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Culture sensitivity, health care utilization, and disability in individuals suffering from bodily complaints – a population-based approach

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0 Abstract and Zusammenfassung

0.1 Abstract

Different bodily complaints are very common in the general population. For many of the most frequent bodily complaints no medical explanation can be found. Consequently they are called medically unexplained or somatoform. Somatoform complaints constitute the core symptoms of somatoform disorders. These are among the most frequent mental disorders in Germany and Europe and are associated with high disability and abnormal illness behavior.

In this publication-based cumulus three articles are presented. These base on three areas which are of major importance for investigations about bodily complaints or somatoform disorders. These areas are the following: 1. Culture sensitivity, 2. Health care utilization, and 3. Disability.

Ad 1. The perception and presentation of bodily complaints, as well as the most frequent bodily symptoms are influenced by the cultural background. Persons with another cultural background (i. e. migrants) share approximately 19% of the German population. However, their mental health has only rarely been investigated. In the first article in this cumulus it is analysed to what extent two common questionnaires for the assessment of somatoform disorders and depression measure the same in Germans as in migrants in Germany (i. e. measurement invariance). Measurement invariance is a crucial precondition for the interpretation of studies on migrants. It was fulfilled for both questionnaires.

Ad 2. Somatoform disorders are related to high health care utilization. The influence of psychological factors on health care utilization has rarely been investigated so far. Also, most studies investigating health care utilization studied selected samples. In the second article in this cumulus predictors for health care utilization are analysed. A representative sample of the German general population as well as a sub-group of persons with many somatoform complaints and a sub-group of persons with few somatoform complaints are investigated. Beside other predictors the intention to visit a doctor in the hypothetical situation of having different bodily complaints was

analysed. In all three groups the same predictors for health care utilization were found. Beside the number and severity of bodily complaints, the mental health, and the employment status, the intention to visit a doctor was an important predictor.

Ad 3. The disability by complaints is one of the most important criteria in diagnosing mental disorders. Thereby, disability is defined as any restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human. However, it has not been investigated what the range of normal disability by bodily symptoms is. In the third article in this cumulus a questionnaire for the assessment of disability by bodily symptoms is evaluated in a representative sample of the German general population. Also, normative data for people with at least one bodily complaint are presented and the influence of disability on health care utilization is investigated. The normative data can be used to describe clinical samples.

The results of the three articles are discussed and perspectives for further studies are described.

0.2 Zusammenfassung

Körperliche Beschwerden verschiedener Art kommen sehr häufig in der Allgemeinbevölkerung vor und sind in vielen Fällen nicht auf eine eindeutige medizinische Ursache zurück zu führen. Nicht organisch erklärbare körperliche Beschwerden werden als somatoforme Symptome bezeichnet und bilden die Kernsymptome somatoformer Störungen. Diese gehören zu den häufigsten psychischen Störungen in Deutschland und Europa und sind mit erhöhtem Leiden und verstärktem Krankheitsverhalten verbunden.

In diesem publikationsbasierten Cumulus werden drei Studienfelder und drei darauf basierende Studien vorgestellt, die eine sehr wichtige Rolle bei der Untersuchung körperlicher Beschwerden und somatoformer Störungen spielen:

1. Kultursensitivität, 2. Inanspruchnahmeverhalten und 3. Beeinträchtigung.

Zu 1. Der kulturelle Hintergrund beeinflusst die Wahrnehmung körperlicher Symptome, die Art der am häufigsten vorkommenden Symptome und die Symptompräsentation vor anderen Personen. Obwohl ca. 19% der in Deutschland lebenden Personen einen anderen kulturellen Hintergrund haben (d. h. Migranten), ist ihre psychische Gesundheit noch kaum untersucht. Im ersten Artikel in diesem Cumulus wurde untersucht, inwiefern zwei der am häufigsten eingesetzten Fragebögen zur Messung von somatoformen Störungen und Depressionen bei Deutschen und in Deutschland lebenden Migranten das Gleiche messen (Messinvarianz). Messinvarianz ist eine wichtige Vorraussetzung für die Interpretation von Studien im Bereich der Migrationsforschung. Messinvarianz konnte für beide Fragebögen bestätigt werden.

Zu 2. Somatoforme Störungen sind mit einer erhöhten Inanspruchnahme medizinischer Leistungen verbunden. Bisher ist der Einfluss psychischer Faktoren auf das Inanspruchnahmeverhalten kaum untersucht. Des Weiteren wurden bislang vor allem selektierte Stichproben analysiert. Der zweite Artikel in diesem Cumulus untersucht Prädiktoren für das Inanspruchnahmeverhalten in der deutschen Allgemeinbevölkerung, in einer Sub-Gruppe von Personen mit vielen somatoformen

Beschwerden und einer Sub-Gruppe mit wenigen somatoformen Beschwerden. Die Intention, beim hypothetischen Vorliegen gewisser Beschwerden einen Arzt aufzusuchen wurde in die Analysen mit einbezogen. Es zeigte sich in allen drei Gruppen die gleichen Prädiktoren für die Arzt-Inanspruchnahme. Die Intention, einen Arzt aufzusuchen war neben der Anzahl und Schwere der körperlichen Beschwerden, der psychischen Gesundheit und der Berufstätigkeit der wichtigste Prädiktor.

Zu 3. Die Beeinträchtigung durch Beschwerden ist eines der wichtigsten Kriterien bei der Diagnose psychischer Störungen. Beeinträchtigung ist dabei definiert als eine Einschränkung oder die fehlende Möglichkeit, etwas so auszuführen wie es für einen Menschen normal ist. Bisher ist aber nicht untersucht worden, wo der Normalbereich bei der Beeinträchtigung durch körperliche Beschwerden liegt. Im dritten Artikel dieses Cumulus wird ein Fragebogen zur Erfassung von Beeinträchtigung durch körperliche Beschwerden in einer repräsentativen Stichprobe evaluiert und Normwerte für Personen mit mindestens einer körperlichen Beschwerde präsentiert. Diese Ergebnisse können zur Einordnung der Beeinträchtigung klinischer Gruppen herangezogen werden. Außerdem wird der Einfluss von Beeinträchtigung auf das Inanspruchnahmeverhalten untersucht.

Abschließend werden die Ergebnisse der drei Artikel zusammenfassend diskutiert und ein Ausblick auf weitere Studienmöglichkeiten gegeben.

1. Introduction

In the introduction, the theoretical background for the following investigations is presented. The first two paragraphs give a broad introduction into the field of bodily complaints and somatoform disorders. The next three paragraphs describe three areas which are of major interest in the investigation of bodily complaints, i. e. culture sensitivity, health care utilization, and disability.

1.1 Bodily complaints

Bodily complaints are very common in the general population. The most frequent bodily complaints are pain symptoms, i. e. back pain, joint pain, pain in extremities, and headache, with 2-year prevalence rates up to 30% (Hessel et al., 2002; Hessel et al., 2005; Rief et al., 2001a). Other common symptoms are abdominal symptoms, e. g. bloating or intolerance of several foods, as well as cardiovascular symptoms, e. g. palpitations, with 2-year prevalence rates of about 10% each. (Hessel et al., 2002; Hiller et al., 2006; Rief et al., 2001a). Women report more bodily symptoms than men (Hesse et al., 2005; Hiller et al., 2006; Rief et al., 2001a). They also suffer from more psychiatric disorders, which is correlated to increased symptom reporting (Haug et al., 2004). However, even after adjustment for psychiatric comorbidity women report more bodily symptoms (Kroenke & Spitzer, 1998a;). Older people suffer from more symptoms than younger persons (Hessel et al., 2005; Hiller et al., 2006; Rief et al., 2001a). Kroenke and Mangelsdorff (1989) found that 84% of fourteen common symptoms in internal medicine patients had no organic etiology and that medical treatment for these symptoms was often ineffective. Among the most common medically unexplained symptoms were pain symptoms, dizziness, and constipation. Khan et al. (2003) showed that 48% of reported bodily symptoms in a primary care clinic were medically unexplained, above all back pain and headache. One fourth of these symptoms persisted over a one-year period. Jackson and Passamonti (2005) investigated physical symptoms over a 5-year period in a primary care clinic and found that 34% of symptoms remained medically unexplained. This was not related

to the presence of anxiey or mood disorders at baseline. But there was an association to somatoform disorders at baseline and to the number of medically explained and unexplained bodily symptoms at baseline.

In summary, bodily symptoms are frequent in the general population and in utilizers of medical care. A broad variety of common bodily symptoms have no organic or medical explanation. Consequently, these complaints are often called "medically unexplained", "functional" or "somatoform".

1.2 Somatoform disorders

Somatoform complaints, i. e. bodily symptoms for which no medical cause was found, are the core symptoms of somatoform disorders.

1.2.1 Epidemiology

Somatoform disorders are among the most frequent mental disorders in Germany and in Europe with prevalence rates from 6 to 11% in the general population (Wittchen et al., 1999; Wittchen & Jacobi, 2005). In primary and secondary care, prevalence rates for somatoform disorders are around 18% (Ansseau et al., 2004; Hansen at al., 2001).

1.2.2 Diagnostic criteria

In the International Classification of Diseases (ICD-10; WHO, 2007) and in the Diagnostic Statistical Manual of Mental Disorders (DSM-IV; APA, 1994), several somatoform disorders are described. The prototype is the somatization disorder (F 45.0; 300.81) which is defined by at least six bodily complaints in two different organic systems persisting over two years (ICD-10) or eight bodily complaints in four different organic systems persisting over several years and beginning before the age of 30 years (DSM-IV), respectively. Prevalence rates for this disorder are very low, i. e. approximately 0.4% in the general population and 0.5 – 6.0% in primary or secondary care (Creed & Barsky, 2004; de Waal et al., 2004; Fink et al., 1999, 2004). The very strict diagnostic criteria for somatization disorder have been critizised and

are currently under debate (e. g. Mayou et al., 2005; Rief & Isaac, 2007a). Lifetime diagnosis was found to be associated with a strong recollection error which hampers the diagnostic validity (Rief & Rojas, 2007b). Besides, there are many persons who do not fulfill the strict diagnostic criteria but who nonetheless suffer from multiple bodily complaints and show abnormal illness behavior. Abnormal illness behavior is defined by increased illness worries, excessively seeking of medical help, use of unnecessary medications, the avoidance of physical demands, and an increased number of sickness days (Pilowsky, 1969, 1997). It is strongly influenced by the sociocultural background (Kirmayer & Looper, 2006).

1.2.3 Abridged criteria

In consequence to the critique on somatization disorder, several alternative approaches were suggested, which are usually labeled as "abridged citeria for somatization disorder" (Escobar et al, 1998; Fink et al., 2007; Kroenke et al., 1997, 1998b; Rief et al., 1996; Rief & Hiller, 1999). These approaches share the core criteria of multiple bodily complaints but are less strict than the criteria for somatization disorder. Prevalence rates for the abridged criteria for somatization disorder are about 8 - 29% in primary and secondary care (Escobar et al., 1998; Fink et al., 2007; Kroenke et al., 1997). They show strong associations with disability and health care utilization, and demonstrate high validity independent of comorbid depressive and anxiety disorder (Creed & Barsky, 2004; Escobar et al., 1998; Fink et al., 2007; Grabe et al., 2003; Kroenke et al., 1997, 1998b; Rief & Hiller, 1999). Gujere and Simon (1999) found that 46% of abridged somatoform disorders persisted over a one-year period. In the study of Jackson and Kroenke (2008), 21% of abridged somatoform disorders persisted over five years.

1.2.4 Etiology and maintenance

The etiology and maintenance of somatoform disorders can be explained by a combination of biological and psychological mechanisms (Rief & Barsky, 2005a). A variety of biological alterations have been found in patients with somatoform

disorders. Some studies found low levels of the stress hormone cortisol (hypocortisolism) in persons with somatoform disorders, but findings are mixed (Heim & Nater, 2007). Serotonergic amino acids were decreased in persons with somatoform disorders (Rief et al., 2004a). Hypocortisolism and decreased serotonergic amino acids could be related to a lower pain threshold, i. e. higher pain sensitivity. Besides, persons with somatoform disorders showed higher concentrations of proinflammatory substances and lower concentrations of anti-inflammatory substances. This is associated with a feeling of being ill (Rief et al., 2001b). Somatoform disorders could also be considered as disorders in the neuronal filter system (Hakala et al., 2004; Rief & Barsky, 2005). Consequently, more and more irrelevant signals from the body are not filtered but become conscious and get attention. However, it is not clear if these biological alterations are causes or consequences of somatoform disorders.

In addition to these biological variables, psychological factors may play an important role in the etiology and maintenance of somatoform disorders. Traumatic events like abuse or immigration, but also a lower socioeconomic status, are risk factors for the development of somatoform disorders. Other psychological factors mainly contribute to the maintenance of somatoform disorders (Rief & Broadbent, 2007c). One of the most important cognitive factors is somatosensory amplification (Barsky, 1992). This concept describes the following vicious circle: 1. attention focusing on bodily sensations causes 2. amplified perception of the intensity and frequency of bodily sensations, which precede 3. interpretation of bodily complaints as signs of illness, which leads to 4. enhanced attention to bodily sensations and so on. This is aggravated by a very strict subjective definition of health as a complete absence of any bodily sensations and a self-concept as being weak that has been described in many people with somatoform disorders (Rief et al., 1998). Also, persons with somatoform disorders tend to have more organic causal attributions (e. g. viral, bacterial, genetic, etc.) instead of psychological causal attributions (e. g. distress, worries, thoughts, nervouseness, etc.) for their complaints than persons with

depression and normal controls (Duddu et al., 2003, 2006; Martin et al., 2007; Rief et al., 2004b). This was associated to abnormal ilness behavior (Rief et al., 2004b).

Conclusion: Although somatoform disorders are among the most frequent mental disorders in Germany and Europe, their prototype –the somatization disorder- has been critizised and is currently under debate. Consequently, several approaches for abridged criteria of somatization disorder have been suggested. These share the core criteria of multiple bodily complaints and were associated to disability and health care utilization. The etiology and especially the maintenace of somatoform disorders can be explained by biological and also by psychological mechanisms.

The **three following paragraphs** describe three areas which are of major interest in the investigation of bodily complaints and somatoform disorders.

1. Culture sensitivity. Cultural and ethnic differences influence the perception and presentation of complaints. This is important because of the high number of migrants in Germany and other western countries.

2. The association of somatoform symptoms to **health care utilization** as a source of high costs for the health care systems.

3. The **disability** in daily living that is associated with bodily complaints.

1.3 Culture sensitivity

Germany is a country with a high rate of persons with migration background (i. e. migrants). According to recent data, migrants constitute 18.6% of the population in Germany (Statistisches Bundesamt, 2007). Migrants are defined as all people who or whose parents were born abroad (Schenk et al., 2006). Several studies found worse health in migrants compared to the German population. This could be due to the migration itself which is assumed to be an incriminating process. Besides, migrants often have a low socioeconomic status, which could be associated with more health risks and worse health care supply (Schenk, 2007). Barriers for the use of health care utilization for migrants are also often discussed, e. g. language problems or insufficient knowledge about health care opportunities (Koch et al., 2008; Wittig et al., 2008). A surprising finding is that migrants were found to live longer than Germans. This was explained by the "healthy-migrant-effect" which means that a selection process takes place in migration and that especially young and healthy persons immigrate (Schenk, 2007). New studies suggest that this finding was due to a statistical error and can not be maintained (Kibele et al., 2008).

Most studies investigated physical health in migrants. Studies on mental health are rare. However, these are important because mental disorders cause high direct and indirect costs with the highest number of lost disability-adjusted life-years in

comparison to other illnesses (Andlin-Sobocki et al., 2005; Europäische Ministerielle WHO-Konferenz Psychische Gesundheit, 2004). Somatoform disorders and depression are the most frequent mental disorders in Germany (Wittchen et al., 1999; Rief et al., 2001; Hiller et al., 2006). It is therefore of critical importance to better describe the frequency and occurrence of somatoform disorders and depression in migrants.

Somatoform disorders are known in all investigated cultural groups. However, several studies showed that the cultural background and ethnic differences influences the pattern of the most frequent bodily symptoms, their perception and the presentation of these symptoms in the health care system (Edwards et al., 2001; Escobar et al., 2007; Kirmayer & Young, 1998; Kirmayer & Looper, 2006; Kirmayer & Sartorius, 2007; Mewes & Rief, submitted). This may complicate the diagnosis of somatoform disorders in migrants. Apart from that, the differentiation to depression might be hindered. This is particularly important because of two reasons. First, detection rates for mental disorders by general practitioners depend on symptom presentation (Collings & The MaGPIe Research Group, 2005; Greer et al., 2006). As general practitioners act as gate-keepers in Germany, their detection rate strongly influences further treament. Second, detection rates for somatoform disorders and also for depression and the rates of appropriate treatment for these disorders are insufficient in general (Fink et al., 1999; Smith & Gardiner, 2006; Wittchen & Jacobi, 2002).

Only very few studies have examined somatoform symptoms and depression in migrants, and outcomes have been mixed. Some studies showed increased prevalence rates whereas some found similar or even lower prevalence rates for migrants in comparison to non-migrant samples (Bhugra, 2004; Glaesmer et al., in press; Lindert et al., 2008; Swinnen & Selten, 2007). These data are difficult to interpret and generalisation to the migrants in the general popuation is often not possible, because most samples were drawn from clinical or medical settings. As there are barriers for health care utilization for migrants, the above mentioned

findings are based on strongly preselected data. Clearly, there is a lack of epidemiological studies in the general population (Zeeb & Razum, 2006).

The **first article** in this cumulus (Mewes et al., submitted) examines cultural sensitivity using two of the most common questionnaires for the screening of somatoform disorders (PHQ-15; Kroenke et al., 1998b, 2002) and depression (PHQ-9; Kroenke et al., 2001) in a representative sample of the German general population. For these questionnaires, measurement invariance is investigated. Measurement invariance is defined as the notion that a certain questionnaire has the same number of underlying factors in different investigated samples (configural invariance), that the items of the questionnaire load with the same magnitude on the underlying factors in all investigated samples (metrical invariance), and that differences between the investigated groups are not due to different difficulty of the items but to real differences in the underlying factors (scalar invariance). If measurement invariance is not fulfilled, results of different groups can not be compared. The results of the first study are crucial for the two other studies in this cumulus, since migrants represented 11% of the investigated study sample. Both the PHQ-15 and PHQ-9 are among the main independent variables in these papers. In the case of measurement invariance, the migrant sub-sample can be integrated into the whole sample and results can be generalized to migrants in Germany.

1.4 Health care utilization

Health care utilization has been defined by the number of doctor visits, the number of days in medical clinics, or the utilization of other supplies of the health care system, e. g. medication, physiotherapy, rehabilitation etc.. As described above (see paragraph 1.2), somatoform disorders are associated with high health care utilization and consequently with raised health care costs without improvement in many cases (Conroy et al., 1999; Hansen et al., 2002; Hollifield et al., 1999; Reid et al., 2001; Rief et al., 2003). Also, individuals who are screened as high somatisers (i. e., they fulfil the cut-off criteria of a self-rating instrument), but who are not known to fulfil the diagnostic criteria for somatoform disorders, show increased health care utilization and increased health care costs compared to non-somatisers (Al Windi, 2005; Barsky et al., 2001, 2005, 2006; Jyväsjärvi et al., 2001; Kolk et al., 2002; Ladwig et al., 2001; Rief et al., 2005b). Although the number of bodily complaints seems to be the most important predictor for health care utilization, other influencing factors have been found. Health care utilization is increased in persons with depression or anxiety disorders (Al-Windi, 2005; Barsky et al., 2005; Glaesmer et al., 2008; Hansen et al., 2002; Katon et al., 2003; Rief et al., 2003, 2005b; Schmitz & Kruse, 2002; ten Have et al., 2001). Studies showed that anxiety, depression, and somatoform complaints contributed independently to health care utilization (Barsky et al., 2005; Rief et al. 2005b). Besides, traumatic events in the childhood and the presence of a post-traumatic stress disorder are associated with increased health care utilization (Biggs et al., 2002; Elhai et al., 2005; Gillock et al., 2005; Newman et al., 2000). In addition to somatoform complaints and mental health, sociodemographic variables were found to be associated with higher health care utilization. Female gender, increasing age, and a lower socioeconomic status were found to be related to increased health care utilization in most studies (Kolk et al., 2002; Ladwig et al., 2000, 2001; Nanke & Rief, 2003; ten Have et al., 2001). The association of employment status and health care utilization is inconsistent in the existing literature. A Canadian study (Kraut et al., 2000) found higher health care utilization in unemployed people, whereas it was

related to lower health care utilization in Sweden (Ahs & Westerling, 2006). Besides, there was no significant difference in health care utilization between retired people and a control group in the studies of Soghikian et al. (1991) and Boaz and Muller (1989). Here, differences between the national social security systems have to be taken into account, i. e. the coverage for supplies of the health care system for unemployed and retired people differs between countries. Ten Have et al. (2001) found that singles had a higher health care utilization than married persons.

So far, most studies have investigated the health care utilization of preselected samples such as primary care patients (Barsky et al., 2001, 2005, 2006; Conroy et al., 1999; Jyväsjärvi et al., 2001; ten Have et al., 2001; von Korff et al., 2007), secondary care outpatients (Al Windi, 2005; Reid et al., 2001, 2002) or inpatients (Hansen et al., 2002; Rief et al., 2003).

The findings are therefore difficult to generalize to the general population and may be biased by preselection of people who are already health care utilizers. Individuals who do not utilize the health care system despite existing symptoms were not integrated in these analyses. Therefore, knowledge about reasons for not using the health care system is limited. However, in order to predict health care utilization, it is important to analyse the whole range of utilization possibilities. This is only possible when non-health care users are also considered.

As illness behavior seems to be in part a learned pattern (Pilowsky, 1969, 1997), psychological factors should play a role in enhanced health care utilization. In the theory of planned behavior (Ajzen, 1991, 2002; Ajzen & Fishbein, 1975), factors like social norms, attitudes towards the action and the outcome, and self-efficacy are important predictors for the intention to do something. The intention to do something is a predictor for the real behavior. There is a lack of studies investigating such psychological factors in association with health care utilization in persons with somatoform disorders and without such disorders in the general population. This is of special interest, because it was frequently assumed that the intention to visit a doctor was generally high in persons with somatoform disorders. On the other hand,

differences in the intention to visit a doctor could also explain why some persons with somatoform disorders show average health care utilization despite a high number of bodily complaints (Hiller & Fichter, 2004).

The **second article** in this cumulus (Mewes et al., 2008) investigates predictors for health care utilization in a representative sample of the German general population. It is also investigated whether predictors differ in persons with somatoform disorders and controls. In addition to the predictors found in other studies, a psychological factor is investigated. The association between the intention to visit a doctor in the hypothetical situation of having different symptoms and health care utilization is analysed. This could be a good starting point in the treatment of somatoform disorders.

1.5 Disability

Disability in daily living is one of the most important criteria in diagnosing mental disorders. It is therefore of major relevance for investigations in clinical psychology. Disability is defined as any restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human (WHO, 1980). In the definition of the WHO, disability is distinct from handicap. Handicap is defined as a disadvantage for a given individual, resulting from an impairment (i. e. any loss or abnormality of psychological, physiological, or anatomical structure or function) or a disability, that limits or prevents the fulfilment of a role that is normal for that individual depending on age, sex, social, and cultural factors (WHO, 1980). Most studies did not differentiate between disability and handicap but used these terms as equivalent. In this cumulus, 'disability' will be used as a term for both contructs.

Disability has generally been measured in two ways. For the first way, the number of 'disability days', i. e. days missed from work or usual activities, is investigated (e. g. Baune et al., 2007; Bijl & Ravelli, 2000; el-Guebaly et al., 2007; Hensing et al., 1996; Merikangas et al., 2007; Schmitz et al., 2007). This seems to be a more objective way to measure disability and direct costs for the health care system and lost productivity can be calculated. The second way to measure disability is via self-rating questionnaires (e. g. Buist-Bouwman et al., 2006; Collings & The MaGPIe Research Group, 2005; Kouzis & Eaton, 1997; Löwe et al., 2008; Stein et al., 2006). Here, the information is more subjective, different areas in daily living can be considered, and it is possible to investigate correlations to other psychological or behavioral factors.

Disability in the general population is influenced by somatic complaints and also by mental health, particularly depression and anxiety (Bijl & Ravelli, 2000; Buist Bouwman et al., 2006; el-Guebaly et al., 2007; Merikangas et al., 2007). Functional disability and health care utilisation increases when physical disorders are accompanied by a mental disorder (Baune et al., 2007; Stein et al., 2006).

As shown above (see paragraph 1.2), somatoform disorders are related to enhanced disability. Many studies have investigated the association between pain as the most

frequent bodily complaint in the general population and disability in clinical groups (i. e., inpatients and outpatients with chronic pain). These studies have reported relationships between disability and pain characteristics, mental health, and pain behavior (Jerome & Gross, 1991; Grönblad et al., 1993, 1994; Tait et al., 1987, 1990; Wurmthaler, 1996).

So far, however, it is not defined what "normal" disability for bodily symptoms in general is. It is unclear if findings from the studies of pain patient samples can be generalized to the general population. This is especially important, because in the WHO-definition of disability, disability is measured by the normal performance for human beings. To interpret disability results of clinical groups, knowledge of disability in the general population is crucial. It can be postulated that even healthy people suffer from minor levels of disability due to some normal discomfort. Therefore, data on disability scores of the general population are urgently needed to interpret disability scores of clinical groups.

The **third article** in this cumulus (Mewes et al., in press) investigates the question to what extent disability is normal. The article had two aims: First, a broadened version of one of the most important questionnaires for the assessment of disability, the Pain Disability Index (PDI; Tait et al., 1987), was psychometrically evaluated in a large representative sample of the general population. Factor structure, reliability, and convergent validity were analysed and normative data were investigated. In particular, normative data for all people of the general population reporting at least one pain or other somatic symptom are reported. Second, for the investigation of criterion validity, the relationship between disability, somatic complaints, depression, and anxiety, on the one hand, and health care utilization on the other were analysed.

2. Studies

2.1 Do the core questionnaires fullfill measurement invariance for migrants and Germans?

Citation: Mewes R., Christ O., Rief W., Glaesmer H., Martin A., Brähler E. (submitted). Are depression and somatisation equivalent for migrants and Germans? Sind Vergleiche im Depressions- und Somatisierungsausmaß zwischen Migranten und Deutschen möglich?: Eine Überprüfung der Messinvarianz für den PHQ-9 und PHQ-15

Theoretical background. Despite substantial numbers of migrants in the German population, knowledge about mental health issues in migrants is rare and inconclusive. Especially for the most frequent mental disorders in Germany and Europe, i. e. somatoform disorders and depression, results are mixed. Most studies investigating mental health issues used selected samples from clinical settings. These data can not be readily generalized to the general population as only patients with access to health care were examined. This is especially difficult in the investigation of migrants, as deficits in the access to health care services for migrants are assumed. For the assessment of depression and somatoform disorders in the general population, the Patient Health Questionnaire-9 (PHQ-9) and the Patient Health Questionnaire-15 (PHQ-15) have shown good validity and reliability. However, subjective concepts about mental and physical health and the presentation of symptoms may be influenced by cultural traditions and norms. Consequently, it is arguable if both instruments assess the same constructs in migrants in Germany and Germans and if results from comparative studies are interpretable. It is crucial to investigate this issue using a population-based approach.

Methods. A representative sample of the German general population (N=2,510) was screened for migration status, somatoform disorders and depression. The 271 migrants in this sample were significantly younger than the non-migrants. To avoid

confoundation, a parallelized German sample was drawn. The PHQ-9 and the PHQ-15 were analysed in reference to measurement invariance in both samples (*N*=271 each). Configural, metric and scalar invariance were investigated.

Results. The PHQ-9 and the PHQ-15 both showed configural, metric and scalar measurement invariance. The PHQ-9 had a one-factorial structure and good internal consistency in both groups. The items of the PHQ-15 showed a five-factorial structure at the first level and one latent factor at the second level. The five factors at level one were labeled as: 1. pain symptoms, 2. gastrointestinal symptoms, 3. pseudoneurological symptoms, 4. cardiovascular symptoms and 5. exhaustion and sleeping difficulties. Three items had to be excluded from the analyses (stomach pain, pain or other problems with the menstruation, pain or problems during sexual intercourse). Using the PHQ-9 and the PHQ-15, comparisons of mean values between migrants and Germans are possible.

Conclusions. The results show that the interpretation of data from comparative studies with migrants and Germans using the PHQ-9 and the PHQ-15 is possible. This is a good basis for further studies about mental health in migrants and for studies which investigate the cultural influence on the presentation of mental and somatic complaints.

2.2 Does the intention to visit a doctor predict health care utilization in the general population and in persons with somatoform disorders?

Citation: Mewes R., Rief W., Brähler E., Martin A., Glaesmer H. (2008). Lower decision threshold for doctor visits as a predictor of health care use in somatoform disorders and the general population**.** *General Hospital Psychiatry 30(4): 331-337*
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Theoretical background. Somatoform disorders are related to increased health care utilisation and high health care costs. Also, individuals who are screened as high somatisers (i. e., they fulfil the cut-off criteria of a self-rating instrument), but do not fulfil the diagnostic criteria for somatoform disorders, show increased health care utilization and contribute to increased health care costs. Illness behaviour, i. e. increased illness worries, excessively seeking of medical help, use of unnecessary medications, the avoidance of physical demands, and an increased number of sickness days, seems to be in part a learned pattern. Therefore, psychological variables should be taken into account in the investigation of health care utilisation in somatisers. The threshold for doctor visits, which may be understood as a general intention to visit a doctor, is frequently supposed to be reduced in patients with somatoform disorders. To our knowledge, this has not been empirically validated as yet. Also, most studies have investigated health care utilization in pre-selected samples such as primary care patients, secondary care outpatients or inpatients. The findings are difficult to generalise and may be biased by preselection of people who are already health care utilisers. However, in order to predict health care utilization, it is important to analyse the whole variability of utilisation. This is only possible when non-health care users are also taken into account. It is unclear whether health care utilization in somatisers and non-somatisers in the general population is determined by existing symptoms or by lower thresholds for doctor visits.

Method. A representative sample of the German general population (N = 2,510) was screened for psychopathology and health care utilization in the prior 12 months. The sample was subdivided into somatisers (n = 712) and controls (n = 1,796) using the Patient Health Questionnaire (PHQ-15). A general tendency to visit doctors even for minor reasons was assessed. Demographic and psychopathological variables were additionally entered into regression analyses to predict health care utilization for the whole investigated sample and the two sub-samples.

Results. Higher somatisation, unemployment or retirement, a lower decision threshold for doctor visits, and higher posttraumatic symptomatology were consistent and unique positive predictors for health care utilization in the prior 12 months. Besides, females and older people showed higher health care utilization in the control group. In the somatisers group, married people had more doctor visits in the prior 12 months than singles or divorced persons.

Conclusions. Not only symptoms per se but also a lower decision threshold for doctor visits contribute to increased health care utilization. Psychopathological and demographic variables can further predict health care utilization in somatising persons and controls. Although somatisation and reduced thresholds for doctor visits are associated, they have to be differentiated from each other, and contribute independently to increased costs.

2.3 When is disability disabling?

Citation: Mewes R., Rief W., Stenzel N., Glaesmer H., Martin A., Brähler E. (in press). What is "normal" disability?- An investigation of disability in the general population. *Pain*
doi:10.1016/j.pain.2008.11.007

Theoretical background. Disability is defined as any restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human (WHO, 1980). Many studies have investigated the highly relevant association between pain and disability in clinical groups using the Pain Disability Index (PDI). These studies have reported relationships between disability and pain characteristics, mental health, and pain behavior. So far, however, it is not defined what "normal" disability for bodily symptoms in general is. Furthermore, there has been a lack of psychometric evaluation of the PDI for the general population. It is unclear if findings from the studies of pain patient samples can be generalized to the general population. Besides, other somatic complaints (e. g. abdominal and cardiovascular) are also common in the general population and in clinical groups. There is a need to account for these symptoms in the assessment of disability. To interpret disability results of clinical groups, knowledge of disability in the general population is crucial. Moreover, to investigate criterion validity of the PDI, the influence on health care utilisation is of special interest. In the present study, a broadened version of the PDI was psychometrically evaluated with a large representative sample of the general population. Factor structure, reliability, and convergent validity were analysed and normative data were investigated. In particular, we wanted to provide normative data for all people of the general population reporting at least one pain or other somatic symptom. The independent impact of disability on health care utilization was also investigated.

Method. A representative sample of the German general population (N =2,510) was screened for disability, somatic complaints, mental health (Patient Health

Questionnaire) and health care utilization. In comparison to the German general population, there were slightly more women in this final sample. The distribution of age and education was equal to the German general population. Following a psychometric evaluation of the PDI, data are provided about the distribution of disability in the general population. 1,774 persons (70.7% of the sample) reported at least one pain or somatic symptom in the Patient Health Questionnaire (PHQ-15) and filled out the PDI. To enhance comparability with pain patients and other clinical groups, normative data for this subsample are presented. For the prediction of health care utilization, stepwise linear regression analysis was calculated.

Results. The psychometric evaluation of the PDI revealed a one-factor solution which accounted for 67% of the variance. Reliability was high (Cronbach's α = .93) and construct validity was satisfactory. Percentage scores for the distribution of disability are provided for those people reporting at least one pain/ somatic symptom. Approximately 30% of persons with one or more somatic complaints indicated no disability through their symptoms. Somatic complaints, disability, unemployment or retirement, depression and anxiety explained 26% of the variance for HCU.

Conclusions. The PDI is an economical, reliable and valid self-rating instrument for assessing disability caused by physical symptoms. It is shown that in some people suffering from somatic complaints, these complaints do not or only weakly interfere with their daily living. The normative data can be used to describe clinical samples. For example, patients with chronic pain show disability scores which equal a percentage score between 95% and 99% of persons with somatic complaints in the general population. These results support the importance of our study aim—namely, the comparison of disability in clinical groups with disability scores of the general population.

Health care utilization in the general population is determined by the number and severity of somatic complaints and also by disability. Symptoms and disability play a crucial but somewhat independent role.

3. Discussion

The presented studies investigated three important areas which are of major interest in the investigation of bodily complaints and somatoform disorders, namely culture sensitivity, health care utilization, and disability. The major findings are briefly summarized in the following sections.

3.1 Culture sensitivity

In the first study, measurement invariance for migrants in Germany and Germans was analysed for two common questionnaires for the assessment of somatoform disorders and depression, i. e. the Patient Health Questionnaire-15 (PHQ-15) and the Patient Health Questionnaire-9 (PHQ-9). The results of the first study were crucial for the two other studies in this cumulus, since migrants represented 11% of the investigated study sample. Both the PHQ-15 and the PHQ-9 were among the main independent variables in the two other papers.

Both questionnaires showed configural, metric and scalar measurement invariance for migrants in Germany and Germans. For the PHQ-9 a one factor solution was revealed. This was in accordance with other studies (Huang et al., 2006). The PHQ-15 had five factors at the first level and one latent factor at the second level. The factor at the second level represented the grade of somatization. Four of the five factors at the first level (pain symptoms, gastrointestinal symptoms, cardiovascular symptoms, and pseudoneurological symptoms) were equal to the symptom categories for the classification of somatization disorder in the DSM-IV and ICD-10. The sexual symptoms were not found to constitute a latent factor in this study.

In summary, the study revealed that the PHQ-15 and the PHQ-9 show measurement invariance for migrants in Germany and Germans. Also, the factorial structure of the PHQ-15 was identified. This is a crucial prerequisite for the interpretation of studies comparing both groups. The results constitute a good basis for continuing studies of mental health in migrants and for studies about the cultural influence on symptom presentation of psychic and bodily complaints.

3.2 Health care utilization

In the second article in this cumulus predictors for health care utilization in a representative sample of the German general population were investigated. It was also investigated whether predictors differ in persons with somatoform disorders and controls. In addition to the predictors found in other studies, a psychological factor was investigated. The association between the intention to visit a doctor in the hypothetical situation of having different symptoms and health care utilization was analysed.

Higher somatisation, unemployment or retirement, a lower threshold for doctor visits, and higher posttraumatic symptomatology were consistent positive predictors for health care utilization in the prior 12 months. In the control group, higher health care utilization was also related to increased age and female gender, whereas married people showed elevated health care utilization in the somatising group. The explained variances of the linear regression analyses equal a large effect size for the whole sample and medium effect sizes for the two sub-samples according to Cohen et al. (2003).

In accordance with previous findings (Al Windi, 2005; Barsky et al., 2001, 2005, 2006; Jyväsjärvi et al., 2001; Kolk et al., 2002; Ladwig et al., 2001; Rief et al., 2005b) the number of bodily symptoms was the most robust predictor of health care utilization. As stated above the influence of employment status on health care utilization is inconsistent in the existing literature (Ahs & Westerling, 2006; Boaz & Muller, 1989; Kraut et al., 2000; Soghikian et al., 1991) . The contradictory findings could stem from the different health care systems or the different representativeness of the investigated samples. For the German health care system and the German general population, unemployment and retirement were associated with higher health care utilization independent of the number of bodily complaints and age. The decision threshold for doctor visits has not been previously investigated for the prediction of health care utilization. Our findings show that it is an important predictor for the number of doctor visits in the prior 12 months. Furthermore, this influence was

independent of the number of possible somatoform symptoms: even high somatisers differ in their willingness to visit a doctor. This could explain why some somatisers show average health care utilization (Hiller & Fichter, 2004). A higher threshold for doctor visits could be understood as a psychological mediator for heath care utilization. In our study, posttraumatic symptomatology was a stronger predictor of health care utilization than generalised anxiety and depression in the whole sample. The association of traumatic stress in the childhood or the presence of a post-traumatic stress disorder and health care utilization has been shown in several studies (Biggs et al., 2002; Elhai et al., 2005; Gillock et al., 2005; Newman et al., 2000). In our sample, anxiety and depression were positively and negatively related to health care utilization, respectively. While the role of anxiety has been confirmed in other studies, the negative association between health care utilization and depression is surprising. Several studies have reported a positive relationship between depression, on the one hand, and health care utilization on the other (Al-Windi, 2005; Glaesmer et al., 2008; Hansen et al., 2002; Katon et al., 2003; Rief et al., 2005b; Schmitz & Kruse, 2002; ten Have et al., 2001). The difference between the studies above and our finding is that we also integrated posttraumatic symptomatology and threshold for doctor visits in the analyses. Posttraumatic symptomatology shares some features with depressive symptomatology, which could explain why depression was not a predictor for health care utilisation in the somatising and control group. The negative relationship between depression and health care utilization in the whole group may be due to listlessness. This is a criterion for depression but not for posttraumatic symptomatology and could possibly lead to lower health care utilization because of the lacking drive. Another explanation is that the variance that was explained by depression in the other studies was explained by the threshold for doctor visits in our study. In accordance with the findings of other studies (Ladwig et al., 2000, 2001; Nanke & Rief, 2003; ten Have et al., 2001) higher health care utilization was found in women and in older people. Surprisingly, these relations were not found in the somatising group. This could be due to the other variables which we took into

account in our analyses but which were not integrated in the other studies. Married people showed elevated health care utilization in the somatising group. This is contrary to other studies (Kouzis & Eaton, 1998; Manning & Fusilier, 1999; ten Have et al., 2001). It is possible that this finding is unique to the group of people with more somatoform symptoms. Partners or children of these individuals could motivate them to visit a doctor because of their symptoms. They could also help them to reach a doctor where it is perhaps more difficult without support, e. g. when the doctor is to far away or a person has difficulties with walking etc.

In summary, the results of the second study showed that the individual threshold for doctor visits was an independent predictor for health care utilization in addition to the number of bodily symptoms. This implicates that both bodily complaints and the threshold for doctor visits might be treated independently in a psychotherapy setting. The threshold might be easier to influence than the somatoform symptoms themselves. This could lead to a reduction of increased health care costs on the one hand and to improved mental health in somatisers on the other hand.

3.3 Disability

In the third article in this cumulus the question to what extent disability is normal is investigated. The article had two aims: First, a broadened version of one of the most important questionnaires for the assessment of disability, the Pain Disability Index (PDI; Tait et al., 1987), was psychometrically evaluated in a large representative sample of the general population. In particular, normative data for all people of the general population reporting at least one pain or other somatic symptom are reported. Second, for the investigation of criterion validity, the relationship between disability, somatic complaints, depression, and anxiety, on the one hand, and health care utilization on the other were analysed.

We found that the PDI measures one underlying factor, supporting its content validity for the assessment of disability as a theoretical construct with one dimension. The PDI showed good reliability, satisfactory convergent and divergent

validity, except for the relationship between disability and satisfaction with leisure time and hobbies. We can assume that disability in the general population—in which generally a range of low disability scores are shown—has a particular impact on leisure time. In subgroups of the general population or clinical samples with higher disability scores, another pattern could emerge—for example, a stronger influence of disability on occupation. However, our results concerning the relationship between satisfaction and disability are correlative and not causal, thus precluding a final interpretation of the direction of their interactions. In accordance with previous studies higher disability scores in the PDI were related to higher age, but not to gender, in the general population. Approximately 30% of persons with one or more somatic complaints indicated no disability through their symptoms, and the mean disability score of the sample with at least one symptom was 9.0, that is rather low. Although those people suffer from somatic complaints, these complaints do not or only weakly interfere with their daily living. These data can be used to describe clinical samples, as the following example shows: The average disability of samples of chronic pain patients equals a percentage score between 95% and 99% of persons with somatic complaints in the general population. These results support the importance of our study aim—namely, the comparison of disability in clinical groups with disability scores of the general population. They confirm the extraordinary disability that can be caused by chronic pain compared to disability scores that are found in the general population with somatic complaints.

Five variables explained 26% of the variance of the number of doctor visits in the prior 12 months. This equals a large effect size according to Cohen et al. (2003). People with more somatic complaints, higher disability, persons who were retired or unemployed and showed higher generalised anxiety had more doctor visits. The influences of somatic complaints, employment, and anxiety on health care utilization are in accordance with other studies investigating health care utilization in the general population. Surprisingly, as in the second study in this cumulus, depression was again a negative predictor. If pain or somatic complaints are controlled for, the

negative relationship between depression and health care utilization may be due to apathy. This is a core diagnostic criterion for depression and could possibly lead to lower health care utilization because of low drive. There should be further investigations focusing on this issue. The results show that somatic complaints, mental health, and disability contribute independently to illness behaviour, supporting the criterion validity of the PDI. Although these concepts are associated, they contain different information. In other words, suffering from somatic complaints and disability can dissociate substantially, and we further confirm that both variables have to be addressed in studies investigating pain patients.

To summarize, this psychometric evaluation supports the use of the PDI as an economical, reliable, and valid self-rating instrument to assess disability caused by physical symptoms. Furthermore, we provide normative data to facilitate the description of clinical pain samples. In the understanding of health care utilization in the general population, the number and severity of somatic complaints as well as disability by physical symptoms play a crucial, distinct role in illness behavior.

3.4 Limitations

Beside several strengths of the presented studies (e.g., the general population approach and large sample size), there are also some shortcomings that need to be addressed. Disability, somatic complaints, depression, anxiety, posttraumatic symptomatology, and life satisfaction were assessed with self-rating instruments. This could lead to biases due to, for example, misunderstanding of the questions, social desirability or measurement errors. However, this argument is weakened by the careful selection of the self-rating instruments, which all indicated good reliability and validity.

Another limitation arises from assessing the number of doctor visits in the prior 12 months using a self-rating questionnaire. This could lead to an underestimation of health care utilization when compared with interview data or health use registers. To avoid underestimation due to neglect of doctor visits, the number of doctor visits

was asked separately for every medical specialisation. Underestimation because of other reasons is also possible and should be taken into account. In general, we assume that our data are in a linear relationship with actual health care use. This implies that even when the number of doctor visits was underestimated in our studies, the results of the linear regressions analyses would remain when using other ascertainment strategies for health care utilization.

3.5 Perspective

The results of the presented studies should lead to further investigations in different areas. Some ideas will briefly be presented here.

First, the PHQ-15 and the PHQ-9 can be used in studies comparing Germans and migrants in Germany on somatoform disorders and depression. Moreover, with this knowledge barrieres to the German health care system for migrants with mental disorders and the detection rate of general practitioners for mental disorders in migrants can be investigated. Also, further studies should investigate measurement invariance for both questionnaires in sub-groups of migrants, e. g. Turkish or Polish migrants as the biggest groups of migrants in Germany. It is unclear, if the results of our study can be generalized to these sub-groups who differs in their cultural background. This is especially important in order to further investigate the influence of the cultural background on symptom perception and symptom presentation. Besides, the results of our study can offer a starting point for the investigation of measurement invariance for other questionnaires measuring somatization and depression.

Second, the concept of the individual threshold for doctor visits and its impact for psychotherapy should be further analysed in future studies. The next research step should include longitudinal data of persons with a somatoform disorder. It should be tested, if the general threshold for doctor visits at baseline can predict health care utilization in the following time. Besides, the threshold for doctor visits should be integrated in a psychotherapy- or primary care- study with somatoform patients.

Moreover, the impact of depression on health care utilization needs further investigation. Above all, it could be examined if our results can be generalized to other health care systems.

Third, as disability by bodily symptoms is an important factor in numerous areas, the broadened version of the PDI can be used for studies investigating very different themes. For example, the validity of different criteria for somatoform disorders can be investigated using disability as a criterion. Also, the impact of bodily complaints on disability in different areas of daily living can be assessed. Further studies which use the PDI can compare their results to the normative data provided in our study.

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5. Attachment

5.1 Paper 1: Mewes R., Christ O., Rief W., Glaesmer H., Martin A., Brähler E. (submitted). Are depression and somatisation equivalent for migrants and Germans? (Sind Vergleiche im Depressions- und Somatisierungsausmaß zwischen Migranten und Deutschen möglich?: Eine Überprüfung der Messinvarianz für den PHQ-9 und PHQ-15).

5.2 Paper 2: Mewes R., Rief W., Brähler E., Martin A., Glaesmer H. (2008). Lower decision threshold for doctor visits as a predictor of health care use in somatoform disorders and the general population**.** *General Hospital Psychiatry 30(4): 331-337*
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5.3 Paper 3: Mewes R., Rief W., Stenzel N., Glaesmer H., Martin A., Brähler E. (in press). What is "normal" disability?-An investigation of disability in the general population. *Pain*
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Sind Vergleiche im Depressions- und Somatisierungsausmaß zwischen Migranten und Deutschen möglich?: Eine Überprüfung der Messinvarianz für den PHQ-9 und PHQ-15

R. Mewes, O. Christ, W. Rief, H. Glaesmer, A. Martin, E. Brähler

Zusammenfassung

Hintergrund. Zur Erfassung der psychischen Gesundheit von Migranten im Vergleich zu Deutschen sind Untersuchungen in der Allgemeinbevölkerung zentral. Für diesen Ansatz hat sich die Verwendung des Depressivitäts- und des Somatisierungsmoduls des Patient Health Questionnaire (PHQ-9 und PHQ-15) bewährt. Es ist jedoch unklar, ob diese Module bei Migranten das Gleiche messen wie bei Deutschen (Messäquivalenz). Dadurch bleibt es fraglich, ob die Ergebnisse vergleichender Studien richtig interpretierbar sind.

Methode. In der vorliegenden Arbeit wurden der PHQ-9 und der PHQ-15 anhand einer großen Stichprobe (je *N*=271) von in Deutschland lebenden Migranten und Deutschen auf Messäquivalenz überprüft.

Ergebnisse. Sowohl für den PHQ-9 als auch für den PHQ-15 wurde Messäquivalenz gefunden. Mittelwertsvergleiche zwischen Migranten und Deutschen sind unter Verwendung dieser Instrumente möglich.

Diskussion. Die Ergebnisse zeigen, dass die Voraussetzung für die Interpretation vergleichender Daten in Bezug auf Migranten und Deutsche mit dem PHQ-9 und PHQ-15 gegeben ist. Sie liefern eine gute Basis für weitergehende Studien im Bereich der Migrationsforschung und zum kulturellen Einfluss auf die Präsentation von psychischen und körperlichen Beschwerden.

Schlüsselwörter: PHQ-9, PHQ-15, Messäquivalenz, Migranten, Allgemeinbevölkerung

Are depression and somatisation equivalent for migrants and Germans?

Abstract

Background. Studies in the general population are crucial for the assessment of mental health in migrants in comparison to Germans. For the assessment of depression and somatisation in the general population, the Patient Health Questionnaire-9 (PHQ-9) and the PHQ-15 have shown good validity and reliability. However, it is arguable if both instruments assess the same constructs in migrants and Germans and consequently if results from comparative studies are interpretable.

Methods. The PHQ-9 and the PHQ-15 were analysed in reference to measurement invariance in a big sample of migrants in Germany and Germans (*N*=271 each).

Results. The PHQ-9 and the PHQ-15 both showed measurement invariance. Using these instruments, comparisons of mean values between migrants and Germans are possible.

Discussion. The results show that the interpretation of data from comparative studies with migrants and Germans using the PHQ-9 and the PHQ-15 is possible. This is a good basis for further studies about mental health in migrants and for studies which investigate the cultural influence on the presentation of mental and somatic complaints.

Key words: PHQ-9, PHQ-15, measurement invariance, migrants, general population

Einleitung

Obwohl die Bundesrepublik Deutschland seit Jahrzehnten ein Einwanderungsland darstellt, ist das Wissen über die psychische Gesundheit der hier lebenden Menschen mit Migrationshintergrund (im Folgenden: Migranten) begrenzt. Zu diesem Personenkreis gehören nach Schenk et al. (2006) alle Menschen, die selber oder deren Eltern (mindestens ein Elternteil) im Ausland geboren sind, unabhängig davon, ob sie die deutsche oder eine ausländische Staatsbürgerschaft besitzen. Diese Personengruppe macht zurzeit einen Bevölkerungsanteil von 18,6% aus (Statistisches Bundesamt, 2007).

Gerade zu den am häufigsten vorkommenden psychischen Störungen wie depressive und somatoforme Störungen (Wittchen et al., 1999; Wittchen & Jacobi, 2005) sind die Ergebnisse aus Studien zu Prävalenzzahlen bei Migranten sehr heterogen (Bhugra, 2004; Swinnen & Selten, 2007). In vielen Studien wurden Stichproben aus klinisch-medizinischen Settings herangezogen. Auf Grund dieser Vorselektion der untersuchten Stichproben erlauben diese Studien nur eingeschränkt Rückschlüsse auf das Vorliegen von depressiven und somatoformen Störungen bei Migranten in der Allgemeinbevölkerung. Diese Daten sind mit Inanspruchnahmeverhalten konfundiert, da eventuell bestehende Zugangsbarrieren im Gesundheitssystem, zum Beispiel durch kulturell bedingte Verständigungsprobleme (Koch et al., 2008), die Inanspruchnahme von Gesundheitsleistungen für Migranten schwieriger gestalten können (Schenk, 2007).

Obwohl somatoforme Störungen in allen bisher untersuchten kulturellen Gruppen vorkommen, wird immer wieder diskutiert, in wiefern die Präsentation dieser Beschwerden im Gesundheitssystem und die Art der am häufigsten auftretenden Beschwerden durch kulturelle Modelle und ethnische Unterschiede geprägt sind (z.B. Edwards et al., 2001; Escobar et al., 2007; Kirmayer & Young, 1998; Kirmayer & Sartorius, 2007). Das kann die Diagnostik somatoformer Störungen, aber auch die der Depression erschweren, wenn man davon ausgeht, dass Migranten beim Arzt stärker als Deutsche körperliche im Vergleich zu psychischen Beschwerden in den

Vordergrund ihres Symptomberichtes stellen. Depressionen werden dadurch eventuell nicht als solche erkannt oder können nicht von somatoformen Störungen abgegrenzt werden, während somatoforme Störungen in der Allgemeinmedizin eher selten diagnostiziert werden.

Um den in den vorliegenden Studien aufgeworfenen Diskussionspunkten unter Umgehung der bestehenden Beschränkungen weiter nach zu gehen, stellen epidemiologische, bevölkerungsrepräsentative Forschungsansätze unter Einbeziehung von Migranten das Vorgehen der Wahl dar (Zeeb & Razum, 2006). Diese Ansätze erschweren allerdings auf Grund der großen Stichprobe die Verwendung von diagnostischen Interviews zur Diagnosestellung. Andererseits ist gerade zur Erfassung von subklinischen depressiven und somatoformen Syndromen und der Einschätzung ihrer Schwere ein dimensionales Erhebungsverfahren notwendig. Auf diesem Hintergrund hat sich der Einsatz des Depressions- (PHQ-9; Kroenke et al., 2001) und Somatisierungsmoduls (PHQ-15; Kroenke et al., 1998, 2002) des Patient Health Questionnaire (PHQ; Löwe et al., 2002; Spitzer et al., 1999) bewährt. Glaesmer et al. (eingereicht) konnten im PHQ unter Kontrolle von Alter und Geschlecht keinen Unterschied zwischen Migranten und Deutschen im Somatisierungs- und Depressionsgrad finden. Um solche Befunde richtig interpretieren zu können, ist es von entscheidender Bedeutung, ob das verwendete Messinstrument bei Migranten das Gleiche darunter liegende Konstrukt –hier den Grad der Depressivität bzw. der somatischen Symptomatik- misst wie bei Deutschen. Huang et al. (2006) sind dieser Frage nachgegangen und haben gefunden, dass dem PHQ-9 bei vier ethnisch und kulturell unterschiedlichen Gruppen jeweils ein Faktor unterliegt (konfigurale Invarianz). Dabei wurde allerdings unberücksichtig gelassen, ob die einzelnen Items in gleicher Höhe auf dem unterliegenden Faktor laden (metrische Invarianz) und ob Mittelwertsunterschiede zwischen den Gruppen nicht durch unterschiedliche Itemschwierigkeiten bedingt sind (skalare Invarianz). Diese Voraussetzungen müssen zur Annahme von Messinvarianz der Skala beim Intergruppenvergleich gegeben sein (Meredith, 1993; Vandenberg & Lance, 2000)

und sind von entscheidender Bedeutung bei der Interpretation von Studienergebnissen aus dem Bereich der Migrationsforschung.

Die vorliegende Studie untersucht Messäquivalenz des PHQ-9 (Kroenke et al., 2001) und PHQ-15 (Kroenke et al., 1998, 2002) bei in Deutschland lebenden Migranten und Deutschen. Wir gehen davon aus, die Befunde von Huang et al. (2006) zum PHQ-9 replizieren zu können, und darüber hinaus auch metrische und skalare Messinvarianz zu finden. Die faktorielle Struktur des PHQ-15 ist bislang nicht untersucht worden, so dass die vorliegende Studie hier explorativen Charakter hat und keine Hypothesen aufgestellt werden. Zur Vermeidung von Konfundierungen durch sprachliche Unterschiede oder Übersetzungsfehler (van de Vijver & Hambleton, 1996), wurde in beiden Stichproben die deutsche Fragebogenversion verwendet.

Methode

Stichprobe

Die Daten der hinsichtlich Alter, Geschlecht, Bildungsstand und Region repräsentativen Stichprobe wurden im Mai/ Juni 2007 mit Hilfe des Meinungsforschungsinstituts USUMA (Berlin) gesammelt. Deutschland wurde dafür in 258 Regionen unterteilt, die die soziodemografische Landesstruktur repräsentieren. Innerhalb der einzelnen Regionen wurden die Haushalte und die Zielpersonen (Einschlusskriterien: 14 Jahre oder älter, ausreichendes Sprachverständnis) randomisiert ausgewählt. Von 4205 ausgewählten Haushalten waren 4055 Adressen valide (qualitätsneutrale Ausfälle von 3,6%). Weitere Ausfallgründe (Krankheit, Urlaub, Verweigerung der Teilnahme, Nichterreichbarkeit) führten zu einer weiteren Reduktion der Stichprobe auf 2510 Personen im Alter zwischen 14 und 93 Jahren (Teilnahmerate: 61,9% der validen Adressen). Der Altersdurchschnitt lag bei 48 Jahren (SD=17,8), 55% der Stichprobe waren weiblich. 271 Personen konnten der Gruppe der Migranten zugeordnet werden (siehe **Tabelle 1**). Da die Migranten im Schnitt wesentlich jünger waren als

die deutsche Stichprobe (43,2±18,1 Jahre vs. 48,6±17,7 Jahre) wurde zur Vermeidung von möglichen Konfundierungen mittels Paarbildung eine nach Alter und Geschlecht zu den Migranten parallelisierte deutsche Vergleichsstichprobe gezogen. Die untersuchte Gruppe der Migranten ist bezüglich der Herkunft recht heterogen. Um die Ergebnisse auf die Gesamtheit der in Deutschland lebenden Migranten generalisieren zu können, wurde die Gruppe der Migranten nicht in Untergruppen nach Herkunftsland o.ä. unterteilt.

Tabelle 1 hier einfügen

Patient Health Questionnaire (PHQ)

PHQ-15 (Kroenke et al., 1998, 2002)**.** Zur Erfassung des Somatisierungsgrades wurde der PHQ-15 eingesetzt. Dieser besteht aus einer Liste von 13 somatoformen Symptomen, d.h. von Beschwerden, die häufig in der Allgemeinmedizin präsentiert werden aber nur in seltenen Fällen auf eine organische Ursache zurückzuführen sind, und aus 2 Items aus dem PHQ-9 („Ein- oder Durchschlafschwierigkeiten/ vermehrter Schlaf“, „Müdigkeit oder Gefühl, keine Energie zu haben“). Die Beeinträchtigung durch diese Symptome in den letzten 4 Wochen kann auf einer Skala von 0 (“nicht beeinträchtigt” bzw. „überhaupt nicht“) bis 2 (“stark beeinträchtigt” bzw. „an mehr als der Hälfte der Tage“) angegeben werden; der Summenwert der Skala hat eine Bandbreite von 0 bis 30.

PHQ-9 (Kroenke et al., 2001)**.** Diese Subskala des PHQ fragt mit 9 Items die wichtigsten Kriterien einer Depression nach DSM-IV (American Psychiatric Association, 2000) ab. Im Vergleich mit klinischen Interviews wurde eine Sensitivität für Depressive Störungen von 95-98% und eine Spezifität von 80-86% gefunden (Gräfe et al., 2004; Löwe et al., 2004a; Wittenkampf et al., 2007). Der PHQ-9 zeigte sich anderen Selbstrating-Instrumenten bei der Erfassung von Depressionen überlegen (Henkel et al., 2003; Löwe et al., 2004b). Die Ausprägung der Depressivität wird für die letzten 2 Wochen auf einer Skala von 0 (“überhaupt nicht”) bis 3 (“beinahe jeden Tag”) beantwortet; der Summenwert der Skala hat somit eine

Bandbreite von 0 bis 27. Die Ergebnisse der Validierungs- und Normierungsstudien von Rief et al. (2004) und Martin et al. (2006) sprechen für den Einsatz des PHQ-9 bei Studien in der deutschen Allgemeinbevölkerung.

Statistische Auswertung

Für beide Skalen wurde zunächst getrennt für die deutsche und die Migrantenstichprobe eine explorative Faktoranalyse durchgeführt, um einen ersten Hinweis auf die Faktorenstruktur zu erhalten. Diese explorative Analyse wurde mit SPSS Version 14 berechnet. Die eigentliche Prüfung der Messäquivalenz erfolgte dann mittels eines multiplen Gruppenvergleichs, wobei unterschiedliche Varianten von Messmodellen (konfirmatorische Faktorenanalyse) miteinander verglichen wurden. Die multiplen Gruppenvergleiche wurden mit Mplus Version 5.1 (Muthén & Muthén, 1998-2007) berechnet. Es wurden jeweils robuste Maximum Likelihood-Schätzer verwendet.

Ergebnisse

In den **Tabellen 2** und **3** sind die Mittelwerte, Standardabweichungen und Interkorrelationen der Items des PHQ-9 und PHQ-15 für beide Teilstichproben zusammengefasst. Der überwiegende Anteil der Items der beiden Skalen zeigte eine zum Teil deutliche Abweichung von der Normalverteilung (Schiefe > |2|, Kurtosis > |7|). Die Items „Bauchschmerzen“ (PHQ-15a), „Menstruationsschmerz oder andere Probleme mit der Menstruation“ (PHQ-15d) und „Schmerzen oder Probleme beim Geschlechtsverkehr“ (PHQ-15e) wiesen nur einen geringen Zusammenhang mit den übrigen Items des PHQ-15 auf. Bei Item PHQ-15d wurden dabei nur Frauen in die Auswertung mit einbezogen (N=137 für Deutsche und N=138 für Migranten).

Tabellen 2 und 3 hier einfügen

Prüfung der Messäquivalenz für den PHQ-9

Faktorenstruktur des PHQ-9

Eine explorative Faktorenanalyse (Hauptachsenanalyse) über alle 9 Items des PHQ-9 ergab sowohl für die deutsche Stichprobe (Eigenwertverlauf: 4.66, 1.04, .71,…) als auch für die Migrantenstichprobe (5.26, 0.95, 0.67,…) eine eindeutig einfaktorielle Lösung. Die interne Konsistenz (Cronbachs Alpha) war in beiden Stichproben zufriedenstellend (deutsche Stichprobe: α = .87; Migrantenstichprobe: α = .90).

Prüfung des Messmodells in beiden Teilstichproben

Mittels einer konfirmatorischen Faktorenanalyse wurde zunächst der Modell-Fit des einfaktoriellen Messmodells in beiden Teilstichproben geprüft. Sowohl in der deutschen Stichprobe (χ^2 = 77.58, df=27, p < .001, CFI = .892, RMSEA = .083, SRMR = .061) als auch in der Migrantenstichprobe (χ^2 = 95.52, df = 27, p < .001, CFI = .897, RMSEA = .097, SRMR = .062) war der Modell-Fit knapp befriedigend (s. Kline, 2004).

Multipler Gruppenvergleich

Zur Prüfung der Messäquivalenz wurden drei Messmodelle, die in einer hierarchischen Beziehung zueinander stehen, mittels eines multiplen Gruppenvergleichs verglichen. In einem ersten Schritt wurde ein Baseline-Modell geschätzt, in dem lediglich die Faktorenstruktur in beiden Teilstichproben gleich vorgegeben wurde, alle Faktorladungen und Iteminterceptsaber frei variieren konnten (Modell A: konfigurale Invarianz). In einem zweiten, restriktiveren Modell wurden die Faktorladungen gleich gesetzt (Modell B: metrische Invarianz), im dritten und letzten Schritt schließlich die Iteminterceptsaber (Modell C: skalare Invarianz). In **Tabelle 4** sind die Anpassungsmaße für die drei Modelle aufgeführt.

Die Ergebnisse des Modellvergleichs zeigten, dass Faktorenstruktur (konfigurale Messinvarianz), Faktorladungen (metrische Invarianz) und Iteminterceptsaber (skalare Invarianz) in der deutschen Stichprobe und der Migrantenstichprobe vergleichbar waren. Somit stützen die Ergebnisse die Annahme von Messäquivalenz des PHQ-9 für Stichproben mit unterschiedlichem kulturellem und ethnischem Hintergrund.

Ist Messäquivalenz gesichert, kann ein Mittelwertvergleich zwischen den beiden Teilstichproben erfolgen. Wir haben hierzu die latenten Mittelwerte mittels eines multiplen Gruppenvergleichs verglichen (s. Reinecke, 2005). Der Mittelwert des latenten PHQ-9 Faktors wurde in der deutschen Stichprobe auf Null restringiert, in der Migrantenstichprobe dagegen frei geschätzt. Der frei geschätzte Mittelwert für den latenten PHQ-9 Faktor gibt dabei die Abweichung zu dem auf Null restringierten Mittelwert in der Vergleichsstichprobe (hier die deutsche Stichprobe) an. Es zeigte sich keine signifikante Abweichung (M = .005, SE = .040, p = .908), die latenten Mittelwerte sind also vergleichbar zwischen den beiden Teilstichproben.

Tabelle 4 hier einfügen

Prüfung der Messäquivalenz für den PHQ-15

Faktorenstruktur des PHQ-15

Die Ergebnisse einer explorativen Faktorenanalyse (Hauptachsenanalyse) über alle 15 Items des PHQ-15 zeigten in beiden Teilstichproben kein eindeutig interpretierbares Muster. Der Eigenwertverlauf in der deutschen Stichprobe (4.31, 1.82., 1.53, 1.08, 0.97, 0.84,…) wie auch in der Migrantenstichprobe (5.09, 1.91, 1.40, 1.21, 0.87, 0.80,…) ließ unterschiedliche Lösungen plausibel erscheinen. Bei Extraktion von nur einem Faktor zeigte sich, dass in beiden Teilstichproben die Items „Bauchschmerzen“ (PHQ-15a), „Menstruationsschmerz“ (PHQ-15d) und „Schmerzen oder Probleme beim Geschlechtsverkehr“ (PHQ-15e) Ladungen von < .30 aufwiesen. Das Ladungsmuster für mehrfaktorielle Lösungen wies in keiner der beiden Teilstichproben ein interpretierbares Muster auf.

Prüfung des Messmodells in beiden Teilstichproben

Da auf Grundlage der explorativen Faktorenanalyse keine der alternativen faktoriellen Lösungen favorisiert werden konnte, haben wir mittels konfirmatorischer Faktorenanalysen zwei alternative Messmodelle miteinander verglichen: Ein Messmodell unter Annahme nur eines latenten Faktors (Messmodell

A) und ein hierarchisches Messmodell, in dem wir basierend auf den DSM-IV und ICD-10 (Dilling & Freyberger, 2006) Kriterien für somatoforme Störungen fünf latente Faktoren erster Ordnung vorgegeben haben, wobei die beiden Items aus dem PHQ-9 („Ein- oder Durchschlafschwierigkeiten/ vermehrter Schlaf", „Müdigkeit oder Gefühl, keine Energie zu haben") einen eigenen Faktor bildeten. Die weiteren Faktoren bildeten Schmerzsymptome („Rückenschmerzen", „Schmerzen in Armen, Beinen, Gelenken", „Kopfschmerzen"), gastrointestinale Symptome („Übelkeit, Blähungen oder Verdauungsbeschwerden", „Verstopfung, nervöser Darm oder Durchfall"), pseudoneurologische Symptome („Schwindel", „Ohnmachtsanfälle"), kardiovaskuläre Symptome („Schmerzen im Brustbereich", „Herzklopfen oder Herzrasen", „Kurzatmigkeit") ab. Die Items „Bauchschmerzen", „Menstruationsschmerz" und „Schmerzen oder Probleme beim Geschlechtsverkehr" wurden aufgrund ihres geringen Zusammenhangs mit allen übrigen Items bei den weiteren Analysen nicht mehr berücksichtig. Die Faktoren erster Ordnung luden alle auf einem latenten Faktor zweiter Ordnung, der den Grad der Somatisierung abbildete. In **Tabelle 5** sind die Ergebnisse zusammengefasst.

Die Ergebnisse zeigten in beiden Teilstichproben die Überlegenheit des hierarchischen Messmodells B mit 5 latenten Faktoren erster Ordnung und einem latenten Faktor zweiter Ordnung. Die Prüfung der Messäquivalenz erfolgte daher für das Messmodell B.

Tabelle 5 hier einfügen

Multipler Gruppenvergleich

Zur Prüfung der Messäquivalenz für den PHQ-15 wurde genauso vorgegangen wie für den PHQ-9 (siehe vorne). In **Tabelle 6** sind die Anpassungsmaße für die drei Modelle aufgeführt. Die Ergebnisse des hierarchischen Modellvergleichs zeigten auch für den PHQ-15 Messäquivalenz bei einem Vergleich einer deutschen Stichprobe mit einer Migrantenstichprobe: Faktorenstruktur (konfigurale

Messinvarianz), Faktorladungen (metrische Invarianz) und Iteminterceptcepts (skalare Invarianz) waren vergleichbar zwischen beiden Stichproben.

Nachdem wir Messäquivalenz für den PHQ-15 sichern konnten, konnte ein Mittelwertvergleich zwischen den beiden Teilstichproben durchgeführt werden. Wir haben hierzu wiederum die latenten Mittelwerte mittels eines multiplen Gruppenvergleichs miteinander verglichen. Der Mittelwert des latenten PHQ-15 Faktors wurde in der deutschen Stichprobe auf Null restringiert, in der Migrantenstichprobe dagegen frei geschätzt. Der frei geschätzte Mittelwert für den latenten PHQ-15 Faktor gibt dabei die Abweichung zu dem auf Null restringierten Mittelwert in der Vergleichsstichprobe (hier die deutsche Stichprobe) an. Es zeigte sich keine signifikante Abweichung (M = .006, SE = .033, p = .846), die latenten Mittelwerte sind also für den PHQ-15 vergleichbar zwischen den beiden Teilstichproben.

Tabelle 6 hier einfügen

Diskussion

Für die Interpretation der Ergebnisse von vergleichenden Studien zwischen Deutschen und Migranten bezüglich psychischer Beschwerden ist das Vorliegen von Messäquivalenz für das verwendete Messinstrument zentral. In der vorliegenden Studie wurden die Depressions- und die Somatisierungsskala des Patient Health Questionnaire (PHQ-9 und PHQ-15) auf Messäquivalenz in einer Stichprobe von in Deutschland lebenden Migranten und einer parallelisierten Stichprobe von Deutschen untersucht.

Beide Skalen zeigten konfigurale, metrische und skalare Messinvarianz. Für den PHQ-9 (Kroenke et al., 2001) fand sich ein latenter Faktor. Wir konnten somit die Ergebnisse von Huang et al. (2006) replizieren und weiter untermauern. Dem PHQ-15 (Kroenke et al., 1998, 2002) lagen fünf Faktoren erster Ordnung zu Grunde, die alle auf einem latenten Faktor zweiter Ordnung luden. Der latente Faktor zweiter Ordnung gab dabei den Grad der Somatisierung wieder. Vier der fünf Faktoren

erster Ordnung (Schmerzsymptome, gastrointestinale Symptome, pseudoneurologische Symptome und kardiovaskuläre Symptome) entsprachen den DSM-IV- und ICD-10- Beschwerdekategorien zur Diagnostizierung einer Somatisierungsstörung. Die Kategorie sexuelle/ genitale Beschwerden konnte in der vorliegenden Untersuchung nicht in einem dem PHQ-15 unterliegenden Faktor abgebildet werden. Bezüglich der beiden Items „Menstruationsschmerzen oder andere Probleme mit der Menstruation“ und „Schmerzen oder Probleme beim Geschlechtsverkehr“ replizieren unsere Ergebnisse den Befund von Rief und Hiller (1999), die diese Beschwerden aus ihrer Beschwerdeliste zur Klassifikation somatoformer Störungen aufgrund von zu geringer Item-Skala-Korrelationen und fehlender diskriminanter Validität ausschließen mussten. Bauchschmerzen ohne organische Ursache kommen bei ca. 11% der erwachsenen Allgemeinbevölkerung in einem 2-Jahreszeitraum vor und sind damit weniger häufig als andere Schmerzbeschwerden ohne organische Ursachen wie z.B. Rückenschmerzen (Rief et al., 2001; Hessel et al., 2005). Eventuell ist die Spezifität von Bauchschmerzen als Indikator für einen erhöhten Somatisierungsgrad bei Erwachsenen geringer als die der anderen abgefragten Beschwerden. Dieses Ergebnis müsste in weiteren Studien überprüft werden.

Es zeigte sich, dass Mittelwertsvergleiche zwischen Migranten und Deutschen mit dem PHQ-9 und PHQ-15 möglich sind. Dieses Ergebnis unterstützt die Interpretation der Befunde von Glaesmer et al. (eingereicht), die keine Unterschiede im Depressions- und Somatisierungsgrad zwischen Deutschen und Migranten gefunden haben.

In der vorliegenden Studie lag der Anteil der Migranten an der Repräsentativstichprobe bei 11,1%, was im Gegensatz zu einem Anteil von 18,6% in der Allgemeinbevölkerung eine Unterrepräsentation darstellt. Allerdings wurden nur Personen ab 14 Jahren in die Stichprobe eingeschlossen. Da Personen mit Migrationshintergrund eine andere Altersstruktur aufweisen als die deutsche Allgemeinbevölkerung und im Durchschnitt wesentlich jünger sind (Statistisches

Bundesamt, 2007), ist anzunehmen, dass die Bezugsgröße von 18,6% hier zu groß ist. Gerade durch die methodisch wichtige Verwendung eines Fragebogens in deutscher Sprache auch bei den Migranten wurden außerdem Personen mit mangelnden Deutschkenntnissen ausgeschlossen. In einer weiteren Untersuchung wäre die Überprüfung von Messäquivalenz bei Verwendung eines reliablen und gut validierten übersetzten Fragebogens von Interesse. Dazu wäre es allerdings nötig, eine sprachhomogene Gruppe von Migranten zu selektieren, was die Generalisierung auf die Gesamtgruppe der in Deutschland lebenden Migranten erschweren würde.

Wie für psychische Beschwerden zu erwarten gewesen ist, wichen die Verteilungen der Items des PHQ-9 und PHQ-15 in der Allgemeinbevölkerung stark von einer Normalverteilung ab. Es ist anzunehmen, dass die Items in Inanspruchnahmepopulationen eine geringere Schiefe und höhere Häufigkeiten aufweisen, so dass die Interkorrelationen zwischen den Items höher ausfallen würden. Für die Allgemeinbevölkerung machte die Abweichung von der Normalverteilung die Verwendung von non-parametrischen Verfahren zur Datenanalyse nötig, bei denen Normalverteilung nicht vorausgesetzt wird. In der vorliegenden Studie wurden robuste Maximum Likelihood- Schätzer verwendet, die für Abweichungen von der Normalverteilung korrigieren. Auf Grund der in der vorliegenden Studie gewonnenen Erkenntnisse wäre für weiterführende Studien eine Analyse mit polychorischen Korrelation zu empfehlen, bei der die Items als kategoriale Variablen spezifiziert werden, denen aber ein latenter kontinuierlicher Faktor zugrunde liegt.

Fazit

Die vorliegende Studie konnte zeigen, dass der PHQ-15 und PHQ-9 für in Deutschland lebende Migranten und Deutsche messäquivalent sind. Damit ist die Voraussetzung für die Interpretation vergleichender Daten in Bezug auf diese Gruppen gegeben. Des Weiteren konnte die Faktorenstruktur des PHQ-15 ermittelt

werden. Diese Befunde liefern eine gute Basis für weitergehende Studien im Bereich der Migrationsforschung und zum kulturellen Einfluss auf die Präsentation von psychischen und körperlichen Beschwerden.

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Tabelle 1: Migranten vs. Deutsche Vergleichsstichprobe

	Migranten (*N*=271)	**Deutsche (*N*=271)**
Frauen % (*N*)	51,7 (140)	51,7 (140)
Alter *M* (*SD*)	43,2 (18,1)	42,7 (19,3)
Sprachkenntnisse % (*N*)		
Muttersprache Deutsch	45 (122)	100 (271)
Sehr gut	19,6 (53)	
Gut	21,8 (59)	
Mittelmäßig	11,4 (31)	
Wenig	1,5 (4)	
Herkunftsländer der Eltern[1] % (*N*)		
Beide Balkanländer	6,6 (18)	
Beide alte EU-Länder	7,0 (19)	
Beide Osteuropa	15,9 (43)	
Beide ehemalige Sowjetunion	18,1 (49)	
Beide Türkei	15,5 (42)	
Beide andere Länder	15,5 (42)	
Eltern aus verschiedenen Ländern	1,8 (5)	

Anmerkungen: [1] Balkanländer: ehemaliges Jugoslawien, Bosnien-Herzegowina, Kosovo, Kroatien, Mazedonien, Serbien
alte EU-Länder: Frankreich, Griechenland, Österreich, Spanien, Italien
ehemalige Sowjetunion: Russland, Ukraine, Weißrussland, Kasachstan

Tabelle 2: Mittelwert, Standardabweichung, Schiefe, Kurtosis (deutsche Stichprobe vor dem Querstrich/Migrantenstichprobe nach dem Querstrich) und Item-Interkorrelationen (deutsche Stichprobe oberhalb der Diagonalen/Migrantenstichprobe unterhalb der Diagonalen) für den PHQ-9

	M	*SD*	Schiefe	Kurtosis	1	2	3	4	5	6	7	8	9
1) phq-9a	0.33/0.37	0.55/.61	1.44 / 1.71	1.13 / 3.15	1	.63	.49	.61	.51	.36	.41	.32	.40
2) phq-9b	0.27/.29	0.52/.62	1.95 / 2.37	3.87 / 2.37	.69	1	.49	.59	.55	.50	.48	.50	.48
3) phq-9c	0.43/.42	0.72/.72	1.67 / 1.89	2.12 /3 .33	.56	.56	1.	.62	.39	.27	.48	.29	.33
4) phq-9d	0.49/.48	0.65/.68	1.24 / 1.47	1.42 / 2.18	.60	.58	.73	1	.45	.46	.57	.34	.34
5) phq-9e	0.26/.23	0.57/.58	2.18 / 2.96	4.19 / 9.23	.54	.61	.43	.46	1	.53	.38	.43	.43
6) phq-9f	0.22/.22	0.52/.55	2.54 / 2.84	6.36 / 8.64	.58	.67	.41	.44	.58	1	.45	.41.	.52
7) phq-9g	0.20/.19	0.49/.49	2.58 / 3.19	7.04 / 12.42	.54	.54	.55	.53	.45	.50	1	.44	.34
8) phq-9h	0.10/.12	0.34/.40	3.52 / 4.36	12.75 / 22.64	.51	.46	.36	.36	.54	.41	.48	1	.55
9) phq-9i	0.09/.09	0.32/.38	3.51 / 4.80	12.64 / 25.00	.51	.61	.44	.43	.60	.63	.56	.67	1

Anmerkungen: Alle Item-Interkorrelation signifikant mit $p < .001$

PHQ-9a: Wenig Interesse/ Freude an Tätigkeiten; PHQ-9b Niedergeschlagenheit; PHQ-9c Schlafschwierigkeiten; PHQ-9d Müdigkeit/ Energielosigkeit; PHQ-9e Verminderter/ übermäßiger Appetit; PHQ-9f niedriger Selbstwert/ Schuldgefühle; PHQ-9g Konzentrationsschwierigkeiten; PHQ-9h Verlangsamung/ Ruhelosigkeit; PHQ-9i Suizidgedanken

Tabelle 3: Mittelwert, Standardabweichung, Schiefe, Kurtosis (deutsche Stichprobe vor dem Querstrich/Migrantenstichprobe nach dem Querstrich) und Item-Interkorrelationen (deutsche Stichprobe oberhalb der Diagonalen/Migrantenstichprobe unterhalb der Diagonalen) für den PHQ-15

	M	*SD*	Schiefe	Kurtosis	1	2	3	4[a]	5	6	7	8	9	10	11	12	13	14	15
1) phq-15a	0.13/0.10	0.37/0.35	2.80/3.59	7.54/13.14	1	.20**	.16**	.33***	.14*	.16**	.18**	.18**	.01	.10	.01	.15*	.39***	.22***	.30***
2) phq-15b	0.41/0.47	0.60/0.66	1.18/1.10	0.37/0.01	.11	1	.49***	.02	.07	.31***	.29***	.24***	-.02	.35***	.26***	.26***	.35***	.34***	.47***
3) phq-15c	0.38/0.42	0.61/0.66	1.34/1.31	0.73/0.43	.07	.63***	1	.04	.11	.29***	.13*	.25***	-.01	.23***	.23***	.21***	.15*	.26***	.31***
4) phq-15d[a]	0.24/0.30	0.52/0.52	2.12/1.47	3.64/1.26	.12	-.11	-.10	1	.35***	.16	.07	.08	-.06	-.08	-.04	.19*	.13	.22*	.24**
5) phq-15e	0.05/0.06	0.23/0.27	5.08/4.86	27.83/25.37	.25***	.14*	.20**	.27***	1	.17**	.09	.08	-.03	.17**	.17**	.16**	.19**	.10	.10
6) phq-15f	0.34/0.36	0.54/0.55	1.30/1.19	0.73/0.45	.15*	.29***	.28***	.21*	.11	1	.27***	.40***	.02	.19**	.18**	.24***	.19**	.27***	.40***
7) phq-15g	0.09/0.08	0.320.28	3.52/3.65	12.70/13.35	.12	.20**	.16**	-.16	.09	.25***	1	.43***	.22***	.40***	.36***	.39***	.43***	.26***	.33***
8) phq-15h	0.15/0.14	0.42/0.42	2.96/3.08	8.41/9.15	.01	.25***	.37***	-.07	.03	.27***	.35***	1	.39***	.36***	.38***	.38***	.27***	.35***	.47***
9) phq-15i	0.03/0.01	0.18/0.15	7.77/11.07	66.60/131.7	-.03	.20**	.20**	-.07	.17**	.16**	.33***	.45***	1	.36***	.40***	.35***	.34***	.18**	.22***
10) phq-15j	0.14/0.11	0.40/0.36	2.92/3.49	8.32/12.4	.06	.26***	.31***	.04	.09	.26***	.40***	.55***	.49***	1	.55***	.43***	.47***	.40***	.41***
11) phq-15k	0.11/0.11	0.35/0.36	3.33/3.49	11.28/12.6	.09	.25***	.25***	-.10	.05	.20**	.55***	.48***	.42***	.65***	1	.40***	.36***	.30***	.36***
12) phq-15l	0.14/0.17	0.41/0.46	3.01/2.69	8.83/6.62	.16**	.27***	.30***	.05	.10	.27***	.12*	.47***	.08	.45***	.30***	1	.68***	.22***	.34***
13) phq-15m	0.15/0.18	0.42/0.45	2.96/2.48	8.41/5.62	.12	.28***	.34***	-.02	.01	.31***	.18**	.44***	.08	.41***	.34***	.64***	1	.24***	.40***
14) phq-15n	0.41/0.39	0.67/63	1.38/1.39	0.57/0.77	.07	.46***	.46***	-.01	.20**	.37***	.25***	.39***	.26***	.40***	.35***	.45***	.41***	1	.64***
15) phq-15n	0.48/0.46	0.61/0.62	0.92/1.02	-.17/-.01	.16**	.46***	.41***	.06	.15*	.37***	.27***	.47***	.26***	.34***	.38***	.40***	.40***	.69***	1

Anmerkungen: * $p < .05$; ** $p < .01$; *** $p < .001$; a N = 137 für deutsche Stichprobe, N = 138 für Migrantenstichprobe

PHQ-15a: Bauchschmerzen; PHQ-15b Rückenschmerzen; PHQ-15c Schmerzen in Extremitäten/ Gelenken; PHQ-15d Menstruationsschmerzen/ -schwierigkeiten; PHQ-15e Probleme/ Schmerzen beim Geschlechtsverkehr; PHQ-15f Kopfschmerzen; PHQ-15g Brustschmerzen; PHQ-15h Schwindel; PHQ-15i Ohnmachtsanfälle; PHQ-15j Herzrasen; PHQ-15k Kurzatmigkeit; PHQ-15l Darmbeschwerden; PHQ-15m Übelkeit, Blähungen, Verdauungsbeschwerden; PHQ-15n Schlafschwierigkeiten; PHQ-15m Müdigkeit/ Energielosigkeit

Tabelle 4: Ergebnisse des multiplen Gruppenvergleichs zur Prüfung der Messäquivalenz des PHQ-9 bei einem Vergleich einer deutschen Stichprobe und einer Migrantenstichprobe

	χ^2 (*df*)	CFI	RMSEA	SRMR	$\Delta\chi^2$-Test (df)[a]
Modell A: konfigurale Invarianz	173.899 (54), *p*<.001	.894	.091	.062	---
Modell B: metrische Invarianz	173.947 (62), *p*<.001	.901	.082	.067	0.048 (8), *p*=0.99
Modell C: skalare Invarianz	187.974 (70), *p*<.001	.896	.079	.067	14.25 (8), *p*=.08

Anmerkungen: a Satorra Bentler-skalierte Chi-Quadrat-Differenz

Tabelle 5: Vergleich zweier alternativer Faktorstrukturen des PHQ-15 in einer deutschen Stichprobe und einer Migrantenstichprobe

Stichprobe	Messmodell	χ^2 (*df*)	CFI	RMSEA	SRMR	$\Delta\chi^2$-Test (df)[a]
deutsche Stichprobe	Messmodell A: 1 Faktor	165.59 (54), p<.001	.751	.087	.086	29.10 (5), *p*<.001
	Messmodell B: hierarchisch, 5 Faktoren erster Ordnung	83.013 (49), *p*<.001	.924	.051	.067	
Migranten-stichprobe	Messmodell A: 1 Faktor	251.96 (54), *p*<.001	.698	.116	.090	70.81 (5), *p*<.001
	Messmodell B: hierarchisch, 5 Faktoren erster Ordnung	107.82 (49), *p*<.001	.91	.067	.071	

Anmerkungen: a Satorra Bentler-skalierte Chi-Quadrat-Differenz

Tabelle 6: Ergebnisse des multiplen Gruppenvergleichs zur Prüfung der Messäquivalenz des PHQ-15 bei einem Vergleich einer deutschen Stichprobe und einer Migrantenstichprobe

	χ^2 (*df*)	CFI	RMSEA	SRMR	$\Delta\chi^2$-Test (df)[a]
Modell A: konfigurale Invarianz	188.46 (98), *p*<.001	.917	.058	.069	---
Modell B: metrische Invarianz	183.388 (105), *p*<.001	.928	.052	.072	1.326 (7), *p*=0.99
Modell C: skalare Invarianz	196.06 (116), *p*<.001	.926	.050	.073	12.827 (11), *p*=.31

Anmerkungen: a Satorra Bentler-skalierte Chi-Quadrat-Differenz

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More than half of all outpatient visits are trigged by physical symptoms which, in turn, are not adequately explained by medical disorders at least half of the time. Further, the presence and severity of somatic symptoms often correlate more strongly with psychological, cognitive and behavioral factors than with physiological or biological findings. Finally, our understanding of the etiology, evaluation, and management of somatic symptoms and functional syndromes is less advanced than our knowledge of many defined medical and psychiatric disorders. This special section, edited by Kurt Kroenke, M.D., will highlight original studies that advance the science and clinical care of somatic symptoms.

Lower decision threshold for doctor visits as a predictor of health care use in somatoform disorders and in the general population

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Abstract

Objective: Somatization is related to elevated health care utilization (HCU) and high health care costs. However, it is unclear whether HCU in somatizers and nonsomatizers in the general population is determined by existing symptoms or by lower thresholds for doctor visits.
Method: A representative sample of the German general population (N=2510) was screened for psychopathology and HCU in the prior 12 months. The sample was subdivided into somatizers (n=712) and controls (n=1796), using the Patient Health Questionnaire (PHQ-15). A general tendency to visit doctors even for minor reasons was assessed. Demographic and psychopathological variables were additionally entered into regression analyses to predict HCU for the whole investigated sample and the two subsamples.
Results: Higher somatization, unemployment or retirement, a lower decision threshold for doctor visits and higher posttraumatic symptomatology were consistent and unique positive predictors of HCU in the prior 12 months.
Conclusion: Not only symptoms per se but also a lower decision threshold for doctor visits contribute to increased HCU. Psychopathological and demographic variables can further predict HCU in somatizing persons and controls. Although somatization and reduced thresholds for doctor visits are associated, they have to be distinguished from each other and contribute independently to increased costs.

Keywords: Decision threshold for doctor visits; General population; Health care utilization; Predictors; Somatization

1. Introduction

Somatoform (i.e., medically unexplained) symptoms are common in the general population [1–3]. They are of special interest for investigations because of their influence on health care utilization (HCU). Many studies have found that people with diagnosed somatoform disorders are high utilizers of primary and secondary health care, without improvement in many cases [4–8]. In addition, individuals who are screened as high somatizers (i.e., they fulfill the cutoff criteria of a self-rating instrument) but who are not known to fulfill the diagnostic criteria for somatoform disorders show elevated HCU and increased health care costs [9–16].

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Illness behavior seems to be, in part, a learned pattern [17,18]. Some people suffering from a symptom seek medical help, while others with the same symptom do not. The general decision threshold for which symptoms people would require medical investigations can be assessed using questionnaires [19]. The threshold for doctor visits is frequently supposed to be reduced in patients with somatoform disorders, although, to our knowledge, this has never been shown. Patients with somatoform disorders may report increased HCU because of the number of symptoms they have, but also because of generally reduced thresholds for doctor visits [20]. The threshold for doctor visits could be understood as a general intention to visit a doctor. The intention to do something is one important predictor of planned behavior, such as illness behavior and HCU [21–23]. However, it is unclear whether the general threshold for doctor visits, which refers to a hypothetical situation of having different symptoms, can predict real behavior.

Most studies have investigated the HCU of preselected samples such as primary care patients [5,9–12,24], secondary care outpatients [6,15,25] or inpatients [7,8], and pain patients demanding treatment [26]. The findings are difficult to generalize and may be biased by preselection of people who are already health care utilizers. Individuals who do not utilize the health care system despite existing symptoms were not integrated into these analyses. Therefore, knowledge on reasons for not using the health care system is limited. However, in order to predict HCU, it is important to analyze the whole variability of utilization. This is only possible when non-health-care users are also taken into account.

The present study aimed to further understand the reasons for HCU. Predictors of HCU were not only analyzed for a whole representative sample of the German general population but also for two subsamples, somatizers and nonsomatizers (controls). Moreover, further potential predictor variables were integrated in order to improve the understanding of HCU. The present study investigated the decision threshold for doctor visits in general — a variable that has been ignored so far. A low threshold means that people have a higher general willingness to visit a doctor for symptoms, while persons with a high decision threshold do not tend to visit doctors for the same symptoms. It is hypothesized that increased HCU in somatizing individuals is not only due to the higher number of physical symptoms but also partly due to reduced decision threshold for doctor visits.

2. Methods

2.1. Subjects

A representative sample of the German general population was selected with the assistance of a demographic consulting company (USUMA, Berlin, Germany). The area of Germany was separated into 258 sample areas representing the different regions of the country. After the selection of a sample area, households of the respective area and members of this household fulfilling the inclusion criteria (age of ≥14 years and ability to read and understand the German language) were selected randomly. The sample was aimed to be representative in terms of age, gender and education. A

Table 1
Sample characteristics and logistic regression of group membership for somatizers and controls

	All probands (N=2510[a])	Controls (n=1796)	Somatizers (n=712)	Wald	P	Exp(B)
Age	48.0 (17.8)	45.5 (17.2)	54.3 (17.7)	16.47	≤.001	1.02
Range	14–93	14–90	14–93			
Female gender (%)	54.5	50.7	63.9	16.79	≤.001	1.81
Marital status (%)						
Married	53.5	54.0	52.4	.001	.969	1.00
Single	25.5	28.7	17.3			
Divorced	10.6	10.0	12.4			
Widowed	10.4	7.3	18.0			
Employment (%)						
Full time/half time	47.2	52.3	34.3	.94	.332	1.06
In education	8.4	9.9	4.8			
Other	10.0	9.8	10.4			
Retired	27.6	21.9	41.9			
Unemployed	6.8	6.0	8.7			
Somatization (PHQ-15)[b]	3.4 (3.8)	1.5 (1.4)	8.3 (3.6)	–	–	–
Depression (PHQ-9)	2.4 (3.5)	1.1 (1.7)	5.8 (4.3)	107.41	≤.001	1.44
Anxiety (PHQ)	2.2 (2.5)	1.1 (1.5)	4.9 (2.7)	153.17	≤.001	1.79
Posttraumatic symptomatology (PDS)	1.7 (4.7)	0.7 (2.5)	4.3 (7.4)	.25	.616	1.01
Doctor visits in the past 12 months	7.6 (9.6)	5.4 (6.1)	13.1 (13.7)	18.64	≤.001	1.04
Threshold for doctor visits	2.3 (0.9)	2.2 (0.9)	2.5 (0.8)	.002	.966	1.00

Nagelkerkes' R^2=.648; $\chi^2(9)$=1412.0; P≤.001.

[a] Two persons with missing values in PHQ-15 were not assigned to the two subsamples.

[b] Somatization (PHQ-15) was excluded from the logistic regression analysis.

first attempt was made for 4205 addresses, of which 4055 were valid. If the selected person was not at home, a maximum of three attempts was made to contact the said person. All subjects were visited by an assistant and informed about the investigation, and self-rating questionnaires were presented. The assistant waited until the participants had answered all questionnaires and offered help to patients when they did not understand the meaning of questions. The data collection took place in May and June 2007. A total of 2510 people between the ages of 14 and 93 years agreed to participate and completed the self-rating questionnaires (participation rate: 61.9% of valid addresses). The mean age was 48.0 years (S.D.=17.8), and 55% of the participants were female, 54% were married, 11% were divorced and 10% were widowed (Table 1).

2.2. Assessment instruments

2.2.1. Patient Health Questionnaire (PHQ)

To assess somatization, anxiety and depression, the respective parts of the German version of the PHQ [27,28] were used. This instrument for psychiatric case definition in primary care demonstrated good validity and reliability. It has been shown to have 98% sensitivity and 80% specificity compared with structured clinical interviews [29].

Somatization was screened with the PHQ-15 subscale, a checklist of 15 somatic symptoms that only rarely have organic explanations. For each symptom, the severity can be rated from 0 (*not bothered at all*) to 2 (*bothered a lot*); the total score ranges from 0 to 30 [30,31]. Total scores of 5, 10 and 15 represent cutoff points for low, medium and high somatic symptom severity [31]. Using these cutoff points, the total sample was divided into two subsamples: somatizers and nonsomatizers (controls). All individuals with a score of ≥5 in the PHQ-15 were categorized as somatizers, and persons with a score of <5 were categorized as controls.

Nine items in the PHQ assess depressive symptoms (PHQ-9) [32,33]. Response categories for these items range from 0 (*not at all*) to 3 (*nearly every day*). For the present study, a continuous depression score was calculated: the sum of the answers to the nine items, ranging from 0 to 27.

Seven items in the PHQ (Items 5a–5g) also assess general anxiety symptoms. Response categories for these items range from 0 (*not at all*) to 2 (*more than half of the days*). Again, a continuous anxiety score was calculated by taking the sum of the answers to the seven items, ranging from 0 to 14.

2.2.2. Posttraumatic Stress Diagnostic Scale (PDS)

A German version of the PDS [34] was used to screen for posttraumatic symptomatology. This version has demonstrated good reliability and validity in the assessment of posttraumatic stress syndromes [35]. For the present study, the PDS total score was used without further differentiating subscores, as the factorial structure was not confirmed [35]. The total score is calculated by summing up the answers to all 17 items, ranging from 0 to 51. A higher score refers to stronger posttraumatic symptomatology.

2.2.3. Number of doctor visits

Subjects were asked to rate how frequently they visited 17 different doctors during the previous 12 months (general practitioners, medical specialists, psychiatrists and psychotherapists). The total number of doctor visits in the prior 12 months was calculated by adding up the frequencies.

2.2.4. Decision threshold for doctor visits

Subjects were asked if they would visit a doctor if 1 of 20 different physical symptoms of different severities occurred (loss of appetite, persistent back pain, ongoing cough, persistent pain in the limbs and muscles, blood in the stool, blood in the urine, swelling ankle, weight loss, persistent diarrhea, abdominal pain, pain in the abdomen, persistent fatigue, shortness of breath, persistent headache, dizziness or fainting, tightness or pain in the chest, having a lump in the throat, state of anxiety, persistent sadness and persistent sleep disturbances) [19,36]. Response categories were 0 (*definitely not*), 1 (*probably not*), 2 (*maybe*), 3 (*probably*) and 4 (*definitely*). For the average threshold for doctor visits, the mean of the 20 answers was calculated. The higher is the total score, the lower is the decision threshold for doctor visits and the higher is the average willingness to visit a doctor.

2.3. Statistical methods

Logistic regression analysis was used to investigate which of the assessed variables predicted group membership for the two subsamples. The number of somatoform symptoms (PHQ-15) was excluded from this analysis to avoid confounding, as it was the variable that was used to divide the samples. For the predictions of HCU in the total sample of the general population and in the two subsamples, stepwise linear regression analyses were performed. The number of doctor visits in the prior 12 months was the dependent variable. The independent variables were age, gender, marital status, employment, education, household income, somatization (PHQ-15), depression (PHQ-9), anxiety (PHQ), posttraumatic symptomatology (PDS) and threshold for doctor visits. Variables were included in the model if $P \leq .05$.

Table 2
Stepwise multiple linear regression analysis predictor variables of the number of doctor visits in the prior 12 months for all probands

	Explained variance (adjusted R^2)	Standardized b	t	P
Somatization	.222	.37	10.94	≤.001
Employment	.237	.10	4.70	≤.001
Threshold for doctor visits	.242	.07	3.72	≤.001
Posttraumatic symptomatology	.248	.10	4.44	≤.001
Age	.250	.05	2.30	.021
Anxiety	.252	.11	3.29	.001
Depression	.254	−.09	−2.84	.005

R^2=.254; $F(7,2258)$=111.2; $P \leq .001$ (excluded variables: gender, marital status, education and household income).

3. Results

3.1. Comparison of the two subsamples

Somatizers were about 9 years older, more often female and almost three times as often widowed as the controls (Table 1). They were also almost twice as often retired and less frequently employed than the controls. Somatizers showed higher scores in all psychopathological measures and in HCU in the prior 12 months than the controls. Group membership was predicted by gender, age, depression, anxiety and doctor visits in the prior 12 months. Somatizers were more often female and had higher age, showed elevated anxiety and depression, and visited a doctor more frequently in the prior 12 months (all $P \leq .001$). Using these variables, 94% of controls and 70% of somatizers were correctly classified.

3.2. Predictors of HCU for the whole sample

Seven predictors explained 25% of the variance of the number of doctor visits in the prior 12 months (Table 2). The strongest predictor was somatization: people with more symptoms visited a doctor more frequently. Employment, the score for the decision threshold for doctor visits, posttraumatic symptomatology, age and anxiety also showed a positive relationship to the number of doctor visits. People who were retired or unemployed, had a lower threshold for doctor visits, had more posttraumatic symptomatology, were older and showed higher generalized anxiety had more doctor visits in the prior 12 months. Depression was the weakest and only negative predictor: people who showed high scores in the other predictors but lower depression scores had higher HCU in the prior 12 months.

3.3. Predictors of HCU for controls

For the controls, 12.5% of the variance of the number of doctor visits in the prior 12 months was explained by six predictors (Table 3). HCU was positively predicted by somatization (PHQ-15), status of employment, the score for the threshold for doctor visits, posttraumatic symptomatology, gender and age. People reported more doctor visits in the prior 12 months if they had more somatic symptoms, were retired or unemployed, had a lower threshold for doctor visits, had more posttraumatic symptomatology, were female and were older.

Table 3
Stepwise multiple linear regression analysis predictor variables of the number of doctor visits in the prior 12 months for controls

	Explained variance (adjusted R^2)	Standardized b	t	P
Somatization	.085	.23	9.17	≤.001
Employment	.107	.12	4.46	≤.001
Threshold for doctor visits	.112	.07	3.07	.002
Posttraumatic symptomatology	.118	.09	3.63	≤.001
Gender	.123	.08	3.17	.002
Age	.125	.06	2.19	.028

R^2=.125; $F(6,1629)$=39.9; $P \leq .001$ [excluded variables: marital status, education, household income, depression (PHQ-9) and anxiety (PHQ)].

Table 4
Stepwise multiple linear regression analysis predictor variables of the number of doctor visits in the prior 12 months for somatizers

	Explained variance (adjusted R^2)	Standardized b	t	P
Somatization	.107	.27	6.64	≤.001
Employment	.124	.15	3.91	≤.001
Threshold for doctor visits	.135	.13	3.45	.001
Posttraumatic symptomatology	.143	.10	2.58	.011
Marital status	.148	−.08	−2.13	.034

R^2=.148; $F(5,624)$=22.8; $P \leq .001$ [excluded variables: age, gender, education, household income, depression (PHQ-9) and anxiety (PHQ)].

3.4. Predictors of HCU for somatizers

Five predictors explained 15% of the variance of the number of doctor visits in the prior 12 months for the somatizers (Table 4). Again, HCU was positively predicted by somatization, status of employment, the score for the threshold for doctor visits and posttraumatic symptomatology. In reference to employment status, retired people showed the highest number of doctor visits in this group. Marital status was negatively related to the number of doctor visits in the prior 12 months (i.e., married people had more doctor visits than single or divorced persons).

4. Discussion

4.1. Study sample

The two investigated subsamples differed substantially. Besides being older and more often female, the somatizers showed greater psychopathological impairment and many more doctor visits in the past 12 months. Of the variables mentioned above, gender, age, depression, anxiety and doctor visits in the past 12 months predicted group membership. Older females with elevated anxiety and depression scores were more likely to belong to the somatizers.

The differences in the psychopathological measures support our choice for the cutoff score of 5 in the PHQ-15 to divide the two groups. Persons above this cutoff score were significantly more impaired in mental health (depression and anxiety) than people who did not meet this criterion.

4.2. Predictors of HCU

Higher somatization, unemployment or retirement, a lower threshold for doctor visits and higher posttraumatic symptomatology were consistent positive predictors of HCU in the prior 12 months. In the control group, higher HCU was also related to higher age and female gender, whereas

married people showed elevated HCU in the somatizing group. The explained variances of the linear regression analyses equal a large effect size for the whole sample and medium effect sizes for the two subsamples according to Cohen et al. [37].

The number of possible somatoform symptoms was the most robust predictor of HCU. Somatization as a positive predictor of HCU in a representative sample of the general population is in accordance with the findings of Rief et al. [16] and Ladwig et al. [13]. A similar relationship was also found in primary care patients [9–11] and medical inpatients [7].

Unemployed or retired persons showed higher HCU in all investigated groups. This was independent of age and of the number of somatoform symptoms. The influence of employment status on HCU is inconsistent in the existing literature. A Canadian study [38] found higher HCU in unemployed people, whereas it was related to lower HCU in Sweden [39]. In contrast to our results, there was no significant difference in HCU between retired people and a control group in the studies of Soghikian et al. [40] and Boaz and Muller [41]. The contradictory findings could stem from the different health care systems or the different representativeness of the investigated samples.

The decision threshold for doctor visits has not been previously investigated for the prediction of HCU, and this is despite the fact that it is particularly relevant, as it is supposed to play a major role in different models for somatoform disorders and HCU. The decision threshold for doctor visits is not a mere result of symptomatology but is, in part, a learned behavior pattern [17,18]. Our findings show that it is an important predictor of the number of doctor visits in the prior 12 months. Furthermore, this influence was independent of the number of possible somatoform symptoms: even high somatizers differ in their willingness to visit a doctor. This could explain why some somatizers show average HCU [42]. A higher threshold for doctor visits could be understood as a psychological mediator for HCU. The association between HCU and the threshold for doctor visits could be seen to be circular. In fact, it is not; planned behavior, such as HCU, is influenced by a number of different factors [21–23]. We could show that the threshold for doctor visits as a mental construct about imagined situations is only one of the possible predictors of HCU.

In our study, posttraumatic symptomatology was a stronger predictor of HCU than generalized anxiety and depression in the whole sample. The relation between posttraumatic symptomatology and HCU has been investigated in veterans [43]. A diagnosis of posttraumatic stress disorder was shown to be associated with increased HCU [43,44]. In addition, Newman et al. [45] found higher HCU in females with childhood sexual abuse. Because childhood sexual abuse is often related to elevated posttraumatic symptomatology in adult females, this result could potentially support our findings. However, the average score for posttraumatic symptomatology was rather low in our sample, so the findings above may not be generalizable to our sample. Interestingly, we were able to show that posttraumatic symptomatology remained a significant predictor even after controlling for depression and anxiety.

In our sample, anxiety and depression were positively and negatively related to HCU, respectively. While the role of anxiety has been confirmed in other studies, the negative association between HCU and depression needs more explanation. Several studies have reported a positive relationship between anxiety and depression, on one hand, and HCU, on the other hand [7,16,23,24]. Supporting our results, Ahs and Westerling [39] found depressive symptoms to be connected to lower HCU. The difference between the studies above and our finding is that we also integrated posttraumatic symptomatology and threshold for doctor visits into the analyses. Posttraumatic symptomatology shares some features with depressive symptomatology, which could explain why depression was not a predictor of HCU in the somatizing and control groups. The negative relationship between depression and HCU in the whole group may be due to apathy. This is a criterion for depression but not for posttraumatic symptomatology, and could possibly lead to lower HCU because of the lack in drive. Another explanation is that the variance that was explained by depression in the other studies was explained by the threshold for doctor visits in our study.

In accordance with the findings for age in the whole sample, Ladwig et al. [46] and Laubach and Brähler [19] reported higher HCU in women and in older people in two representative samples of the German general population. Surprisingly, these relations were not found in the somatizing group. This could be due to the other variables that we took into account in our analyses but were not integrated into the studies above.

Married people showed elevated HCU in the somatizing group. Contrary to this result, Manning and Fusilier [47], as well as Kouzis and Eaton [48], showed that a lack of social support was related to higher HCU. A study by ten Have et al. [24] also found higher HCU in people who lived alone. It is possible that this finding is unique to the group of people with more somatoform symptoms. Partners or children of these individuals could motivate them to visit a doctor because of their symptoms. They could also help them to reach a doctor where it is perhaps more difficult without support.

4.3. Limitations

Besides several strengths of the study (e.g., the general population approach), there are also some shortcomings. Somatization, depression, anxiety and posttraumatic symptomatology were assessed with self-rating instruments. Whereas self-ratings are valid for assessing a continuous range of anxiety, depression and posttraumatic symptomatology, this is less clear for somatization. Medical diagnoses were lacking, thus questioning whether the symptoms were really somatoform (i.e., medically unexplained). Only a systematic chart review could achieve greater certainty, but

that was impossible with such a large study group. Therefore, we used the next best approach — self-rating with the PHQ-15. Besides this, the argument is weakened by the fact that the listed symptoms have been found to be medically unexplained in most cases in other studies [6,49,50].

Another limitation might be that the number of doctor visits in the prior 12 months was also assessed by a self-rating questionnaire. This could lead to an underestimation of HCU when compared with interview data or health use registers. To avoid underestimation due to neglect, the number of doctor visits was asked separately for every medical specialization. Underestimation due to other reasons is also possible and should be taken into account. In general, we assume that our data are a linear transformation of the real health care use. This implies that even when the number of doctor visits was underestimated in our study, the results of the linear regressions analyses would remain when using other ascertainment strategies for HCU.

4.4. Perspective

Our results showed that the individual threshold for doctor visits was an independent predictor of HCU, in addition to the number of somatic symptoms. This implicates that both somatoform symptoms and the threshold for doctor visits might be treated independently in psychotherapy. The clinician or general practitioner can easily assess the threshold for doctor visits by a self-rating questionnaire. If this threshold is reduced, the clinician can address this issue specifically in his or her discussions with the patient. The threshold might be easier to influence than the somatoform symptoms themselves. This could lead to a reduction in health care costs, on one hand, and to improved mental health in somatizers, on the other hand. The concept of the individual threshold for doctor visits and its impact on psychotherapy should be further analyzed in future studies. The next research step should include longitudinal data of persons with a somatoform disorder. Whether the general threshold for doctor visits at baseline can predict HCU in the future should be tested. Besides this, the threshold for doctor visits should be integrated into a psychotherapy or primary care study with somatoform patients.

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What is "normal" disability? An investigation of disability in the general population

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ABSTRACT

Many studies have investigated the highly relevant association between pain and disability in clinical groups using the Pain Disability Index (PDI). To interpret these results, knowledge of disability in the general population is crucial. Moreover, to investigate criterion validity of the PDI, the influence on health care utilisation (HCU) is of special interest. In the present study, a broadened version of the PDI was psychometrically evaluated with a large representative sample of the general population. The independent impact of disability on HCU was also investigated. A representative sample of the German general population ($N = 2510$) was screened for disability, somatic complaints, mental health (PHQ) and HCU. Following a psychometric evaluation of the PDI, data are provided about the distribution of disability in the general population. For the prediction of HCU, stepwise linear regression analysis was calculated. The psychometric evaluation of the PDI revealed a one-factor solution, high reliability, and satisfactory construct validity. Percentage scores for the distribution of disability are provided ~~for the total sample but also~~ for those people reporting at least one pain/somatic symptom. These data allow a better description of disability in clinical samples. Somatic complaints, disability, unemployment or retirement, depression and anxiety explained 26% of the variance for HCU. The PDI is an economical, reliable and valid self-rating instrument for assessing disability caused by physical symptoms. HCU in the general population is determined by the number and severity of somatic complaints and also by disability. Symptoms and disability play a crucial but somewhat independent role.

1. Introduction

Disability is defined as any restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human [40]. The association between pain as the most frequent somatic complaint in the general population [18,30] and disability is highly relevant. Many studies have investigated this association in clinical groups (i.e., inpatients and outpatients with chronic pain). To assess disability, the Pain Disability Index (PDI) [35], an economical, valid and reliable self-rating instrument, has been frequently used. These studies have reported relationships between disability and pain characteristics, mental health, and pain behavior [14,15,21,35,37].

So far, however, there has been a lack of psychometric evaluation of the PDI for the general population. It is unclear if findings from the studies of pain patient samples can be generalized to the general population. Besides, other somatic complaints (e.g., abdominal and cardiovascular) are also common in the general population and in clinical groups [30]. There is a need to account for these symptoms in the assessment of disability. To interpret disability results of clinical groups, knowledge of disability in the general population is crucial. It can be postulated that even healthy people suffer from minor levels of disability due to some normal discomfort. Therefore, data on disability scores of the general population are urgently needed to interpret ~~the~~ disability scores of clinical groups. Disability in the general population is not only influenced by somatic complaints but also by mental health, particularly depression and anxiety [4,5,10,27]. Functional disability and health care utilisation (HCU) increase when physical disorders are accompanied by a mental disorder [2,34]. To demonstrate convergent validity, the PDI should show a positive relationship with these variables.

Another important aspect of validity is criterion validity – i.e., the association of questionnaire results with behavior in daily living. Since disability is strongly associated with the number and severity of somatic complaints and mental health, this could question its criterion validity. To investigate this aspect of the PDI and to measure its independent value in the assessment of illness behavior, the influence on HCU is of special interest. Studies in this area have shown that somatic symptoms as well as anxiety and depression result in enhanced HCU in the general population [13,24,28,29,32,39]. So far, most studies have investigated the influence of physical and psychiatric disorders when analyzing

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the impact of disability on HCU. However, somatic complaints of different severities and sub-threshold mental problems are very common in the general population, and, although they do not fulfil diagnostic criteria for a medical or psychiatric disorder, they nonetheless interfere with subjective well-being [19]. Considering this, a dimensional assessment of physical complaints and mental health seems to be more appropriate in a general population approach.

The present study had two aims: First, a broadened version of the PDI was psychometrically evaluated with a large representative sample of the general population. Factor structure, reliability, and convergent validity were analysed, and normative data were investigated. In particular, we wanted to provide normative data for all people of the general population reporting at least one pain or other somatic symptom~~s~~. Second, the relationship between disability, somatic complaints, depression, and anxiety on the one hand, and HCU on the other hand was analysed. We hypothesized that not only somatic symptoms but also disability would explain HCU as an additional, incremental factor.

2. Methods

2.1. Subjects

A representative sample of the German general population was selected with the assistance of a demographic consulting company (USUMA, Berlin, Germany). The area of Germany was separated into 258 sample areas representing the different regions of the country. After selection of a sample area, households of the respective area and members of this household fulfilling the inclusion criteria (age at or above 14, able to read and understand the German language) were selected randomly. The sample was aimed to be ~~the~~ representative in terms of age, gender, and education. A first attempt was made for 4205 addresses, of which 4055 were valid. If not at home, a maximum of three attempts were made to contact the selected person. All subjects were visited by a study assistant, informed about the investigation, and self-rating questionnaires were presented. The assistant waited until participants answered all questionnaires, and offered help if persons did not understand the meaning of questions. The data collection took place in May and June 2007. A total of 2510 people between the ages of 14 and 93 years agreed to participate and completed the self-rating questionnaires (participation rate: 61.9% of valid addresses) (for sample characteristics, see Table 1). In comparison to the German general population (GGP; Statistical Bundesamt Germany, 2007), there were slightly more women in this final sample (54.5% in our sample vs. 51.0% in the GGP). The allocation of age and education was equal to the GGP (*age: 15–24* years: 11.6% vs. 13.6%; 25–44 years: 31.8% vs. 32.9%; 45–64 years: 35.0% vs. 30.5%; ⩾65 years: 21.6% vs. 23.0%; *education:* still in school: 3.9% vs. 4.5%; ⩽9 years: 44.2% vs. 43.8%; >9 years: 49.0% vs. 50.8%; first indication = our sample, second indication = GGP). 1774 persons (70.7% of the sample; 58.3% female; 50.5 ± 17.3 years old, range: 14–93 years) reported at least one pain or somatic symptom in the Patient Health Questionnaire (PHQ-15) [22] and answered the PDI [35]. The average number of somatic complaints in this group was 4.6 (SD = 3.8). To enhance comparability with pain patients and other clinical groups, some of the presented results refer to this subsample of people reporting at least one symptom.

2.2. Measures

2.2.1. Disability

Disability was assessed with the Pain Disability Index (PDI), which measures disability by pain in seven areas of daily living (family/home responsibilities, recreation, social activities, occupation, sexual behavior, self-care, life-support activity). Psychometric evaluations of the PDI in outpatients and inpatients with chronic pain found high internal consistency (α = .86–.87) and test–retest reliability (ICC = .91), good convergent validity in reference to mental health (i.e., depression, anxiety), pain characteristics and pain behavior, and good concurrent validity [14,15,21,35,36]. A German version of the PDI [9] was used. This version has shown high internal consistency (α = .88) and good criterion validity in reference to pain intensity and depression in inpatients and outpatients with chronic pain [9]. To broaden the usability of the PDI, we modified the instruction, replacing the target symptom "pain" with "physical symptoms". Response categories ranged from 0 ("no disability") to 10 ("total disability"); the total score ranged from 0 to 70.

Table 1
Sociodemographic data, mental health and health care utilisation in the representative sample of the German general population (N = 2510).

Age	48.0 (17.8)
Range	14–93
Female% (n)	54.5 (1368)
Marital status% (n)	
Married	53.5 (1343)
Single	25.5 (640)
Divorced	10.6 (267)
Widowed	10.4 (260)
Employment% (n)	
Full-time/half-time	47.2 (1184)
In education	8.4 (212)
Other	10.0 (250)
Retired	27.6 (694)
Unemployed	6.8 (170)
Disability (PDI)	6.8 (11.4)
Range of potential score	0–70
Somatic complaints (PHQ-15)	3.4 (3.8)
Range of potential score	0–30
Depression (PHQ-9)	2.4 (3.5)
Range of potential score	0–27
Anxiety (PHQ)	2.2 (2.5)
Range of potential score	0–14
State of health	2.8 (0.9)
Range of potential score	0–4
Life satisfaction (FLZ^M)	30.6 (5.9)
Range of potential score	8–40
Doctor visits past 12 months	7.6 (9.6)

2.2.2. Somatic complaints, anxiety, and depression

To assess somatic complaints, anxiety, and depression, the respective parts of the German version of the Patient Health Questionnaire (PHQ) [25,33] were used. For psychiatric case definition in primary care, this instrument has demonstrated good validity and reliability. Compared with structured clinical interviews, 98% sensitivity and 80% specificity were shown [26].

Somatic complaints were screened with the PHQ-15 subscale, a checklist of 15 somatic symptoms typical for primary care patients, which often are unexplained, that is, not clearly attributable to biomedical causes. The PHQ-15 assesses a broad range of pain symptoms, especially pain in the stomach, back pain, headache, chest pain, pain in extremities or in joints, pain associated with menstruation, and pain during sexual intercourse. For the last 4 weeks, the severity of each symptom can be rated from 0 ("not bothered at all") to 2 ("bothered a lot"); the total score ranges from 0 to 30 [22,23].

Nine items of the PHQ assess depressive symptoms (PHQ-9). The PHQ-9 has shown high sensitivity and specificity [16,41]. Response categories for these items range from 0 ("not at all") to 3

("nearly every day"). For the present study, a continuous depression score was calculated: the sum of the answers to the nine items, ranging from 0 to 27. Rief et al. [31] have presented normative data for this score in the German general population.

Seven items of the PHQ (items 5a–g) assess general anxiety symptoms. Response categories for these items range from 0 ("not at all") to 2 ("more than half of the days"). Again, a continuous anxiety score was calculated by taking the sum of the answers to the seven items, ranging from 0 to 14.

2.2.3. Self-reported state of health

Subjects were asked to rate their general state of health in the prior 4 weeks on a single item. Response categories were very good (4), good (3), satisfying (2), bad (1), very bad (0).

2.2.4. Life satisfaction

Satisfaction with life was assessed by a self-rating scale on life satisfaction – i.e., the General Life Satisfaction module (FLZ^M) [17]. This German questionnaire has shown good internal consistency ($\alpha = .82$) and validity [17]. Subjects were asked to rate their satisfaction with eight areas of life (friends/acquaintances, leisure time/hobbies, health, income/financial security, occupation/work, housing/living conditions, family life/children, partner relationship/sexuality). Response categories ranged from dissatisfied (1) to very satisfied (5), the total score ranging from 8 to 40.

2.2.5. Health care utilisation

Subjects were asked to rate how frequently they visited doctors of 17 different specialities during the previous 12 months (general practitioners, medical specialists, psychiatrists and psychotherapists). The total number of doctor visits in the prior 12 months was calculated by adding up the frequencies. This questionnaire stems from the German National Health Survey, 1998 [3].

2.3. Statistical methods

SPSS 15.0 was used for all statistical analyses. Factor structure of the PDI was analysed using exploratory factor analysis. A principal axis factor analysis with promax rotation was conducted. As recommended by Fabrigar et al. [11], the number of factors to be extracted was determined by several criteria. We used Horn's [20] parallel analysis (comparison of the eigenvalues of the observed correlation matrix with the average eigenvalues of the correlation matrices computed from randomly generated datasets) as well as the scree plot [6]. To test the adequacy of the items for factor analysis, the Kaiser–Meyer–Olkin test of sampling adequacy and Bartlett's test of sphericity were conducted. Furthermore, descriptive analyses of the PDI items, corrected part–whole correlations of the items with the PDI total score, and Cronbach's α as a measure for the reliability of the PDI total score were carried out. Construct validity (i.e., convergent and divergent validity) of the PDI was analysed using Pearson's correlations. In accordance with the criteria recommended by Fisseni [12], the PDI should show high positive correlations ($r \geqslant .60$) with somatic complaints, depression, and anxiety and high negative correlations with self-rated state of health and satisfaction with health to fulfil convergent validity. To fulfil criteria for divergent validity, the PDI should show low negative correlations ($r \leqslant -.40$) with satisfaction in the other areas of life. Normative data for the sample with at least one somatic symptom were calculated using percent scores, because the distribution of the data did not meet the assumption of normality.

For the prediction of health care utilisation, stepwise linear regression analysis was calculated. The dependent variable was the number of doctor visits in the past 12 months. The independent variables were age, sex, employment, disability (PDI), somatic complaints (PHQ-15), depression (PHQ-9), and anxiety (PHQ).

3. Results

3.1. Psychometric properties of the PDI

3.1.1. Factor structure

A principal axis factor analysis was used to investigate the underlying dimensions of the PDI. The items in the present data set yielded a very good Kaiser–Meyer–Olkin value of .93. The Bartlett test for sphericity was significant ($\chi^2(21) = 13{,}735.4$, $p \leqslant .001$), showing that the variables were appropriate for factor analysis. Parallel analysis [20] and scree plot [6] favored a single-factor solution, precluding the need for a rotation strategy. The factor accounted for 67% of the variance in the items. Loadings are presented in Table 2.

3.1.2. Item characteristics, reliability and validity

The mean values of disability in the different areas of daily living were low in the investigated sample ($N = 2{,}434$), ranging from 0.6 to 1.2 (Table 2, third column). The subgroup of persons with at least one somatic complaint ($n = 1774$, fourth column of Table 2) showed slightly higher disability scores. The corrected part–whole correlations were very high for the following items: disability (by physical symptoms) in family/home responsibilities, recreation and social activities ($r = .85–.86$); the item disability in sexual behavior showed a moderate correlation to the corrected total score ($r = .65$). Internal consistency as a measure of the reliability of the scale can be considered to be very good (Cronbach's $\alpha = .93$; Table 2, bottom line).

The PDI total score showed high correlations with the measures of somatic complaints and mental health (PHQ; $r = .60–.66$), self reported state of health ($r = -.60$), and satisfaction with health (FLZ^M; $r = -.64$), fulfilling our criteria for convergent validity (Table 3). In reference to the criteria for divergent validity, satisfaction with other areas of life (FLZ^M) showed lower correlations to disability by physical symptoms (PDI), ranging from −.19 (satisfaction with housing/living conditions) to −.31 (satisfaction with friends/acquaintances) (Table 3). Only satisfaction with leisure time/hobbies was moderately correlated with the PDI total score ($r = -.43$).

3.1.3. Normative data

Age and disability were significantly correlated ($r = .30$, $p \leqslant .001$). Therefore, normative data are provided separately for six age groups (Table 4). We found no gender influence on disability (PDI total score (M ± SD): men = 6.6 ± 11.8, women = 6.9 ± 11.1; $t(2432) = -.68$, $p = .50$) and abstained from adjusting the normative data for gender. To enhance comparability with pain patient samples, and to avoid bias of data, we present normative data for those persons ($n = 1774$) who reported at least one somatic complaint, instead of presenting data for the whole sample.

3.2. Relation of disability to health care utilisation (HCU)

Five predictors explained 26% of the variance of the number of doctor visits in the last 12 months (Table 5). The strongest predictor was somatic complaints: people with more symptoms visited a doctor more frequently. Disability, employment, and anxiety also showed a positive relationship to the number of doctor visits. People with more disability, persons who were retired or unemployed and showed higher generalised anxiety had more doctor visits in the prior 12 months. Surprisingly, depression was the only negative predictor: people who showed high scores in the other predictors but lower depression scores had higher HCU in the prior 12

Table 2
PDI factor analysis loadings, score distribution and internal consistency.

Item	Loading (N = 2434)	Total sample disability; mean (SD) ** (n = 2434)	People with at least 1 symptom; mean (SD)** (n = 1774)	IC* (N = 2434)
Family/home responsibilities	.89	1.2 (2.0)	1.7 (2.2)	.86
Recreation	.88	1.2 (2.1)	1.6 (2.5)	.85
Social activities	.90	1.0 (1.9)	1.4 (2.2)	.86
Occupation	.81	1.2 (2.2)	1.6 (2.5)	.79
Sexual behavior	.67	0.9 (2.1)	1.2 (2.3)	.65
Self-care	.81	0.6 (1.6)	0.9 (1.8)	.77
Life-support activity	.77	0.7 (1.5)	0.9 (1.8)	.74
Total score		6.8 (11.4)	9.0 (12.6)	.93

* IC = Internal consistency (items: corrected part–whole correlation; total score: Cronbach's α).
** The range of the potential score (min–max) of each item is 0–10; the range of the potential total score is 0–70.

months. A further analysis showed that the bivariate correlation between depression and HCU was .36 ($p \leqslant .001$). Controlling for the variables mentioned in Table 5, age and sex did not contribute to health care utilisation.

4. Discussion

The assessment of disability is crucial in ~~the~~ studies involving pain patients but requires comparison with normative data of the general population to decide whether clinical samples are close to average or seriously disabled. Therefore, we investigated one of the most frequently used instruments to assess disability in pain, the Pain Disability Index (PDI), in the general population.

4.1. Psychometric properties of the PDI

We found that the PDI measures one underlying factor, supporting its content validity for the assessment of disability as a theoretical construct with one dimension. In studies with clinical samples, the factor structure of the PDI has remained unclear: whereas Tait et al. [35,38] found support for a two-factor solution, the results of Chibnall and Tait [7] favor a one-factor solution. The PDI showed good reliability in reference to internal consistency and the corrected part–whole correlations. Convergent validity can be assumed to be satisfactory, and was confirmed by substantial correlations with symptoms along with ~~the~~ state of health and satisfaction with ~~the~~ health status. Divergent validity was also shown, except for the relationship between disability and satisfaction with leisure time and hobbies. This correlation exceeded our criteria for divergent validity. We can assume that disability in the general population – with generally a range of low disability scores – has a particular impact on leisure time. In subgroups of the general population or clinical samples with higher disability scores, another pattern could emerge – for example, a stronger influence of disability on occupation. However, our results concerning the relationship between satisfaction and disability are correlative and not causal, thus precluding a final interpretation of the direction of their interactions.

Table 3
Convergent and divergent validity of the PDI (PDI total score).

	Convergent	Divergent
Somatic complaints (PHQ-15)	.66**	
Depression (PHQ-9)	.66**	
Anxiety (PHQ)	.60**	
State of health	−.60**	
Satisfaction with health	−.64**	
Satisfaction with friends/acquaintances		−.31**
Satisfaction with leisure time/hobbies		−.43**
Satisfaction with income/financial security		−.24**
Satisfaction with occupation/work		−.30**
Satisfaction with housing/living conditions		−.19**
Satisfaction with family life/children		−.25**
Satisfaction with partner relationship/sexuality		−.28**

** $p \leqslant .001$.

Higher disability scores in the PDI were related to higher age, but not to gender, in the general population. In accordance with this, Chibnall and Tait [7] found an age effect in their sample of chronic pain patients. The missing relationship between disability and gender was also confirmed in samples with chronic pain [35]. In contrast, Chibnall and Tait [7] found a significant but very small main effect for gender, whereas Tait et al. [38] found somewhat higher disability scores in women than in men.

Approximately 30% of persons with one or more somatic complaints indicated no disability through their symptoms, and the mean disability score of the sample with at least one symptom was 9.0. Although those people suffer from somatic complaints, these complaints do not or only weakly interfere with their daily living. These data can be used to describe clinical samples, as the following example shows: Samples of chronic pain patients showed average disability scores of 45 [7,37]. For an average age of 43–45 years, this equals a percentage score between 95% and 99% with somatic complaints in the general population, indicating ~~a~~ very high disability in these clinical groups suffering from pain. These results support the importance of our study aim – namely, the comparison of disability in clinical groups with disability scores of the general population. They confirm the extraordinary disability that can be caused by ~~the~~ chronic pain compared to ~~the~~ disability scores that are found in the general population with somatic complaints.

4.2. Relation of disability to health care utilisation

Five variables explained 26% of the variance of the number of doctor visits in the prior 12 months. This equals a large effect size according to Cohen et al. [8]. People with more somatic complaints, higher disability, persons who were retired or unemployed and showed higher generalised anxiety had more doctor visits. The influences of somatic complaints, employment, and anxiety on HCU are in accordance with other studies investigating HCU in the general population [24,28,29,32,39]. Surprisingly, depression was a negative predictor: people who showed high scores in the other predictors but lower depression scores had a higher HCU in the prior 12 months. Supporting our results, Ahs and Westerling [1] and Mewes et al. [28] found that depressive symptoms can be associated with lower HCU under certain circumstances. If pain or somatic complaints are controlled for, the negative relationship between depression and HCU may be due to apathy. This is a core diagnostic criterion for depression, and could possibly lead to lower HCU because of low drive. There should be further investigations focusing on this issue.

Table 4
Normative data for the general population with at least one somatic complaint (percentage ranges and corresponding raw scores).

Percentage range (%)	18–30 years (n = 228)	31–40 years (n = 272)	41–50 years (n = 343)	51–60 years (n = 319)	61–70 years (n = 336)	>70 years (n = 234)	Total (n = 1774)
10	0	0	0	0	0	0	0
20	0	0	0	0	0	2	0
30	0	0	0	1	2	5	0
40	1	0	1	3	4	6	2
50	2	1	3	6	6	10	4
60	4	3	5	8	10	13	7
70	6	6.1	7	12	14	18.5	10
80	8	10	11.2	20	18.6	26	16
90	14	19.7	20.6	30	29.3	40	26
95	24.6	29	29.8	41	39	47.5	37.3
99	48.1	54.3	48	60.6	63	59.7	58.3

The results show that somatic complaints, mental health, and disability contribute independently to illness behavior, supporting the criterion validity of the PDI. Although these concepts are associated, they contain different information. In other words, suffering from somatic complaints and disability can dissociate substantially, and we further confirm that both variables have to be addressed in studies investigating pain patients.

4.3. Limitations

Beside several strengths of the study (e.g., the general population approach and large sample size), there are also some shortcomings. Disability, somatic complaints, depression, anxiety, and life satisfaction were assessed with self-rating instruments. This could lead to biases due to, for example, misunderstanding of the questions, social desirability or measurement errors. However, this argument is weakened by the careful selection of the self-rating instruments, which all indicated good reliability and validity.

To broaden the usability of the PDI (i.e., to assess disability by physical symptoms in general) we used a modified instruction of the instrument, using the more general term "physical symptoms" instead of "pain". We consider this as one strength of our investigation. However, it could also be assumed that the modification influenced the results and complicates the comparison to other studies using the PDI in its original version. On the other hand, pain as the most frequent somatic complaint in the general population [18,39] constituted the major part of the assessed physical symptoms. Therefore, we have no reasons to believe that the assessment of pain has other implications on disability in daily living than the assessment of physical symptoms in general. Moreover, our approach facilitates an adaptation of the PDI to other areas of the health care system (e.g., disability caused by cardiac or pulmonary problems).

Another limitation arises from assessing the number of doctor visits in the prior 12 months using a self-rating questionnaire. This could lead to an underestimation of HCU when compared with interview data or health use registers. To avoid underestimation due to neglect, the number of doctor visits was asked separately for every medical specialisation. Underestimation because of other reasons is also possible and should be taken into account. In general, we assume that our data are in a linear relationship with actual health care use. This implies that even when the number of doctor visits was underestimated in our study, the results of the linear regressions analyses would remain when using other ascertainment strategies for HCU.

Table 5
Stepwise multiple linear regression analysis predictor variables of the number of doctor visits in the prior 12 months*.

	Explained variance (adjusted R^2)	Standardised beta	t	p
Somatic complaints	.223	.33	10.14	⩽.001
Disability	.248	.22	8.96	⩽.001
Employment	.258	.10	5.78	⩽.001
Depression	.261	−.15	−4.54	⩽.001
Anxiety	.264	.11	3.37	.001

* R^2 = .264; $F(5,2412)$ = 174.6; $p \leqslant .001$.

5. Conclusions

To summarize, this psychometric evaluation supports the use of the PDI as an economical, reliable and valid self-rating instrument to assess ~~the~~ disability caused by ~~the~~ physical symptoms. Furthermore, we provide normative data to facilitate the description of clinical pain samples.

In the understanding of HCU in the general population, the number and severity of somatic complaints as well as ~~the~~ disability by ~~the~~ physical symptoms play a crucial, distinct role on illness behavior. Moreover, the impact of depression on HCU needs further investigation.

Declaration of interest

The authors declare no conflicts of interest.

Acknowledgement

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6. Curriculum Vitae

Professional Positions

since 07/2007	Fellow, Department of Clinical Psychology and Psychotherapy (Chair: Prof. Dr. W. Rief), Philipps-University of Marburg, Germany
06/05 – 06/07	Fellow and lecturer (courses in statistics for psychological and medical students, eating disorders) Department of Psychosomatic Medicine and Psychotherapy (Chair: Prof. Dr. W. Senf), University of Duisburg-Essen, Germany
01/02 – 03/05	Research assistant, Institute for Experimental Psychology, Heinrich-Heine-University of Düsseldorf, Germany
Research interests:	somatoform disorders, eating disorders, migration, health care utilization, self-efficacy, locus of control

Ad hoc reviewer for scientific journals:

Zeitschrift für Medizinische Psychologie

Psychotherapy Education

since 07/2007	Trainee in the Postgraduate Program for Psychological Psychotherapists (Cognitive-Behavioral Therapy) at the Institute for Psychotherapy Marburg (IPAM), Department of Clinical Psychology and Psychotherapy, Philipps-University of Marburg, Germany
since 05/2003	Trainee in the Psychotherapy Training Program for Family- and Systemic Therapy (AFS), Köln, Germany

Clinical Experience

since 07/2007	Psychotherapist (Cognitive-behavioral psychotherapy) at the Outpatient Clinic for Psychotherapy, Philipps-University of Marburg, Germany
06/05 – 06/07	Clinical psychologist (diagnostics, group therapy for eating disorders, psychotherapy with couples) at the

	University Hospital for Psychosomatic Medicine and Psychotherapy, University of Duisburg-Essen, Germany
12/03 – 04/04	Internship (neuropsychological diagnostics and psychotherapy, individual psychotherapy, group psychotherapy for anxiety disorders and substance use disorders) at the Alexianer-Hospital for Psychiatry and Neurology Krefeld, Germany

University Education in psychology

10/99 – 09/01	University of Trier, Germany: Bachelor of Science (Vordiplom)
10/01 – 06/05	Heinrich-Heine-University of Düsseldorf, Germany: Master of Science (Diplom) (summa cum laude)
Master thesis:	Analysis of weight curves of inpatients with anorexia nervosa

7. Publications

Submitted

Mewes R., Christ O., Rief W., Glaesmer H., Martin A., Brähler E. (submitted). Sind Vergleiche im Depressions- und Somatisierungsausmaß zwischen Migranten und Deutschen möglich?: Eine Überprüfung der Messinvarianz für den PHQ-9 und PHQ-15.

Mewes R., Rief W. (submitted). Sind somatoforme Beschwerden und Krankheitsattribution bei türkischen Migranten durch den kulturellen Hintergrund oder den Migrationsprozess bestimmt?

Buhlmann U., Glaesmer H., **Mewes R.**, Fama J.M., Wilhelm S., Brähler E., Rief W. (submitted). Updates on the prevalence of body dysmorphic disorder: A population-based survey

Buhlmann U., Wilhelm S., Glaesmer H., **Mewes R.**, Brähler E., Rief W. (submitted). Perceived appearance-related teasing in body dysmorphic disorder: A population-based survey

Tagay S., Herpertz S., **Mewes R.**, Senf W. (submitted). Was können Gewichtverluste bei Anorexia nervosa über den Ausgang eines vorzeitigen Therapieendes leisten?

Glaesmer H., Brähler E., Martin A., **Mewes R.**, Rief W. (submitted). Gender differences in health care utilization - does the health care utilization propensity influence them?

Glaesmer H., Wittig U., Brähler E., Martin A., **Mewes R.**, Rief W. (submitted). Health care utilization of immigrants and the native population – a population based study in Germany

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***** IF >5; ** IF 2-5; * IF 0.5-2**

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2008

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Other Abstracts

2008

Glaesmer H., Wittig U., Brähler E., Martin A., **Mewes R**., Rief W.: Sind Personen mit Migrationshintergrund häufiger von psychischen Störungen betroffen als die Allgemeinbevölkerung? In *P. Warschburger, W. Ihle, G. Esser (Hrsg): Seelisch gesund von Anfang an.* Beiträge zur Fachgruppentagung Klinische Psychologie, Potsdam, 1.-3. Mai 2008 (S.226). Universitätsverlag Potsdam. ISBN 978-3-940793-34-8.

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2007

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8. Affirmation

I affirm that my dissertation with the title

Culture sensitivity, health care utilization, and disability in individuals suffering from bodily complaints – a population-based approach

was written by myself and without forbidden help.

I did not hark back to any other sources or help than the ones listed.

The dissertation has not been submitted to any other university, neither in the recent nor in similar forms. And it has not been used for the purpose of any other examinations.

Marburg, Ricarda Mewes