis of the German Health Survey (GHS, Jacobi et al., 2004) sample of $N = 4181$ adults randomly selected from the German population. With a sensitivity of 0.91 [confidence interval (CI): 0.87–0.94] and a specificity of 0.97 (CI: 0.96–0.98), an index of four symptoms for both genders (SSI4) appears to be a satisfying equivalent to the SSI4/6.

In line with the current DSM-IV criteria the assessment of the lifetime experience of somatoform symptoms is followed by identification and probing of clinically significant symptoms which cannot be entirely explained by a medical condition or substance use (alcohol, medication or drug). Clinical significance is indicated either by seeking help from a medical doctor or other mental health professional, or significant distress and interference with daily life because of the symptom. To examine whether a symptom is clinically unexplained the interviewer asks for the diagnosis the physician provided. Whenever the participant reports a medical condition or substance use the interviewer is directed to ask if the symptom in question has always been the result of a physical illness, injury or other somatic conditions respectively of taking medication, drugs or alcohol. These questions are also asked when a participant has not seen a physician due to the symptoms considered. Interviewers were instructed to rate diagnoses of functional somatic symptoms such as irritable bowel syndrome, fatigue, etc. as somatoform conditions rather than medical explanations to ensure

that participants with such diagnoses were also evaluated in detail within the somatoform disorder section. Moreover the CIDI probes for the onset of each somatoform symptom, whereas age of last occurrence is only probed if the diagnostic threshold for the respective diagnosis is reached.

The CIDI65+ incorporates DSM-IV diagnostic algorithms for somatization disorder, abridged somatization disorder (SSI4) and pain disorder, while hypochondriasis and undifferentiated somatoform disorder are not included.

3.4.3 | Assessment of quality of life and level of functioning

In addition to the CIDI65+ two self-rated questionnaires to assess quality of life and functioning were deployed. The World Health Organization (WHO) Quality of Life BREF (WHOQoL-BREF, WHO, 2004) is a widely used instrument with good psychometric properties (WHOQoL Group, 1998) and can be successfully administered in older people (Naumann & Byrne, 2004). In our study a shortened version of the original questionnaire was deployed, whereby satisfying

correlation coefficients of $r = 0.78$ – 0.91 could be found between the reduced scale and the original scale in the pilot sample of the MentDis_ICF65+ study. The 12-item self-administered version of the WHO Disability Assessment Schedule II (WHODAS-II, WHO, 2000) was used to assess level of functioning in regard to cognition, mobility, self-care, getting along, life activities and participation. As part of the WHODAS it was also assessed how many days in the past month a respondent was totally unable to carry out his or her usual activities or work because of any health condition.

3.4.4 | Assessment of symptom severity

To rate symptom severity the Health of the Nation Outcome Scales 65+ (HoNOS65+, Burns et al., 1999) was used. This expert-rated instrument consists of 12 scales measuring severity in regard to behaviour, impairment, symptoms and social functioning. These scales are: behavioural disturbance, non-accidental self-injury, problem drinking or drug use, cognitive impairment, physical illness, hallucinations and delusions, depressive symptoms, other mental and behavioural symptoms (including somatoform symptoms), problems with relationships,

TABLE 1 Prevalence of single lifetime somatoform symptoms by gender (N = 3142)

	Women		Men		OR (95% CI)	p Value
	%w	95% CI	%w	95% CI		
Pain symptoms						
Abdominal and belly pain	32.67	30.21–35.12	24.52	21.48–27.56	1.50 (1.31–1.72)	<0.001
Back pain	65.17	61.25–69.10	55.71	51.04–60.38	1.49 (1.16–1.91)	<0.01
Pain in the joints	56.77	53.15–60.39	41.75	39.03–44.47	1.84 (1.59–2.14)	<0.001
Pain in arms or legs	41.22	34.90–47.54	29.77	25.75–33.79	1.67 (1.30–2.15)	<0.001
Chest pains	11.16	9.89–12.43	14.55	12.10–17.00	0.74 (0.61–0.89)	<0.01
Headaches	34.37	30.79–37.94	21.45	17.47–25.44	1.94 (1.67–2.26)	<0.001
Painful menstrual periods	27.30	25.29–29.31	—	—	—	—
Pain while urinating	12.06	9.43–14.68	7.91	6.15–9.67	1.61 (1.24–2.08)	<0.01
Difficulty in urinating	6.22	4.58–7.85	17.57	15.57–19.58	0.31 (0.23–0.41)	<0.001
Genital pain	3.93	1.63–6.24	2.86	1.80–3.91	1.40 (0.75–2.60)	0.275
Other pain	3.68	2.30–5.06	2.65	1.84–3.45	1.41 (1.01–1.96)	<0.05
Gastrointestinal and pseudo-neurological						
Vomiting	17.47	13.00–21.95	11.66	7.17–16.15	1.64 (1.19–2.26)	<0.01
Diarrhoea	20.99	13.60–28.39	18.62	11.03–26.22	1.18 (0.90–1.55)	0.218
Difficulties keeping balance	22.41	18.33–26.49	15.98	13.06–18.91	1.53 (1.16–2.01)	<0.01
Loss of sensation in arms or legs	11.08	8.56–13.61	11.38	8.87–13.90	0.97 (0.71–1.33)	0.842
Paralyses	2.59	1.48–3.70	3.45	1.41–5.49	0.74 (0.42–1.31)	0.286
Seizures	3.54	2.38–4.70	4.28	2.14–6.42	0.82 (0.56–1.20)	0.290
Fainting	11.14	9.39–12.89	6.68	5.11–8.25	1.75 (1.31–2.35)	<0.01
Unconsciousness	6.33	4.38–8.29	3.77	1.84–5.61	1.75 (1.18–2.59)	<0.01
Amnesia	5.29	2.88–7.70	4.21	2.47–5.94	1.28 (0.87–1.88)	0.196
Sexual and other symptoms						
Shortness of breath	20.61	17.49–23.73	16.31	12.54–20.07	1.35 (1.17–1.55)	<0.001
Weakness	15.61	13.07–18.16	10.24	7.36–13.12	1.63 (1.24–2.15)	<0.01
Urinate to often	17.53	14.22–20.85	24.01	21.07–26.96	0.67 (0.57–0.78)	<0.001
Numbness/tingling	23.84	20.85–26.84	16.67	13.55–19.79	1.57 (1.23–2.01)	<0.01
Often feeling sickly	3.98	2.95–5.00	2.32	0.87–3.78	1.75 (0.93–2.37)	0.078
Sexual problems	1.88	1.10–2.66	10.70	7.94–13.45	0.16 (0.10–0.25)	<0.001

Note: Percentages are weighted and take into account the clustered and stratified sample structure; Reference category = women.

problems with activities of daily living, problems with living conditions and problems with leisure activities. Each item is scored from zero (no problem) to four (severe problem) on a 5-point scale. A review of the psychometric properties of the HoNOS65+ concludes that the instrument has good validity, reliability, sensitivity to change, and utility (Pirkis et al., 2005).

TABLE 2 Twelve-month prevalence rates of abridged somatization and pain disorder across countries ($N = 3142$)

	%w	95% CI
<i>Abridged somatization disorder (SSI4)</i>		
Israel	4.04	1.10–6.98
UK	1.52	0.34–2.70
Germany	2.45	1.54–3.36
Switzerland	1.07	0.00–3.09
Italy	1.38	0.46–2.29
Spain	0.68	0.32–1.05
Over all	1.67	1.05–2.30
<i>Pain disorder</i>		
Israel	6.14	3.09–9.19
Switzerland	3.54	2.19–4.89
UK	3.37	1.88–4.86
Germany	2.57	1.69–3.44
Italy	2.03	0.76–3.30
Spain	1.85	0.92–2.78
Over all	2.57	1.79–3.35

Note: percentages are weighted and take into account the clustered and stratified sample structure.

3.5 | Statistical analyses

All analyses were computed using Stata 12.1 (StataCorp, 2011). Analyses were weighted (regarding the number of inhabitants of countries, Eurostat, 2013) and take into account the clustered and stratified sample structure (study centre as cluster variable and four strata by sex and two age groups, 65–74 and older than 74 years). Two answer our first research question, the adjusted prevalence rates for all somatoform disorders were estimated as marginal means from a weighted logistic regression adjusting for age (in five-year intervals), gender and study centre.

We used logistic regressions adjusted for age, gender and study centre to explore the association between socio-demographic factors (marital status, financial situation, education) and somatoform disorders (present versus absent).

Logistic regression analyses were also performed to analyse the associations of somatoform and other mental and somatic disorders, whereby the somatoform status is considered as possible predictor in this case (research question 2). To analyse the relation between somatoform disorders and measures of functional impairment, quality of life and symptom severity, we performed separated linear regression analyses with the WHODAS-II sum score, disability days, WHOQoL-BREF global score, and the HoNOS65+ total score as dependent variables; these models were adjusted for gender, age, any past-year mood and any past year anxiety disorder (research question 3). Further linear regression models were performed to examine the relation between somatoform disorders and past-year help-seeking behaviour and the use of analgesics (research question 4).

TABLE 3 Socio-demographic correlates of any past-year abridged somatization disorders (SSI4) and pain disorder ($N_{\min} = 3118$)

	12-Month SSI4 ($n = 58$)			12-Month pain disorder ($n = 93$)		
	%(95% CI)	OR (95% CI)	p	%(95% CI)	OR (95% CI)	p
<i>Gender</i>						
Male	1.59 (0.77–2.41)	REF	—	1.78 (0.71–2.85)	REF	—
Female	1.73 (0.98–2.49)	1.09 (0.61–1.95)	0.758	3.26 (2.34–4.17)	1.87 (1.07–3.26)	<0.05
<i>Age</i>						
65–69	1.46 (0.61–2.31)	REF	—	2.96 (1.83–4.09)	REF	—
70–74	0.85 (0.04–1.65)	0.58 (0.23–1.42)	0.217	4.24 (2.72–5.77)	1.46 (0.83–2.54)	0.175
75–79	1.90 (0.64–3.16)	1.31 (0.61–2.81)	0.474	1.12 (0.44–1.79)	0.37 (0.18–0.77)	<0.05
> 80	3.35 (2.24–4.47)	2.35 (1.26–4.39)	<0.05	1.07 (0.06–2.20)	0.35 (0.11–1.13)	0.076
<i>Marital status</i>						
Married	1.74 (0.83–2.67)	REF	—	2.16 (1.28–3.03)	REF	—
Widowed/separated/divorced	1.78 (0.23–3.32)	1.02 (0.30–3.41)	0.974	3.25 (1.90–4.61)	1.53 (0.88–2.68)	0.126
Never married	0.00 (0.00–0.00)	—	—	3.10 (0.02–6.18)	1.46 (0.45–4.75)	0.513
<i>Financial situation</i>						
Very good/good	1.34 (0.23–2.45)	REF	—	2.75 (1.80–3.70)	REF	—
Just enough	1.51 (0.78–2.24)	1.13 (0.41–3.16)	0.804	2.21 (1.16–3.26)	0.80 (0.47–1.35)	0.379
Very poor/poor	5.72 (1.64–9.81)	4.57 (1.41–14.77)	<0.05	3.24 (0.98–5.51)	1.19 (0.53–2.66)	0.659
<i>Education</i>						
Years of schooling, mean (SD)	9.05 (3.27)	0.91 (0.80–1.03)	0.121	10.29 (3.17)	0.94 (0.85–1.05)	0.283

Note: % = adjusted prevalence taking into account the clustered and stratified sample structure; OR, odds ratio; SD, standard deviation; REF, reference category.

TABLE 4 Association of somatoform disorders with other DSM-IV disorders and physical illness (N = 3142)

	12-Month SS14 (n = 58)				12-Month pain disorder (n = 93)			
	% no(95% CI)	% yes(95% CI)	OR(95% CI)	p	% no(95% CI)	% yes(95% CI)	OR(95% CI)	p
Any affective disorder (n = 489)	13.40(12.22–14.57)	30.62(13.98–47.25)	3.09(1.27–7.50)	<0.05	13.03(11.80–14.26)	35.71(27.58–43.85)	3.79(2.47–5.82)	<0.001
Major depression (n = 372)	10.36(8.93–11.80)	15.24(5.57–24.95)	1.63(0.65–4.09)	0.282	10.09(8.67–11.51)	22.14(10.59–33.69)	2.49(1.17–5.29)	<0.05
Dysthymia (n = 104)	2.70(2.31–3.09)	15.10(4.01–26.18)	7.00(3.20–15.34)	<0.001	2.60(2.11–3.10)	12.95(4.50–21.40)	5.79(2.27–14.74)	<0.01
Bipolar disorder (n = 86)	2.43(1.56–3.30)	5.07(–2.80–12.95)	2.22(0.53–9.28)	0.257	2.39(1.52–3.26)	5.21(–1.03–11.46)	2.34(0.64–8.62)	0.189
Any anxiety disorder (n = 492)	16.65(15.60–17.69)	49.71(30.08–69.34)	5.57(2.16–14.38)	<0.01	16.40(15.17–17.62)	44.64(34.54–54.73)	4.42(2.63–7.43)	<0.001
GAD (n = 98)	2.85(2.20–3.51)	20.94(5.92–35.96)	10.41(3.01–35.99)	<0.01	2.80(2.21–3.40)	13.76(6.32–21.20)	5.78(3.00–11.11)	<0.001
Panic disorder (n = 93)	3.43(2.69–4.17)	26.17(9.87–42.48)	10.47(3.91–28.01)	<0.001	3.47(2.77–4.17)	14.19(5.31–23.08)	2.20(0.94–5.18)	0.068
Agoraphobia (n = 123)	4.66(4.06–5.25)	20.19(7.28–33.11)	5.88(2.27–15.24)	<0.01	4.44(3.83–5.04)	20.36(9.86–30.87)	5.51(2.55–11.93)	<0.001
Specific phobia (n = 280)	9.12(8.19–10.04)	11.54(0.06–22.48)	1.35(0.37–4.95)	0.631	8.88(8.09–9.66)	18.61(9.51–27.72)	2.25(1.14–4.44)	<0.05
Social phobia (n = 36)	1.35(0.81–1.89)	0.78(–0.54–2.10)	0.67(0.09–5.08)	0.686	1.20(0.68–1.73)	5.35(1.36–9.34)	4.27(1.49–12.30)	<0.01
OCD (n = 29)	0.79(0.30–1.29)	1.93(–1.19–5.06)	2.45(0.28–21.35)	0.398	0.77(0.33–1.21)	2.76(–1.42–6.93)	3.38(0.45–25.65)	0.224
PTSD (n = 54)	1.22(0.60–1.85)	9.73(–1.94–21.40)	8.87(2.62–30.08)	<0.01	1.20(0.45–1.95)	5.77(1.77–9.77)	5.99(1.86–19.23)	<0.01
Any substance-related disorder (n = 259)	8.98(7.41–10.55)	4.89(–1.86–11.64)	0.49(0.10–2.41)	0.365	9.09(7.57–10.61)	2.88(–1.89–7.65)	0.32(0.55–1.81)	0.184
Alcohol abuse (n = 144)	5.05(4.27–5.82)	0.19(–0.24–0.62)	0.03(0.00–0.36)	<0.01	5.12(4.34–5.90)	0.09(–0.12–0.31)	0.02(0.00–0.24)	<0.01
Alcohol dependence (n = 37)	1.26(0.90–1.61)	0.25(–0.31–0.81)	0.16(0.02–1.69)	0.121	1.28(0.91–1.65)	0.10(–0.12–0.32)	0.09(0.01–1.03)	0.052
Nicotine dependence (n = 115)	3.92(3.08–4.77)	5.01(–3.44–13.46)	1.26(0.18–8.94)	0.811	3.96(3.25–4.70)	2.88(–1.30–7.07)	0.72(0.18–2.89)	0.623
Any physical illness (n = 2629)	83.95(82.84–85.05)	99.63(98.86–100.00)	52.09(5.50–492.90)	<0.01	84.19(83.22–85.16)	84.66(74.72–94.61)	1.08(0.49–2.36)	0.842

Note: Reported percentages are weighted and take into account the clustered and stratified sample structure; OR, odds ratio; CI, confidence interval; GAD < generalized anxiety disorder; OCD, obsessive compulsive disorder, PTSD, post-traumatic stress disorder.

4 | RESULTS

4.1 | Prevalence of somatoform symptoms and disorders

The frequencies of specific somatoform symptoms reported by participants in our sample are displayed in Table 1. Overall 88.7% of respondents reported at least one somatoform symptom in their lifetime and 63.1% reported three or more symptoms. The three most frequently mentioned symptoms were back pain (60.1%), followed by pain in the joints (50.1%) and pain in arms or legs (36.1%). This rank order was similar for both sexes. We found several significant gender differences regarding the frequency of mentioned symptoms, whereby the most striking differences revealed for pain in the joints and headaches, which were reported more frequently by women, as well as for difficulties in urinating and sexual problems, which were reported more frequently by male participants (see Table 1).

The adjusted and weighted prevalence for any past-year somatoform disorder was 3.88% (95%-CI [2.94;4.82]) in our sample. We found no case fulfilling criteria for somatization disorder according to DSM-IV, neither 12-month nor lifetime. The adjusted prevalence of past-year abridged somatization according to Escobar, Rubio-Stipec, Canino, and Karno (1989) (SSI4) was 1.67% (95%-CI [1.05;2.30]) and the prevalence for past-year pain disorder was 2.6% (95%-CI [1.79;3.35]). The prevalence rates for any past year somatoform disorder varied significantly across centres ($p < 0.005$) whereby lowest rates were found for Spain with a prevalence of 2.51% (95%-CI [1.25;3.77]) and highest for Israel with a prevalence of 8.32% (95%-CI [5.51;11.13]), this was also the case for pain and abridged somatization disorder (see Table 2).

4.2 | Socio-demographic correlates

We found no significant gender differences in the prevalence rates for past-year abridged somatization disorder, but for pain disorder, whereby the odd to suffer from a past-year pain disorder was found to be higher for female participants [odds ratio (OR) = 1.87, 95%-CI [1.07;3.26]; $p < 0.05$; see Table 3]. Considering age-related differences, we found that the chance to suffer from past-year abridged somatization disorder was about two times higher for participants aged 80 or older compared to their younger counterparts (OR = 2.35, 95%-CI [1.26;4.39]; $p < 0.05$). In contrast the chance to suffer from past year pain disorder was found to be significantly lower for participants aged 75–79 years compared to those who were 65–69 years old at the time of the interview (OR = 0.37, 95%-CI [0.18;0.77]; $p < 0.05$). The OR of suffering from past-year abridged somatization disorder was nearly five-times higher for those who rated their financial situation as poor, compared to participants who rated their financial situation as good (OR = 4.57, 95%-CI [1.41;14.77]; $p < 0.05$).

4.3 | Comorbidity

Individuals with a past-year somatoform disorder had a nearly four times higher chance to suffer from any past-year affective disorder (OR = 3.63, 95%-CI [2.48;5.29]; $p < 0.001$) and an about five times

TABLE 5 Association of somatization with measures of impairment ($N_{\min} = 3059$)

	12-Month SSI3			Pain disorder		
	No [mean (SD)]	Yes [mean (SD)]	β (95% CI)	No [mean (SD)]	Yes [mean (SD)]	β (95% CI)
<i>Functional impairment</i>						
WHODAS-II sum score	17.54 (6.75)	30.28 (9.16)	7.91 (5.06–10.76)	17.60 (6.86)	23.76 (9.17)	4.81 (2.80–6.81)
Disability days	1.41 (5.18)	8.95 (11.19)	6.12 (3.47–8.77)	1.48 (5.37)	4.00 (7.17)	0.82 (–0.43–2.08)
Quality of life						
Global rating WHOQOL-BREF	68.48 (18.12)	42.98 (21.26)	21.40 (16.69–26.12)	68.38 (18.28)	55.71 (21.40)	7.63 (2.12–13.14)
<i>Symptom severity</i>						
HoNOS65+ total score	0.29 (0.30)	0.68 (0.47)	0.23 (0.05–0.40)	0.30 (0.31)	0.55 (0.40)	0.14 (0.05–0.23)
<i>Help-seeking</i>						
Doctor visits past 12 month	9.03 (10.78)	14.58 (12.92)	7.85 (0.28–15.44)	8.89 (10.55)	13.51 (16.14)	6.85 (0.33–13.36)
<i>Medication</i>						
Use of analgesics past 30 days	1.23 (1.47)	2.07 (1.64)	0.81 (0.11–1.53)	1.22 (1.47)	2.00 (1.50)	0.63 (0.01–1.26)

Note: models are adjusted for age, gender, any past-year anxiety disorder, any past-year affective disorder, past year PTSD and physical illness; WHODAS-II, World Health Organization (WHO) Disability Assessment Schedule; WHOQOL-BREF, WHO Quality of Life BREF; HoNOS65+, Health of the Nation Outcome Scales 65+.

higher chance to have a past-year anxiety disorder (OR =4.76, 95%-CI [3.38;6.69]; $p < 0.001$) compared to participants without a somatoform disorder. We neither found a significant relation between any somatoform disorder and substance-related disorders ($p = 0.095$), nor with any 12-month physical illness ($p = 0.157$).

A more detailed analysis of comorbidity patterns showed that both, abridged somatization and pain were significantly associated with dysthymia and generalized anxiety disorder (GAD), as well as agoraphobia and post-traumatic stress disorder (PTSD). However, solely pain disorder was associated with major depression, specific and social phobia, whereby abridged somatization was associated with panic disorder and physical illness (see Table 4).

4.4 | Impairments and help-seeking behaviour

Analysing the associations between somatoform disorders and level of function adjusted for potential confounder variables (age, gender, anxiety disorders, affective disorders, PTSD, and physical illness) revealed that both abridged somatization and pain disorder were significantly associated with increased values of overall functional impairment, significant decrease in health-related quality of life and an increase in expert-rated overall symptom severity. A significant increase in the number of disability days was only found for abridged somatization disorder. Moreover help-seeking behaviour, defined as the number of past year doctor visits, was increased for participants suffering from abridged somatization or pain disorder, whereby they reported nearly five more visits on average, compared to participants without abridged somatization or pain. Furthermore the frequency of the use of analgesics within the past 30 days was higher for individual fulfilling criteria for abridged somatization or pain (see Table 5).

5 | DISCUSSION AND CONCLUSION

5.1 | Prevalence of somatoform symptoms and disorders

Overall 3.88% of elderly participants in this study met criteria for any past-year somatoform disorder. This rate is somewhat lower than those reported in other studies investigating somatoform disorders in younger age groups (Canino et al., 1987; Escobar et al., 1989; Hiller, Rief, & Braehler, 2006; Jacobi et al., 2004; Lieb, Pfister, Mastaler, & Wittchen, 2000; Ritsner et al., 2000; Robins et al., 1984). However, the frequencies of reported single somatoform symptoms were higher in our sample, compared to a study by Rief, Hessel, and Braehler (2001), who investigated somatization symptoms in the general population. This finding indicates that single somatoform symptoms might increase in older age groups, but do not lead to an increase in the prevalence of defined somatoform disorders.

We did not find one single case fulfilling criteria for somatization disorder according to DSM-IV, which is in line with other studies (Bland et al., 1988; Hessel et al., 2003; Regier et al., 1988) and underlines the widespread assumption, that current criteria are too restrictive and need to be revised (Janca, 2005; Löwe et al., 2008; Mayou, Kirmayer, Simon, Kroenke, & Sharpe, 2005). The 12-month prevalence

of abridged somatization disorder was found to be 1.67% in this study. To our knowledge there is only one further study investigating abridged forms of somatization in the general elderly population (Leikens et al., 2007). The authors of this study report a prevalence of 9.8% for at least three clinical relevant somatoform symptoms identified by the CIDI. This divergent finding might be due to the fact that in the study by Leikens et al. (2007) no age-specific version of the CIDI was used and that interviewers were not specially trained in interviewing older participants, as the study was a general population study covering all age groups with no special focus on elderly respondents; this might have led to an over-estimation of somatoform symptoms by misinterpretation of somatic symptoms as somatoform in their nature. In addition cultural differences could also be of importance in interpreting these findings, as we found significant variations between countries in the present study. However, cultural aspects of somatoform disorders are not the focus of the present study and should be investigated in more detail in future research. One preliminary explanation for the increased prevalence rates found in Israel, compared to the other study centres, might lie in the higher probability of experienced trauma and migration, which are both linked to somatization (Aragona et al., 2011; Bermejo, Nicolaus, Kriston, Hölzel, & Härter, 2012; Sack, Lahmann, Jaeger, & Henningsen, 2007; Waitzkin & Magana, 1997).

5.2 | Correlates of somatoform disorders

In line with our expectations, we found a significant gender difference for pain disorder, with a higher chance to fall ill for female participants. However, unlike in studies of younger age groups, where women were found to be much more likely to suffer from any somatoform condition (Jacobi et al., 2004; Johnson, 2008; Kapfhammer, 2005; Ladwig et al., 2001; Tseng & Natelson, 2004), we did not find a significant gender difference in the prevalence of abridged somatization. Yet, our finding is in line with the result by Hessel et al. (2003), who found that elderly females did not report more somatoform symptoms than elderly males. The apparent disappearing of gender differences in older age groups might arise from the fact that traditional role perceptions become blurred, due to multiple symptoms and a general increasing dependency on others. Another explanation might lie in the applied diagnostic criteria. As shown in previous studies the male/female ratio changes with defined symptom thresholds in the way that female predominance becomes less obvious with lower thresholds (Kroenke, Spitzer, deGruy, & Swindle, 1998; Liu, Clark, & Eaton, 1997; Rief et al., 2001; Robins et al., 1984). Moreover we found a significant decline in the prevalence rate with age for pain disorder, while an opposite effect could be found for abridged somatization, indicating a different course of the two disorders. Further differences between these two somatoform subgroups revealed in observed comorbidity patterns. Solely pain disorder was associated with specific phobia, social phobia and major depression, whereby abridged somatization was associated with panic disorder and physical illness. Besides these variations, a more general comorbidity pattern could also be found, underlining that comorbidity is common among elderly subjects suffering from abridged somatization and pain disorder. We found a strong

association between both disorders and anxiety (GAD, as well as agoraphobia and PTSD), which is well known from adult population-based studies (for an overview see Creed & Barsky, 2004). There is some evidence that this association remains stable in older age groups (Rubio & Lopez-Ibor, 2007), or even increases (Sheikh et al., 1999), which is consistent with our findings. The association between somatoform and affective disorders was also found to be significant in our study, which is in line with previous results (Hilderink et al., 2009; Yu & Lee, 2012). We initially focussed on examining comorbidity as independent from each other; however, it could be of interest in further research to explore the interplay between somatization, anxiety and chronic depression in more detail.

Another question of particular interest when considering comorbidity in an elderly population, concerns the relation between general medical conditions and somatoform symptoms. In our sample we found a strong association between abridged somatization and physical illness, in that participants suffering from abridged somatization had a 50-times higher chance to report a comorbid physical illness, indicating that almost all participants fulfilling criteria for past-year abridged somatization report a comorbid medical condition. This finding is in line with those from Cheng (1992), who found a significant correlation between the self-reported number of chronic illnesses and somatization in a sample of females aged 65–85, recruited from senior centres. In a more recent study Wilkinson, Bolton, and Bass (2001) found a comorbid concurrent physical illness in 53% of their consecutive sample of elderly people referred to a consultation-liaison psychiatric clinic for problems with somatic symptoms or pain. On the one hand, these findings underline the importance of seriously considering the interplay between somatization and medical conditions in the elderly and, on the other hand, allude to the essential problem of overlapping constructs. Looking at the reported somatoform symptoms, which lead to the diagnosis of abridged somatization in more detail, it becomes obvious that the most frequently named symptoms (back pain, pain in the joints, and pain in arms or legs) are directly related to the most frequently reported comorbid physical illnesses, which are musculoskeletal and inflammatory diseases. It is therefore questionable to speak of comorbidity in the narrower sense at this point and further research should investigate the phenomenon in more detail, by comparing somatoform symptom patterns between patients suffering from different medical conditions.

5.3 | Impairments and help-seeking

As shown in previous studies concerning younger age groups, somatoform disorders are associated with a wide range of impairments (e.g. Escobar et al., 1989; Gureje et al., 1997; Kroenke et al., 1998; Kroenke & Spitzer, 1998; Ladwig et al., 2001; Ritsner et al., 2000; Spitzer et al., 1995). The burden which elderly people with a somatoform condition experience is underlined by the findings that reported functional impairment is higher for those suffering from abridged somatization or pain compared to other respondents. Controlling for age, gender, comorbid anxiety and mood disorders in the analysis allows the interpretation of this finding as a correlate of somatization and pain itself, rather than an epiphenomenon of comorbid conditions. This finding is also in line by those from Cheng (1992),

who found a significant negative correlation between somatization and activities of daily living in a community-based sample of elderly women. Significantly increased rates of expert-rated overall symptom severity, as well as decreased rates of quality of life illustrate the considerable evidence for marked impairments of somatoform conditions in the elderly. Again those findings remain significant when controlling for age, gender and comorbid mental disorders and demonstrate the clinical importance of abridged somatization and pain disorder in the elderly.

Beside the earlier mentioned impairments, we found that participants suffering from abridged somatization or pain disorder reported an increased number of health care use and use of analgesics compared to respondents without any somatoform disorder. Unfortunately we did not have the chance to assess medication use in detail in our study and are currently unable to provide information about drug abuse or patterns of prescribed and non-prescribed use. Therefore the phenomenon of self-medication in elderly patients suffering from a somatoform disorder should be investigated in more detail in further studies.

5.4 | Limitations

To our knowledge, this is the first study which systematically assessed somatoform symptoms and disorders in a large community-based sample of older adults. However, some major limitations have to be considered when interpreting our results. As mentioned earlier satisfying reliability of the CIDI65+ somatoform disorder section could not have been demonstrated yet partly due to time lapse effects and particularly low base rates of somatoform disorders within the test–retest study (Wittchen et al., 2015), which clearly extenuates the interpretation of our results. Moreover the CIDI65+ does not cover the full spectrum of somatoform disorders, which is why we cannot provide any information about hypochondriasis or undifferentiated somatoform disorders in the elderly. Unfortunately we were not able to include new DSM-5 criteria (APA, 2013) in our study and therefore cannot make any statements about validity of this approach. However, our findings might support the decision to skip the restrictive criteria for somatization disorder to some extent, as we did not find a single case fulfilling them in our study.

In addition the rather low response rates might constrict external validity of our findings. Likewise a potential selection bias has to be kept in mind when interpreting the results of the present study. However, to assess the comparability of the recruited samples with the general population, comparisons with regard to socio-demographic characteristics were made between the MentDis sample and general population characteristics with satisfying results (Volkert et al., under review).

Despite the limitations (s.a.) this study is valuable in demonstrating, in a large international community sample of older adults, that somatoform syndromes in the elderly are a prevalent, highly comorbid phenomenon, which accompanies significant impairment in functioning, quality of life and well-being. Compared to studies investigating somatoform conditions in younger age groups, the results of the present study suggest that prevalence rates decline after the age of 65, which is in line with the conclusions by Hilderink et al. (2013), who discuss several

potential explanations for a decrease in the prevalence of somatoform disorders in the elderly in a recent review. By using a standardized interview, which has been adapted to the needs of the elderly, and by inclusion of an abridged form of somatization we were able to address their main points of critique on previous research in the present study and provide a preliminary data base for further research and practice.

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DECLARATION OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

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APPENDIX

TABLE A1 CIDI65+ somatoform symptom list

<i>Which of the following problems have you ever had?</i>			
1 O	abdominal pain	7 O	painful menstrual periods
2 O	back pain	8 O	pain when urinating
3 O	pains in the joints	9 O	difficulty in urinating
4 O	pains in arms or legs	10 O	pain in private parts
5 O	chest pains	11 O	other pains?which:_____
6 O	headaches (migraine, tension, other)		
12 O	vomiting	16 O	paralysis
13 O	diarrhoea	17 O	seizures
14 O	difficulty keeping balance	18 O	spells of weakness/fainting
15 O	loss of sensation in arms or legs	19 O	unconsciousness
		20 O	amnesia
21 O	shortness of breath	24 O	numbness or tingling
22 O	weakness	25 O	often ill
23 O	too frequent urination	26 O	sexual problems