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Somatoform Disorders and Medically Unexplained Symptoms in Primary Care

A Systematic Review and Meta-analysis of Prevalence

Heidemarie Haller, Holger Cramer, Romy Lauche, Gustav Dobos

SUMMARY

Background: The literature contains variable figures on the prevalence of somatoform disorders and medically unexplained symptoms in primary care.

Methods: The pertinent literature up to July 2014 was retrieved by a systematic search in the PubMed/MEDLINE, PsychInfo, Scopus, and Cochrane databases. The methodological quality and heterogeneity (I^2) of the retrieved trials were analyzed. The prevalence rates of medically unexplained symptoms, somatoform disorders, and their subcategories were estimated, along with corresponding 95% confidence intervals (CI), with the aid of random-effects modeling.

Results: From a total of 992 identified publications, 32 studies from 24 countries involving a total of 70 085 patients (age range, 15–95 years) were selected for further analysis. All had been carried out between 1990 and 2012. The primary studies were more heterogeneous overall; point prevalences for the strict diagnosis of a somatization disorder ranged from 0.8% (95% CI 0.3–1.4%, $I^2 = 86\%$) to 5.9% (95% CI 2.4–9.4%, $I^2 = 96\%$), with higher estimated prevalences in studies that applied less restrictive diagnostic criteria. At least one type of somatoform disorder was diagnosable by DSM-IV and/or ICD-10 criteria in a fraction of primary-care patients that ranged from 26.2% (95% CI 19.1–33.3%, $I^2 = 98\%$) to 34.8% (95% CI 26.6–44.6%, $I^2 = 92\%$). The percentage of patients complaining of at least one medically unexplained symptom ranged from 40.2% (95% CI 0.9–79.4%, $I^2 = 98\%$) to 49% (95% CI 18–79.8%, $I^2 = 98\%$). The quality of the studies, in general, was only moderate. No relationship was found between study quality and prevalence estimates.

Conclusion: The statistical heterogeneity of the included studies is very high. Somatoform disorders and medically unexplained symptoms are more common than generally assumed. The found prevalences highlight the importance of these conditions in primary care.

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Patients with non-specific, functional, or somatoform disorders seek contact with primary care physicians to an extent that is above average (1). They often have recurring physical symptoms that cannot be explained at all, or only to an unsatisfactory degree, with a specific medical diagnosis. Even though psychiatric disorders highly correlate with medically unexplained symptoms, the extent of the occurring symptoms cannot be completely explained with psychopathological factors (e1–e3). For this reason, the DSM (Diagnostic and Statistical Manual for Mental Disorders) (e4, e5) and the ICD (International Classification of Diseases) (e6) classify such symptoms that cannot be medically explained in separate somatoform categories.

To diagnose a somatization disorder, 6 to 13 (depending on the manual) impairing, medically unexplained symptoms with a duration of at least two years are required. The undifferentiated somatoform disorder is less restrictive: it is defined as at least one impairing medical symptom with a minimum duration of six months. The diagnosis of chronic pain disorder also requires one medically unexplained and impairing pain symptom that has been present for six months or longer. The diagnosis of a conversion disorder is made in cases where at least one unexplained and impairing neurological deficit is present. Somatoform autonomic dysfunction is characterized by a minimum of three unexplained and impairing cardiovascular, gastrointestinal, respiratory, or urogenital symptoms. The residual category of an unspecified somatoform disorder requires merely a medically unexplained symptom, which doesn't have to be accompanied by significant impairment.

In the literature, the classifications abridged somatization disorder and multisomatoform disorder have also been described. Abridged somatization disorder is present if a minimum of four impairing, medically unexplained symptoms are confirmed in women and six such symptoms in men (2), whereas the definition of multisomatoform disorder applies if at least three impairing unexplained symptoms with a minimum duration of two years are diagnosed (3). Because of the overall low validity of the diagnostic criteria to date, the DSM-5 includes revised definitions and concepts for somatoform disorders

and medically unexplained symptoms. A corresponding update has been announced for ICD-11, expected in the spring of 2015.

Medically unexplained symptoms and somatoform disorders are often underdiagnosed in primary care (e7) and therefore cannot be treated adequately. The associated costs therefore rise further—independent of somatic and psychiatric comorbidities (4). The most recent estimates assume that 20% of primary care patients have somatoform disorders (5). Ia-level evidence for the prevalence of subcategories of somatoform disorders and medically unexplained symptoms does currently not exist.

This article analyzes the prevalence rates in primary care on the basis of a systematic review of the literature with meta-analysis.

Methods

The study was conducted in accordance with the guidelines laid out in the MOOSE (Meta-Analysis Of Observational Studies in Epidemiology) statement (e8).

Search strategy

Our systematic search strategy included electronic databases, as well as manual screening of reference lists. PubMed/Medline, PsycINFO, Scopus, and the Cochrane library were searched from database inception through July 2014. Our search restrictions for PubMed included only studies published in English or German. The search strategy was derived from a comprehensive list of search terms published with the guideline for non-specific, functional, and somatoform physical symptoms (5) and is shown in the *Box*.

Inclusion criteria

Two authors (HH, RL) independently screened study abstracts and assessed the suitability of full-text studies. The following inclusion criteria were applied:

- Study type: the studies had to be original articles of epidemiological surveys that had been published in peer-reviewed journals in either English or German.
- Diagnostic criteria: the studies had to investigate subcategories of somatoform disorders (F45.0 – F45.9/ 300.81 + 300.11) according to the ICD-10, DSM-III-R, or newer versions of the DSM. Hypochondriacal and body dysmorphic disorders (F45.2/300.7) were excluded because of their different psychopathology. Furthermore we included studies that collected data on subthreshold somatoform disorders and medically unexplained symptoms by using standardized instruments.
- Setting and study population: samples had to consist of patients in primary care. Population-based studies were not included. No restrictions were imposed in terms of age, countries, or time. In cases where several publications existed for the same study population we included the most relevant of these.

Data extraction

The following characteristics of the studies were extracted independently by two of the authors (HH, RL). Where inconsistencies were found, these were discussed with a third author (HC): the study's country of origin, study period, sample size with corresponding response rate, age range of the patients, data collection instruments, diagnostic criteria of somatoform disorders/medically unexplained symptoms, and reported prevalence rates.

Evaluation of methodological quality

To rate the methodological quality of the included studies, quality standards for epidemiological studies (e9) were applied in an adapted version including five criteria (6):

- Representative sample with unbiased sampling strategy,
- Adequate sample size (≥ 1000),
- Adequate response rate ($\geq 70\%$),
- Comparison of responders and non-responders,
- Valid and standardized assessment of somatoform disorders and medically unexplained symptoms.

For each quality criterion, we assessed the risk of bias:

- As low risk (+) if the respective criterion had been adequately met,
- As high risk (–) where the respective criterion had not been or not adequately been met,
- As unclear risk (?) where insufficient information was available to assess the risk.

The quality evaluation was also done independently by two of the authors (HH, RL) and, in case of inconsistencies, these were discussed with a third author (HC).

Data analysis and synthesis

We used a standardized Microsoft Excel (version 12.3.5, Microsoft, Redmond, USA) spreadsheet (e10) to calculate prevalence rates and standard errors. We used the Review Manager software package (version 5.2, Nordic Cochrane Centre, Copenhagen, Denmark) to conduct the meta-analysis on the basis of random effects models. For each subcategory of a somatoform disorder, weighted prevalence rates with 95% confidence intervals (95% CI) were calculated. Heterogeneity between studies was estimated on the basis of the raw proportions, by using the I^2 statistical test. Intervals were defined as follows (e11, e12):

- Low heterogeneity (I^2 of 0–24%)
- Moderate heterogeneity (I^2 of 25–49%)
- Substantial heterogeneity (I^2 of 50–74%)
- Relevant heterogeneity (I^2 of 75–100%).

In order to assess heterogeneity, we conducted χ^2 tests with $p \leq 0.10$ (e11). To assess the robustness of the study results to bias, we conducted sensitivity analyses with exclusively high-quality studies that met at least the following criteria: representative sampling strategy, adequate response rate, valid and standardized assessment of somatoform disorders/medically unexplained symptoms.

Results

Search results

The electronic database search identified a total of 988 publications. Two further studies were found by searching reference lists and two more studies as a result of expert recommendations. After excluding 114 duplicates, we screened the abstracts of 878 studies and assessed 60 full text studies for their suitability. We excluded 28 of these (2, e13–e39). 32 studies were included and analyzed (3, 7–37) (*Figure 1*).

Study characteristics

The *eTable* shows detailed descriptions of the included studies. The studies were conducted between 1990 and 2012, and most of them are from Europe (8, 9, 12, 15, 17, 18, 20, 21, 23, 29, 30, 32–34, 36, 37), followed by North America (3, 14, 16, 22, 25, 27, 28), the Middle East (7, 11, 13, 26), Australia and South East Asia (10, 24), and Africa (31). A multicenter study that was reported in two publications included 15 centers from 14 countries (19, 35).

The total number of patients came to 70 085; their ages ranged from 15 to 95. One sample consisted exclusively of adolescents (23), whereas all other studies investigated adult samples that occasionally included data from adolescents.

Study quality

The methodological quality of the studies was moderate on average. 23 of the 32 studies reported unbiased sampling strategies (3, 7–9, 11, 12, 15–21, 24–28, 30, 32–35, 37), 19 studies had adequate response rates of at least 70% (7–9, 11, 13, 15–17, 20–23, 26, 27, 30, 32, 34, 36, 37), and 27 studies represented valid data collections of somatoform disorders and medically unexplained symptoms (3, 8–10, 12–19, 21–26, 28–30, 32–37). 10 studies met all three criteria (8, 9, 15–17, 21, 26, 30, 34, 37). 16 studies had a sample size of at least 1000 patients (3, 9, 10, 12, 14, 16, 18, 19, 21, 24, 26, 27, 30, 33, 35, 37). Only 8 out of 32 studies compared responders and non-responders (12, 14, 16, 19, 22, 24, 35, 37) (*Table 1*).

Results of the meta-analysis

The estimated prevalence rates of somatoform disorders and medically unexplained symptoms are shown in *Table 2* and *Figure 2*. While the primary studies were subject to wide heterogeneity, the estimated point prevalence rates for somatization disorders were—depending on the manual—between 0.8% (95% CI: 0.3 to 1.4%; $I^2=86$) and 4.7% (95% CI: 3.6 to 5.8%; $I^2=99$). They rose to 12.8% (95% CI: 10.2 to 15.3%; $I^2=86$) when data on somatization disorder were collected by using questionnaires rather than clinical interviews. Point prevalence rates for subcategories of somatoform disorders that required only one medically unexplained symptom varied by diagnostic manual:

- Chronic pain disorder between 1.9% (95% CI: 0.4 to 3.4%; $I^2=84$ %) and 8.1% (95% CI: 3.9 to 12.3%; $I^2=92$ %),

BOX

List of search terms

- #1 somatoform disorder[Mesh] OR somatiz*[Title/Abstract] OR somatis*[Title/Abstract] OR medically unexplained*[Title/Abstract] OR psychosomatic disorder[Mesh] OR ((psycholog*[Title/Abstract] OR psychogen*[Title/Abstract] OR psychosom*[Title/Abstract] OR psychophysiol*[Title/Abstract] OR functional*[Title/Abstract] nonspecific[Title/Abstract] OR non specific[Title/Abstract] OR non-specific[Title/Abstract] OR psychogenic[Title/Abstract] OR nonorganic[Title/Abstract]) AND (syndrome[Title/Abstract] OR disorder[Title/Abstract] OR illness[Title/Abstract] OR symptom[Title/Abstract] OR pain[Title/Abstract]))
- #2 ambulatory care* OR primary health care* OR physicians, family* OR (specialties, medical* NOT psychiatry*) OR general pract* OR family pract* OR family doctor* OR family physician* OR family medicine* OR primary care*
- #3 epidemiology[Mesh] OR epidemiolog*[Title/Abstract] OR prevalence[Title/Abstract]
- #4 #1 AND #2 AND #3

FIGURE 1

Selection of included studies. SFD, somatoform disorders; MUS, medically unexplained symptoms

TABLE 1

Quality assessment of included studies

Reference	Representative sampling strategy	Adequate sample size (≥ 1000)	Adequate response rate ($\geq 70\%$)	Comparison of responders and non-responders	Valid and standardized assessment of data on SFD/MUS
Alqahtani 2008 (7)	+	-	+	?	-
Aragona 2005 (8)	+	-	+	?	+
Broers 2006 (9)	+	+	+	?	+
Clarke 2008 (10)	-	+	-	?	+
Cwikel 2008 (11)	+	-	+	?	-
de Waal 2004 (12)	+	+	-	+	+
El-Rufaie 1999 (13)	?	-	+	?	+
Escobar 1998 (14)	?	+	-	+	+
Faravelli 1997 (15)	+	-	+	?	+
Feder 2001 (16)	+	+	+	+	+
Fink 1999 (17)	+	-	+	?	+
Garcia-Campayo 1998 (18)	+	+	?	?	+
Haftgoli 2010 (20)	+	-	+	?	-
Hanel 2009 (21)	+	+	+	?	+
Jackson 2008 (22)	?	-	+	+	+
Janiak-Baluch 2013 (23)	?	-	+	?	+
Khoo 2012 (24)	+	+	-	+	+
Kirmayer 1991 (25)	+	-	-	?	+
Kroenke 1997 (3)	+	+	?	?	+
Laufer 2013 (26)	+	+	+	?	+
Löwe 2008 (27)	+	+	+	?	-
Lynch 1999 (28)	+	-	-	?	+
Mergl 2007 (29)	-	-	?	?	+
Norton 2007 (30)	+	+	+	?	+
Ohaeri 1994 (31)	-	-	?	?	-
Peveler 1997 (32)	-	-	+	-	+
Roca 2009 (33)	+	+	?	?	+
Schoepf 2003 (34)	+	-	+	?	+
Simon 1999 (35)/Gureje 1997 (19)	+	+	-	+	+
Steinbrecher 2011 (36)	?	-	+	?	+
Toft 2005 (37)	+	+	+	+	+

+, low risk for bias; -, high risk for bias; ?, unclear risk for bias; SFD, somatoform disorders; MUS, medically unexplained symptom

- Undifferentiated somatoform disorder between 9.3% (95% CI: 6.6 to 12%; $I^2=76\%$) and 38.1% (95% CI: 13.1 to 63.1%; $I^2=97\%$),
- Unspecified somatoform disorders between 12.5% (95% CI: 7.2 to 17.7%; $I^2=89\%$) and 14.7% (5.6 to 23.7%; $I^2=98\%$).

Further point prevalence rates were estimated for:

- Somatoform autonomic dysfunction of 9.4% (95% CI: 3.0 to 15.7%; $I^2=93\%$),
- Abridged somatization disorder of 17.9% (95% CI: 14.6 to 21.3%; $I^2=92\%$),
- Multisomatoform disorder of 12.6% (95% CI: 9.1 to 16.1%; $I^2=93\%$).

TABLE 2

Estimated prevalence rates of somatoform disorders and medically unexplained symptoms in primary care

Diagnosis	No of studies	No of study participants	Prevalence rates in % (95% CI)	Range in %	Heterogeneity I ² in %
Somatization disorder					
Point prevalence					
DSM III-R	2	860	2.9 (–1.1 to 6.9)	1 to 5.1	89 (p=0.003)
DSM IV	5	28 727	0.8 (0.3 to 1.4)	0.5 to 1.4	87 (p<0.001)
ICD-10	9	35 372	4.7 (3.6 to 5.8)	0 to 12	99 (p<0.001)
Questionnaires	11	20 508	12.8 (10.2 to 15.3)	4.2 to 35.2	96 (p<0.001)
Lifetime prevalence					
ICD-10	2	2179	5.9 (–5.7 to 17.4)	0 to 11.8	99 (p<0.001)
Undifferentiated somatoform disorder					
Point prevalence					
DSM III-R/DSM IV	3	1356	38.1 (13.1 to 63.1)	13 to 79	97 (p<0.001)
ICD-10	4	2798	9.3 (6.6 to 12)	5.5 to 11.8	76 (p=0.005)
Lifetime prevalence					
ICD-10	2	2179	13.4 (11.8 to 14.9)	12.4 to 13.6	0 (p=0.560)
Chronic pain disorder					
Point prevalence					
DSM III-R/DSM IV	3	2237	1.9 (0.4 to 3.4)	0.8 to 7.3	84 (p=0.002)
ICD-10	4	2798	8.1 (3.9 to 12.3)	4.4 to 16.8	92 (p<0.001)
12-month prevalence					
DSM III-R/DSM IV	2	1293	6.2 (–5.0 to 17.4)	0.6 to 12	98 (p<0.001)
Lifetime prevalence					
ICD-10	2	2179	9.2 (–0.4 to 18.7)	4.5 to 14.2	96 (p<0.001)
Conversion disorder					
12-month prevalence					
DSM III-R/DSM IV	2	1293	0.1 (–0.2 to 0.3)	0 to 0.3	41 (p=0.190)
Somatoform autonomic dysfunction					
Point prevalence					
ICD-10	3	2404	9.4 (3.0 to 15.7)	4.3 to 12.5	93 (p<0.001)
Somatoforme disorder, unspecified					
Point prevalence					
DSM III-R/DSM IV	3	9122	14.7 (5.6 to 23.7)	4.2 to 27.2	98 (p<0.001)
ICD-10	2	2179	12.5 (7.2 to 17.7)	9.6 to 15	89 (p=0.003)
Lifetime prevalence					
ICD-10	2	2179	20.5 (15.4 to 25.6)	18.3 to 23.6	75 (p=0.050)
Abridged somatization disorder					
Point prevalence	6	29 909	17.9 (14.6 to 21.3)	5.9 to 21	92 (p<0.001)
Multisomatoform disorder					
Point prevalence	5	10 467	12.6 (9.1 to 16.1)	8.2 to 23.5	93 (p<0.001)
≥ Somatoform disorder					
Point prevalence	7	12 875	26.2 (19.1 to 33.3)	11.7 to 52.9	98 (p<0.001)
12-month prevalence	2	1293	18.9 (11.1 to 26.6)	15 to 22.9	91 (p=0.001)
Lifetime prevalence	2	2179	41 (23.5 to 58.5)	32.4 to 50.3	95 (p<0.001)
≥ Medically unexplained symptom					
Point prevalence	2	1237	40.2 (0.9 to 79.4)	20.5 to 60.6	98 (p<0.001)
12-month prevalence	2	1293	49 (18 to 79.8)	33.3 to 64.8	98 (p<0.001)

FIGURE 2

Forest plot example: Point prevalence of undifferentiated somatoform disorder according to ICD-10. In 92% of all meta-analyses, heterogeneity (I^2) was also above the top quartile.
 IV, inverse variance method; 95% CI, 95% confidence interval; SE, standard error

The lowest prevalence was calculated for conversion disorders, based on 12-months, of 0.1% (95% CI: -0.2 to 0.3% ; $I^2=41\%$).

Estimated lifetime prevalence rates were:

- Somatization disorder, 5.9% (95% CI: -5.7 to 17.4% ; $I^2=99\%$),
- Chronic pain disorder, 9.2% (95% CI: -0.4 to 18.7% ; $I^2=96\%$),
- Undifferentiated somatoform disorders, 13.4% (95% CI: 11.8 to 14.9% ; $I^2=0\%$),
- Unspecified somatoform disorder 20.5% (95% CI: 15.4 to 25.6% ; $I^2=75\%$).

For the total of all patients who had at least one somatoform disorder according to DSM/ICD, the estimated point prevalence was 26.2% (95% CI: 19.1 to 33.3% ; $I^2=98\%$), the 12-month prevalence was 18.9% (95% CI: 11.1 to 26.6% ; $I^2=91\%$), and the lifetime prevalence was 41% (95% CI: 23.5 to 58.5% ; $I^2=95\%$). The estimated point prevalence and 12-month prevalence for at least one unexplained medical symptom—without the criteria for a somatoform diagnosis according to DSM/ICD being met—were 40.2% (95% CI: 0.9 to 79.4% ; $I^2=98\%$) and 49% (95% CI: 18 to 79.8% ; $I^2=98\%$).

Sensitivity analysis

In the analysis of exclusively high-quality studies, it was possible only to calculate point prevalence rates (Table 3). For somatization disorders, however, these varied according to the data collection method between 5.9% (95% CI: 2.4 to 9.4% ; $I^2=96\%$) and 16.6% (95% CI: 9.4 to 23.6% ; $I^2=98\%$). The rate for chronic pain disorders was 9.3% (95% CI: 2.1 to 16.5% ; $I^2=95\%$); for undifferentiated somatoform disorders, 8.9% (95% CI: 5.2 to 12.6% ; $I^2=84\%$); and for somatoform autonomic dysfunction, 9.4% (95% CI: 3.0 to 15.7% ; $I^2=93\%$). At least one somatoform diagnosis according to DSM/ICD was ascertained an average of 34.8% (95% CI: 26.6 to 44.6% ; $I^2=92\%$) of patients. Further

reported prevalence rates are based on only one high-quality study. Substantial differences to prevalence estimates based on the entire study pool were not seen, but heterogeneities between high-quality studies were still above the top quartile.

Discussion

Summary of evidence

The present meta-analysis shows wide heterogeneity in the prevalence rates of somatoform disorders and medically unexplained symptoms in primary care. Altogether, low point prevalence rates were seen, of 0.8% to 5.9% for strict DSM/ICD diagnoses of a somatization disorder. If less restrictive diagnostic criteria were applied the prevalence estimates were higher. Differences in diagnoses according to DSM and ICD were large, as were the differences between data collected by questionnaire and those collected by clinical interview. The methodological quality of the studies, which was moderate, did not, however, seem to substantially affect prevalence estimates.

In total, the point prevalence for the diagnosis of at least one somatoform disorder according to DSM or ICD was 26.2%, and 34.8% when only data from high-quality studies were included. The mean lifetime prevalence was 41%. At least one medically unexplained symptom was diagnosed in 40–49% of all primary care patients. The upper confidence limits were up to 80%.

Strengths and limitations

This is the first systematic review with meta-analysis on the prevalence rates of somatoform disorders and medically unexplained symptoms in primary care. Earlier reviews did not include any more than nine original studies and dealt only with the prevalence rates of selected somatoform disorders (e1, e3). The associated meta-analysis included 32 studies and provides a more comprehensive overview of the prevalence rates of subcategories of somatoform disorders as well as of

TABLE 3
Sensitivity analysis

Diagnosis	No of studies	No of study participants	Prevalence rates in % (95% CI)	Range in %	Heterogeneity I ² in %
Somatization disorder					
Point prevalence					
DSM III-R	1	673	0.7 (0.1 to 1.3)	–	–
DSM IV	1	191	0.8 (–0.5 to 2)	–	–
ICD-10	4	5200	5.9 (2.4 to 9.4)	1.8 to 10.1	96 (p<0.001)
Questionnaires	5	5343	16.5 (9.4 to 23.6)	4.2 to 35.2	98 (p<0.001)
Lifetime prevalence					
ICD-10	1	1785	11.8 (10.2 to 13.4)	–	–
Undifferentiated somatoform disorder					
Point prevalence					
DSM III-R/DSM IV	1	191	27 (19.6 to 34.4)	–	–
ICD-10	3	2404	8.9 (5.2 to 12.6)	5.5 to 11.8	84 (p=0.002)
Lifetime prevalence					
ICD-10	1	1785	13.6 (11.9 to 15.3)	–	–
Chronic pain disorder					
Point prevalence					
DSM III-R/DSM IV	1	191	7.3 (3.5 to 11.1)	–	–
ICD-10	3	2404	9.3 (2.1 to 16.5)	4.4 to 16.8	95 (p<0.001)
12-month prevalence					
DSM III-R/DSM IV	1	673	0.6 (0.1 to 1.2)	–	–
Lifetime prevalence					
ICD-10	1	1785	4.5 (3.5 to 5.5)	–	–
Conversion disorder					
12-month prevalence					
DSM III-R/DSM IV	1	673	0.3 (–0.1 to 0.7)	–	–
Somatoform autonomic dysfunction					
Point prevalence					
ICD-10	3	2404	9.4 (3.0 to 15.7)	4.3 to 12.5	93 (p<0.001)
Somatoform disorder, unspecified					
Point prevalence					
DSM III-R/DSM IV	1	191	27.2 (19.8 to 34.6)	–	–
ICD-10	1	1785	15 (13.2 to 16.8)	–	–
Lifetime prevalence					
ICD-10	1	1785	18.3 (16.3 to 20.3)	–	–
Abridged somatization disorder					
Point prevalence	–	–	–	–	–
Multisomatoform disorder					
Point prevalence	–	–	–	–	–
≥ Somatoform disorder					
Point prevalence	3	2404	34.8 (24.6 to 44.6)	24.8 to 52.9	92 (p<0.001)
12-month prevalence	1	673	15 (12.1 to 17.9)	–	–
Lifetime prevalence	1	1785	32.4 (29.7 to 35)	–	–
≥ Medically unexplained symptom					
Point prevalence	1	191	60.7 (49.5 to 71.6)	–	–
12-month prevalence	1	673	33.3 (28.9 to 38.7)	–	–

the entire range of somatoform and medically unexplained disorders.

Furthermore we interpreted our results on the background of wide heterogeneity between the included studies. We were able to mostly exclude methodological heterogeneity, where the variability of estimated rates was due to differences in the quality of the primary studies. The effects of clinical heterogeneity—such as different sample characteristics, sampling strategies, or varying diagnostic approaches—could not be excluded. Subgroup analyses in different countries and over different time periods did not show any decrease in heterogeneity. The exclusion of a cross-cultural study (19, 35) reduced—in the analysis of point prevalence rates of a somatization disorder according to DSM-IV, with a negligible change of the prevalence rate in the decimal range—heterogeneity from 86% to 0%; but in two other analyses, these remained 99% and 92%, even after the study had been excluded (data not shown). Further subgroup analyses would require a larger number of primary studies. Even now, for about half of the meta-analysis, only two studies were included, which explains the occasional higher point prevalence rates compared with 12-month prevalence rates. It is also probable that the wide heterogeneity has statistical causes, because I^2 tends towards 100 more than other measures of heterogeneity, especially where the number of included studies is small (<20) and standard errors are small (e40, e41).

Implications for future research

With regard to the wide heterogeneity of the primary studies and the occasionally wide confidence intervals of individual meta-analyses, further studies are required in order to test the accuracy of the estimates rates found. To reduce the risk for bias, future studies should follow the published standards for reporting epidemiological studies (STROBE) (38). Furthermore, researchers should refrain from diagnosing somatoform disorders and medically unexplained symptoms merely by questionnaire. The high numbers of false-positive cases that cannot be excluded when using this method have been reported for many mental disorders (39).

Implications for clinical practice

The prevalence of somatoform disorders and medically unexplained symptoms in primary care is much more differentiated than the average rate of 20% that has been hitherto assumed (5). At present, according to data from the statutory health insurance funds, 91% of all patients with an F4 diagnosis according to the ICD-10 are exclusively under the care of general practitioners and specialists in somatic medicine (40). For this reason, it is particularly these professional groups that are confronted with the associated diagnostic and therapeutic challenges. The clinical practice guidelines provide evidence-based recommendations for diagnostic and therapeutic strategies, which should take account of psychosocial factors and be implemented

according to a stepped and collaborative care model coordinated by primary care physicians (5).

Conclusion

Somatoform disorders and medically unexplained symptoms have been reported more often than was assumed in the past. In spite of the wide heterogeneity of the primary studies, the systematic prevalence estimates support the importance of medically unexplained, functional, and somatoform physical symptoms in the primary care setting.

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Conflict of interest statement

The authors declare that no conflict of interest exists.

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KEY MESSAGES

- In a scenario of high heterogeneity of the primary studies, the prevalence of somatoform disorders and medically unexplained symptoms in primary care is very differentiated.
- Point prevalence rates for the strict diagnosis of somatization disorder were found to be only between 0.8 and 5.9%, but an average of 26.2–34.8% of patients under the care of general practitioners report at least one somatoform disorder according to DSM or ICD, and 40.2–49% at least one medically unexplained symptom.
- Substantial differences in the prevalence rates were also found between diagnoses according to the DSM and the ICD, as well as in the data collection by means of questionnaire and clinical interview.

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Corresponding author

Dipl.-Psych. Heidemarie Haller
Klinik für Naturheilkunde und Integrative Medizin, Kliniken Essen-Mitte
Medizinische Fakultät, Universität Duisburg-Essen
Am Deimelsberg 34a, 45276 Essen, Germany
h.haller@kliniken-essen-mitte.de

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ORIGINAL ARTICLE

Somatoform Disorders and Medically Unexplained Symptoms in Primary Care

A Systematic Review and Meta-analysis of Prevalence

Heidemarie Haller, Holger Cramer, Romy Lauche, Gustav Dobos

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eTABLE

Description of included studies

Reference	Country of origin	Study period	Sample size (response rate)	Age range	Data collection for SFD/MUS	Diagnostic criteria for SFD/MUS	Prevalence rates
Alqahtani 2008 (7)	Saudi-Arabia	2003	224 (99%)	17–68	Questionnaire	SD according to GHQ	Point prevalence: 14.3% (n = 32)
Aragona 2005 (8)	Italy	2002–2003	301 (84%)	16–70	Questionnaire	SD according to BSI	Point prevalence: 35.2% (n = 106.4)
Broers 2006 (9)	Bosnia and Herzegovina	2003–2004	1133 (72%)	≥ 18	Questionnaire and interview	SD according to PRIME-MD PHQ	Point prevalence: 16.1% (n = 182.4)
Clarke 2008 (10)	Australia	2004–2006	10 507 (66%)	≥ 18	Questionnaire and doctor's diagnosis	SD according to PRIME-MD PHQ	Point prevalence: 10.1% (n = 1 059)
Cwikel 2008 (11)	Israel	NA	971 (77%)	25–75	Questionnaire	SD according to SCL	Point prevalence: 11.8% (n = 114.6)
de Waal 2004 (12)	Netherlands	2000–2001	1046 (59%)	25–80	Questionnaire, clinical interview (subsample)	SD according to SCAN (DSM-IV diagnosis) USD according to SCAN (DSM-IV diagnosis) CPD according to SCAN (DSM-IV diagnosis) CD according to SCAN (DSM-IV diagnosis) SD + USD + CPD + CD according to SCAN (DSM-IV diagnoses) ≥ 1 MUS according to SCAN	Point prevalence: 0.5% (n = 5.2) Point prevalence: 13% (n = 136) Point prevalence: 1.6% (n = 16.7) Point prevalence: 0.2% (n = 2.1) Point prevalence: 15% (n = 156.9) Point prevalence: 20.5% (n = 214.4)
El-Rufaie 1999 (13)	United Arab Emirates	NA	644 (99%)	16–65	Questionnaire, clinical interview (subsample)	SD according to CIS (ICD-10 diagnosis)	Point prevalence: 12% (n = 77.3)
Escobar 1998 (14)	USA	NA	1455 (50%)	18–66	Clinical interview	SD according to CIDI (DSM-IV diagnosis) SD according to CIDI (ICD-10 diagnosis) ASD according to CIDI	Point prevalence: 0.5% (n = 8) Point prevalence: 0.06% (n = 1) Point prevalence: 21% (n = 305)
Faravelli 1997 (15)	Italy	1990	673 (84%)	≥ 15	Clinical interview	SD according to SADS-L (DSM-III-R diagnosis) USD according to SADS-L (DSM-III-R diagnosis) CPD according to SADS-L (DSM-III-R diagnosis) CD according to SADS-L (DSM-III-R diagnosis) SD + USD + CPD + CD according to SADS-L (DSM-III-R diagnoses) ≥ 1 MUS according to SADS-L	12-month prevalence: 0.7% (n = 4.7) 12-month prevalence: 13.4% (n = 90.2) 12-month prevalence: 0.6% (n = 4) 12-month prevalence: 0.3% (n = 2) 12-month prevalence: 15% (n = 100.9) 12-month prevalence: 33.3% (n = 224.1)
Feder 2001 (16)	USA	1999	1007 (80%)	18–70	Questionnaire, interview (subsample)	SD according to PRIME-MD PHQ	Point prevalence: 4.2% (n = 42)
Fink 1999 (17)	Denmark	NA	191 (86%)	18–65	Questionnaire, clinical interview (subsample)	SD according to SCAN (DSM-IV diagnosis) USD according to SCAN (DSM-IV diagnosis) CPD according to SCAN (DSM-IV diagnosis) SD-U according to SCAN (DSM-IV diagnosis) SS + USD + CPD + SD-U according to SCAN (DSM-IV diagnosis) SD according to SCAN (ICD-10 diagnosis) USD according to SCAN (ICD-10 diagnosis) CPD according to SCAN (ICD-10 diagnosis) SAF according to SCAN (ICD-10 diagnosis) SD + USD + CPD + SAF according to SCAN (ICD-10 diagnoses) ≥ 1 MUS according to SCAN	Point prevalence: 0.8% (n = 1.5) Point prevalence: 27% (n = 51.6) Point prevalence: 7.3% (n = 13.9) Point prevalence: 27.2% (n = 52) Point prevalence: 52.9% (n = 101) Point prevalence: 5.7% (n = 10.9) Point prevalence: 5.5% (n = 10.5) Point prevalence: 7.3% (n = 13.9) Point prevalence: 12.5% (n = 23.9) Point prevalence: 17.7% (n = 33.8) Point prevalence: 60.6% (n = 115.7)

Reference	Country of origin	Study period	Sample size (response rate)	Age range	Data collection for SFD/MUS	Diagnostic criteria for SFD/MUS	Prevalence rates
Garcia-Campayo 1998 (18)	Spain	NA	1559 (NA)	28–63	Questionnaire, clinical interview (subsample)	ASD according to SPPI	Point prevalence: 16.3% (n = 254)
Haftgoli 2010 (20)	Switzerland	2004–2005	917 (90%)	≥ 18	Questionnaire	MSD according to PRIME-MD PHQ	Point prevalence: 15.1% (n = 138)
Hanel 2009 (21)	Germany	2005–2006	1751 (71%)	18–65	Questionnaire and doctor's diagnosis	SD according to PRIME-MD PHQ	Point prevalence: 18.4% (n = 323)
Jackson 2008 (22)	USA	1994–1996	500 (93%)	≥ 18	Questionnaire and interview	MSD according to PRIME-MD PHQ	Point prevalence: 8.2% (n = 41)
Janiak-Baluch 2013 (23)	Germany	2012	511 (84%)	11–17	Questionnaire	SD according to CSI	Point prevalence: 7.2% (n = 36.8)
Khoo 2012 (24)	Malaysia	NA	1763 (64%)	≥ 18	Interview	SD according to ICD-10 symptom checklist (ICD-10 diagnosis)	Point prevalence: 8.8% (n = 155.1)
Kirmayer 1991 (25)	Canada	NA	685 (51%)	18–75	Questionnaire and clinical interview	SD according to DIS-SSI (DSM-III-R diagnosis) ASD according to DIS-SSI	Point prevalence: 1% (n = 7) Point prevalence: 16.6% (n = 114)
Kroenke 1997 (3)	USA	NA	1000 (NA)	18–91	Questionnaire and doctor's diagnosis	MSD according to PRIME-MD PQ SD-U according to PRIME-MD PQ (DSM-III-R diagnosis) CPD according to PRIME-MD PQ (DSM-III-R diagnosis) MSD + SD-U + CPD according to PRIME-MD PQ	Point prevalence: 8.2% (n = 82) Point prevalence: 4.2% (n = 42) Point prevalence: 0.8% (n = 8) Point prevalence: 11.7% (n = 117)
Laufer 2013 (26)	Israel	1999–2004	2796 (98%)	18–65	Questionnaire, clinical interview (subsample)	SD according to CIDI-PHC (ICD-10 diagnosis)	Point prevalence: 5.9% (n = 165)
Löwe 2008 (27)	USA	2005	2091 (90%)	18–95	Questionnaire	SD according to PRIME-MD PHQ	Point prevalence: 9.5% (n = 199)
Lynch 1999 (28)	USA	NA	119 (69%)	≥ 18	Clinical interview	SD according to DIS (DSM-IV Diagnosis) USD according to DIS (DSM-IV Diagnosis) ASD according to DIS MSD according to DIS	Point prevalence: 0.8% (n = 1) Point prevalence: 79% (n = 94) Point prevalence: 5.9% (n = 7) Point prevalence: 23.5% (n = 28)
Mergl 2007 (29)	Germany	2000–2001	394 (NA)	18–88	Clinical interview	SD according to CIDI (ICD-10 diagnosis) USD according to CIDI (ICD-10 diagnosis) CPD according to CIDI (ICD-10 diagnosis) SD-U according to CIDI (ICD-10 diagnosis) SD + USD + CPD + SD-U according to CIDI (ICD-10 diagnosis)	Point prevalence: 0% (n = 0)/lifetime prevalence: 0% (n = 0) Point prevalence: 10.4% (n = 41)/lifetime prevalence: 12.4% (n = 49) Point prevalence: 5.3% (n = 21)/lifetime prevalence: 14.2% (n = 56) Point prevalence: 9.6% (n = 38)/lifetime prevalence: 23.6% (n = 93) Point prevalence: 25.4% (n = 100)/lifetime prevalence 50.3% (n = 198)
Norton 2007 (30)	France	2003–2004	1151 (88%)	≥ 18	Questionnaire and doctor's diagnosis	SD according to PRIME-MD PHQ	Point prevalence: 11.3% (n = 129)
Ohaeri 1994 (31)	Nigeria	1991	861 (NA)	15–84	Questionnaire	SD according to GHQ	Point prevalence: 11.7% (n = 101)
Peveler 1997 (32)	UK	NA	175 (79%)	17–81	Clinical interview	SD according to DIS (DSM-III-R Diagnosis) ASD according to DIS	Point prevalence: 5.1% (n = 9) Point prevalence: 35% (n = 61)
Roca 2009 (33)	Spain	NA	7931 (NA)	18–90	Questionnaire and interview	MSD according to PRIME-MD PHQ SD-U according to PRIME-MD PHQ (DSM-IV diagnosis) MSD + SD-U according to PRIME-MD PHQ	Point prevalence: 14% (n = 1111) Point prevalence: 14.8% (n = 1174) Point prevalence: 28.8% (n = 2285)

Reference	Country of origin	Study period	Sample size (response rate)	Age range	Data collection for SFD/MUS	Diagnostic criteria for SFD/MUS	Prevalence rates
Schoepf 2003 (34)	Germany	1995	428 (95%)	18–60	Questionnaire, clinical interview (subsample)	SD according to SDS (ICD-10 diagnosis) USD according to SDS (ICD-10 diagnosis) CPD according to SDS (ICD-10 diagnosis) SAF according to SDS (ICD-10 diagnosis) SD + USD + CPD + SAF according to SDS (ICD-10 diagnoses)	Point prevalence: 1.8% (n = 7.7) Point prevalence: 8.7% (n = 37.2) Point prevalence: 16.8% (n = 71.9) Point prevalence: 12.1% (n = 51.8) Point prevalence: 24.8% (n = 106)
Simon 1999 (35). Gureje 1997 (19)	Cross-cultural	1991–1992	25 916 (96%)	18–65	Questionnaire, clinical interview (subsample)	SD according to CIDI (DSM-IV diagnosis) SD according to CIDI (ICD-10 diagnosis) ASD according to CIDI	Point prevalence: 1.4% (n = 362.8) Point prevalence: 2.8% (n = 725.6) Point prevalence: 19.7% (n = 5105.5)
Steinbrecher 2011 (36)	Germany	2008	620 (96%)	18–89	Questionnaire, clinical interview (subsample)	USD according to CIDI (DSM-IV diagnosis) CPD according to CIDI (DSM-IV diagnosis) CD according to CIDI (DSM-IV diagnosis) USD + CPD + CD according to CIDI (DSM-IV diagnoses) ≥ 1 MUS according to CIDI	12-month prevalence: 10.9% (n = 67.6) 12-month prevalence: 12% (n = 74.4) 12-month prevalence: 0% (n = 0) 12-month prevalence: 22.9% (n = 142) 12-month prevalence: 64.8% (n = 401.8)
Toft 2005 (37)	Denmark	2000	1785 (81%)	18–65	Questionnaire, clinical interview (subsample)	SD according to SCAN (ICD-10 diagnosis) USD according to SCAN (ICD-10 diagnosis) SAF according to SCAN (ICD-10 diagnosis) CPD according to SCAN (ICD-10 diagnosis) SD-U according to SCAN (ICD-10 diagnosis) SD + USD + SAF + CPA + SD-U according to SCAN (ICD-10 diagnoses)	Point prevalence: 10.1% (n = 180.3)/lifetime prevalence: 11.8% (n = 210.6) Point prevalence: 11.8% (n = 210.6)/lifetime prevalence: 13.6% (n = 242.8) Point prevalence: 4.3% (n = 76.8)/lifetime prevalence: 4.4% (n = 78.5) Point prevalence: 4.4% (n = 78.5)/lifetime prevalence: 4.5% (n = 80.3) Point prevalence: 15% (n = 267.8)/lifetime prevalence: 18.3% (n = 326.7) Point prevalence: 30% (n = 553)/lifetime prevalence: 32.4% (n = 578)

ASD, abridged somatization disorder; BSI, Bradford Somatic Inventory; CD, conversion disorder; CIDI, Composite International Diagnostic Interview;
CIDI-PHC, Composite International Diagnostic Interview—Primary Health Care Version; CIS, Clinical Interview Schedule;
CSI, Children Somatization Inventory; DIS, Diagnostic Interview Schedule; DIS-SSI, Diagnostic Interview Schedule—Somatic Symptom Index; DSM, Diagnostic and Statistical Manual of Mental Disorders;
CPD, chronic pain disorder; GHQ, General Health Questionnaire; ICD, International Classification of Diseases;
MSD, multisomatoform disorder; MUS, medically unexplained symptoms; NA, not available; PRIME-MD P(H)Q, Primary Care Evaluation of Mental Disorders—Patient (Health) Questionnaire;
SAF, somatoform autonomic dysfunction; SADS-L, Schedule of Affective Disorders and Schizophrenia (lifetime version); SCAN, Schedules for Clinical Assessment in Neuropsychiatry;
SD, somatization disorder; SD-U, somatoform disorder, unspecified; SDS, somatoform disorder schedule; SFD, somatoform disorders;
SCL, Symptom Checklist; SPPI, Standardized Polyvalent Psychiatric Interview; USD, undifferentiated somatoform disorder