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International PhD Dissertation

Somatization, Culture and Immigration in Primary Health Care Settings: The case of Spain

PhD Program in Psychiatry

Faculty of Medicine; Department of Psychiatry and Legal Medicine;
Universitat Autònoma de Barcelona (Autonomous University of Barcelona)

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Abbreviations

APA	American Psychiatric Association
BISS	Barcelona Immigration Stress Scale
CFA	Confirmatory Factor Analysis
CI	Confidence Interval
DSM	Diagnostic and Statistical Manual of mental disorders
ECA	Epidemiological Catchment Area
EFA	Exploratory Factor Analysis
df	Degrees of Freedom
GADS	Goldberg Anxiety & Depression Scale
GHQ	General Health Questionnaire
GPS	General Physical Symptoms
ICD	International Statistical Classification of Diseases and Related Health Problems
LMICs	Low- and Middle- Income Countries
PHC	Primary Health Care
M	Mean
MINI	MINI International Neuropsychiatric Interview
MUPS	Medically Unexplained Physical Symptoms
OR	Odds Ratio
PTSD	Post-Traumatic Stress Disorder
SD	Standard Deviation
SES	Socioeconomic Status
SPPI	Standardized Polyvalent Psychiatric Interview
USA	United States of America
UN	United Nations
WHO	World Health Organization

Abstract

The current international PhD dissertation project is a three-fold research work that aims to critically elaborate on the phenomenon of somatization in primary health care settings among immigrants and natives (total sample N=3,006; immigrants N=1,503 and natives N=1,503) in Spain. The immigrants come from five ethnic/geographical regions: North African, Sub-Saharan, Eastern European, Asian and Latin American. The first study explores the relationship between psychiatric diagnosis and types/frequency of somatic symptoms in the two groups of origin, and further examines whether immigrants are more prone to exhibit more somatic symptoms than native-born Spanish primary health care patients. The second study, attached to the PhD dissertation, includes the further validation of the Barcelona Immigration Stress Scale (BISS) with a view to determine the post-migration risk factors that may condition the mental health of immigrants in the country. The third study provides a nuanced analysis of the predictive factors of somatization in immigrant primary health care patients and native counterparts. The biomedical explanatory model of somatization is contrasted against the culture-specific one, which includes a socio-cultural paradigm of the experience and manifestation of somatic symptoms in primary care. The quantitative analysis of our clinical data has allowed qualitative interpretations of the observed differences in the presentation of somatic symptoms between the two groups. We suggest that the application of psychiatric criteria in primary health care may conclude to rigid diagnoses that do not allow health professionals to understand the meaning-making of the somatic symptoms and may lead to under-recognition or mis-diagnosis of a wide range of culture-specific mental conditions. Our research highlights significant clinical implications informing the factors that influence how medical practitioners reach diagnoses in primary care settings in an increasingly multi-cultural society.

CHAPTER 1 • General Introduction

1.1. Global Mental Health and Migration

Global health is “an area for study, research and practice that places a priority on improving health and achieving equity in health for all people worldwide” (Koplan et al., 2009). Global mental health is the application of these principles to the domain of mental health and psychosocial support needs (Patel et al., 2011) (Movement of Global Mental Health, 2010). More than a decade ago, the World Health Organization’s (WHO) World Health Report 2001 called for the integration of mental health into primary care, acknowledging the burden of mental, neurological, and substance use disorders globally, the lack of specialized health care providers to meet treatment needs—especially in low- and middle-income countries (LMICs), and the fact that many people seek care for mental conditions in primary care (WHO, 2001).

The field of global mental health has been largely focused on the large treatment gaps in low- and middle-income countries. However, the field needs to recognize the needs for improved care, outcomes and reduced inequities in all world regions. There are many underserved subpopulations in high-income countries for whom the provision and quality of mental health care in primary health care (PHC) and specialists’ clinics vary widely (Patel & Prince, 2010). In a globalizing world, the field of global mental health needs to address transnational influences of mental health, such as migration (Torres, Alcántara, Rudolph, & Viruell-Fuentes, 2016; Zimmerman, Kiss, & Hossain, 2011).

The UN estimates there are over 244 million people living outside of their country of origin (United Nations Population Fund, 2016). Hall and Olf (2016) have

recommended continued context-specific research, intervention and prevention programs addressing the mental health of individuals and communities in transitions. Event exposure that may hinder the mental health of migrants can occur during three key phases: pre-migration, transit and post-migration (Zimmerman et al., 2011).

Migration, as a stress generating aspect, functions as a risk factor in the development of mental health problems (Martinez Moneo & Martinez Larrea, 2006). Post-migration stressors are key determinants for poor mental health (Stotz, Elbert, Müller, & Schauer, 2015). The context, where post-migration stressors may occur, conditions their impact on the mental health and psychosocial wellbeing of the immigrants (Alegria et al., 2004; Kirmayer & Young, 1999) . In other words, socio-cultural contextual factors in the country of reception, such as legal frameworks of immigration, the national socio-economic situation, the cultural distance between the culture in the country of reception and the one in the country of origin (associated with language, religion and so on), influences immigrants' psychosocial adaptation. Therefore, it is important to explore the mental health conditions of immigrants separately at each distinct phase of the migration continuum (pre-migration, transit and post-migration) and specifically in every different country of reception. For the purpose of the current study, we explored the case in Spain.

1.2. Immigration in Spain and associated Mental Health Challenges

Some countries in Europe, like Spain, that have been traditionally exporters of migrants have shifted to become importers (Carta, Bernal, Hardoy, & Haro-Abad, 2005). As of 2010, around 15% of the population was foreign born, with 8.9% from outside the

European Union and the remaining 5.1% born from another EU member state (Eurostat, 2011).

Over the past fifteen years, Spain has seen a considerable upswing in immigration in large part due to the improvement of its economy during the first decade of 2000s, its proximity to Africa, and its relatively porous borders (Pereda, Actis, & Prada, 2008). This has resulted in a new socio-political reality with consequent associated social and health challenges (Arango, 2004). Its historical links, cultural similarities, and geographical proximities with the regions of some of its migrant groups, such as North Africa and Latin America, make for an interesting context in which to further the understanding of the relationship between migration and mental health.

Concerning immigrants' access to health services, Spain has a rather unique policy considering the European context. Since 2000, even illegal immigrants have been entitled to public health care as long as they meet one of the following conditions: registration with their municipal census (which has no implication on their illegal status), visiting an emergency room, being 18 years old or under, and being pregnant (*Ley Orgánica 4/2000*). Based on the National Health Survey carried out by the Spanish National Statistics Institute between 2006 and 2007 (Cantarero & Pascual, 2008), Antón and Muñoz De Bustillo (2010) reported on the health care utilization by immigrants in Spain. According to their findings, it seems that immigrants in Spain do not use primary and hospital care more frequently than Spanish natives. However, immigrants have a lower access to specialists and visit emergency rooms with a higher frequency than nationals. Consequently, they are likely to address their mental (Tomás-Sábado, Qureshi, Antonin, & Collazos, 2007) conditions at primary care level or at medical emergencies.

The incidence of specific types of mental health problems is influenced by the nature of the migration experience, in terms of adversity experienced before, during and after resettlement. Recognizing and appropriately treating mental health problems among immigrants in primary care poses a series of challenges. These include doctor-patient communication difficulties because of language and cultural differences; patients' lack of familiarity with the health care system; cultural understandings of mental health and the effect of cultural shaping of symptoms and illness behavior on diagnosis, coping and treatment; differences in family structure and process affecting adaptation, acculturation and intergenerational conflict; as well as aspects of acceptance by the receiving society that affect employment, social status and integration (Kirmayer et al., 2011; Li & Browne, 2000; Priebe et al., 2011; Scheppers, van Dongen, Dekker, Geertzen, & Dekker, 2006).

1.2.1. Immigrant Mental Health: Why Culture Matters

One of the greatest challenges in addressing immigrants' mental health needs in primary health care is related to the interplay of mental health and culture. According to Bhugra (2004) when people migrate from one nation or culture to another, they carry their knowledge and expressions of distress with them.

Formulations on the interconnection of mental health and culture are rooted in the three general orientations that have been described as absolutist, universalist (or etic) and relativist (or emic) (Berry, Poortinga, Segall, & Dasen, 2002). Apart from the absolutist approach, which posits invariance of psychopathological phenomena across cultures, all proponents on the subject are in agreement that culture exerts some degree of influence upon psychopathological processes and manifestations (Draguns & Tanaka-

Matsumi, 2003). In relation to mental disorders, the etic or universalist view emphasizes comparability of cross-culturally or even globally applicable psychopathology-related dimensions or categories. Emic or culturally relativist investigators and clinicians avoid comparison and categorization and caution against the dangers of applying mental diagnostic criteria cross-culturally. Instead they focus on the context of a phenomenon within a culture and flag the ability to investigate and comprehend such a phenomenon within the culture's frame of reference. Culture plays a vital role in perceived aetiologies, symptomatic expression and effective treatments of psychiatric disorders (Aina, 2018).

The importance of culture in mental health care has taken a significant position with the incorporation of cultural considerations into clinical assessment and diagnostic formulation in the past few decades. The American Psychiatric Association (APA) introduced the concept of cultural formulation through its incorporation into the revised 4th edition of Diagnostic and Statistical Manual of mental disorders' system (DSM-IV-TR) (American Psychiatric Association, 2000). The cultural formulation interview (Lewis-Fernández et al., 2014), incorporated in DSM-5 (American Psychiatric Association, 2013), provides a systemic review of the individual's cultural background, the role of the cultural context in the expression and evaluation of symptoms and dysfunction. Its main goal is to assist clinicians in identifying cultural-contextual factors that can potentially affect the patient in the therapeutic setting.

Compelling evidence for the importance of the socio-cultural influences on mental health and illness has been provided by studies of migrant populations and diverse ethnocultural communities (Marsella & Yamada, 2010). Cross-national epidemiological and clinical studies documented substantial variations across and within population groups in the modes of expression, explanation and personal and social

response to psychological distress and dysfunction (Draguns & Tanaka-Matsumi, 2003). This implies that it is impossible to consider immigrants as a homogeneous group concerning risk for mental disorders (Carta et al., 2005), referring to the cultural identity of every individual migrant.

Acknowledging the associated challenges and the cultural perspectives in immigrant mental health, this gives rise to common symptoms encountered in primary health care and specialty medicine that have no definite medical diagnosis (Nimnuan, Hotopf, & Wessely, 2001). The links between physiology, bodily sensations and symptom experiences reflect the complexity of neurological, mental and cultural processes that translate physiological perturbances into experience (Kirmayer, Groleau, Looper, & Dao, 2004). The term “medically unexplained physical symptoms” (MUPS) has been introduced to refer to such symptoms and the corresponding phenomenon has been characterized as “somatization”.

1.3. Somatization: A Mental Health Challenge in Primary Health Care

1.3.1. Somatization and Culture: Beyond the Myths

Patients who present somatic symptoms in primary care straddle the interface between physical and mental ill-health and hence may be perceived differently by the biomedically oriented physician and by the clinician who may be more prepared to consider psychosocial aspects of illness (Katon, Ries, & Kleinman, 1984). Thus, somatization has been described by two distinct medical perspectives. A prominent definition of somatization is provided by Lipowski (1988), who stated that somatization

is a tendency to experience and communicate psychological distress in the form of physical symptoms, such as headache, constipation, weakness of back pain. This definition, driven from the biomedical model, is predicated on the Cartesian dualism that separates mind and body and limits the understanding of health between soma and psyche. Alternatively, and while holding an anthropological perspective, Kleinman and Kleinman (1985) have defined the concept of somatization as “the expression of personal and social distress in an idiom of bodily complaints with medical help seeking” (p. 430). Somatization, in this context, is not a disease entity but a process whose result is the illness experience of medically unexplained symptoms.

Early studies suggest that ethnic groups that have immigrated to Western countries tend to express emotional distress in somatic symptoms (Escobar, 1995; Farooq, Gahir, Okyere, Sheikh, & Oyebode, 1995; Hulme, 1996; Mumford, Devereux, Maddy, & Johnston, 1991). However, Kirmayer (2001) warns against this generalization, which is mostly based on anecdotal observations, comparisons between groups belonging to heterogeneous settings (clinical, general population) and diverse social backgrounds (migrants vs refugees), as well as multiple definitions of somatizations (psychiatric diagnostic terms, abridged constructs or psychosocial descriptions). Somatization is indeed common in all cultures and societies, and, thus, the tendency towards somatic expression of emotional distress is ubiquitous (Isaac, Janca, & Orley, 1996; Kirmayer & Young, 1998).

1.3.2. Somatization: Medical predicament or Specific disorder

Over 90% of patients with mental health problems are treated only in primary care (Goldberg & Huxley, 1992; Shepherd & Clare, 1981). Psychiatric cases presenting to primary health care tend to differ from cases seen in specialty mental health settings in that patients tend to present with somatic rather than psychosocial distress (Shepherd & Wilkinson, 1988). Half of the patients diagnosed with a psychiatric disorder repeatedly visit medical doctors at primary health care and initially present somatic symptoms as the main motive of consultation (Dubovsky, 1997; Katon et al., 1991; Katon et al., 1984). The articulation of mental distress primarily through physical symptomatology poses a series of challenges to primary health care practitioners.

Around one third of patients attending primary care have “medically unexplained physical symptoms” (MUPS), also known as “functional somatic symptoms” (Dimsdale, Xin, Kleinman, Patel, & Narrow, 2009; Kroenke & Harris, 2001), and can range from acute to chronic and from mild to severe. Such symptoms can occur as a manifestation of any underlying psychiatric condition such as anxiety, depression and other common mental disorders (CMD). Depending on the number, frequency and severity of these symptoms, they may be concomitant of somatoform disorder according to ICD-10 (revised as “bodily distress disorder” in ICD-11, (World Health Organization, 2018) and DSM-IV-TR (revised as “somatic symptom disorder” in DSM-5, (American Psychiatric Association, 2013) diagnostic criteria. The set of criteria that classify physical symptoms as psychopathological conditions are revised in every new edition of DSM (van Dessel, van der Wouden, Dekker, & van der Horst, 2016) and ICD (Gureje & Reed, 2016) systems,

reflecting the challenging task to adequately identify and correctly diagnose somatoform-related dimensions of mental health.

Although MUPS are frequently associated with psychological distress and psychiatric somatoform disorders, the clinical usefulness of applying ICD-10 (World Health Organization, 1992) and DSM-IV (American Psychiatric Association, 1994) somatoform diagnoses to individuals with MUPS has been questioned (Patel & Sumathipala, 2006). In fact, rather than a diagnosis, Bass and Benjamin (1993) conceptualize the experience and manifestation of MUPS as a process through which an individual overly focuses on physical symptoms and denies to a lesser or greater extent psychosocial factors for the symptoms. This may be due to several factors, summarized in the review of Burton (2003), where physiology, personality characteristics, life experiences, health cognitions, and interaction with health care professionals are important elements in understanding MUPS.

The importance of developing a better understanding of MUPS and the phenomenon of somatization stems from the increasing need to adequately address associated challenges in primary health care. First, MUPS are a burden to both health professionals and patients (Weiland et al., 2018). The difficult doctor-patient relationship and “difficult patients” has been the subject of considerable anecdotal study. Hahn et al. (1994) have demonstrated that “difficult” patients are characterized by psychosomatic symptoms. Medical professionals find patients whose symptoms have no underlying pathology difficult to handle and may feel incompetent themselves to reach agreement with their patients on problem definition (Salmon, 2007). The unnecessary medicalization of such conditions may also result in poor health outcomes. On the other hand, many patients with MUPS do not feel understood by their health

professional and may experience a lack of empathy and acceptance for their physical symptoms and suffering (Stone, Wojcik, Durrance, & Carson, 2002). The low interrater reliability and poor validity of physicians' judgments on whether somatic symptoms are medically explained or not has been illustrated in various studies (Fink, Rosendal, & Olesen, 2005; Klaus et al., 2013). In many cases, the physicians' personal criteria rather than the clinical picture seem to affect whether symptoms are deemed to be based on a biomedical condition. Rief and Martin (2014) have critically illustrated that some physicians think of symptoms like back pain as almost always medically caused, whereas others consider them mainly psychosomatic. Moreover, many symptoms go back and forth between being considered medically explained or unexplained over time (Klaus et al., 2013).

Second, the degree of disability and role impairment associated with MUPS— independent of comorbidity with somatization—have been previously discussed (Creed & Barsky, 2004; Harris, Orav, Bates, & Barsky, 2009). Severely somatizing patients spend more days in bed, (Smith, Monson, & Ray, 1986), have higher rates of disability, (Katon et al., 1991), more occupational and social role impairment, (Gureje, Simon, Ustun, & Goldberg, 1997; Itheme, Nnaji, Moses, & Ogunfowokan, 2014), more unemployment (Swartz, Landerman, Blazer, & George, 1989), and require more sick leave (J. I. Escobar et al., 1987).

Third, because of perceptions that providers do not adequately acknowledge patients' somatic concerns (Donovan & Blake, 2000) and the high rates of disability associated with somatization (Katon et al., 1991; Kroenke, 2003; van der Leeuw et al., 2015), repeated health care visits may contribute to high health care expenditures (Barsky, Orav, & Bates, 2005; Frosthalm, Petrie, Ørnbøl, & Fink, 2014). MUPS are costly

for society not only because of high health-care utilization, but also through lost working years, early retirement pensions, and social expenses (Fink, Rosendal, & Olesen, 2005) . The chronic somatizing patients have an excessive use of health-care services both in primary care and in specialized health-care sector with numerous hospitalizations, surgical procedures, and futile treatments (Per Fink, Sørensen, Engberg, Holm, & Munk-Jørgensen, 1999).

The lack of medical explanation for such somatic symptoms has been viewed by two main approaches. On one hand the biomedical paradigm holds a universalist approach, which posits a model of human being that is universally applicable. Medical knowledge gained from epidemiological or experimental studies involves group averages and processes that can be detected above the “noise” of individual variability. Diagnostic systems are based on ideal typical cases abstracted from the complexity and diversity of illness experience. On the other, the relativist or emic approach reminds us that local realities may not necessarily coincide or cohere with our perspective, acknowledging cultural differences in the ways in which we experience, express, and explain our existence. Thus, a cultural perspective draws attention to the social contexts within which symptoms arise, are given meaning, and are managed.

1.3.3. Explanatory models of somatization: Biomedical versus Culture-specific

Biomedical explanatory models of somatization

Goldberg and Bridges (1988) defined somatizers ¹, or patients who disproportionately emphasize somatic complaints, as those characterized by: (a) not mentioning psychological symptoms, (b) attributing their symptoms to a physical problem when consulting a PHC practitioner, (c) having symptoms concordant with a psychiatric diagnosis, and (d) having somatic symptoms assessed that are likely to improve with psychiatric treatment.

According to the biomedical paradigm, three types of somatization have been identified in primary health care (Kirmayer & Robbins, 1991): a) syndrome of medically unexplained symptoms and somatization disorder (or somatic symptom disorder according to DSM-5), b) hypochondriasis (or illness anxiety disorder according to DSM-5), and c) somatic signs and symptoms of psychiatric disorders.

The first concept refers to functional symptoms or functional diseases with no organic cause. Somatization disorder, characterized by a history of at least eight unexplained symptoms in four or more bodily systems for several years with an onset before thirty years of age according to DSM-IV-TR, represents the extreme end of the continuum of somatoform severity (American Psychiatric Association, 2000), and it is in fact an “exclusion” diagnosis, i.e. a diagnosis made by the exclusion of other diseases. In DSM-5 (American Psychiatric Association, 2013), it is referred to as “somatic symptom disorders and is defined by the psychological criterion: “excessive thoughts, feelings, or

¹ Linguistically, we use the term “*somatizer*” throughout the text, to interchangeably refer to the term “*somaticizer*”.

behaviors related to the somatic symptoms or associated health concerns” (Mayou, 2014). DSM-5 presents diagnostic criteria, focusing on the psychological *impact* the somatic symptoms have on the individual rather than on their *cause* (i.e., whether medically explained or unexplained) (Barsky, 2016).

As an illustrative example of the first biomedical explanatory concept of somatization in the form of somatoform disorder, we present the findings of the large-scale study of WHO on the cross-cultural perspectives of somatization (Gureje et al., 1997). The study, that took place in fifteen countries in four continents, revealed that the high variability in the occurrence of somatoform disorders across different sites could not be explained by cultural nor developmental differences. These differences were only attributed to the doctor-patient relationship and care system organization (Gureje, 2004). To explain this low correlation with culture, it is important to consider that there are quite strict rules for the somatoform disorder in DSM. This study was heavily criticized on the basis that it was conducted in large cities and not in more rural regions where people are less “westernized”.

The second concept, hypochondriasis (or illness anxiety disorder according to DSM-5) is a psychiatric disorder, in which patients are convinced that they have a serious disease, with all the signs of this disease. They have a delusional belief in their disease or are obsessed by their symptoms, and it is difficult to convince them of their signs.

The third concept to somatization involves medically unexplained physical symptoms (MUPS) being part of the symptoms of mental disorders, such as depression, anxiety and adjustment disorders. There is a substantial body of psychiatric literature on the prevalence, incidence and nature of somatic symptoms as concomitants of

psychiatric disorder (Barsky, 2014). Somatization tends to be comorbid with mental disorders in general and anxiety and depression in particular.

From the perspective of biomedicine, somatization is commonly viewed as maladaptive, consisting of a pattern of thoughts and behaviors that complicate diagnosis and the course of illness (Allen, Gara, & Escobar, 2001; Pennebaker & Watson, 1991). Many of those patients are resistant to psychological treatment, and the prognosis of the condition is poor (Brown, 2004). Barsky (1992) has described the influence of psychological distress on the perception or reporting of somatic symptoms as “somatosensory amplification”. There is significant evidence that these patients have more negative beliefs about their symptoms than patients with physical disease. For example, one study comparing patients with rheumatoid arthritis and chronic fatigue syndrome (CFS) found that CFS patients had more negative views of their illness but similar levels of physical disability (Moss-Morris & Chalder, 2003).

Somatization is biomedically seen as a dysfunctional response to psychosocial stress that entails denial (e.g., “I don’t have a problem”), repression (i.e., “I need to get that off my mind”), or suppression (i.e., “I can deal with it later”) (Dubovsky, 1997). Illness perceptions play a role in the perpetuation of symptoms in somatoform disorders (Frostholm et al., 2014). Clinicians have developed a range of strategies for deflecting the threat to medical competence posed by medically unexplained symptoms (Cournoyea & Kennedy, 2014; Kirmayer, Groleau, Looper, & Dao, 2004). Generally, these involve shifting the blame from the limits of medicine to some characteristic of the patient.

Given our psychologically oriented culture, it is an easy slide from declaring a symptom unexplained to attributing it to specific psychological traits or states of the

patient. This gives meaning to distress, locates the responsibility for care within the system of medical specialization, and neutralizes the threat to professional competence posed by the ambiguity or resistance to treatment of persistent symptoms.

As a result, constructive critiques on the biomedical explanatory models of somatization raise questions as to the cultural validity of screening measures and diagnostic criteria, often referred to as “category fallacy” (Kleinman, 1980), addressing the cultural complications with the diagnostic concept. The application of North American criteria for somatoform disorders, such as those found in the DSM, may pathologize individuals who are using such culturally sanctioned patterns of distress to express or negotiate personal and social predicaments (Kirmayer & Weiss, 1997). Therefore, observed ethnic differences may reflect socially circumscribed patterns of seeking help and symptom presentation rather than differences in underlying psychopathology.

Culture-specific explanatory models of somatization

According to (Kirmayer, 1984a, 1984b) somatic complaints are a way of expressing personal or social distress –the body serving as the core symbol system for communicating emotional and social experience. This anthropological perspective of somatization (Kirmayer & Young, 1998, 1999) underlines its cultural meaning; where psychological theories of somatization focused on individual characteristics need to be expanded to recognize the fundamental social meanings of bodily distress. Therefore, somatization, apart from psychogenic is also sociogenic, because culture can shape responses to and expressions of distress (Angel & Guarnaccia, 1989). Within the culture-specific paradigm, there are three main concepts associated with the sociogenic nature

of somatization: alexithymia, stigma related to mental disorders, and biomedical dualism versus holistic approaches to health.

Alexithymia, which is the inability to express emotions, is often encountered outside of Western countries, such as in East Asian cultures, where these traits are more adaptive (Ryder et al., 2008). A quantitative review of the literature (De Gucht & Heiser, 2003) has established a strong association between alexithymia and somatization. The degree of emotion conveyed in interaction cross-culturally has been described via a neutral/expressive continuum (Mendez, 2010).

According to Mendez (2010), in “neutral cultures” such as in Asia, feelings and emotions are not made obvious in interaction, gestures and facial expressions are minimal, and tone of voice is kept neutral. As a result, rather than express emotions verbally, individuals from these cultures may be more likely to have their emotions manifest physically (i.e., somatization). In contrast, within “expressive cultures” such as in Latin America, feelings and emotions are made obvious in interaction, gestures and facial expressions are active, and tone of voice varies with the speaker’s attitude towards a topic—these traits may reduce the chances that individuals somaticize their emotions (Mendez, 2010). Some existing research supports this theory; for example, in a UK study, significantly higher levels of somatization were reported among Asian people than among native English (Bal & Cochrane, 1990). Additionally, Ryder et al. (2008) examined differences in symptom presentation among psychiatric outpatients with Chinese and Euro-Canadian backgrounds. The authors concluded that Chinese patients reported more somatic symptoms on spontaneous problem report and in a structural clinical interview than Euro-Canadian patients. Moreover, Latinos living in Los Angeles,

USA, were significantly less likely than Whites to meet criteria for somatization disorder (Zhang & Snowden, 1999) according to the National Institute of Mental Health multisite Epidemiological Catchment Area (ECA) study (Regier et al., 1984).

Further, within the framework of the “idiom of stress” hypothesis, Kleinman (1977) has stated that somatization is more common in cultures where stigma relates to psychiatric problems and the expression of emotional distress is inhibited. The hypothesis predicts that the association of somatization and mental health is mitigated by culture, where somatization is a functional response that indirectly discloses distress and thereby relieves distress. Consciously or unconsciously, some individuals may prefer to present somatic problems rather than psychological problems because of the fear of being called “crazy” by their community.

Thirdly, there are different ways in understanding the construction and deconstruction of self across cultural groups. In their prolegomenon on the “mindful body”, Scheper-Hughes & Lock (1987) describe Cartesian dualistic thought as based on the division between mind and body, which characterizes the biomedical context. Mind-body divisions are not present in holistic medical approaches that emphasize integrative practices and complimentary duality (Wen, 1998). As a result, the perception of self as a union or a distinction between mind and body influences the expression of somatic or psycho-emotional symptoms of psychological distress in different cultures. The notion of an “emotional body” transcends the mind-body dualism of the western construction of self and constructs a different experience of depression, anxiety and emotions in general (Squire, 2003).

The culture-specific explanatory paradigm informs the somatization phenomenon among immigrants, as a heterogeneous population group, in primary health care settings. Such sociosomatic explanations move beyond the narrow biomedical framework that seeks only to identify and correct physiological perturbations and further the psychological understanding that emphasize the inner theatre of the mind (Kirmayer, 2004). Driven by ethnographic knowledge, the paradigm affirms the need to culturally appropriate medical practices that embrace indigenous aspects of mental health understanding (Moghaddam, 1987; Moghaddam & Taylor, 1986).

1.4. The present research: Outline and Research Questions/ Objectives/Hypotheses

So far, the background against which we can understand the complexities of somatization in primary health care for immigrants of different cultural backgrounds has been described. The main motive for undertaking the current research initiative on the phenomenon of somatization was to give light to the ambiguous, diverse, and sometimes contrary to each other, clinical perspectives in addressing the needs of patients in multi-cultural societies, immigrants and natives, who experience and express somatic symptoms in primary care consultations. Our research consists of four original studies that are elaborated upon in the following chapters and aim to further the understanding of the subject area in the specific context of Spain.

The first study (Chapter 2) explores the phenomenon of somatization among immigrant and native-born primary health care patients in Spain (total sample N=3,006;

immigrants N=1,503 and Spanish native-born N=1,503). There are two research questions, with corresponding objectives and hypotheses, attached to this study:

Research Question 1:

What is the relationship between psychiatric diagnosis and types/frequency of somatization in immigrants and native-born Spanish primary health care patients?

Objective 1:

To explore whether primary care patients with specific psychiatric diagnosis are more prone to exhibit somatic symptoms than those with no psychiatric conditions endorsed.

Hypothesis 1:

Immigrants and native-born patients with anxiety and/or depression –as their main diagnosis-- are more prone to exhibit somatic symptoms than those without a diagnosis of anxiety and/or depression.

Research Question 2:

Do immigrants at primary health care exhibit significantly more psychosomatic symptoms than native-born counterparts?

Objective 2:

To explore the quantitative and qualitative variations of somatization between immigrants and native-born primary care patients.

Hypothesis 2:

Immigrant do not show significantly more somatic symptoms than native-borns in primary health care settings.

With the view to capture the contextual factors in which immigrants are studied, we carried out a further validation of the Barcelona Immigration Stress Scale (BISS) (Chapter3), which has been developed to measure the immigration-related stress in Spain (Tomás-Sábado et al., 2007). The sample used for the further psychometric validation of the BISS comprised a total of 915 immigrants primary health care patients residing in Catalonia autonomous region Spain. Therefore, the second study, attached to our research, has the following objective:

Objective 3:

To examine the psychometric properties, including internal validity and reliability, of the Barcelona Immigration Stress Scale and further validate the instrument.

The third study (Chapter 4) explores the predictors of somatization in primary health care patients (total sample N=3006), including immigrant as well as native-born patients. The two research questions, with corresponding objectives and hypotheses, are described below:

Research Question 4:

What are the predictive factors of somatization in immigrants and native-born primary care patients?

Objective 4:

To investigate the factors which influence the incidence of somatization among immigrants and Spanish native-born in primary health care.

Hypothesis 4:

Socio-demographic characteristics and mental/physical morbidities may influence the incidence of somatization among immigrants and natives at primary health care.

Research Question 5:

Immigrants from which ethnic/geographical region tend to express more frequently psychosomatic symptoms?

Objective 5:

To investigate potential differences in the levels of somatization among immigrants from different ethnic/geographic origin (North African, Eastern European, Sub-Saharan, Latin American, Asian).

Hypothesis 5:

There are differences in the expression of somatic symptoms among immigrants from different ethnic origins.

All three studies, described in Chapters 2, 3 and 4 respectively, are part of a large scale, multi-center, cross-sectional research carried out in Primary Health Care (PHC) settings in two autonomous regions of Spain, Aragón and Catalonia, with a view to explore the prevalence of psychiatric morbidity and substance abuse among immigrants compared to native counterparts (Qureshi et al., 2013, 2014) . In total 34 primary health centers from the two autonomous regions were included in the research study.

Catalonia is a highly economically and commercially developed region, in which more than 15% of the Spanish population resides, the bulk of whom live in Barcelona

(European Commission Growth Database, 2017). The region is bilingual, with a strong support for the language of Catalan. 20 health centers were included, most of them located in the province of Barcelona. Aragón has an average level of economic development, and is less urbanized than Catalonia, with some 3% of the total population of the country (European Commission Growth Database, 2017). The only language spoken is Spanish. 14 health centers from the three provinces that compose the region were included in the sample.

Details of the study's design, sampling and recruitment procedures, including inclusion and exclusion criteria of the patients, as well as the entailed ethical aspects have been reported previously (Qureshi et al., 2013). Since the period of the data collection phase, the research team –specialized in migrant mental health— has developed an interest in the somatization aspects of psychiatric morbidity in the immigrant population, mainly because of the type of referrals from primary health care centers to mental health specialty units within the established national referral network. The study received ethical clearance from the University Hospital Vall d'Hebron institutional review board. All participants gave informed consent and the interviews were completed anonymously.

Lastly, we looked at somatization in a large community sample (N = 4,864) in the United States of America (USA), with a view to compare our results derived from primary health care settings with those from a population-wide sample (Annex 1). We analyzed data from the National Latino and Asian American Study (NLAAS), a nationally representative survey of noninstitutionalized Latino and Asian adults (above 18 years of age) in the coterminous United States, carried out as part of the National Institute of Mental Health Collaborative Psychiatric Epidemiological Studies (Alegría et al., 2004;

Heeringa et al., 2004). The sample consisted of 2554 Latino/Latino American participants (Mexican, Puerto Rican, Cuban, and other Latino), 2095 Asian/Asian American participants (Chinese, Vietnamese, Filipino, and other Asian), and 251 non-Latino Whites.

The objective of the study was to examine the racial/ethnic differences in general physical symptoms and medically unexplained physical symptoms with a specific focus in the investigation of the role of educational attainment in such differences. The study was a fruit of the doctoral fellowship at Disparities Research Unit, Massachusetts General Hospital/Harvard Medical School in Boston, USA.

The last chapter of the manuscript (chapter 5) reviews the hypotheses attached to the studies and elaborates critically on the discussion of the main findings of our research work.

CHAPTER 2 • Somatization in Immigrants and Native-born Spanish Primary Care patients

2.1. Introduction

2.1.1. Putting into perspective the explanatory models of somatization in Primary Health Care

Earlier in the General Introduction the two main explanatory models of somatization were described. On the one hand the biomedical paradigm, predicated on a universalist approach, seeks to pathologize the appearance of somatic symptoms or medically unexplained physical symptoms (MUPS), by narrowing them down to somatoform-related disorders while downplaying the cultural aspects of somatic manifestations (Bridges, Goldberg, Evans, & Sharpe, 1991; Dubovsky, 1997; Gureje et al., 1997; Gureje, 2004). On the other hand, the culture-specific model of somatization acknowledges the cultural variation in the clinical representations of mental suffering, where the body serves as the core symbol for communicating emotional and social experience (Angel & Guarnaccia, 1989; Kirmayer & Young, 1998; Kirmayer, 2004; Kirmayer, 1984; Kirmayer, 1984a; Kleinman, 1977; Squire, 2003; Wen, 1998). Under the culture-specific paradigm, the phenomenon of somatization is omnipresent across cultures (Isaac et al., 1996; Kirmayer & Young, 1999). However, reviewing the relevant literature, we observed disagreements over which cultures tend to exhibit more somatic symptoms than others.

Indeed, research findings show considerable variability in the incidence of somatic symptoms both across and between cultures. It has been argued that natives of egocentric/individualistic western societies tend to “psychologize” their mental

suffering, whereas those in sociocentric/collectivistic non-western societies tend to “somatize” more (Keyes & Ryff, 2003). The individualism-collectivism dimension has been measured empirically and relies on shared cultural values. In egocentric/individualistic societies personal achievement, independent identities and the direct expression of feelings are valued (Triandis, 1995; Triandis, 1989). In sociocentric/collectivistic societies relationships are interdependent and individuals’ achievements and self-worth are inseparable from the quality and nature of their social relationships (Kwan, Bond, & Singelis, 1997). Fear of social evaluation, apprehension about social encounters and levels of social distress are higher in collectivistic than individualistic cultures (Okazaki, 1997). Therefore, individuals from collectivistic societies tend to cloak their distress in bodily complaints in order to maintain social ties (Kleinman & Kleinman, 1985), cultivating an idiom of distress whereby individuals confide their emotional distress indirectly. On the other hand, somatization of distress in individualistic societies reflect a physical disease rather than emotional distress from interpersonal and social difficulties. It may be considered dysfunctional because it is inconsistent with the cultural value of direct expression of feelings (Thoits, 1994).

However, Bekker & Schepman (2009) have concluded that the relationship between ethnicity and somatization is not as straightforward as commonly assumed. In their study, the dualistic vision on separate somatic and psychological health persisting in Western-European health appeared not to reflect migrants’ perspective of health; patients from non-Western, sociocentric-collectivistic societies use somatic and psychological attribution styles without one excluding the other. A priori assumptions regarding illness representations of ethnic minority patients and immigrants,

understandable from possible uncertainty of health professionals (Perron & Hudelson, 2005), should thus be avoided.

The longstanding claim in the literature that non-Westerners are prone to somatize psychological distress thus reflects a culturally reductive polarization (the psychologically expressive West vs the somatizing non-West), an overly simplistic conceptualization of somatization (in strict diagnostic criteria vs as a symbol of personal/social suffering), all predicated on unsystematic comparisons of samples from different settings (mental health clinics, primary care settings or community) (Kirmayer & Ryder, 2016).

A systematic review and meta-analysis of the prevalence of somatoform disorders and MUPS in primary health care conducted by Haller et al. (2015) included thirty-two studies, out of 992 identified publications, from twenty-four countries. The review showed a wide heterogeneity in the prevalence rates of such conditions in primary care. Differences in diagnoses according to DSM and ICD were large, as were the differences between data collected by questionnaire and those collected by clinical interview. If less restrictive diagnostic criteria, also known as abridged measures of somatization, were applied the prevalence estimates were higher.

Across multiple cultures, somatization has been found though to be positively associated with anxiety and depression. Krueger et al. (2003), after analyzing seven common psychopathological conditions in the World Health Organization (WHO) Collaborative Study of Psychological Problems in General Health Care (Ustun & Sartorius, 1995) in fourteen countries, concluded that somatic symptoms were found to be indicators of anxiety and depression across multiple nations in primary care. Somatic symptoms of depression are common in many cultures, but their frequency varies

depending on how somatization is defined. There is substantial variation in how frequently patients with depression present with strictly somatic symptoms. In part, this variation may reflect characteristics of physicians and health care systems, as well as cultural differences among patients (Simon, VonKorff, Piccinelli, Fullerton, & Ormel, 1999). Interestingly, Dere et al. (2013) have argued that the tendency of Chinese patients to make 'somatized' clinical presentations appears to be limited to depression, whereas in North America anxiety disorders are more commonly "somatized".

2.1.2. Mental health and somatization among immigrants: Addressing the challenge

According to a systematic review of the literature of mental health in immigrants versus the native-born population, immigration is linked with depression, anxiety and a greater tendency of somatization (Bas-Sarmiento, Saucedo-Moreno, Fernández-Gutiérrez, & Poza-Méndez, 2017). The review, which was based on twenty-one selected studies of a total of 817, reveals that these pathologies are linked to the migration process and stress experienced.

Migration is an emergent social phenomenon with a great impact on mental health, but it does not lead exclusively to the development of psychiatric disorders (Kirmayer et al., 2011). Mental health problems might be universal, but their clinical expression may be determined by personal and socio-cultural factors endorsed by the immigrants (Bhugra, 2004; Carta et al., 2005) as well as sanctioned by the receiving country (Alegría et al., 2004; Kirmayer & Young, 1999). Rates of mental disorders vary in different immigrant groups, but these differences do not simply reflect the rates in the countries of origin. Instead, prevalence of specific types of mental problems among

immigrants can be linked to migration trajectories in terms of adversity experienced before, during and after resettlement (Stuart, Klimidis, & Minas, 1998). Immigrants are not a homogeneous group and the context (country of origin vs country of reception) as well as settings (clinical versus community) in which they are examined, influences the experience, expression and explanation of mental health problems.

According to the main findings of a large-scale study of immigrants in Spain (N=1,503), the type and prevalence of psychopathology depends on the ethnic origin of immigrants and their mental health is highly influenced by the receiving country (Qureshi et al., 2013). The notion of “cultural congruity” (Bhugra & Arya, 2005) suggests that cultural similarity between the ethnic origin of immigrants and the country of reception correlates negatively with psychopathology. Further, the findings of a large-scale retrospective, observational primary health care study in Spain (N= 69,067) corroborate the “healthy immigrant effect”, which reinforces the observation that foreign-born immigrant populations have a lower morbidity burden than native-born population (Cunningham, Ruben, & Narayan, 2008; Calderón-Larrañaga et al., 2011; Constant, García-Muñoz, Neuman, & Neuman, 2018; Vang, Sigouin, Flenon, & Gagnon, 2017). Soon after arriving in their new country, immigrants typically demonstrate lower rates of common mental health problems than the native-borns; however, over time, rates increase to become like those in the native-born population (Kirmayer et al., 2011; McDonald & Kennedy, 2004). At individual level, migrants are a self-selected segment of the origin population and might systematically differ from non-migrants in the reception country in terms of health (Marmot, Adelstein, & Bulusu, 1983). Additionally, at the host state level, receiving countries may impose immigrant admissions policies of

positive health (Chiswick, Lee, & Miller, 2008; Jasso, Massey, Rosenzweig, & Smith, 2000).

According to Al-Baldawi (2002) migrants show various mental and somatic symptoms due to migration-related stress that might be a “natural reaction” to the changes they face. Aragona et al.'s study (2012) on somatization in primary health care in immigrants in Italy (N=3,105) showed that one-fourth of immigrants showed somatic symptoms, as measured by the Bradford Somatic Inventory (BSI-21), to express their distress with the South Americans showing the highest rates of somatization. To distinguish between psychosomatic responses to stress from psychosomatic symptoms related to pathological conditions among immigrants is an important and difficult task, while it is necessary to reduce the risk of over- or under- diagnosing the migrant’s mental health problems (Aragona et al., 2005). The “idiom of distress” hypothesis predicts that the association of somatization and mental health is mitigated by culture, where somatization is a functional response that indirectly discloses distress and thereby relieves distress (Kleinman, 1977).

Somatic symptoms, as common features of many cultural “idioms of distress”, consist of a general phenomenon in primary health care across nations and cultures. The application of North American criteria for somatoform disorders, such as those found in the DSM, may pathologize individuals who are using such culturally sanctioned patterns of distress to express or negotiate personal and social predicaments (Kirmayer & Weiss, 1997). Therefore, observed ethnic differences may reflect socially circumscribed patterns of seeking help and symptom presentation rather than differences in underlying psychopathology.

2.1.3. Study Rationale

Researchers studying somatization across cultures/nations or migration groups face the dilemma of applying the diagnostic criteria derived from one cultural context to others in which their applicability might be doubtful. Such studies tend to focus on the type and prevalence of somatic symptoms rather than on the understanding and meaning-making of such symptoms that may facilitate doctor-patient relationship.

The research objectives that shape the focus of the first study are presented in paragraph 1.4. of the present manuscript.

2.2. Methods

2.2.1. Sample

A convenience non- probabilistic sample was employed. Participation in the study required that participants be at least 18 years old and have the minimal level of Spanish language comprehension to understand the interview process. Participants in the immigrant group had to be born outside of Spain and be from one of the specified geographic regions, whereas the Spanish group had to be of Spanish nationality, self-identified as Spanish, and not a member of the Roma ethnic group (who they are considered an ethnic minority in all European countries).

The total sample of the study was N=3,006. In both regions of Aragón and Catalonia, where the study was conducted, the sample of the immigrant population (N=1,503) was adapted to the patterns of immigrant primary care use as described by the centers. In Chapter 1, paragraph 1.4, we described specific characteristics of the two autonomous regions related to the study.

The geographical regions of origin for the recruited immigrants were grouped as follows: Latin-American (614; 40.85%), North African (235; 15.7%), Sub-Saharan (234; 15.6%), Asian (213; 14.2%) and Eastern European (207; 13.8%). All immigrants were born outside Spain except from one from the Asian ethnic group. Their time of stay in Spain varied widely from one month to thirty years. The sample of the Spanish population recruited was selected by adjusting gender, age and residence to the immigrant sample (N=1,503). Table 1 displays the distribution of the examined sample by age, gender, group of origin (natives/immigrants) and for the immigrants, by geographical region and time spent in Spain.

Table 1.

Sample distribution by group of origin, age, gender, and additionally for the sample of immigrants by ethnic/geographical group and time spent in Spain

	Age		Gender		Time in Spain (months)		
	M (yrs)	SD	N (female)	%	M	SD	Test of differences ** F (df); p
Native Born N=1,503	32.5	9.4	922	61.3%	-	-	-
Immigrants N=1,503	32.5	9.3	922	61.3%	44.15	46.9	
<i>North African</i> N=235 (15.9%)	31.5	8.5	114	48.3%	55.35	53.1	35.668 ₍₄₎ ; p < .001
<i>Sub-Saharan</i> N=234 (15.8%)	31.5	8.7	99	42.3%	50.66	51.3	
<i>Eastern European</i> N=204 (13.8%)	29.2	7.9	150	72.5%	25.33	23.2	
<i>Asian</i> N=213 (14.4%)	33.1	8.4	81	38.0%	68.61	57.7	
<i>Latin American</i> N=592 (40.1%)	34.1	10.2	478	77.9%	35.31	38.9	

****Bonferroni pairwise comparisons**

<i>Ethnic Group (a)</i>	<i>Ethnic Group (b)</i>	<i>Mean Difference (a-b)</i>	<i>95% CI</i>	<i>p</i>
North African	Eastern European	30.021	[17.974, 42.067]	< .001
	Sub-Saharan	4.693	[-6.99, 16.38]	1
	Latin American	20.040	[10.33, 29.75]	< .001
	Asian	-13.261	[-25.23, -1.29]	.019
Eastern European	Sub-Saharan	-25.328	[-37.37, -13.28]	< .001
	Latin American	-9.981	[-20.12, 0.16]	< .001
	Asian	-43.282	[-55.61, -30.96]	.057
Sub-Saharan	Latin American	15.346	[5.64, 25.05]	< .001
	Asian	-17.954	[-29.93, -5.98]	< .001
Latin American	Asian	-33.301	[-43.35, -23.25]	< .001

*In the total sample of the immigrants, 1,478 (out of N=1,503) have reported on their time spent in Spain.

2.2.2. Assessment Instruments

All assessment instruments were administered in Spanish language. Thus, only Latin American and Spanish groups were interviewed in their native language.

Self-perceived physical health:

Self-reported physical health was evaluated with the dichotomous question: “Do you have any physical disease?”

Psychiatric morbidity:

The psychiatric morbidity was measured by the administration of the Spanish version of MINI International Neuropsychiatric Interview (MINI) (Lecrubier et al., 1997). The Spanish validation study of MINI was performed by (Bobes, 1998). Specific diagnostic categories and global psychiatric morbidity were recorded. The MINI has

been used extensively throughout the world and shows good acceptance and validity across multiple cultures and languages (de Azevedo Marques & Zuardi, 2008; Mukhtar, Bakar, Junus, & Board, 2012; Otsubo et al., 2005). MINI has been previously utilized successfully in refugee studies (Durieux-Paillard, Whitaker-Clinch, Bovier, & Eytan, 2006; von Lersner, Elbert, & Neuner, 2008).

Screening for Mental-health wellbeing:

The General Health Questionnaire-12 (GHQ-12; Goldberg & Blackwell, 1970) is a short screening device for mental health and since its development it has been extensively used in different settings and diverse cultures. Total scores range from 0 to 46, with higher scores representing higher levels of mental distress. GHQ-12 has been validated in Spanish by Sánchez-López and Dresch (2008). A reliability analysis was carried out on the GHQ-12 scale. Cronbach's alpha showed the questionnaire to reach good reliability for the total sample $\alpha=0.931$, as well as for the samples of the immigrants $\alpha=0.918$, and of native-borns $\alpha=0.941$.

Screening for Generalized Anxiety and Depression:

The Goldberg Anxiety and Depression Scale (GADS; Goldberg et al., 1987) is an 18-item self-report symptom screening inventory. The scores for the subscales GADS-Anxiety and GADS-Depression range from 0 to 9, with higher scores representing more symptoms. The Spanish validation of the instrument was studied by Montón et al. (1993). Cronbach's alpha showed acceptable reliability of the scale for the total sample $\alpha=0.818$, as well as for the samples of immigrants $\alpha=0.818$, and of native-borns $\alpha=0.820$, separately.

Psychosomatic morbidity:

The somatic symptoms section of the Standardized Polyvalent Psychiatric Interview (SPPI) allows the evaluation of somatic disturbances in patients. SPPI has been developed to assess primarily medical patients and present adequate psychometric properties (Lobo et al., 1993). It permits the coding of Bridges & Goldberg's categories of attribution of somatic symptoms ($\kappa=0.93$). According to them the criteria for somatization include two terms, which are subject to rating bias, i.e. patient's and mental health professional's bias (KBridges & Goldberg, 1985): the *somatizers* (STs) are patients with psychiatric or psychological problems who present to the PHC practitioner with physical complaints, and in whom a functional diagnosis, i.e. of non-medically explained symptoms, was recorded, and, the *psychologizers* (PGs) are patients with psychiatric or psychological problems who present to the PHC practitioner with psychological complaints. The somatic section of SPPI has been used in Spain for the assessment of psychosomatic morbidity in native born primary care patients (García-Campayo, Alda, Sobradiel, Olivan, & Pascual, 2007; García-Campayo et al., 2008; García-Campayo, Campos, Marcos, Perèz-Echeverría, & Lobo, 1996). The SPPI global score refers to the rating of caseness of somatization and is coded in a 5-point scale, ranging from 0, which indicates that the patient is a non-case, to 4, which indicates that he/she is a severe case. Cronbach's alpha illustrated that the somatic section of SPPI holds good reliability for the total sample $\alpha=0.807$, and for the samples of immigrants $\alpha=0.801$ and native borns $\alpha = 0.819$.

2.2.3. Variables

For the first part of the analysis, the independent variable was the group of origin of the patients, i.e. immigrants or native-born Spanish. Variables of interest in our analysis included: the incidence of general somatization, the presence of current psychiatric disorders according to MINI, the comorbidity of the two conditions, the self-reported physical health as well as the attribution style of the general somatization experienced. The incidence of “general somatization” was treated as a dependent variable when examined in relation to the time spent in Spain, for the sample of immigrants. Types of current psychiatric disorders and scores on GHQ-12 scale, GADS-Anxiety and GADS-Depression sub-scales were also variables of interest for our analysis.

The dependent variable of “general somatization” is utilized as an alternative abridged measure to diagnose psychosomatic morbidity in the sample. It was calculated based on the SPPI global score on somatic symptoms as a more global, integrated and cultural-sensitive alternative to the strict and narrow diagnostic criteria of somatoform (DSM-IV-TR) or somatic symptom (DSM-5) disorders, since it considers the frequency and intensity of somatic symptoms, the attribution style of such symptoms and their impact on daily life. The variable of the comorbidity between current psychiatric disorder and general somatization was calculated statistically.

The attribution style of somatization was explored in relation to the patients’ group or origin. The five attribution categories included in the SPPI questionnaire (i.e. the person *a) attributes physical symptoms on psychic disorder or "on nerves" exclusively, b) admits presence of psychological disorders, but thinks that actual symptoms are physical, c) admits that symptoms are influenced by "nerves", but still considers them as a physical problem, d) as in the previous case, but also doubts that*

symptoms are influenced by "nerves", e) total attribution to physical illness) were dichotomized. For the purpose of the dichotomization, we considered positive responses to the first two categories as psychological-related attribution and positive responses to the rest three categories as physical-related attribution style.

For the second part of the analysis, the independent variable was the group of origin of the patients, i.e. immigrants or native-born Spanish. The variables considered in the analyses were the presence and types of somatic symptoms as identified and extracted from all assessment instruments administered: a) somatic section of the SPPI, apart from the gynecological symptoms because of study-related inconsistencies (28 items), b) MINI (25 items), c) GADS (7 items), d) GHQ-12 (1 item). In total 61 somatic symptoms were examined.

2.2.4. Data analysis

Analyses were conducted using SPSS 23.0 (Statistics IBM, 2015). First, we generated descriptive statistics for the sample examined across the variables of interest. The total sample was adjusted by age and gender; thus, no test of differences was conducted. For the sample of immigrants examined, ANOVA test was performed to determine any differences in relation to the time spent in Spain across the 5 ethnic groups of origin.

Then, the analysis took place by group of origin at two levels: (a) psychopathology-level: general somatization and psychiatric disorders, (b) symptomatology-level: incidence of somatic symptoms as encountered in the administered screening and diagnostic tools. Associations among the qualitative dichotomous variables of interest were explored using odds ratio (ORs) and chi-square

tests (χ^2). Firstly, we explored the relationship between the group of origin (immigrants versus native Spanish) with the prevalence of any current psychiatric disorder, the incidence of general somatization, the comorbidity of the two conditions, the self-reported health and the attribution styles of somatization. For the sample of the immigrants examined, we additionally examined the differences in the incidence of general somatization in relation to their time spent in Spain. Effect sizes were calculated accordingly. Later, the association of specific psychiatric disorder with general somatization was examined for the total sample, the sample of immigrants and the sample of natives separately. t-tests were conducted to determine mean differences in GHQ-12, GADS-Anxiety and GADS-Depression scores against the incidence of somatization for the total sample, the sample of immigrants and the sample of natives separately. Further, we looked at the variations in the incidence of somatic symptoms between the two groups.

We used an alpha level of .05 for the statistical significance of all tests conducted.

2.3. Results

2.3.1. Descriptive Statistics

Descriptive information of the sample, organized by group origin, is presented in Table 1. For the group of immigrants, there were significant differences across the 5 groups of origin in terms of time spent in Spain ($F_{(4)}= 35.668$; $p < .001$). Ten Bonferroni post-hoc pairwise tests were conducted with an adjusted p value of $\alpha/10$, i.e. 0.005 per test. The comparisons illustrated that all immigrants' ethnic groups or origin were significantly different to each other in terms of time spent in Spain except for the ethnic

group of North Africans relative to Sub Saharans and the Eastern Europeans compared to the Asians (Table 1).

2.3.2. General Somatization and Psychiatric Disorders by group of origin

Table 2 shows the morbidity of current psychiatric disorder and general somatization as well as the comorbidity of the two conditions in both groups of origin. No significant differences in psychiatric morbidity between immigrants and Spanish PHC patients according to MINI psychiatric interview (24.1% in immigrants vs 26.1% in native Spanish; 95% CI: [0.760, 1.057]; Qureshi et al., 2013) were found. No significant differences between the two groups of origin were observed for general somatization (13.1% in immigrants vs 12.5% in native born; 95% CI: [0.854-1.318]) nor for comorbidity of psychiatric disorder with general somatization (7.4% in migrants vs 7.3% in native born; 95% CI: [0.768, 1.328]). Interestingly, native born PHC patients are more probable to report that their physical health is poor relative to the immigrant study participants (22.5%; OR=0.728, 95% CI: [0.607,0.874]).

For those patients with general somatization (immigrants N=194, 13.1% and native-born Spanish N=181, 12.5%) the attribution styles of the somatization experienced was explored. No significant associations ($\chi^2_{(1)} = 1.989$; $p=.158$) were found between somatic-related attribution (immigrants N=119, 61.3% and native-born Spanish N=98, 54.1%) and psychological related attribution (immigrants N=75, 38.7% and native-born Spanish N=83, 45.9%) by group or origin.

Table 2.

Morbidity of current psychiatric disorder, general somatization, comorbidity of the two, attribution styles of somatization and self-perceived physical health in immigrants and native-born Spanish patients

	Immigrants (N=1,503)		Native born (N=1,503)		OR	95% CI	p
	N	%	N	%			
Current Psychiatric Disorder (MINI)	362	24.1%	393	26.1%	.896	[0.760, 1.057]	.192
General Somatization (SPPI)	194	13.1%	181	12.5%	1.061	[0.854, 1.318]	.593
Physical Attribution	119	61.3%	98	54.1%	1.344	[0.891, 2.027]	.158
Psychological Attribution	75	38.7%	83	45.2%			
Comorbidity Psychiatric Disorder & General Somatization	111	7.4%	110	7.3%	1.010	[0.768, 1.328]	.944
Self-perceived illness	255	17.4%	333	22.5%	.728	[0.607, 0.874]	.001

*In the total sample of the immigrants 1478 have reported on their time spent in Spain.

All patients with diagnosed psychiatric disorder, according to the MINI, were likely to present somatization complaints, independent of their group of origin. For the total sample 30.1% (N=221) of patients with psychiatric diagnosis presented general somatization (OR=5.695, 95% CI: [4.531, 7.157], $p < .001$). For the immigrants' sample 31.6% (N=111) of those with psychiatric diagnosis presented general somatization (OR=5.817, 95% CI: [4.236, 7.988], $p < .001$) and for the native-born sample 28.6% (N=110) with psychiatric diagnosis presented general somatization (OR=5.597, 95% CI: [4.031-7.772], $p < .001$).

For those patients who presented "general somatization" (immigrants N=194, 13.1% and natives N=181, 12.5%), the attribution styles of their somatic symptoms were

explored. Both immigrants and natives are likely to attribute their somatic suffering in physical, rather than psychological factors, but no significant differences were found between the two groups.

For the sample of immigrants, general somatization was examined in relation to their time spent in Spain. Interestingly, significant mean differences in general somatization) were observed in relation to their time spent in Spain ($t_{(1,475)} = 2.308$, 95% CI: [1.252, 15.428], $p = .021$; rho Spearman = -0.065, $p = .013$). Our findings indicated that there is an inverse, though very small relationship between the time spent in Spain and the incidence of general somatization. Immigrants who do not show somatic symptoms (based on SPPI) have spent significantly more time in Spain ($M = 45.41$ months, $SD = 47.709$) than those who do endorse somatic symptoms ($M = 37.07$ months, $SD = 41.186$). The calculated effect size is small (d Cohen = $0.187 < 0.2$).

With a view to elaborate further on the issue, the association of somatization with specific psychiatric conditions according to MINI (Table 3) was examined for the total patient sample as well as for the samples native born Spanish patients separately.

Table 3.

Associations of specific psychiatric disorder and somatization disorder in (a) total Primary Health Care sample, (b) the sample of immigrants and (c) the sample of native-born Spanish

(a) TOTAL SAMPLE: IMMIGRANTS AND NATIVE-BORN SPANISH						
	Specific Psychiatric Diagnosis (MINI)	General Somatization* (SPPI)		OR	95% CI	p
		YES (N/%)	NO (N/%)			
	Psychiatric disorder (any, current)	514 69.9%	221 30.1%	5.695	[4.531, 7.157]	< .001
1	Major Depression, current (past 2 weeks)	148 41.1%	212 58.9%	7.196	[5.603, 9.243]	< .001
2	Major Depression, recurrent	77 42.1%	106 57.9%	6.398	[4.328, 8.161]	< .001
3	Generalized Anxiety Disorder	86 37.1%	146 62.9%	5.310	[3.649, 6.559]	< .001
4	Dysthymia, current (past 2 years)	28 7.5%	39 1.5%	5.204	[3.162, 8.565]	< .001
5	Mania, current	17 4.5%	31 1.2%	3.865	[2.117, 7.055]	< .001
6	Hypomanic, current	32 8.5%	78 3.1%	2.962	[1.933, 4.537]	< .001
7	Panic disorder, current (past month)	30 8.0%	23 .9%	9.554	[5.486, 6.638]	< .001
8	Agoraphobia, current	28 7.5%	45 1.8%	4.494	[2.767, 7,298]	< .001
9	Social phobia, current (past month)	17 4.5%	37 1.4%	3.239	[1.805, 5.814]	< .001
10	Obsessive-compulsive disorder (past month)	14 3.7%	27 1.1%	3.637	[1.889, 7.001]	< .001
11	Post-traumatic stress disorder, current (past month)	17 4.5%	25 1.0%	4.811	[2.573, 8.998]	< .001
12	Alcohol dependence, current (past 12 months)	17 4.5%	69 2.7%	1.709	[0.994, 2.939]	.050
13	Alcohol abuse, current (past 12 months)	17 4.6%	96 3.8%	1.220	[0.720, 2.068]	.459

	Specific Psychiatric Diagnosis (MINI)	General Somatization* (SPPI)		OR	95% CI	p
		YES (N/%)	NO (N/%)			
14	Drug dependence, current (past 12 months)	14 3.7%	53 2.1%	1.827	[1.003, 3.327]	.046
15	Drug abuse, current (past 12 months)	10 2.7%	47 1.8%	1.458	[0.730, 2.912]	.282
16	Psychotic disorder, current (past 12 months)	9 2.4%	13 0.5%	4.840	[2.054, 1.405]	< .001
17	Mood disorder with psychotic symptoms	12 3.2%	7 0.3%	12.086	[4.727, 0.900]	< .001
18	Anorexia nervosa, current	1 0.3%	2 0.1%	3.414	[0.309, 7.743]	.287
19	Bulimia nervosa, current	3 0.8%	18 0.7%	1.136	[0.333, 3.875]	.838

(b) IMMIGRANTS

	Specific Psychiatric Diagnosis (MINI)	General Somatization* (SPPI)		OR	95% CI	p
		YES (N/%)	NO (N/%)			
	Psychiatric disorder (any, current)	240 68.4%	111 31.6%	4.250	[4.250, 8.044]	< .001
1	Major Depression, current	77 38.55%	123 61.5%	6.207	[4.407, 8.741]	< .001
2	Major Depression, recurrent	35 41.7%	49 58.3%	5.530	[3.477, 8.797]	< .001
3	Generalized Anxiety Disorder	44 36.1%	78 63.9%	4.532	[3.017, 6.807]	< .001
4	Dysthymia, current (past 2 years)	14 7.2%	20 1.6%	4.916	[2.440, 9.905]	< .001
5	Mania, current	6 3.1%	19 1.5%	2.123	[0.837, 5.384]	.105
6	Hypomanic, current	15 7.7%	43 3.4%	2.417	[1.315, 4.440]	.003
7	Panic disorder, current (past month)	11 5.7%	8 0.6%	9.580	[3.803, 24.130]	< .001
8	Agoraphobia, current	12 6.2%	17 1.3%	4.914	[2.309, 10.457]	< .001

	Specific Psychiatric Diagnosis (MINI)	General Somatization* (SPPI)		OR	95% CI	p
		YES (N/%)	NO (N/%)			
9	Social phobia, current (past month)	8 4.1%	22 1.7%	2.481	[1.088, 5.653]	.026
10	Obsessive-compulsive disorder (past month)	7 3.6%	16 1.2%	2.983	[1.211, 7.346]	.013
11	Post-traumatic stress disorder, current (past month)	10 5.2%	16 1.2%	4.324	[1.933, 9.672]	< .001
12	Alcohol dependence, current (past 12 months)	6 3.1%	31 2.4%	1.292	[0.532, 3.138]	.571
13	Alcohol abuse, current (past 12 months)	5 2.6%	33 2.6%	1.009	[0.389, 2.616]	.986
14	Drug dependence, current (past 12 months)	2 1.0%	6 .5%	2.222	[0.445, 11.087]	.318
15	Drug abuse, current (past 12 months)	3 1.6%	3 .2%	6.711	[1.345, 33.489]	.007
16	Psychotic disorder, current (past 12 months)	4 2.1%	10 .8%	2.679	[0.832, 8.627]	.086
17	Mood disorder with psychotic symptoms	5 2.6%	5 .4%	6.759	[1.938, 23.570]	.001
18	Anorexia nervosa, current	1 .5%	0 .0%	.010	[0.995, 1.015]	.010
19	Bulimia nervosa, current	1 .5%	11 .9%	.599	[0.077, 4.665]	.621

(c) NATIVE-BORN SPANISH

	Specific Psychiatric Diagnosis (MINI)	General Somatization* (SPPI)		OR	95% CI	p
		YES (N/%)	NO(N/%)			
	Psychiatric disorder (any, current)	274 71.4%	110 28.6%	5.597	C	< .001
1	Major Depression, current	71 44.4%	89 55.6%	8.558	[5.923, 2.365]	< .001
2	Major Depression, recurrent	42 42.4%	57 57.6%	6.398	[4.139, 1.314]	< .001
3	Generalized Anxiety Disorder	42 38.2%	68 61.8%	5.310	[3.479, 8.105]	< .001

	Specific Psychiatric Diagnosis (MINI)	General Somatization* (SPPI)		OR	95% CI	p
		YES (N/%)	NO (N/%)			
4	Dysthymia, current (past 2 years)	14 7.7%	19 1.5%	5.520	[2.717, 11.216]	< .001
5	Mania (current)	11 6.1%	12 0.9%	6.789	[2.949, 15.626]	< .001
6	Hypomanic (current)	17 3.4%	35 2.8%	3.661	[2.005, 6.683]	< .001
7	Panic disorder, current (past month)	19 10.5%	15 1.2%	9.789	[4.878, 19.644]	< .001
8	Agoraphobia, current	16 8.8%	28 2.2%	4.291	[2.273, 8.100]	< .001
9	Social phobia, current (past month)	9 5%	15 1.2%	4.378	[1.887, 10.157]	< .001
10	Obsessive-compulsive disorder (past month)	7 3.9%	11 0.9%	4.597	[1.759, 12.016]	.001
11	Post-traumatic stress disorder, current (past month)	7 3.9%	9 0.7%	5.632	[2.071, 15.315]	< .001
12	Alcohol dependence, current (past 12 months)	11 6.1%	38 3.0%	2.091	[1.049, 4.169]	.032
13	Alcohol abuse, current (past 12 months)	12 6.7%	63 5.0%	1.362	[0.719, 2.577]	.341
14	Drug dependence, current (past 12 months)	12 6.6%	47 3.7%	1.839	[0.956, 3.536]	.064
15	Drug abuse, current (past 12 months)	7 3.9%	44 3.5%	1.115	[0.495, 2.516]	.792
16	Psychotic disorder, current (past 12 months)	5 2.8%	3 0.2%	12.190	[2.888, 51.460]	< .001
17	Mood disorder with psychotic symptoms	7 3.9%	2 0.2%	25.789	[5.314, 125.152]	< .001
18	Anorexia nervosa, current	0 0%	2 0.2%	.998	[0.996, 1.001]	.593
19	Bulimia nervosa, current	2 1.1%	7 0.6%	2.018	[0.416, 9.789]	.374

* Note: N/% of general somatization represent values within the specific psychiatric disorder examined.

Patients with any current psychiatric disorder were significantly more likely to report somatic symptoms than those with no psychiatric disorder (69.9%, OR= 5.695, 95% CI: [4.531, 7.157]). This pattern was observed when the same analysis took place separately for the samples of immigrants (68.4%, OR=4.250, 95% CI: [4.250, 8.044]) and native-born (71.4%, OR=5.597, 95% CI: [4.250, 8.044]) patients.

Contrary to our expectations, patients with major depression, current (58.9%, OR=7.196, 95% CI: [5.603-9.243]) and recurrent (57.9%, OR=6.398, 95% CI: [4.328-8.161]), and generalized anxiety disorder (62.9%, OR=5.310, 95% CI: [3.649-6.559]) were less likely to present general somatization symptoms. Same patterns were observed for the samples of immigrants and natives too.

The presence of other specific psychiatric conditions (for the total sample: *dysthymia, mania, hypomanic disorder, panic disorder, agoraphobia, social phobia, obsessive-compulsive disorder, post-traumatic stress disorder, alcohol dependence, psychotic disorder, mood disorder with psychotic symptoms*) was significantly likely to be associated with general somatization. Similar patterns are observed for immigrants and native-born Spanish separately (Table 3).

These results based on psychiatric morbidity (MINI) were contrasted against those found when the incidence of general somatization was examined in relation to the (sub-)scores obtained on the mental health screening instruments: GHQ-12, GADS-Depression and GADS-Anxiety (Table 4). Patients with general somatization showed significantly higher rates of mental distress (M= 16.43, SD= 13.501), depression- (M=3.68, SD=2.731) and anxiety- related (M=5.27, SD=3.082) symptomatologies than those with lower rates of mental distress (M=12.72, SD=10.886; $t_{(2,873)}=-5.893$, $p<.001$) and fewer depression (M=1.13, SD=1.959; $t_{(2,920)}=-22.218$, $p<.001$) and fewer anxiety

($M=2.09$, $SD=2.625$; $t_{(2,923)}=-21.382$, $p<.001$) symptoms, who did not present somatic symptoms. The same pattern of results was observed when the same analyses were repeated for the sample of immigrants and natives separately. The corresponding effect sizes calculated were from moderate to large.

Table 4.

Test of differences in general somatization related to mental health well-being (GHQ-12), depression-related symptomatology (GADS-Depression) and anxiety-related symptomatology (GADS-Anxiety) for the (a) total Primary Health Care sample, (b) the sample of immigrants and (c) the sample native-born Spanish

(a) TOTAL SAMPLE: IMMIGRANTS AND NATIVE-BORN SPANISH					
	General Somatization (SPPI)		Effect size d Cohen	$t_{(df)}$; 95% CI	p
	YES (M/SD)	NO (M/SD)			
GHQ-12	16.43/13.501	12.72/10.886	0.303	-5.893 _(2,873) ; [-4.944, -2.476]	< .001
GADS-Depression	3.68/2.731	1.13/1.959	1.073	-22.218 _(2,920) ; [0.115, -2.779]	< .001
GADS-Anxiety	5.27/3.082	2.09/2.625	1.111	-21.382 _(2,923) ; [0.167, -3.508]	< .001
(b) IMMIGRANTS					
	General Somatization (SPPI)		Effect size d Cohen	$t_{(df)}$; 95% CI	p
	YES (M/SD)	NO (M/SD)			
GHQ-12	15.12/12.527	13.22/10.717	0.163	-2.199 _(1,427) ; [-3.596, -0.206]	.028
GADS-Depression	3.72/2.728	1.16/1.990	0.327	-15.775 _(1,470) ; [-2.877, -2.241]	< .001
GADS-Anxiety	5.31/3.052	2.18/2.618	1.101	-15.161 _(1,472) ; [-3.534, -2.725]	< .001

(c) NATIVE-BORN SPANISH

	General Somatization (SPPI)		Effect size d Cohen	t _(df) ; 95% CI	p
	YES (M/SD)	NO (M/SD)			
GHQ-12	17.76/14.341	12.22/11.030	0.433	-6.064 _(1,444) ; [-7.331, -3.748]	< .001
GADS-Depression	3.64/2.741	1.10/1.928	1.072	-15.624 _(1,448) ; [-2.866, -2.226]	< .001
GADS-Anxiety	5.23/3.122	2.01/2.630	1.116	-15.060 _(1,449) ; [-3.646, -2.806]	< .001

2.3.3. Somatic symptoms by group of origin

Table 5 shows the prevalence of somatic symptoms as reported by immigrants and Spanish native born PHC patients across the diagnostic (MINI, SPPI) and screening (GHQ, GADS) instruments administered.

Table 5.

Incidence of somatic symptoms in immigrants and native-born Spanish Primary Health Care patients

	Immigrants (N=1,503)		Native-born (N=1,503)		OR	95% CI	p
	N*	%*	N	%			
A. SPPI (SOMATIC SECTION)							
A.1. GASTROINTESTINAL							
Vomits	58	3.9%	59	3.9%	0.998	[0.689, 1.444]	.990
Abdominal pain	208	14.1%	127	8.5%	1.770	[1.402, 2.236]	< .001
Nauseas	128	8.6%	98	6.5%	1.356	[1.032, 1.783]	.028
Flatulences	120	8.1%	126	8.4%	0.964	[0.742, 1.251]	.781
Diarrhea	53	3.6%	94	6.3%	0.556	[0.394, 0.785]	< .001
Intolerances	73	4.9%	52	3.5%	1.447	[1.006, 2.080]	.045
A.2. PAIN							
Extremities	241	16.3%	212	14.1%	1.184	[0.969, 1.446]	.099
Spin	414	28%	464	30.9%	0.869	[0.742, 1.017]	.080
Joints	149	10.1%	170	11.3%	0.877	[0.695, 1.107]	.269

	Immigrants (N=1,503)		Native-born (N=1,503)		OR	95% CI	p
	N*	%*	N	%			
When urinating	59	4%	20	1.3%	3.077	[1.843, 5.135]	< .001
Other	25	1.7%	16	1.1%	1.596	[0.849, 3.001]	.143
A.3. CONVERSION							
Amnesia	56	3.8%	46	3.1%	1.245	[0.837, 1.851]	.279
Difficulty to swallow	23	1.6%	25	1.7%	0.933	[0.527, 1.652]	.813
Loss of voice	20	1.4%	39	2.6%	0.514	[0.298, 0.885]	.015
Deafness	20	1.4%	28	1.9%	0.721	[0.404, 1.286]	.266
Double vision	9	.6%	3	.2%	3.057	[0.826, 11.315]	.078
Blurry vision	46	3.1%	35	2.3%	1.345	[0.861, 2.099]	.191
Blindness	5	.3%	0	0%	1.003	[1.000, 1.006]	.024
Fainting	26	1.8%	30	2%	0.877	[0.516, 1.491]	.628
Seizure or attack	3	.2%	11	.7%	0.275	[0.077, 0.989]	.034
Problems in walking	11	.7%	18	1.2%	0.617	[0.291, 1.312]	.205
Paralysis or muscular weakness	25	1.7%	33	2.2%	0.764	[0.452, 1.292]	.314
Retention or difficulty urinating	10	.7%	13	.9%	0.779	[0.341, 1.783]	.554
A.4. SEXUAL LIFE							
Sexual difficulties	33	2.2%	29	1.9%	1.158	[0.700, 1.918]	.567
A.5. CARDIOPULMONARS							
Dyspnoea	109	7.4%	111	7.4%	0.996	[0.757, 1.311]	.979
Palpitations	187	12.4%	187	12.5%	0.998	[0.803, 1.241]	.988
Thoracic pain	146	9.9%	100	6.7%	1.534	[1.177, 2.000]	.001
Dizziness	149	10.1%	127	8.5%	1.212	[0.945, 1.554]	.129

B. GADS

Anxiety Subscale							
Bad sleep	375	56.8%	381	62.3%	0.798	[0.637, 0.999]	.048
Headaches	371	56.3%	328	53.6%	1.115	[0.894, 1.392]	.333
Vegetative symptoms	203	30.8%	210	34.3%	.852	[0.674, 1.078]	.182
Worried about own health	399	60.6%	284	46.4%	1.779	[1.424, 2.224]	.000
Difficulty to fall asleep	335	50.9%	334	54.6%	0.863	[0.692, 1.076]	.191
Depression Subscale							
Little energy	490	32.9%	515	34.3%	0.941	[0.808, 1.095]	.432
Loss of weight	164	27.4%	135	23.7%	1.218	[0.935, 1.585]	.143

C. MINI

MINI MAJOR DEPRESSIVE EPISODE							
Appetite changes	194	47.2%	114	44.5%	1.114	[0.814, 1.524]	.501
Tiredness	219	53.3%	174	68.8%	0.518	[0.373, 0.720]	< .001
Difficulties to sleep	291	55.1%	165	64.7%	0.669	[0.485, 0.923]	.014
Greater slowness	207	50.4%	158	61.7%	0.629	[0.458, 0.865]	.004
When depressed, bad sleep	75	51.4%	51	43.2%	1.388	[0.852, 2.260]	.187

	Immigrants (N=1,503)		Native-born (N=1,503)		OR	95% CI	p
	N*	%*	N	%			
MINI DYSTHYMIA							
Appetite changes	37	58.7%	27	60.0%	0.949	[0.435, 2.068]	.895
Difficulties to sleep	42	67.7%	36	78.3%	0.583	[0.242, 1.406]	.227
Tired or with no energy	43	69.4%	40	87%	0.339	[0.123, .936]	.032
MINI (HYPO)MANIC EPISODE							
When exalted, need of less sleep	77	37.2%	62	26.4%	1.653	[1.103, 2.477]	.015
When exalted, so physically active that others worry	207	50.4%	158	61.7%	0.629	[0.458, 0.865]	.004
MINI PANIC DISORDER							
Palpitations	62	91.2%	143	83.6%	2.023	[0.798, 5.132]	.132
Hand sweating	43	63.2%	114	69.1%	0.769	[0.425, 1.393]	.386
Tremblings	36	52.9%	92	53.8%	0.966	[0.550, 1.697]	.904
Difficulties to breathe	46	67.6%	140	82.4%	0.448	[0.236, 0.852]	.013
Choking sensation	50	73.5%	132	77.2%	0.821	[0.430, 1.566]	.549
Pain or discomfort on the chest	41	60.3%	107	62.6%	0.908	[0.511, 1.616]	.743
Nauseas	27	39.7%	81	47.6%	0.724	[0.409, 1.281]	.266
Dizziness	41	60.3%	109	64.9%	0.822	[0.460, 1.468]	.507
Sleeping body	34	50%	64	37.6%	1.656	[0.939, 2.922]	.080
Hot flashes or chills	43	64.2%	102	60.0%	1.194	[0.665, 2.146]	.552
MINI POST-TRAUMATIC STRESS DISORDER							
Difficulties to sleep	28	90.3%	14	70%	4.000	[0.869, 18.421]	.063
MINI GENERALISED ANXIETY DISORDER							
Restless	119	78.3%	111	90.2%	0.390	[0.192, 0.793]	.008
Tensed	119	78.3%	112	91.1%	0.354	[0.171, 0.735]	.004
Tired	110	72.4%	88	71.5%	1.042	[0.614, 0.704]	.880
Sleeping problems	109	71.7%	89	72.4%	0.968	[0.570, 1.645]	.905

D. GHQ-12

Loss of sleep	291	19.3%	229	15.2%	1.336	[1.104, 1.615]	.003
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* Note: N/% represent the number of patients and the corresponding % within the group of origin that present the somatic symptoms examined.

Immigrants and native-born Spanish PHC patients differ in the type, rather than the frequencies, of somatic symptoms presented.

Immigrant patients were found significantly more likely to develop: *abdominal pain* (14.1% for immigrants vs 8.5% for natives, OR=1.770, 95% CI: [1.402, 2.238]); *nauseas* (8.6% for immigrants vs 6.5% for natives, OR=1.356, 95% CI: [1.032, 1.783]); *food*

intolerances (4.9% for immigrants vs 3.5% for natives, OR=1.447, 95% CI: [1.006, 2.080]; pain when urinating (4% for immigrants vs 1.3%, OR=3.077, 95% CI: [1.843, 5.135]; blindness (0.3% for immigrants vs 0% for natives, OR=1.003, 95% CI: [1.000, 1.006]; thoracic pain (9.9% for immigrants vs 6.7% for natives, OR=1.534, 95% CI: [1.177, 2.000] ; worries about own health (60.6% for immigrants vs 46.4% for natives, OR=1.779, 95% CI: [1.424, 2.224]; need to sleep less (for those presenting symptoms of (hypo)maniac episode) (37.2% for immigrants vs 26.4% for natives, OR=1.653, 95% CI: [1.103-2.477]; loss of sleep (19.3% for immigrants vs 15.2% for natives, OR=1.336, 95% CI: [1.103-1.61] than native Spanish ones.

On the other hand, Spanish native born patients were significantly more likely to develop: *diarrhea (6.3% for natives vs 3.6% for immigrants, OR=0.556, 95% CI: [0.394-0.785]; loss of voice (2.6% for natives vs 1.4% for immigrants, OR=0.514, 95% CI: [0.298-0.885]; convulsions or attacks (0.7% for natives vs 0.2% for immigrants, OR=0.275, 95% CI: [0.077, 0.989]; bad sleep when anxiety (62.3% for natives vs 56.8% for immigrants, OR=0.789, 95% CI: [0.647, 0.999]; fatigue or with no energy (68.8% for natives vs 53.3% for immigrants, OR=0.518, 95% CI: [0.373, 0.720], difficulties to sleep (64.7% for natives vs 55.1% for immigrants, OR=0.669, 95% CI: [0.485, 0.923], slower in talking & moving than normal (for those presenting symptoms related to current mayor depression) (61.7% for natives vs 50.4% for immigrants, OR=0.629, 95% CI: [0.458-0.865]; tiredness or without energy (for those presenting symptoms of dysthymia) (87% for natives vs 69.4% for immigrants, OR=0.339, 95% CI: [0.123, 0.936]; hyperactivity (for those presenting symptoms of (hypo)maniac episode) (61.7% for natives vs 50.4% for immigrants, OR=0.629, 95% CI: [0.458, 0.865]; difficulties in breathing (for those presenting symptoms related to panic attack disorder) (82.4% for natives vs 67.6% for*

immigrants, OR=0.448, 95% CI: [0.236, 0.852]; agitation (90.2% for natives vs 78.3% for immigrants, OR=0.390, 95% CI: [0.192, 0.793], tension (for those presenting symptoms related to generalized anxiety) (91.1% for natives vs 78.3% for immigrants, OR=1.336, 95% CI: [1.104, 1.615] than immigrant PHC patients.

The results reflect qualitative differences of somatization as expressed by immigrants and native-born Spanish PHC patients. Immigrants PHC patients were more likely to develop somatic symptom that do not correspond to specific psychiatric conditions, whereas the native born Spanish patients were more likely to present somatic symptoms that are related to psychiatric conditions, such as depression and anxiety.

2.4. Discussion

In rapidly changing Spanish society, there is an observed shift from ethnically homogeneous population towards a multicultural society due to migration flux and the current refugee crisis. The need for good health service for immigrants has therefore become of increasing importance. Our study sample (N=3,006) consisted of primary health care patients, immigrants and native-Spanish. Therefore, the results cannot be generalized for the general population nor for mental health patients. The scope of the study was to investigate the detection and interpretation of somatic symptoms in relation to mental health problems as assessed in primary care. Hence, our results can be generalized to patients in primary health care settings in the specific cultural context of Spain.

2.4.1. General Somatization and Psychiatric Disorders by group of origin

The first step of the analysis took place at the level of psychiatric disorders and addresses the first research question attached to the study (Chapter 1, paragraph 1.4).

No significant differences between immigrants and native-born primary health care patients were found in the psychiatric morbidity (as assessed by MINI), general somatization rates (as evaluated by SPPI), neither in the comorbidity of the two. The results are in accordance to the findings of a recent primary care case control study, by Halldorsdottir, Jonsson and Gudmundsson (2016), which concluded that immigrants and nonimmigrants attending a health care center in Iceland present the same physical and mental diagnoses. According to Kirmayer et al. (2011) among immigrants, the prevalence of common mental health problems in primary health care is initially lower than in the general population, but over time, it increases to become similar to that in the general population. In our study sample, the majority of the immigrants (75.1%, N=1,110) have spent more than one year in Spain. Further, almost half of immigrants in the sample (40.9%, N=614) come from Latin America countries, which have many cultural commonalities with Spain. Under the concept of “cultural congruity” (Bhugra & Arya, 2005), Latin American immigrants in Spain may present similar rates of mental distress, as expressed in the incidence of psychiatric disorders and general somatization, when compared to Spanish native-borns (Qureshi et al., 2013), which therefore, conditions the mean prevalence of mental distress in the total sample of immigrants.

Despite the fact that there were observed no differences in mental health problems between the two groups, native-born patients were more likely to report that their physical health is poor than immigrant patients did. Moreover, there were observed significant differences in the general somatization among immigrants in

relation to their time spent in Spain. Those who have spent fewer time in the host country present slightly higher incidence rates of general somatization symptoms. Thus, our findings are not in accordance to the “healthy immigrant effect”, as we expected, which refers to the notion that foreign-born immigrants are typically healthier than the native-born population (Cunningham et al., 2008; Constant et al., 2018; Diaz et al., 2015; Vang, Sigouin, Flenon, & Gagnon, 2017b). The results emphasize the argument that somatization is not a psychopathological phenomenon, but rather an “idiom of distress”, an embodied language of experience and expression of mental suffering.

That no significant differences were found in the attribution styles of somatization between immigrant and native-born Spanish patients with general somatization may be conditioned by several factors. In a US study, (Helman, 1985) found that primary care patients suffering from chronic “psychosomatization” hold multi-causal explanations for their condition that linked physical, psychological, and social aspects of their life. Somatic and psychological attribution do not clearly represent two mutually exclusive categories of symptom presentation, supporting that somatization is dimensional rather than categorical (Katon et al., 1991; Kirmayer, Robbins, & Paris, 1994). That means there are often more than one attributional causal ways to explain symptoms, that cannot be simply dichotomized between physical and psychological, as it was the case in our study. Additionally, social as well as spiritual/religious attribution styles of somatization need to be taken into consideration in primary care (Kirmayer, 2015; Kuittinen, Mölsä, Punamäki, Tiilikainen, & Honkasalo, 2017).

In our examined sample, general somatization was associated with higher rates of mental distress (GHQ-12), depression- (GADS-Depression) and anxiety- (GADS-Anxiety) related symptoms. However, at psychopathology level this was not exactly the

case. On one side, some specific psychiatric conditions were likely to be associated with somatization complaints. This supports conclusions of previous research that somatic complaints are the main motive of primary care consultations (Hartman et al., 2009) even if they are concomitant to mental disorders. On the other side and contrary to our hypothesis, for the total sample and separately for every group of origin, patients with major depression, current (past two weeks) and recurrent, as well as generalized anxiety disorder, are less likely to present somatic symptoms. This is opposite to the literature that suggests that physical symptoms frequently co-occur with depressive and/or anxiety disorders (Henningsen, Zimmermann, & Sattel, 2003; Kroenke, Jackson, & Chamberlin, 1997; Van Boven et al., 2011).

Two large studies in primary and secondary care did not find a direct association between medically unexplained symptoms and anxiety and mood disorders (N=890, Nimnuan et al., 2001; N=500, Jackson & Passamonti, 2005). A systematic review of MUPS by Henningsen et al. (2003) found an association with mental disorders and fibromyalgia, chronic fatigue, nonulcerative dyspepsia, and irritable bowel syndrome, but concluded, “there is only limited meta-analytic evidence for the same sort of association for medically unexplained physical symptoms in general” (p. 528). This is similar to other studies in which the relationship between MUPS and emotional disorders was found to be unclear (Kroenke & Mangelsdorff, 1989; Maiden, Hurst, Lochhead, Carson, & Sharpe, 2003). A study by Bridges et al. (1991) revealed that “somatizers” were found to be less depressed, had lower trait anxiety, and were less likely to discuss emotional problems with a medical doctor or consult a general practitioner for depressive symptoms when compared to “psychologizers”.

The fact that distinct results were found when the association of general somatization with depression and anxiety was explored at symptoms-level (GADS) and psychopathology-level (MINI), indicate the strictness of the diagnostic criteria to capture the idiomatic variations of somatization, irrespective to ethnic/cultural differences. The application of psychiatric criteria in primary health care may conclude to rigid diagnoses that do not allow health professionals to understand the meaning-making of the somatic symptoms.

2.4.2. Somatic symptoms by group of origin

The quantitative analysis we carried out at symptoms' level showed some interesting qualitative results, which respond to the second research question attached to the study (chapter 1, paragraph 1.4). Immigrants are less likely to present somatic symptoms that correspond to specific psychiatric conditions relative to the native-born Spanish group. In other words, the observed differences are qualitative (*type* of physical symptoms), rather than quantitative (*number* of physical symptoms). The presence of culturally distinctive somatic symptoms that are not noted in current diagnostic criteria may lead to under-recognition or mis-diagnosis of a wide range of culture-specific syndromes documented by ethnographic research (Good, 1977; Guarnaccia, DeLaCancela, & Carrillo, 1989; Kleinman, Anderson, Finkler, Frankenberg & Young, 1986; Lock & Dunk, 1987; Simons & Hughes, 1985). This gives support to the concept of "category fallacy", introduced by Kleinman (1980), addressing the complications of diagnostics cross-culturally. Diagnostic systems are based on ideal typical cases abstracted from the complexity and diversity of disease experience (Kirmayer et al., 2004). Whereas the DSM includes changes in appetite and weight, sleep disturbances,

lack of concentration or diminished ability to think or indecisiveness as somatic symptoms of, for example, depression, most clinicians and patients talk about headache, body ache, fatigue, tiredness, bodily sensations and other sensory changes as somatic symptoms (Chaturvedi, 2009).

Many cultural traditions provide explanations to the physical symptoms that may not fit with biomedical notions and psychological concepts, such as the sociogenic nature of somatization (Angel & Guarnaccia, 1989; Kirmayer & Young, 1998). Sociosomatic theories, based on ethnophysiological principles, link physical symptoms and bodily distress with family situations and social conditions allowing patients to generate own explanations for their symptoms, and thus, providing anthropological evidence to the social determinants' approach to health (Marmot et al., 2017). Such explanatory models seem to be contrary to the concept of "psychological mindedness", which is described by one's motivation and ability to explore and understand psychological processes within one-self and others (Beitel, Ferrer, & Cecero, 2005).

Based on the findings drawn from a study on a large community sample (N=2,400) in Canada, Kirmayer et al. (2004) suggest that given our psychologically oriented culture, it is an easy slide from declaring a symptom unexplained to attributing it to specific psychological traits or states of the patient. This gives meaning to distress, locates the responsibility for care within the system of medical specialization, and neutralizes the threat to professional competence posed by the ambiguity or resistance to treatment of persistent symptoms.

The obtained quantitative results have triggered qualitatively interpretations of the differences in the rates of somatic symptoms as experienced by immigrants and Spanish patients. Since the conceptualization of our study, we recognized the difficulties

in measuring and explaining somatic symptoms of native and immigrant patients in primary care settings. Somatic symptoms are subjective experiences. Measuring and quantifying something which is subjective to personal experience and which may be interpreted differently by health professionals is a challenging task (Chaturvedi & Desai, 2013). The poor understanding of bodily symptoms by clinicians makes it difficult to measure them accurately and reliably, and consequently, to address adequately patients' needs at primary health care.

Our study results hold some clinical implications at primary health care level. A precondition for the treatment of somatic symptoms is that they are identified. The brevity and narrow focus of the typical clinical encounter in primary care does not allow most patients enough time to construct a meaningful narrative about their symptoms. The prognostic value of somatic symptoms needs to be given significance by primary care health professionals. Integrating knowledge of cultural influences on psychopathology into primary practice requires a shift from diagnostic terms to a holistic view and understanding of the person. This can provide a conceptual framework for culturally competent knowledge translation and adaptation of models, measures and interventions.

There are some limitations attached to the study, that may be addressed by future studies. Qualitative methodologies, such as focus group discussions and individual in-depth interviews, did not triangulate the findings of our quantitative study. By this way, valuable subjective information on the experience, expression and expectations related to somatic symptoms and their treatment could have been addressed. Further, beyond the presence of them, no data was collected on the importance and weighted significance somatic symptoms may have for the patient

compared to other symptoms experienced. It is suggested that primary care patients undertake the task to rate and prioritize their experienced mental and physical symptoms individually on the basis of the distress these may cause to them.

Conclusion

The study has provided an innovative elaboration of the phenomenon of somatization, as indicative to psychopathology, in primary health care for immigrants and native-born Spanish patients. The quantitative analysis of the clinical data has allowed some qualitative interpretation of the observed differences in the presentation of somatic symptoms between the two groups. It is a matter of understanding the patients' meaning-making of symptoms, rather than labelling them under a specific diagnostic category. Under the general conception that diagnosis increases the probability of understanding the condition of the patient, we flag out the potential error that this implies. There is an increasing need that primary care medical practice and research methodologies be reframed qualitatively in rapidly changing multi-cultural societies towards.

CHAPTER 3 · Further validation of Barcelona Immigrants Stress Scale (BISS)

3.1. Introduction

As was explained earlier in the previous chapters of the manuscript, post-migration stressors are may determine the mental health of immigrants (Stotz et al., 2015). The socio-cultural context in the country of reception, where post-migration risk factors may occur, impact the psychological and somatic manifestations of the suffering implied (Alegría et al., 2004; Kirmayer & Young, 1999). Specific to somatization, Kirmayer (1984) has argued that somatic complaints are a way of expressing personal and social distress, undelying the sociogenic aspects on how culture of origin and the contact with the culture of reception shape responses to and expressions of disrtess (Angel & Guarnaccia, 1989).

As a preamble of our study research on the predictors of somatization among immigrants primary health care patients (compared to those encountered among Spanish natives) (Chapter 4), we considered fundamental to elaborate on the further validation of Barcelona Immigration Stress Scale (BISS), which determines the post-immigration risk factors related to distress.

3.1.1. Stress, Immigration and Mental Health

Stress refers to any event in which either the demands of the environment or internal pressures, or both, exceed the adaptive resources of the individual (Monat & Lazarus, 1991). Stress associated with immigration and/or intercultural contact has

come to receive considerable research attention over the past decade as a means of making sense of the relationship between immigration and mental health. Migratory processes have become an important topic in clinical research due to the potential stressors involved and their repercussion on psychosocial stability. Bhugra (2004b) argues that the cultural differences encountered by immigrants often require people to adapt, to restructure their identity, to identify what they have lost and to begin facing the possible stressors of migration. If the crisis is not effectively resolved, this process can lead to symptoms that may intensify and increase the likelihood of a person suffering from chronic stress and, subsequently, mental disorders. As a consequence, (Patino & Kirchner, 2010) suggest that the host society must develop efficient tools in order to prevent mental health problems linked to migration.

3.1.2. Acculturation & Acculturative Stress

The notion of acculturation refers to the process by which migrating individuals and groups who come into contact with individuals from the receiving culture undergo a process of cultural change (Redfield, Linton, & Herskovits, 1936). Schwartz and Unger (2017) have exposed the difficulties in the clear and precise conceptualisations of acculturation as well as in the definition, operationalization and measurement of the construct in host countries.

The concept of acculturative stress has been debated and criticized by both clinicians and researchers concluding to contradictory arguments. Rudmin (2009) called for the dismissal of the construct in psychological research because, arguing that it makes little sense to derive a stress-based construct predicated on a process that is not inherently stressful, in opposition to what Bhugra (2004b) had stated earlier on the

relationship between mental distress and migration. Inconsistencies are, also, observed in the definition of the dimensions/domains that acculturative stress may encompass with little emphasis on the contextual and multifaceted nature of acculturation processes (Doucerain, Deschênes, Gouin, Amiot, & Ryder, 2017).

Some researchers tend to stay “true” to the acculturative aspect of the construct; whereas others would appear to include stressors confronted by immigrants and/or culturally different people that are not directly related to intercultural contact, a requisite for “true” acculturative stress. The inclusion of “discrimination” as a factor found in the Acculturative Stress in International Students Scale (Sandhu & Asrabadi, 1994) or the Barcelona Immigration Stress Scale (Tomás-Sábado, Antonin, Qureshi, & Collazos, 2007) exemplifies this, a factor explicitly rejected in the Multidimensional Acculturative Stress Scale (Rodriguez, Myers, Mira, Flores, & Garcia-Hernandez, 2002) precisely because, as Rodriguez and colleagues argue, it is not inherent in acculturation.

The effects of perceived discrimination and low socioeconomic status (SES), which often co-occur with acculturation, have been confounded with and misattributed to acculturation processes according to some proponents (Galand & Dupont, 2002; Krieger, Smith, Naishadham, & ..., 2005). Magana and Hovey (2003) using an open-ended questionnaire found that Mexican migrant workers identified a number of social stressors (economic situation, housing, legal status) which were associated with depression. In addition, research shows that socioeconomic and other general psychosocial factors are central to explaining much of the variance found in the mental health of migrants (Shobe, Coffman, & Dmochowski, 2009; Tinghög, Hemmingsson, & Lundberg, 2007). Thus, it appears that the acculturative stress may be better predicted, rather than described, by these two stressors.

3.1.3. Measurement Issues and Tools on Immigration-related Stress

The main body of research on immigration and stress focus on particular culturally diverse immigrant groups such as Mexican migrant workers (Magana & Hovey, 2003)(Joseph D Hovey & Magaña, 2002), foreign students (Abdel-Khalek & Al-Damaty, 2003; Sandhu & Asrabadi, 1994; Yeh & Inose, 2003; Ying, 2005), the elderly Arabs (Wrobel, Farrag, & Hymes, 2009), Latino adolescent drug users (Vega, Zimmerman, Warheit, & Gil, 2002), Southeast Asian refugees (Nicassio, Solomon, Guest, & McCullough, 1986), and Indian migrants (Bhattacharya, 2011). Indeed, the bulk of studies focus on one target population, to the extent that a number of instruments have been developed with one particular population group in mind (e.g. Hispanic Stress Inventory by Cervantes, Padilla, & Salgado de Snyder, 1991; or the Multidimensional Acculturative Stress Inventory by (Rodriguez et al., 2002).

On the other hand, Demands of Immigration Scale (Aroian, Norris, Tran, & Schappler-Morris, 1998) focuses on immigration-related issues for immigrants preceding from any cultural origin. The scale consists of 23 items divided into 6 subscales: Loss, Novelty, Occupation, Language, Discrimination, and Not at Home. It shows good psychometric properties, and has been validated in a number of different languages, including Arabic (Aroian, Kaskiri, & Templin, 2008) and Chinese (Tsai, 2002), and has been used with other immigrant groups such as Latinos in the US (Coffman & Norton, 2010).

Although the Demands of Immigration Scale as an assessment instrument shows considerable promise, the Spanish and indeed European immigration context, combined with research that demonstrates the importance of a range of general psychosocial

stressors, requires an instrument more sensitized that captures the heterogeneity of the immigrant population in a given local context. To that end, the Barcelona Immigration Stress Scale was developed (Tomás-Sábado et al., 2007). The instrument consists of 42 items divided into 4 subscales: Rejection, Homesickness, Hopelessness and Discrimination.

3.1.4. Emic vs Etic Approaches in Immigration-related Stress

As noted, many of the existing acculturative stress instruments have been developed for use with specific cultural groups. This clearly has the advantage of responding to the specific situation and characteristics of the different immigrant groups, consistent with what has been called the “cultural psychology” perspective which is “emic” in its focus on specific cultural groups (Valsiner, 2007). This approach makes sense in that it allows for the specificity of the construct to each group; however, this approach lacks the “cross-cultural psychology” or “etic” approach which allows for cross-cultural comparisons and understanding (Triandis, 2000). The difficulty with cross-cultural comparisons, however, relies on the fact that cultural differences are such that certain constructs are derived from such different cultures that it would make no sense to treat them as belonging to the same entity.

This issue on emic versus etic mental health approach is a complex one in the area of measurement. “Equivalence” (Poortinga, 1989) is the implicit notion that exists in any intergroup study in which it is assumed that variance in a given construct is a function of real variance rather than group membership (He & Vijver, 2012). At the same time, research increasingly indicates the centrality of culture in most everything human as exemplified by the cultural neurosciences (Chiao et al., 2010; Lin & Telzer, 2018) . The

meaning of any given notion or experience will have its particular cultural nuances, even within a given culture. Further, research as such would be extraordinarily limited when it strictly follows an emic or relativist approach, in which any given construct can only be examined within a particular cultural context, rendering intercultural or comparative research impossible (Kanarek, 2013; Ulin, 2007).

3.1.5. Study Rationale

The first psychometric evaluation of the BISS was completed with a small number (N=92; Tomás-Sábado et al., 2007) of immigrants in the Barcelona region. It is noteworthy that no Latin Americans were included in this initial sample. Although the initial validation was carried out with the general “immigrant group” taken as coherent, both conceptually and driven by research on similar datasets, we consider it important to acknowledge heterogeneity and as such not simply assume that immigrant groups as a whole will perform in the same way. The cultural competence aspects of such instruments pertain to their flexibility in screening across domains that are adjusted to the situational needs of the immigrant. The original factor structure, although nominally consistent with the proposed model, was not a satisfactory fit, indeed, Tomás-Sábado and colleagues concluded that the instrument best be conceived of as measuring a single construct.

The objective, then, of the current study, as described in paragraph 1.4. of the manuscript, is to examine the psychometric properties, including the internal discriminant validity of the BISS with immigrants, primary care patients in the greater metropolitan area of Barcelona.

3.2. Methods

3.2.1. Previous scale development

As commented in the introduction, an initial set of 42 items was developed and validated by Tomás-Sábado et al. (2007) including subscales on Rejection, Homesickness, Hopelessness and Discrimination. This preliminary version of the scale showed a one-dimensional structure with a very high reliability close to one ($\alpha = .94$). Regarding the anchor points of the scale, a four-point Likert scale (totally agree, moderately agree, moderately disagree, totally disagree) was chosen. This mode allows to avoid middle response bias (Moors, 2008). This scale has been used in several studies on acculturative stress (e.g. Aichberger et al., 2015; Revollo, Qureshi, Collazos, Valero, & Casas, 2011).

3.2.2. Sample and procedure

Participants of the study included all immigrants recruited for the study outlined in chapter 2, across 20 primary health care centres from the autonomous region of Catalonia, most of them located in the province of Barcelona (N=801). On a later stage, 114 immigrants were additionally interviewed from the same primary care centres, with the view to amplify the sample size.

Thus, the sample used for the further psychometric validation of the Barcelona Immigration Stress Scale (BISS) comprised a total of 915 immigrants primary care attendees. Among these, there were North Africans (14.3%), Eastern Europeans (7.2%), Sub Saharans (12.8%), Latin Americans (47.2%) and Asians (18.5%). The sampling strategy corresponded to the ethnic composition of primary care foreign users. Because

of language familiarity, there was a certain bias towards those participants who could respond to the questionnaires without comprehension barriers.

The average age was 33.25 (± 8.9), with a range from 17 to 67 years. Regarding sex composition, 60.7% of the sample were women. The average time of stay in Spain was five years (± 4.2) with a range of 1 month to 30 years. Twenty-five percent of the sample had completed higher education. In addition, a quarter of the sample was currently unemployed. Three quarters of the sample had a monthly income ranging from one to two times the Spain National Minimum Wage. Relatedly, three quarters of the sample had a working permit and 82% a residence permit.

3.2.3. Data analysis

Before analysing the data, we carried an analysis of extreme cases by calculating the mean and standard deviation of all responses for each participant. We excluded from analysis a total of 7 questionnaires that were considered to have responded extremely (all answers corresponding to “Totally disagree”).

We calculated frequencies, asymmetry and kurtosis parameters, as well as item-total correlations, for each item to decide upon its inclusion in exploratory and confirmatory factor analyses (EFAs and CFAs). The former technique was combined with the latter through the identification of stable and theoretically congruent structures appearing in consecutive principal components analyses, whose fit could be tested through structural equation modelling. Through the analysis of item-total correlations, EFA and CFA factor loading valences. Finally, reliability was tested using Cronbach's alpha. All these analyses were performed first for the whole ethnically diverse sample, and, once a coherent, well-fitted structure was identified, for each of the ethnic groups.

The psych (Revelle, 2018), lavaan (Rosseel, 2012), and ltm (Rizopoulos, 2006) packages for the R software (Rizopoulos, 2006) were used to compute all the statistical analyses.

We used an alpha level of .05 for the statistical significance of all tests conducted.

3.3. Results

Frequencies, asymmetry and kurtosis parameters for each item are displayed in Table 6. After an analysis of the data obtained, we decided to remove items that had an asymmetry and kurtosis greater than 1 or less than -1 (7 items, see Table 6). We then calculated Cronbach's alpha for the 35-item scale and Cronbach's alpha, if item deleted, for each item, finding good values ($\alpha=.922$ for the 35 items remaining, all items above $\alpha=.919$). Later, we calculated item-total correlations with the rest of remaining items, and all showed good correlation with the rest of the structure.

Table 6.

Descriptive data of the initial 42-item pool

Item	Title	Frequencies (%)				Asymmetry ¹	Kurtosis ²
		Totally agree	Moderately agree	Moderately disagree	Totally disagree		
**1	I do not feel good in this country.	8.4	11.4	9.0	71.3	-1.468	0.667
*2	Since I moved here, my life has gotten worse.	5.6	7.4	11.3	75.2	-1.954	2.638
*3	I often feel that I am treated like a delinquent.	3.7	4.8	4.6	84.5	-2.834	6.964
4	People here think that immigrants do not have the same social rights.	27.3	17.6	12.6	40.1	-0.193	-1.641
5	I regret having left my country.	12.7	10.2	11.1	65.2	-1.227	-0.065
6	People here would never accept an immigrant in their family.	10.1	10.7	15.6	61.2	-1.217	0.073

Item	Title	Frequencies (%)				Asymmetry ¹	Kurtosis ²
		Totally agree	Moderately agree	Moderately disagree	Totally disagree		
**7	I cannot handle the pace of life in this country.	9.8	9.2	10.6	68.4	-1.442	0.581
8	I am not sure if I want to stay here.	29.5	10.7	9.7	48.5	-0.363	-1657
9	I feel guilty for having left my family.	17.2	9.6	6.4	64.5	-1.041	-0.662
10	Society constantly reminds you that you are an immigrant.	32.0	11.9	9.5	44.2	-0.218	-1.740
11	In this country, immigrants do not have the opportunity to obtain higher-ranking jobs.	25.9	11.9	11.1	48.9	-0.453	-1.537
12	To succeed here one has to renounce one's culture.	14.4	6.6	7.5	69.3	-1.335	0.066
13	I feel that people often do not include me in their activities because I belong to a different culture.	14.2	6.9	8.4	67.8	-1.325	0.069
14	It bothers me that people here do not understand my cultural values.	16.2	8.4	10.1	63.3	-1.107	-0.459
*15	I do not feel accepted here.	8.0	9.0	11.0	70.1	-1.594	1.142
16	People do not trust me because I am an immigrant.	17.5	10.1	11.8	58.3	-0.922	-0.811
*17	I am treated worse because of my appearance.	8.9	6.4	8.4	73.7	-1.807	1.790
18	I feel discriminated against when it comes to finding housing.	18.4	7.3	8.1	63.7	-1.055	-0.643
19	I feel pressured by the people of this country to adopt their lifestyle.	11.1	7.8	9.5	68.7	-1.453	0.535
20	I feel observed when I enter a store because they suspect that I will steal something.	19.9	8.7	7.1	61.9	-0.914	-0.942
21	I feel alone.	25.5	10.7	6.9	55.1	-0.571	-1.480
22	I cannot put up with the situation, which I am in for much longer.	11.4	9.1	8.4	68.3	-1.397	0.349
23	I am worried that I cannot support my family.	34.6	10.7	6.0	46.2	-0.169	-1.815
24	I frequently feel tense.	23.5	14.3	10.4	49.5	-0.475	-1.495
25	I have financial problems.	28.4	16.9	14.0	38.8	-0.153	-1.642
26	I am very worried about my health.	41.9	12.5	9.3	34.1	0.193	-1.747
27	I feel very bad when I think about everything I	31.5	13.2	10.6	42.1	-0.170	-1.731

left behind in my country.

Item	Title	Frequencies (%)				Asymmetry ¹	Kurtosis ²
		Totally agree	Moderately agree	Moderately disagree	Totally disagree		
28	I feel that people observe me when I am out in public.	14.3	10.1	6.4	66.6	-1.170	-0.337
*29	I feel that I have failed.	8.9	4.8	7.3	76.1	-1.943	2.254
30	It is very difficult for me to solve my problems.	18.1	10.8	10.3	57.8	-0.851	-0.973
*31	It worries me that I have involved other people in my decision to immigrate.	11.6	7.2	4.0	73.7	-1.571	0.750
32	I have too many responsibilities.	41.1	12.1	9.0	35.3	0.161	-1.767
33	I do not have adequate housing.	21.2	7.3	8.4	60.4	-0.869	-1.032
34	I feel like I have abandoned my family.	19.7	8.0	6.6	63.5	-0.961	-0.872
35	I do not trust the people of this country.	10.8	8.3	9.6	68.5	-1.446	0.527
36	I miss my family.	64.6	12.7	5.2	14.8	1.321	0.126
**37	It worries me that I cannot educate my children according to my culture.	20.9	8.5	5.8	59.6	-0.849	-1.087
38	I miss the ambience of my hometown.	53.4	15.1	6.8	21.6	0.805	-1.047
* 39	It is difficult for me to practice my religion.	9.5	4.2	3.3	79.9	-2.070	2.582
**40	I feel that I will fail in this country.	16.1	7.0	6.1	67.8	-1.215	-0.286
41	I have felt that my culture is undervalued.	11.4	7.9	8.4	69.3	-1.461	0.530
**42	I feel that I do not belong to this society.	18.9	11.3	9.1	57.8	-0.814	-1.060

* Removed due to asymmetry and/or kurtosis scores. ** Removed within latent structure analysis calculations

¹ The standard error of Asymmetry is between 0.082 and 0.083.

² The standard error of Kurtosis is between 0.164 and 0.166.

Consecutive exploratory factor analyses using Varimax rotations were carried with the 35 remaining items, using the *eigenvalue higher than one* criterion and forcing the structure to 3 and 4 factors. This procedure was repeated, excluding five items with low (<.45) and/or distributed loadings. As there were small differences between three and four factor-solutions in terms of variance explained (42%, 38.2%) and all the items from the two factors explaining less variance in the four-factor solution were grouped into a single factor, we opted for a three-factor solution (Table 7).

Table 7.*Exploratory factor analysis of the 30-item structure with corresponding factor loadings*

Items (30)	Factor Loadings		
	Discrimination	Psychosocial Stress	Homesickness
4 People here think that immigrants do not have the same social rights.	0.594		
5 I regret having left my country.			0.498
6 People here would never accept an immigrant in their family.	0.547		
8 I am not sure if I want to stay here.			0.525
9 I feel guilty for having left my family.			0.583
10 Society constantly reminds you that you are an immigrant.	0.635		
11 In this country, immigrants do not have the opportunity to obtain higher ranking jobs.	0.534		
12 To succeed here one has to renounce one's culture.	0.581		
13 I feel that people often do not include me in their activities because I belong to a different culture.	0.670		
14 It bothers me that people here do not understand my cultural values.	0.648		
16 People do not trust me because I am an immigrant.	0.624		
18 I feel discriminated against when it comes to finding housing.	0.529		
19 I feel pressured by the people of this country to adopt their lifestyle.	0.521		
20 I feel observed when I enter a store because they suspect that I will steal something.	0.530		
21 I feel alone.		0.481	

Items (30)	Factor Loadings		
	Discrimination	Psychosocial Stress	Homesickness
22 I cannot put up with the situation which I am in for much longer.		0.464	
23 I am worried that I cannot support my family.		0.669	
24 I frequently feel tense.		0.630	
25 I have financial problems.		0.694	
26 I am very worried about my health.		0.529	
27 I feel very bad when I think about everything I left behind in my country.			0.597
28 I feel that people observe me when I am out in public.	0.528		
30 It is very difficult for me to solve my problems.		0.650	
32 I have too many responsibilities.		0.544	
33 I do not have adequate housing.		0.456	
34 I feel like I have abandoned my family.			0.564
35 I do not trust the people of this country.	0.530		
36 I miss my family.			0.620
38 I miss the ambience of my hometown.			0.662
41 I have felt that my culture is undervalued.	0.533		

Since Varimax includes orthogonal rotations, which impose the restriction that the factors cannot be correlated, we also considered oblique rotations, by using Oblimin, which allows the factors to be correlated with one another. Since these correlations were found to be less than 0.5, as showed in Table 8, we opted for the EFA applying Varimax rotations.

Table 8.*Factor Correlation Matrix/Oblimin*

	Discrimination	Psychosocial Stress	Homesickness
Discrimination	1.000	0.472	0.419
Psychosocial Stress	0.472	1.000	0.371
Homesickness	0.419	0.371	1.000

Once we identified a coherent three-factor structure (Table 7), we calculated its unidimensionality through Cronbach's alpha and multidimensional fit through confirmatory factor analysis, showing good parameters (Table 9). Table 9 shows unidimensional and multidimensional fits for the 35-item structure, the final 30-item structure as well as unidimensional fit parameters for each final subscale.

Figure 1 shows the CFA path diagram of the final model.

Table 9.*Reliability and confirmatory factor analysis fit parameters*

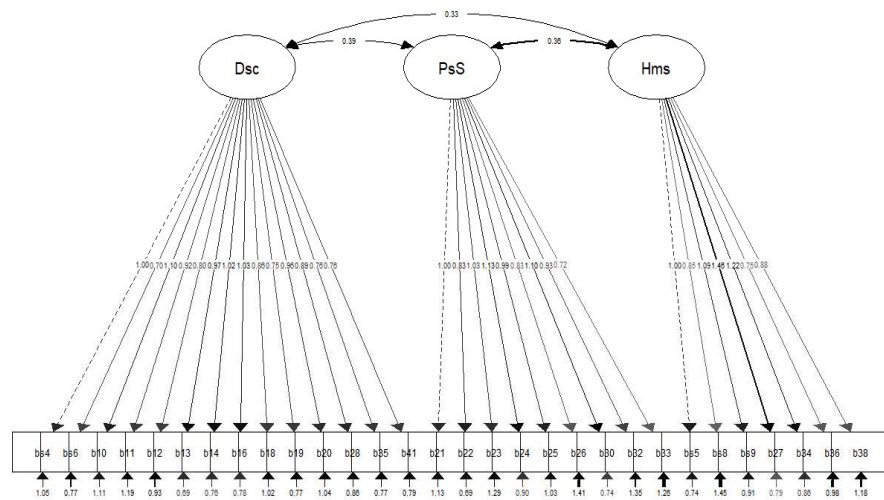
	MFTS	CFI	TLI	RMSEA	SRMR	Alpha
ETHNIC DIVERSE IMMIGRANT SAMPLE						
Unidimensional fit after excluding asymmetric and or leptoplaticurtic items (35 items)	8730.51	.785	.772	.063	.057	.922
Unidimensional fit (final 30 items)	7568.38	.778	.762	.069	.061	.911
Multidimensional fit (35 items)	8730.51	.874	.866	.048	.046	NA
Multidimensional fit (final 30 items)	7568.38	.893	.884	.048	.044	NA
Unidimensionality of final subscales						
Discrimination (14 items)	3348.24	.923	.909	.063	.042	.872
Psychosocial stress (9 items)	1772.93	.938	.918	.068	.041	.801
Homesickness (7 items)	1266.91	.897	.846	.102	.057	.754

MFTS: Minimum Function Test Statistic, CFI: Comparative Fix Index, TLI: Tucker Lewis Index, RMSEA: Root Mean Square Error of Approximation, SRMR: Standardized Root Mean Square Residual.

The dimensions of the final structural model were named as follows: Discrimination (items 4, 6, 10, 11, 12, 13, 14, 16, 18, 19, 20, 28, 35, 41), Psychosocial Stress (items 21, 22, 23, 24, 25, 26, 30, 32, 33) and Homesickness (items 5, 8, 9, 27, 34, 36, 38).

Figure 1.

Structural equations diagram of the final model (30 items) of the scale.



3.3 Discussion

According to our findings, we consider that the further validation of the Barcelona Immigration Stress Scale (BISS) has added value to the instrument in a way that best reflects the common areas of distress experienced by immigrants, who were attending in primary health care centres in Catalonia, Spain. The sample for its further validation (N=951) was larger and more representative to the immigration population in the region, than the one examined for its preliminary validation (N=92) (Tomás-Sábado et al., 2007). Moreover, the earlier version of the BISS understands immigration stress as a single factor construct, such that the total score, rather than subscale scores, is used for assessments. However, the further validated version of the scale underlines the importance of screening immigration stress across domains that are adjusted to the situational needs of the immigrant.

Results show three final dimensions/subscales, namely: Discrimination, Psychosocial Stress and Homesickness. The final structure of the BISS demonstrated an adequate fit according to CFA parameters and good reliability.

The subscale of Discrimination addresses the perceived discrimination on immigrants' acculturation (Mossakowski, 2003; Schnittker, 2011). Perceived discrimination can be conceived as a belief that one has been treated unfairly because of one's origin. It may result from a sense of being differentially treated in public places or of being barred access to sources of information, social networks, and peer groups. In a sense, perceived discrimination indicates the nature of the interaction between immigrants and the receiving society. It shows the incongruence between the

orientation and expectations that immigrants and the receiving society have of each other (Jasinskaja-lahti, Liebkind, Jaakkola, & Reuter, 2006). It constitutes a negative life experience and a potential source of chronic stress and, thus, can explain deficiencies in immigrants' well-being and health, resulting to a disruptive effect on social adjustment in the host society (Liebkind, Jasinskaja-Lahti, & Solheim, 2004).

The subscale of Psychosocial Stress refers to any everyday life stressors that may condition the wellbeing of the immigrant, such as issues related to housing, family, work and other responsibilities (Arbona et al., 2010; Hoppe, 2011; Hovey & Magaña, 2000). Such stressors are not unique to the post-migration phase, since native populations may also face similar life challenges in everyday life in the same social contexts where immigrants are studied.

The subscale of Homesickness refers to the distress caused by actual or anticipated separation from familiar or loved people or places (Thurber, 1999). According to Thurber, it is mostly accompanied by cognitive components such as acute longing and intrusive thoughts about home and attachment objects. Stroebe and colleagues (2002) have proposed that homesickness results from the combined effects of loss (loss-orientation) and adjustment to the new situation (restoration-orientation). Just as grieving people must cope with the loss experience and changes to their circumstances, Stroebe and colleagues proposed that homesick individuals must cope with the loss (even if temporary) of their family and friends, as well as their changed circumstances.

The clinical implications of the study include a culture-sensitive approach in screening for immigration-related stress in primary health care. Immigration stress may

compromise the physical and mental health of individuals if not identified and addressed by clinicians (Bhugra, 2004). The BISS tool can allow early screening and detection of such stressors/risk factors contributing to the prevention of mental health problems linked to immigration in the host countries (Patino & Kirchner, 2010). It describes an efficient clinical tool that permits primary health care professionals to capture a global picture of the immigrant patient's psychosocial profile towards the prevention and treatment of post-immigration related mental conditions.

The present validation of BISS holds an etic approach, while acknowledging that immigration stress is a multi-dimensional construct, and its effective measurement in primary health care depends on the flexibility in understanding the situational needs of every immigrant/individual across the three subscales identified. Further research, endorsing an emic approach, is in progress on examining the validity and reliability of the three BISS subscales for each ethnic origin: North Africans, Eastern Europeans, Sub Saharans, Latin Americans and Asians. The further validated scale would also need to be tested in primary health care settings outside Barcelona, Catalonia, in other clinical settings, such as in mental health speciality units, and in different cultural contexts of host countries.

Conclusion

In conclusion, the new validated BISS scale provides specificity to the structure of the model with very good psychometric properties. As a multi-dimensional instrument, it can serve in understanding the various socio-cultural factors that may cause distress among immigrants when examined at primary health care settings.

CHAPTER 4 • Predictors of somatization among Immigrants and Native-born Spanish Primary Health Care patients

4.1. Introduction

So far, we have explored the phenomenon of somatization in Spanish primary health care settings among immigrants and natives (Chapter 2). In addition, while taking into account the social factors that shape the experience and expression of mental and physical symptoms, we specified the immigration stress-related risk factors that shape such manifestations at post-migration level in the given Spanish context (Chapter 3). With a view to examine in-depth the qualitative, rather than quantitative differences in the incidence of somatic symptoms between immigrants and Spanish native born primary health care patients, we proceed to investigate the predictors that influence the incidence of somatization in culture-diverse population groups.

According to Kirmayer and Ryder (2016) attention to mediators of somatization involves unpacking longstanding stereotypes to understand the cognitive, emotional and social factors that influence symptom experience and expression. To our understanding, exploring the independent effects of culture on somatization may result in a suppression or a magnification of such an effect. Cultural differences related to somatization may be more pronounced among people with specific sociodemographic characteristics related to gender, age, education and social circumstances associated with post-migration, such as immigration-related stress and time spent in the host country, dependently or independently of physical and mental morbidities. This

interactive perspective may allow more precise estimations in the effect of culture on somatization.

Although our sample comes from primary care settings, which likely conditions the attribution styles of experienced somatic symptoms by the individual and, thus, the corresponding health-seeking behaviors, as stated in the earlier chapters, the literature reviewed to support the study on backset the potential predictors of somatization, stems from both culture-diverse population studies (Escobar, Burnam, Karno, Forsythe, & Golding, 1987; Kirmayer et al., 2004) and primary care settings (Jyväsjarvi et al., 2001; Mumford, Devereux, et al., 1991; Simon, Gater, Kisely, & Piccinelli, 1996).

4.1.1. Predictors of somatization

When the bodily nature and cultural meaning of mental suffering is assessed and validated, most patients acknowledge that stress, emotions and social circumstances have an effect on their physical condition (Kirmayer, 2004). Based on the findings of a telephone survey of a stratified random sample of 2,400 residents in a culturally diverse inner-city neighborhood in Canada by Kirmayer et al. (2004), the only predictor of medically unexplained symptoms (MUPS) was psychological distress, as measured by the GHQ instrument. People who reported more MUPS in the past 12 months made significantly more visits to a general practitioner, but not to specialists, including psychiatrists and other mental health practitioners. In a large-scale population study in Los Angeles, USA (N=3,312), conducted by Escobar et al. (1987), the somatization construct was found to be positively associated with sociodemographic and psychopathological factors such as older age, female and the presence of a psychiatric diagnosis, particularly major depressive and dysthymic disorders.

Similar results are encountered in primary health care practice. Anxiety, depression and physical illness were found to be independent predictors of somatization, as measured by Bradford Somatic Inventory (Mumford, Bavington, et al., 1991), in general practice (Mumford, Devereux, et al., 1991). The perceptual style such as somatosensory amplification has been suggested to foster somatization (Wise & Mann, 1994). Based on the findings of a case-control study (Jyväsjärvi et al., 2001), that investigated the association of somatization, as measured by SCL-36 somatization subscale (Derogatis, Lipman & Covi, 1973), and frequent attendance in primary health care, hypochondriacal beliefs and psychiatric comorbidity explained frequent attendees' somatization.

Apart from mental and/or physical comorbidities, which may predict somatization in primary care, sociodemographic variables have also been examined. The World Health Organization's (WHO) Psychological Problems in General Health Care (PPGHC) study across 15 nations (N=5,438) corroborated the moderate inverse relationship between level of education and prevalence of somatization (Simon, Gater, Kisely, & Piccinelli, 1996). The international study also illustrated that both somatization disorder, as assessed per the DSM-IV-TR, and somatization, as measured by the Somatic Symptom Index (SSI, Escobar et al., 1989), tend to be associated with older age of the respondent. Individuals above 45 years demonstrated a higher risk for somatization symptoms and disorders than those 31 to 44 years of age (Gureje et al., 1997).

Based on the same international database, Piccinelli and Simon (1997) noted that females reported higher levels of somatic symptoms and emotional distress than males, while a strong correlation between somatic symptoms and emotional distress was found in both sexes. Medically unexplained symptoms are more common in women

and the effect of gender on somatic symptom reporting is independent of psychiatric morbidity (Kroenke & Spitzer, 1998). Even at psychopathological level, a systematic review of 47 studies examining the epidemiology of somatization disorder and hypochondriasis illustrated a clear female predominance in both disorders. The review also observed a consistent relationship between these two disorders and few years of education and frequent comorbidity with anxiety and depressive disorders (Creed & Barsky, 2004).

4.1.2. Predictors of somatization specific to Immigrants

Barsky (1979), summarizing a large body of early literature, observed that somatization is more common among ethnic groups that discourage the direct expression of emotional distress. Early research in this area suggested that patients of Hispanic or Asian origin often expressed psychological distress in somatic terms and frequently denied any potential link between psychological distress and somatic symptoms (Escobar et al., 1987; Kirmayer & Groleau, 2001; Parker, Cheah, & Roy, 2001). More recent studies have called that interpretation into question. For example, a cross-sectional community study in an urban setting in Chile indicated that Hispanic subjects were generally aware of the link between somatic symptoms and psychological health and did not attempt to hide or “mask” their psychological symptoms (Skapinakis & Araya, 2011). Across the neutral/expressive continuum of Mendez (2010), people from “neutral cultures” of origin, such as Asians, tend to “somatize” their mental suffering more than people from “expressive cultures” of origin, such as Latinos, who tend to “psychologize” their mental conditions. These considerations, although contradictory in

their findings, seem to provide evidence that it is impossible to consider immigrants as a homogeneous group (Carta et al., 2005), as it has been discussed in Chapter 1.

Immigrants do not only comprise a diverse and heterogeneous group of the general population, but also their mental problems are subject to the social context where they are expressed. In Spain, research has been carried out on mental and psychosomatic disorders in immigrant populations. Their findings indicate the following factors associated with such conditions: labor and economic instability, cultural and social marginalization, family estrangement, pressures to send money to their families, racial discrimination and lack of statutory documentation (Bernal, 2003; Celaya, 1993; Ugarte, 1993; de la Vega, 1993).

Schick et al. (2016) report that post-migration living difficulties are more strongly associated with psychological distress than the sociodemographic characteristics of the individuals. Among immigrants, who report homesickness, somatic responses such as stomachache, headaches, loss of appetite and sleeping disturbances are common (Watt & Badger, 2015). Heightened levels of psychosomatic symptoms have been observed among immigrants who perceive themselves as a target or victim of discrimination by members of the dominant culture group (Jasinskaja-lahti et al., 2006). The post-migration environment has been shown to have a considerable influence on mental health regardless of prior traumatic exposures, with the level of social support in exile an important determinant of the severity of possible psychopathology (Lie, 2002).

Further, the time spent in the host country, as reflected in the concept of “healthy immigrant effect” (Cunningham et al., 2008; Calderón-Larrañaga et al., 2011; Constant et al., 2018; Vang et al., 2017b) and the cultural distance between the culture of origin and the host culture, expressed as “cultural congruity” (Bhugra & Arya, 2005), seem to

play a key role in understanding the bodily manifestations of suffering as cultural products of an inter-cultural adaptive integrative process. The concepts have been previously discussed in this manuscript under paragraphs 2.1.2 and 2.4.1.

4.1.3. Study Rationale

Our work illustrated in the previous chapters, and the literature reviewed on the factors that are associated with the phenomenon of somatization in primary health care, introduces the present study on the predictors of somatization among immigrants and native-born Spanish patients in primary health care settings. The study objectives are described under paragraph 1.4.

4.2. Methods

4.2.1. Sample

For the analyses of the present study we treated the two sample sets used for the studies outlined in chapters 2 and 3 as separate ones. The first one (N= 3,006), referred to as sample ARAGAT, corresponds to the one utilized for exploring the phenomenon of somatization in immigrant (N=1,503) and native-born (N=1,503) primary care patients in Catalonia and Aragón autonomous regions of Spain (Chapter 2), and the second one, referred to as sample BISS, corresponds to the immigrants' sample (N= 915) of primary health care used for conducting the further validation of Barcelona Immigrants Stress Scale (BISS) (Chapter 3). Details on the samples' sociodemographic

characteristics of interest are included in the respective chapters (paragraphs 2.2.1 and 3.2.2.).

4.2.2. Assessment instruments

The assessment instruments are described in paragraph 2.2.2. These included a dichotomous question on self-perceived physical health, MINI International Neuropsychiatric Interview to diagnose psychiatric morbidity, GHQ-12 to assess mental health well-being, GADS to screen for generalized anxiety and depression and the somatic symptoms section of SPPI to assess general somatization. All instruments were administered in Spanish.

Additionally, the BISS subscales on Discrimination, Psychosocial stressors and Homesickness were included in the analyses. Taking into account that the responses on the subscales were on a 4-point Likert scale the corresponding minimum and maximum scores were as follows: BISS Discrimination: minimum score 14 maximum 56; BISS Psychosocial stressors: minimum 9, maximum 36; BISS Homesickness: minimum 7 maximum 28.

4.2.3. Variables

Our dependent variable was the incidence of general somatization (yes/no). The variable of interest/independent variable included the group of origin (immigrants, Spanish natives) or ethnic origin of immigrants (North African, Eastern European, Sub Saharan, Latin American and Asian). Across the course of the analysis, we examined the predictive value of several other independent variables, including: age, gender and educational attainment, self-reported physical health, mental health well-being (GHQ-

12), anxiety-related symptoms (GADS-Anxiety), depression-related symptoms (GADS-Depression) as well as general psychiatric morbidity (MINI), current general anxiety disorder (MINI) and current major depression (MINI). For the analysis conducted for the sample of immigrants, we additionally examined the predictive value of the three BISS subscales/dimensions: Discrimination, Psychosocial Stress and Homesickness, and the time spent in Spain.

4.2.4. Data Analysis

Analyses were conducted using SPSS 23.0 (Statistics IBM, 2015). First, we conducted bivariate analyses and tests of mean differences for each independent variable to determine whether it was significantly related to the incidence of general somatization. Odds ratio and Chi-square tests within crosstabs and t-tests were used in order to address the statistical associations. Then, we utilized three series of binary logistic multiple regressions with general somatization as the outcome measure/dependent variable. The multiple regression series occurred in the following order: first, we examined the relation between group of origin and somatization while controlling for age, gender and educational attainment (Model 1: Socio-demographics). Then, we incorporated self-perceived physical health, GHQ-12 mental health well-being, GADS anxiety and GADS depression (Model 2: Mental health Symptomatology). Finally, we incorporated in Model 1 self-perceived physical health, MINI psychiatric morbidity, MINI generalized anxiety disorder and MINI major depression (Model 3: Psychopathology). The three series were repeated for the sample of the immigrants' sample group with the difference that in Model 1 we included their ethnic group of

origin (5 groups), instead of group of origin, the scores on BISS subscales (3) and the time spent in Spain.

We used an alpha level of .05 for the statistical significance of all tests conducted.

4.3. Results

4.3.1. Descriptive Statistics

The descriptive characteristics of the two sample sets examined have been discussed in Chapters 2 and 3 respectively.

4.3.2. Bivariate Analyses

Prior to conducting regression analyses, we conducted bivariate logistic regression analyses with each of our independent variables and the outcome variable/dependent variable, i.e. general somatization. These results are displayed in Tables 10 and 11 for both sample sets examined, sample ARAGAT and sample BISS.

For the ARAGAT sample (Table 10). As concluded in Chapter 1, the group of origin did not demonstrate a significant relationship with general somatization. Female patients reported more somatic symptoms than male ones (OR=2.697, 95% CI: [2.069, 3.516]). No significant differences were encountered in terms of age. Significant differences were observed in regard with educational attainment as patients with primary education endorsed more somatic symptoms to the rest ($\chi^2_{(3)} = 14.058, p = .003$). Patients with self-perceived physical illness were significantly more likely to present higher incidents of somatization (OR=2.544, 95% CI: [2.010, 3.219], $p < .001$). Significant

mean differences on general somatization were found in relation to mental health well-being, anxiety and depressive symptomatology. Patients who scored higher at GADS-Anxiety ($t_{(457.304)} = 18.986$, 95% CI: [-3.508, -2.850], $p < .001$) and GADS-Depression ($t_{(429.767)} = 17.416$, 95% CI: [-2.842, -2.266], $p < .001$) subscales reported significantly higher mean levels of somatization. The effect sizes were large in both cases (d Cohen > 0.80). Finally, primary care patients diagnosed with current psychiatric disorder (OR= 5.695, 95% CI: [4.531, 7.157], $p < .001$), current major depression (OR=7.196, 95% CI: [5.603, 9.243]) and general anxiety disorder (OR=4.892, 95% CI: [3.649, 6.559]) were significantly less likely to present general somatization symptoms.

Table 10.

Bivariate analyses examining links to general somatization: Sample set of immigrant and native-born primary care patients (N= 3,006; sample ARAGAT)

	General Somatization* (SPPI)					
	Yes		No		Effect size Cohen d	Significance
	Mean	SD	Mean	SD		
Age (years)	33.10	9.615	32.51	9.376	0.062	$t_{(2,928)} = -1.134$, 95% CI: [-1.610, 0.430], $p = .257$
GHQ-12	16.43	13.501	12.72	10.886	0.303	$t_{(436.945)} = 5.024$, 95% CI: [-5.161, -2.259], $p < .001$
GADS-Anxiety	5.27	3.082	2.09	2.625	1.111	$t_{(457.304)} = 18.986$, 95% CI: [-3.508, -2.850], $p < .001$
GADS-Depression	3.68	2.731	1.13	1.959	1.073	$t_{(429.767)} = 17.416$, 95% CI: [-2.842, -2.266], $p < .001$
	N	%	N	%	Significance	
Group of origin						
Immigrants	194	13.1%	1,284	86.9%		
Native-born	181	48.3%	1,271	87.5%		
						$\chi^2 = 0.286$, OR= 1.061, 95% CI: [0.854, 1.318], $p = .593$

		N	%	N	%	Significance
Gender	<i>Female</i>	300	16.4%	1,526	83.6%	$\chi^2=57.240$, OR=2.697, 95% CI: [2.069, 3.516], p< .001
	<i>Male</i>	75	6.8%	1,029	93.2%	
Educational Attainment	<i>No schooling</i>	4	6.5%	58	93.5%	$\chi^2(3) = 14.058$, p= .003
	<i>Primary</i>	123	16.1%	641	83.9%	
	<i>Secondary</i>	158	12.8%	1,074	87.2%	
	<i>University</i>	88	10.4%	759	89.6%	
Self-perceived physical health	<i>Presence of physical illness</i>	133	35.8%	453	77.3%	$\chi^2=63.567$, OR=2.544, 95% CI: [2.010, 3.219], p< .001
	<i>Absence of physical illness</i>	238	10.3%	2,062	89.7%	
MINI psychiatric disorder, current		221	59.4%	514	69.9%	$\chi^2=259.169$, OR= 5.695. 95% CI: [4.531, 7.157], p< .001
MINI major depression, current		148	41.1%	212	58.9%	$\chi^2=294.297$, OR=7.196, 95% CI: [5.603, 9.243], p< .001
MINI generalized anxiety disorder, current		86	37.1%	146	62.9%	$\chi^2=132.164$, OR=4.892, 95% CI: [3.649, 6.559], p< .001

* Note: N/% of general somatization represent values within the specific psychiatric disorder examined.

For the BISS sample (Table 11). Age, time spent in Spain and educational attainment were not significantly associated to the incidence of general somatization. The relationship between ethnic group of origin and general somatization was significant. Latin American immigrants (13.4%) were more likely to present more somatic symptoms than the rest. Female patients were more likely to present somatic symptoms than male ones. Significant mean differences on somatization were observed in relationship to the three immigration stress-related dimensions: discrimination, psychosocial stress and homesickness. Mean BISS sub-scale scores were higher among immigrant patients with no incidence of somatization. Significant mean differences were

also found in relation to mental health well-being, anxiety and depressive symptomatology. Contrary to the results of the ARAGAT sample (Table 10), immigrant primary care patients with a self-perceived illness were less likely to report somatic symptoms (OR= 0.384, 95% CI: [0.235, 0.629]). Patients who scored higher at GADS-Anxiety ($t_{(896)}= 12.055$, 95% CI: [3.073, 4.269], $p < .001$) and GADS-Depression ($t_{(99.791)}= 10.054$, 95% CI: [2.410, 3.594], $p < .001$) subscales reported significantly higher mean levels of somatization. The effect sizes were large (Cohen $d > 0.80$). Finally, primary care immigrant patients diagnosed with current psychiatric disorder (OR= 5.695, 95% CI: [4.531, 7.157]), current major depression (OR= 6.460, 95% CI: [3.998, 10.437], $p < .001$) and general anxiety disorder (OR= 3.859, 95% CI: [1.648, 9.035], $p < .001$) were significantly less likely to present general somatization symptoms.

Table 11.

Binary analyses examining links to general somatization: Sample set of immigrant primary care patients (N=915, sample BISS)

	General Somatization (SPPI)				Effect size Cohen d	Significance
	Yes		No			
	Mean	SD	Mean	SD		
Age (years)	33.511	8.67	33.278	8.94	0.026	$t_{(897)}= 0.236$, 95% CI: [1.710, 2.176], $p= .814$
Time in Spain (months)	56.42	51.182	62.95	50.311	-0.129	$t_{(897)}= -1.166$, 95% CI: [-17.523, 4.459], $p= .244$
BISS Discrimination	40.229	11.465	44.78	9.744	-0.428	$t_{(95.814)}= -3.478$, 95% CI: [-4.551, 1.308], $p= .001$
BISS Psychosocial Stress	20.202	7.742	26.065	6.809	-0.804	$t_{(97.505)}= -6.665$, 95% CI: [-7.608, -4.116], $p < .001$

	General Somatization (SPPI)					
	Yes		No		Effect size Cohen d	Significance
	Mean	SD	Mean	SD		
BISS Homesickness	16.153	5.735	19.031	5.347	-0.519	t ₍₈₅₈₎ = -4.677, 95% CI: [-4.086, -1.670], p< .001
GHQ-12	27.42	6.856	22.10	5.179	0.876	t _(100.640) = 7.137, 95% CI: [3.841, 6.798], p< .001
GADS-Anxiety	5.92	2.942	2.25	2.717	1.296	t ₍₈₉₆₎ = 12.055, 95% CI: [3.073, 4.269], p< .001
GADS-Depression	4.27	2.729	1.27	2.098	1.233	t _(99.791) = 10.054, 95% CI: [2.410, 3.594], p< .001
3.841, Ethnic Group	N	%	N	%		Significance
<i>North African (14.3%)</i>	12	9.4%	115	90.6%		$\chi^2(4) = 11.704, p= .020$
<i>Eastern European (7.2%)</i>	4	6.2%	61	93.8%		
<i>Sub-Saharan (12.8%)</i>	7	6.0%	109	94%		
<i>Latin American (47.2%)</i>	57	13.4%	368	86.6%		
<i>Asian (18.5%)</i>	10	6%	158	94%		
Gender						
<i>Female</i>	74	13.5%	473	86.5%		$\chi^2= 19.398, OR= 0.303,$ 95% CI: [0.173, 0.529], p< .001
<i>Male</i>	16	4.5%	338	95.5%		
Educational Attainment						
<i>No schooling</i>	3	7%	40	93%		$\chi^2(3) = 5.997, p= .112$
<i>Primary</i>	21	11.4%	164	88.6%		
<i>Secondary</i>	51	11.6%	387	88.4%		
<i>University</i>	14	6.1%	215	93.9%		
Self-perceived physical health						
<i>Presence of physical illness</i>	27	19.3%	113	80.7%		$\chi^2= 15.330, OR= 0.384,$ 95% CI: [0.235, 0.629], p< .001
<i>Absence of physical illness</i>	63	70%	686	91.6%		
MINI psychiatric disorder, current	49	29.9%	115	70.1%		$\chi^2= 88.210, OR= 4.569,$ 95% CI: [4.569, 11.450], p< .001
MINI major depression, current	37	31.9%	79	68.1%		$\chi^2= 70.940, OR= 6.460,$ 95% CI: [3.998, 10.437], p< .001
MINI generalized anxiety disorder, current	8	28.6%	20	71.4%		$\chi^2= 11.099, OR= 3.859,$ 95% CI: [1.648, 9.035], p< .001

Note: N/% represent values within the independent variable examined.

4.3.3. Binary Logistic Regression Models

The three models of binary regression analyses were conducted for the ARAGAT sample (N=3,006) of primary health care immigrant and native Spanish patients in Aragón and Catalonia autonomous regions and the BISS sample (N=915) of immigrant primary care patients in Barcelona province of Catalonia. The corresponding results are presented in Tables 12 and 13.

For the ARAGAT sample (Table 12). Model 1 of socio-demographic characteristics included group of origin (immigrants and natives as reference group), gender (male as reference group), age, educational attainment (no schooling as reference group, primary, secondary and university). Gender was found to be a reliable predictor of general somatization, with female patients more likely to present general somatization than males (OR =2.787, 95% CI: [2,132, 3.643], $p < .001$). When compared to patients with no schooling, those with university education reported significantly more somatic symptoms (OR= 1.590, 95% CI: [0.553, 4.566], $p < .001$). The rest of the independent variables were not found to be significant predictors of somatization within Model 1 of sociodemographic characteristics. The model had a good fit (Hosmer-Lemeshow test; $\chi^2_{(8)} = 8.292$, $p = .405$) explaining a 2.7% of the total variance for general somatization (R-squared statistics; Cox = 0.027). The most important predictors in order of the weight of coefficients (Wald) were gender and education.

Model 2, which refers to the mental health symptomatology model, includes the independent variables of Model 1 as well as the independent variables of self-perceived physical health (absence of physical illness as the reference group), mental health well-being (total score GHQ-12), depression-related symptomatology (GADS-Depression sub-

score) and anxiety-related symptomatology (GADS-Anxiety sub-score). According to Model 2, gender, self-perceived physical health, mental health well-being as well as anxiety and depression as assessed by GADS screening instrument were observed to be reliable predictors of somatization. Female patients (OR= 2.111, 95% CI: [1.571, 2.837], $p < .001$) and patients who reported a physical illness (OR= 1.930, 95% CI: [0.600, 6.205], $p < .001$) were more likely to manifest somatic symptoms than male respondents and those who did not report a physical illness. Mental health well-being was found to be a marginally significant predictor of somatization (OR=0.989, 95% CI: [0.979, 1.000], $p = .049$), while GADS-anxiety symptomatology (OR= 1.248, 95% CI: [1.184, 1.317]) and GADS-depression (OR= 1.234, 95% CI: [1.159, 1.315]) were found to be significant predictors too. The model had a good fit (Hosmer-Lemeshow test; $\chi^2_{(8)} = 11.219$, $p = .190$) explaining a 14.9% of the total variance for somatization (R-squared statistics; Cox= 0.149). The most important predictors of the mental health symptomatology model (Model 2) in order of the weight of coefficients (Wald) were anxiety-related symptoms (GADS), depression-related symptoms (GADS), gender and self-perceived physical illness.

Model 3, which refers to the psychopathology-related model, includes the independent variables of Model 1 and additionally, self-perceived physical illness, psychiatric morbidity (MINI), major depression (MINI) and generalized anxiety disorder (MINI). The significant predictors of the model in order of the weight coefficients (Wald) were gender (female; OR= 2.67, 95% CI: [2.006, 3.571], $p < .001$), psychiatric morbidity (OR= 3.069, 95% CI: [2.167, 4.346], $p < .001$), self-perceived physical illness (OR= 2.027, 95% CI: [2.167, 4.346], $P < .001$) major depression (OR= 2.149, 95% CI: [1.512, 3.053], $p < .001$) and generalized anxiety disorder (OR= 1.443, 95% CI: [1.011, 2.058], $p = .043$). The

model had a good fit (Hosmer-Lemeshow test; $\chi^2_{(8)}= 8.932$, $p= .348$) explaining a 11.5% of the total variance for somatization (R-squared statistics; Cox= 0.115).

Table 12.

Binary logistic regression models for general somatization (SPPI) as a dependent variable (sample ARAGAT, N=3,006)

Model/Predictors						
Model 1: Socio-demographics	B	Wald	df	OR	95% CI	p
Group of origin Reference Category: Natives	0.069	0.366	1	1.071	[0.857, 1.340]	.545
Gender Reference Category: Male	1.025	56.229	1	2.787	[2.132, 3.643]	< .001
Age	0.006	0.908	1	1.006	[0.994, 1.017]	.341
Educational attainment Reference Category: University						
No schooling		15.694	3			.001
Primary	1.022	3.676	1	2.779	[0.977, 7.902]	.055
Secondary	0.735	1.912	1	2.085	[0.736, 5.907]	.167
University	0.463	37.323	1	1.590	[0.553, 4.566]	< .001

*Goodness of fit: Hosmer-Lemeshow test; $\chi^2_{(8)}= 8.292$, $p= .405$
R-squared statistics, Cox & Snell $R^2= .027$*

Model 2: Mental Health symptomatology	B	Wald	df	OR	95% CI	p
Group of origin Reference Category: Natives	0.056	0.187	1	1.057	[0.821, 1.361]	.665
Gender Reference Category: Male	0.747	24.583	1	2.111	[1.571, 2.837]	< .001
Age	-0.003	0.152	1	0.997	[0.984, 1.011]	.697
Educational attainment Reference Category: No schooling						
No schooling		3.863	3			.277
Primary	0.889	2.259	1	2.433	[0.763, 7.760]	.133
Secondary	0.699	1.411	1	2.013	[0.635, 5.381]	.235
University	0.658	1.218	1	1.930	[0.600, 6.205]	.270

Self-perceived physical health Reference Category: Absence of physical illness	0.581	16.323	1	1.930	[0.600, 6.205]	< .001
GHQ-12	-0.011	3.879	1	0.989	[0.979, 1.000]	.049
GADS-Anxiety	0.222	66.465	1	1.248	[1.184, 1.317]	< .001
GADS-Depression	0.210	42.746	1	1.234	[1.159, 1.315]	< .001

Goodness of fit: Hosmer-Lemeshow test; $\chi^2_{(8)} = 11.219$, $p = .190$
R-squared statistics, Cox & Snell $R^2 = 0.149$

Model 3: Psychopathology	B	Wald	df	OR	95% CI	p
Group of origin Reference Category: Natives	0.124	0.975	1	1.132	[0.885, 1.447]	.323
Gender Reference Category: Male	0.985	44.800	1	2.677	[2.006, 3.571]	< .001
Age	0.001	0.011	1	1.001	[0.988, 1.014]	.917
Educational attainment Reference Category: No schooling						
No schooling		4.495	3			.213
Primary	0.868	2.296	1	2.381	[0.775, 7.317]	.130
Secondary	0.689	1.458	1	1.992	[0.651, 6.096]	.227
University	0.600	1.078	1	1.992	[0.651, 6.096]	.299
Self-perceived physical health Reference Category: Absence of physical illness	0.707	25.867	1	2.027	[1.544, 2.662]	< .001
MINI psychiatric disorder, current Reference Category: Absence of disorder	1.121	39.897	1	3.069	[2.167, 4.346]	< .001
MINI major depression, current Reference Category: Absence of disorder	0.765	18.210	1	2.149	[1.512, 3.053]	< .001
MINI generalized anxiety disorder, current Reference Category: Absence of disorder	0.366	4.085	1	1.443	[1.011, 2.058]	.043

Goodness of fit: Hosmer-Lemeshow test; $\chi^2_{(8)} = 8.932$, $p = .348$
R-squared statistics, Cox & Snell $R^2 = 0.115$

For the BISS sample (Table 13). The same series of binary logistic regressions were performed for the BISS primary care sample of immigrants with the difference that Model 1 included independent variables, which address specific post-immigration factors.

The model related to socio-demographics (Model 1) included as independent variables ethnic group (Asian as reference group), gender (male as reference group), age, educational attainment (no schooling as reference group), time spent in Spain and the BISS sub-scale scores of Discrimination, Psychosocial Stress and Homesickness. The two significant predictors of somatization for this model, in order of the weighted coefficients (Wald), were psychosocial stress (OR= 0.893, 95% CI: [0.854, 0.934], $p < .001$) and gender (OR= 3.518, 95% CI: [1.781, 6.949], $P < .001$). The model had a good fit (Hosmer-Lemeshow test; $\chi^2_{(8)} = 9.690$, $p = .287$) explaining 8.9% of the total variance for somatization (R-squared statistics; Cox= 0.089).

Model 2 examines the predictive value of the independent variables of Model 1, self-perceived physical health as well as those that measure mental health symptomatology in terms of mental health well-being (GHQ-12) as well as anxiety- and depression- related symptoms (GADS). in order of the weighted coefficients (Wald), the significant predictors of somatization in this model were GADS-anxiety (OR= 1.313, 95% CI: [1.159, 1.488], $p < .001$), GADS-depression (OR= 1.319, 95% CI: [1.142, 1.524], $p < .001$), gender (female, OR= 3.221, 95% CI: [1.552, 6.686], $p = .002$) and self-perceived physical illness (3.825, 95% CI: [0.999, 3.695], $p = .050$). The model had a good fit (Hosmer-Lemeshow test; $\chi^2_{(8)} = 8.231$, $p = .411$) explaining 16.4% of the total variance for somatization (R-squared statistics; Cox= 0.164).

Model 3, which included Model 1 independent variables, self-perceived physical health as well as psychiatric morbidity, major depression, generalized anxiety disorder according to MINI, refers to the psychopathology-related model. The significant predictors, in order of the weight of coefficients (Wald), were gender (OR= 3.746, 95% CI: [1.831, 7.665], $p < .001$) any psychiatric disorder (OR= 4.112, 95% CI: [1.686, 10.029], $p = .002$), psychosocial stress (OR= 0.931, 95% CI: [0.886, 0.979], $p = .05$) and self-perceived physical illness (OR= 2.198, 95% CI: [1.185, 4.077], $p = .012$). The model had a good fit (Hosmer-Lemeshow test; $\chi^2_{(8)} = 5.526$, $p = .700$) explaining 16.4% of the total variance for somatization (R-squared statistics; Cox= 0.121).

Table 13.

Binary logistic regression models for general somatization (SPPI) as a dependent variable (sample BISS, N=915)

Predictor	B	Wald	df	OR	95% CI	p
Model 1: Socio-demographics						
Ethnic Group						
Reference Category: Asian						
<i>North African</i>	0.057	0.011	1	1.058	[0.362, 3.095]	.917
<i>Eastern European</i>	0.083	0.015	1	1.086	[0.284, 4.158]	.904
<i>Sub-Saharan</i>	-0.270	0.210	1	0.764	[0.241, 2.417]	.647
<i>Latin American</i>	0.230	0.252	1	1.259	[0.512, 3.092]	.616
<i>Asian</i>		1.260	4			.868
Gender	1.258	13.121	1	3.518	[1.781, 6.949]	< .001
Reference Category: Male						
Age	0.007	0.236	1	1.007	[0.978, 1.038]	.627
Educational attainment						
Reference Category: No schooling						
No schooling		1.851	3			.604
Primary	0.348	0.179	1	1.416	[0.283, 7.086]	.672
Secondary	0.407	0.255	1	1.502	[0.309, 7.296]	.614
University	-0.030	0.001	1	0.971	[0.186, 5.058]	.972
Time in Spain (months)	0.000	0.004	1	1.000	[0.995, 1.006]	.950

BISS Discrimination	0.006	0.147	1	1.006	[0.976, 1.036]	.702
BISS Psychosocial Stress	-0.113	24.619	1	0.893	[0.854, 0.934]	< .001
BISS Homesickness	0.000	0.000	1	1.000	[0.947, 1.056]	.996

Goodness of fit: Hosmer-Lemeshow test; $\chi^2_{(8)} = 9.690$, $p = .287$
R-squared statistics, Cox & Snell $R^2 = .089$

Model 2: Mental Health symptomatology	B	Wald	df	OR	95% CI	p
Ethnic Group						
Reference Category: Asian						
North African	-0.295	0.246	1	0.745	[0.233, 2.385]	.620
Eastern European	-0.239	0.106	1	0.788	[0.187, 3.319]	.745
Sub-Saharan	0.002	0.000	1	1.002	[0.286, 3.514]	.997
Latin American	-0.388	0.605	1	0.678	[0.255, 1.805]	.437
Asian		0.973	4			.914
Gender						
Reference Category: Male						
	1.170	9.854	1	3.221	[1.552, 6.686]	.002
Age						
	-0.011	0.353	1	0.989	[0.955, 1.025]	.553
Educational attainment						
Reference Category: No schooling						
No schooling		4.977	3			.173
Primary	0.900	1.028	1	2.460	[0.432, 14.010]	.311
Secondary	0.413	0.226	1	1.512	[0.276, 8.292]	.634
University	-0.088	0.009	1	0.916	[0.156, 5.369]	.922
Time in Spain (months)	-0.001	0.126	1	0.999	[0.993, 1.005]	.723
BISS Discrimination	0.009	0.287	1	1.009	[0.977, 1.041]	.592
BISS Psychosocial Stress	-0.022	0.568	1	0.979	[0.925, 1.035]	.451
BISS Homesickness	-0.007	0.059	1	0.993	[0.938, 1.051]	.807
Self-perceived physical health	0.653	3.825	1	3.825	[0.999, 3.695]	.050
Reference Category: Absence of physical illness						
GHQ-12	-0.046	2.484	1	0.955	[0.901, 1.011]	.115
GADS-Anxiety	0.272	18.216	1	1.313	[1.159, 1.488]	< .001
GADS-Depression	0.277	14.207	1	1.319	[1.142, 1.524]	< .001

Goodness of fit: Hosmer-Lemeshow test; $\chi^2_{(8)} = 8.231$, $p = .411$
R-squared statistics, Cox & Snell $R^2 = 0.164$

Model 3: Psychopathology	B	Wald	df	OR	95% CI	p
Ethnic Group						
Reference Category: Asian						
<i>North African</i>	0.028	0.003	1	1.029	[0.343, 3.088]	.96
<i>Eastern European</i>	-0.109	0.024	1	0.896	[0.225, 3.57]	.877
<i>Sub-Saharan</i>	-0.073	0.014	1	0.929	[0.279, 3.089]	.905
<i>Latin American</i>	-0.052	0.012	1	0.950	[0.371, 2.43]	.914
<i>Asian</i>		0.062	4			1
Gender	1.321	13.078	1	3.746	[1.831, 7.665]	< .001
Reference Category: Male						
Age	0.000	0.000	1	1	[0.969, 1.033]	.986
Educational attainment						
Reference Category: No schooling						
No schooling		2.454	3			.484
Primary	0.407	0.225	1	1.503	[0.279, 8.086]	.635
Secondary	0.322	0.146	1	1.380	[0.264, 7.206]	.703
University	-0.172	0.038	1	0.842	[0.150, 4.718]	.845
Time in Spain (months)	-0.001	0.199	1	0.999	[0.993, 1.005]	.655
BISS Discrimination	0.006	0.152	1	1.006	[0.976, 1.037]	.696
BISS Psychosocial Stress	-0.072	7.865	1	0.931	[0.886, 0.979]	.005
BISS Homesickness	-0.003	0.01	1	0.997	[0.944, 1.054]	.921
Self-perceived physical health	0.788	6.248	1	2.198	[1.185, 4.077]	.012
Reference Category: Absence of physical illness						
MINI psychiatric disorder, current	1.414	9.665	1	4.112	[1.686, 10.029]	.002
Reference Category: Absence of disorder						
MINI major depression, current	-0.061	0.017	1	0.941	[0.375, 2.36]	.897
Reference Category: Absence of disorder						
MINI generalized anxiety disorder, current	-0.549	0.85	1	0.578	[0.993, 1.855]	.357
Reference Category: Absence of disorder						

*Goodness of fit: Hosmer-Lemeshow test; $\chi^2_{(8)} = 5.526, p = .700$
R-squared statistics, Cox & Snell $R^2 = 0.121$*

4.4. Discussion

The conceptualization of the three models of multiple regression was a result of the findings derived from our first study (Chapter 1). In sum, primary care patients (natives and immigrants examined as a total sample, and as separate two sub-samples) with any psychiatric disorder, and specifically with major depression and generalized anxiety disorder, were less likely to manifest somatic symptoms than those with no diagnoses (Table 4). On the other hand, for the same groups of patients, higher incidence of somatization was observed among those with higher levels of mental distress and symptomatology of anxiety and depression (Table 5). These differences in the manifestation of somatization, depending on the application of psychiatric diagnostics (MINI) or mental health screening tools (GHQ-12, GADS-Depression and GADS-Anxiety), were considered in the series of regression modeling performed.

Model 1 tested for the predictive value of sociodemographic characteristics specific to the primary care samples examined. Model 2 included the variables tested in Model 1 and additionally, self-perceived presence of illness, mental health well-being (as measured by GHQ-12), anxiety symptoms (as screened for by the subscale of GADS-Anxiety) and depression-related symptomatology (as screened for by the subscale of GADS-Depression). Model 3 tested for the predictive value of the sociodemographic variables as in Model 1, self-perceived presence of illness and MINI-derived psychopathology conditions, i.e. the incidence of any psychiatric morbidity, major depression and generalized anxiety disorder. In this sense, we explored progressively the predictors of general somatization focusing first on socio-demographics (Model 1),

then on mental health symptomatology (Model 2) and lastly, on psychopathology (Model 3).

Generally, for all primary care patients, irrespective to their group of origin, gender has been proved to be a reliable predictor across all three models. Group of origin (immigrants vs natives) – a variable of interest to our study, was not found to be a significant predictor of general somatization. Within the model of socio-demographics, patients with university education were more likely to present somatic symptoms in relation to the ones with no schooling (OR= 1.590, 95% CI: [0.553, 4.566], $p < .001$), significance that was lost in the models of mental health symptomatology and psychopathology. Self-perceived illness, mental health distress, anxiety and depression-related symptoms as well as psychiatric morbidity, general anxiety disorder and major depression were all significant predictors of the incidence of somatization for primary care patients.

Specific to the results derived from the regressions conducted for immigrant patients of primary care in Barcelona province, some distinct patterns of general somatization were observed. As for all primary care patients, gender has been a significant predictor of somatization among immigrants across the three models tested. Despite the fact that bivariate analyses showed significant associations between ethnic groups and the incidence of somatization ($\chi^2_{(4)} = 11.704$, $p = .020$), immigrants' ethnic group of origin was not proved to be a significant predictor of the phenomenon. Psychosocial stress was a reliable predictor in the models of socio-demographics (OR= 0.893, 95% CI: [0.854, 0.934], $p < .001$) and psychopathology (OR= 0.931, 95% CI: [0.886, 0.979], $p = .005$). Additionally, self-perceived illness, anxiety and depression-related

symptoms as well as psychiatric morbidity, had a significant predictive value on the incidence of somatization for primary care patients.

Our findings support previous research on the predictive value of gender on somatization (Escobar et al., 1987; Kroenke & Spitzer, 1998; Piccinelli & Simon, 1997). The strong link between physical and mental health (Nabi, Kivimaki, De Vogli, Marmot, & Singh-Manoux, 2008; Surtees et al., 2008) was confirmed by the fact that self-perceived illness has a consistent, reliable predictive value on general somatization both for the total sample and the immigrants' one (Mumford, Devereux, Maddy & Johnson, 1991). As expected, for all primary care patients the expression of somatic symptoms is predicted by mental distress (Kirmayer et al., 2004), any psychiatric disorder (Escobar et al., 1987; Derogatis, Lipman & Covi, 1973) and particularly with anxiety and depression (Creed & Barsky, 2004; Mumford et al., 1991). However, specific to the immigrants, attendees of primary care, somatization was predicted by general psychiatric morbidity and, anxiety-/depression-related symptoms that do not reach to meet corresponding psychiatric diagnostic criteria, i.e. generalized anxiety disorder and major depression. This supports the results of Chapter 1, where international psychiatric diagnostic criteria, conceived in specific cultural contexts and applicable for certain cultures, fail to capture the ways mental suffering is expressed by cultures different to the Western egocentric/individualistic ones. Further to this argument, and as described also earlier in Chapter 1, MINI psychiatric diagnostic criteria imply "psychological mindedness" elements that are not usually endorsed by patients who tend to experience their mental suffering through physical symptoms (Beitel et al., 2005; Bekker & Schepman, 2009)(Beitel et al., 2005; Bekker & Schepman, 2009).

The model that best described the variance of somatization for the general primary health care patients and for the immigrants-attendees of primary care was the one that referred to mental health well-being and symptomatology (Model 2; $R^2= 0.149$ and $R^2= 0.164$ respectively), implying that the experience and manifestation of somatic symptoms is generally best understood beyond psychopathological conditions and diagnoses. Moreover, neither the nativity of the patients (immigrants vs natives), nor the immigrants' ethnic group origin and time spent in Spain predict the incidence of somatization. Therefore, the body and its sensations comprise a medium for expressing suffering, which may not be mental, but rather social (Angel & Guarnaccia, 1989; Kirmayer & Young, 1998), and may not reach pathological levels, but rather be distressful for the patient.

Despite the fact that immigrants' ethnic group of origin was not found to have a significant predictive value over the phenomenon of somatization, significant relationships were observed between the two variables. Latin Americans (13.4%) were more likely to present somatic symptoms than the rest of the immigrants, contrary to what Mendez (2010) has proposed that "expressive cultures", such as in Latin America, tend to "psychologize" their distress. Our results encourage a skeptical view over the simplistic way of categorizing cultures based on their expressive types of distress, since this may be conditioned by contextual factors (host country) and health settings (primary health care, specialty mental clinics, emergencies).

Post-migration factors related to discrimination and homesickness, did not reach to predict general somatization among immigrants as expected. Only psychosocial stressors were observed to have an inverse predictive value on the phenomenon. In two

of the three models tested, immigrants with high levels of psychosocial stress were very marginally likely to present fewer somatic symptoms in primary care consultations. This gives rise to the issue that the BISS scale addresses concepts of “psychological insight” and “psychological mindedness”, common among individuals who do not tend to “somatize” their distress. Further, contrary to previous research (Jasinskaja-lahti et al., 2006; Lie, 2002; Schick et al., 2016; Watt & Badger, 2015), our findings support the argument that somatization is independent to post-migration conditions. The process of focusing on, amplifying, and clinically presenting somatic symptoms as expressions of emotional (and indirectly social) distress are universal, especially when examined in primary health care settings (Kirmayer & Young, 1998).

A major challenge in conceptualizing the study was the grouping of the immigrants according to their ethnical background. Referring to geographical regions, rather than specific countries/nations, widens the definition of ethnicity, while acknowledging at the same time the cultural heterogeneity that is embedded in each of them. Therefore, it is noted that we do not pretend to derive cross-cultural results, since comparing cultures would be an undoable task.

Further, it is worth noting that all study interviews were carried out in Spanish. Although it would have been preferable to collect data in the native language of each immigrant group included in the studies, this was not feasible due to linguistic limitations of available instruments (i.e., the instruments used are not available in the all of the native languages of the various ethnic groups of immigrants) and because the research work did not have the resources necessary to adequately and correctly translate the instruments. To that end, Spanish was the medium used to ensure

uniformity, even if this came at the cost of excluding non-Spanish speaking immigrant patients.

The clinical implications of our study results rely on drawing the attention of primary health care professionals in addressing somatic symptoms as symbols of communication, rather than signs of pathology, when treating both natives and immigrants. Embracing symptoms-based interventions with a patient-centered approach in general practice will avoid risks of categorizing patients according to their ethnicity, and further cultural background.

Conclusion

Gender, self-perceived illness, psychiatric morbidity (other than generalized anxiety disorder and major depression) and anxiety-/depression-related symptoms that do not reach psychopathological conditions are universal predictors of general somatization in Spanish primary health care patients. Generalized anxiety disorder and major depression have a predictive value only for Spanish native-borns. Post-migration factors, that may hinder the mental health condition of immigrants, are associated positively with the incidence of somatization but do not hold a significant predictive value of the phenomenon. These results inform primary health care practice, where the majority of patients reach the services expressing physical symptoms, that need to be translated according to the individual patient's paradigm of experiencing health.

CHAPTER 5 • General Discussion & Concluding Remarks

In this section, we will review the five hypotheses attached to the three studies (outlined in Chapter 1, paragraph 1.4) and we will discuss them summarizing the main findings of our research work on the trivial subject of somatization across cultures/ethnicities, among immigrants and native-born Spanish primary care patients.

The first study (Chapter 2) explored the relationship between any current psychiatric diagnosis and the incidence of somatization in immigrants and native-born Spanish primary health care patients and further, it examined the quantitative and qualitative variations of somatization between the two groups. The first hypothesis (Hypothesis 1) suggesting that immigrant and native-born patients with anxiety and depression, as their main diagnosis, are more prone to exhibit somatic symptoms than those without, was partially confirmed. Distinct results were obtained when the analysis was made at psychopathology-level, using psychiatric diagnostic criteria (MINI) and at symptomatology-level, using the screening instruments of Goldberg Anxiety-Depression Scale (GADS-Depression and GADS-Anxiety subscales). Major depression and generalized anxiety disorder were negatively associated with the incidence of general somatization, whereas GADS-Depression and GADS-Anxiety were positively associated with the presence of somatic symptoms. This finding imply that MINI psychiatric criteria capture Western egocentric/individualistic idioms of distress (Keyes & Ryff, 2003; Triandis, 1995), which endorse “psychological mindedness” (Beitel et al., 2005) in the expression and manifestation of anxiety and depression, in particular. The rigidity of such criteria does not allow the elaboration of the meaning-making of somatic

symptoms as idiomatic expressions of mental distress. Hence, it would appear to be that MINI psychiatric caseness and GADS symptomatology are rather distinct entities capturing different experiential aspects of mental conditions.

The second hypothesis (Hypothesis 2), attached to the first study, suggested that immigrants do not show significantly more somatic symptoms than native-borns in primary health care settings. The hypothesis was partially confirmed since our findings concluded that there are qualitative, rather than quantitative, variations of somatic symptoms, as manifestations of psychiatric morbidity, between the two groups. The differences in the *type*, rather than the *quantity*, of physical symptoms endorsed by immigrants and native counterparts are not addressed in the diagnostic systems. This may lead to under-diagnosis or mis-diagnosis of mental distress in primary care settings, as reflected by Kleinman's "category fallacy" concept (1980).

Moving beyond the idiomatic "psychological insight" of psychiatric diagnostics, we later focused on the sociogenic explanatory models of somatization (Angel & Guarnaccia, 1989), under the culture-specific paradigm of mental health (Kirmayer & Young, 1999). For this reason, we drew attention to the contextual factors in which immigrants are studied by carrying out a further validation of the Barcelona Immigration Scale (BISS) (Chapter 3). The objective of the study (Objective 3) was met successfully as the final structure of the BISS demonstrated an adequate fit according to CFA parameters and good reliability. It included three dimensions/subscales, namely: Discrimination (14 items; $\alpha=0.872$), Psychosocial Stress (9 items; $\alpha=0.801$) and Homesickness (7 items; $\alpha=0.754$).

By investigating the factors which influence the incidence of somatization among immigrants and Spanish native-born in primary health care (Chapter 4), we came across to some interesting results. Our findings confirmed the first hypothesis (Hypothesis 4) of this study suggesting that socio-demographics and mental/physical morbidities may have a predictive value on the phenomenon of somatization in primary care. Among the sociodemographic characteristics examined, gender (female) had a strong predictive value. Mental distress (GHQ-12), psychiatric morbidity (MINI), generalized anxiety disorder (MINI), major depression (MINI), anxiety-related symptoms (GADS-Anxiety) and depression-related symptoms (GADS-Depression) were found to be significant predictors of general somatization. Specific to the sample of the immigrants, anxiety- and depression-related symptoms (GADS) that did not meet the corresponding diagnostic criteria were found to be significant predictors. Among the post-migration stress-related factors, only psychosocial stress may predict somatization in immigrants, patients of primary care.

The second hypothesis attached to our third study (Hypothesis 5), according to which there were expected differences in the expression of somatic symptoms among immigrants based on their ethnic group of origin, was partially confirmed. Neither the group of origin (immigrants versus natives), nor the immigrants' ethnic group held a predictive value in relation to general somatization. However, a significant association was observed between general somatization and the ethnic groups of origin, with Latin American immigrants (13.4%) more likely to present somatic symptoms than the rest. This result challenges previous research that classify people from "expressive" cultures, such as the Latin American, as "psychologizers" of their mental distress (Mendez, 2010). Somatization is an omnipresent phenomenon (Isaac et al., 1996; Kirmayer & Young,

1998) set beyond the simplistic view of categorizing cultures/ethnicities based on the ways people experience, express and explain their mental distress.

The ethical issues related to somatic symptoms, their understanding, management and communication about these by health professionals are seldom discussed (Chaturvedi, 2013). The medical care system reinforces somatization, since primary care professionals, equipped with extensive training in the biomedical model, do not systematically evaluate the psychosocial stress that often underlies somatic complaints (Katon et al., 1984). An ethical approach in managing somatization in multi-cultural contexts would include side-stepping the physical versus psychological dilemma and using an integrated reiteration of medical, psychological and social assessments (Chaturvedi & Desai, 2013).

Patients' characteristics, such as race/ethnicity/culture, gender, educational attainment and social class, may produce bias in clinical judgment. This bias can promote either over-diagnosis or under-diagnosis of health conditions. López (1989) hypothesized that clinicians hold differential subjective base rates of disorders for different patient groups and they differ in information processing, as a function of their own cultural background, compared to the one endorsed by the patients. Consequently, clinicians' judgments can bias diagnoses and screening results, even standardized mental health instruments (which was the case in our research work) are applied. Thus, the doctor-patient interaction may be prominent in shaping patient's symptomatology (Sayar & Ismail, 2001).

The clinical bias, based on the individual characteristics of the patients, culture and ethnicity among others, overestimate the role of the individual while minimizing the

importance of contextual factors (Kirmayer, Young, & Robbins, 1994). Globalization and transnational migration provide a rich framework for generating new medical practices that acknowledge the embodied, enacted and extended views of health experience for both immigrants and natives in the host countries. A socio-contextual paradigm can provide a conceptual framework for recognizing the ways in which context can shape idiomatic expressions of mental distress. Kleinman's paper on "category fallacy" (1980) has marked the beginning of a "new cross-cultural psychiatry" stating that "psychiatric categories are bound to the context of professional psychiatric theory and practice in the West" (p.4). As White (1982), Kirmayer (1984), and Bekker and Schepman (2009) point out, it may be ethnocentric to view bodily complaints as a simple result of lack of "psychological mindedness"(Draguns, 1996).

Our research displayed an innovative approach in exploring the phenomenon of somatization in immigrants and Spanish native-born primary health care patients with mental health morbidity. We have provided insight to the ambiguous issue of medically unexplained physical symptoms (MUPS), suggesting that such symptoms *do* have an explanation that relies in the interrelationship between psychological, social and physical states, under the emic or culturally relativist approach of transcultural psychiatry. Primary health care practitioners are encouraged to engage in the examination of the meaning-making of the physical symptoms, rather than the underlying pathology behind them, while focusing on the person, rather than on the culture that s/he may represent.

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Annex 1

Working Title: Racial/ethnic differences in general physical symptoms and medically unexplained physical symptoms: Investigating the role of education

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WORKING DOCUMENT###

INTRODUCTION

Distressing physical symptoms, also known as somatic symptoms, are a widely experienced phenomenon, with approximately one in five primary care visits driven by this type of complaint (Steinbrecher, Koerber, Frieser, & Hiller, 2011). Somatic symptoms have been identified as the most common reason for primary care visits (Rief & Martin, 2014), with up to 80% of the general population experiencing somatic symptoms, and about 20% suffering from serious and disabling somatic complaints (Hiller, Rief, & Brähler, 2006).

Somatic symptoms have been classified and, further interpreted in different ways. General physical symptoms (GPS) refer to somatic symptoms that can be

medically explained in the context of a general physical medical conditions. Those that lack an obvious organic medical cause are known as medically unexplained physical symptoms (MUPS) and can range from acute to chronic and from mild to severe. Some chronic clusters of MUPS have been labeled as syndromes, such as irritable bowel syndrome, fibromyalgia, or atypical chest pain. Although MUPS are frequently associated with psychological distress and psychiatric somatoform disorders, the clinical usefulness of applying ICD-10 (World Health Organization, 2010) and DSM-IV (American Psychiatric Association, 1994) somatoform diagnoses to individuals with MUPS has been questioned (Patel & Sumathipala, 2006). In fact, rather than a diagnosis, Bass & Benjamin (1993) conceptualize the experience and manifestation of MUPS as a process through which an individual overly focuses on physical symptoms and denies partially or overly psychosocial factors for the symptoms. This may be due to several factors, summarized in the review of Burton (2003), where physiology, personality characteristics, life experiences, health cognitions, and interaction with health care professionals are important elements in understanding MUPS. To address the complexity of the issue Kleinman & Kleinman (1985) have introduced the concept of somatization as “the expression of personal and social distress in an idiom of bodily complaints with medical help seeking” (p. 430).

The importance of developing a better understanding of MUPS stems from the increasing need to adequately address associated challenges. First, MUPS are a burden to both health professionals and patients (Weiland et al., 2015). Medical professionals find patients whose symptoms have no underlying pathology difficult to handle and may feel incompetent themselves to reach agreement with their patients on problem definition (Salmon, 2007). The unnecessary medicalization of such conditions may also

result in poor health outcomes. On the other hand, many patients with MUPS do not feel understood by their health professional and may experience a lack of empathy and acceptance for their physical symptoms and suffering (Stone et al, 2002). The low interrater reliability and validity of physicians' judgments on whether somatic symptoms are medically explained or not has been illustrated in various studies (Fink, Rosendal, & Olesen, 2005; Klaus et al., 2013). In many cases, the physicians' personal criterion rather than the clinical picture seems to affect whether symptoms are deemed to be based on a biomedical condition. Rief and Martin (2014) have critically illustrated that some physicians think of symptoms like back pain as almost always medically caused, whereas others consider them mainly psychosomatic. Moreover, many symptoms go back and forth between being considered medically explained or unexplained over time (Klaus et al., 2013).

Second, the degree of disability and role impairment associated with MUPS— independent of comorbidity with somatization—have been previously discussed (Harris et al, 2009; Creed & Barsky, 2004). Severely somatizing patients spend more days in bed (Smith, Monson & Ray, 1986), have higher rates of disability (Katon et al., 1991), more occupational and social role impairment (Gureje, Simon, Ustun & Goldberg, 1997), more unemployment (Swartz, Landerman & George, 1991), and require more sick leave (Escobar et al., 1991).

Third, because of perceptions that providers do not adequately acknowledge patients' somatic concerns (Donovan & Blake, 2001) and the high rates of disability associated with somatization (Kroenke et al, 1994), repeated health care visits may contribute to high health care expenditures (Frostholm et al, 2014). MUPS are costly for society not only because of high health-care utilization, but also through lost working

years, early retirement pensions, and social expenses (Fink et al, 2005). The chronic somatizing patients have an excessive use of health-care services both in primary care and in specialized health-care sector with numerous hospitalizations, surgical procedures, and futile treatments (Fink, 1992).

Racial/Ethnic Differences in Unexplained Physical Symptoms

Individuals' cultural backgrounds can also complicate accurate diagnosis of physical symptoms and their causes, as racial/ethnic differences may reflect socially determined patterns of help-seeking and symptom presentation rather than differences in underlying psychopathology (Kirmayer & Weiss, 1997). Early research in this area suggested that patients of Hispanic or Asian origin often expressed psychological distress in somatic terms and frequently denied any potential link between psychological distress and somatic symptoms (Escobar et al., 1987; Kirmayer & Groleau, 2001; Parker, Cheah, & Roy, 2001). More recent studies have called that interpretation into question. For example, a cross-sectional community study in an urban setting in Chile indicated that Hispanic subjects were generally aware of the link between somatic symptoms and psychological health and did not attempt to hide or "mask" their psychological symptoms (Skapinakis & Araya, 2011).

Rohlof and colleagues (2014) have highlighted three culture-specific models that aim to explain the concept of somatization: alexithymia; stigma and discrimination; and biomedical dualism versus holistic approaches to health. Alexithymia, which is the inability to express emotions, is often encountered outside of Western countries, such as in East Asian cultures, where these traits are more adaptive (Ryder et al., 2008). The degree of emotion conveyed in interaction cross-culturally has been described via a

neutral/expressive continuum. According to Mendez (2010), in “neutral cultures” such as in Asia, feelings and emotions are not made obvious in interaction, gestures and facial expressions are minimal, and tone of voice is kept neutral. As a result, rather than express emotions verbally, individuals from these cultures may be more likely to have their emotions manifest physically (i.e., somatization). In contrast, within “expressive cultures” such as in Latin America, feelings and emotions are made obvious in interaction, gestures and facial expressions are active, and tone of voice varies with the speaker’s attitude towards a topic—these traits may reduce the chances that individuals somaticize their emotions (Mendez, 2010). Some existing research supports this theory; for example, in a UK study, significantly higher levels of somatization were reported among Asian people than among native English (Bal & Cochrane, 1990). Moreover, Ryder and colleagues (2008) examined differences in symptom presentation among psychiatric outpatients with Chinese and Euro-Canadian backgrounds. The authors concluded that Chinese patients reported more somatic symptoms on spontaneous problem report and in a structural clinical interview than Euro-Canadian patients.

Further, within the framework of the “idiom of stress” hypothesis, Kleinman (1977) has stated that somatization is more common in cultures where stigma relates to psychiatric problems and the expression of psychological distress is inhibited. The hypothesis predicts that the association of somatization and mental health is mitigated by culture, where somatization is a functional response that indirectly discloses distress and thereby relieves distress. Consciously or unconsciously, some individuals may prefer to present somatic problems rather than psychological problems because of the fear of being called “crazy” by their community. This framework would lead us to hypothesize that Asian and Latino patients would be more likely to express their distress as somatic

problems than their White counterparts with similar psychological distress or mental health problems.

Per the third explanatory model proposed by Rohlof and colleagues (2014), different cultural groups develop varying understandings of the construction and deconstruction of self. The perception of self as a union with or a distinction from the mind and body influences the expression of somatic or psycho-emotional symptoms of psychological distress in different cultures (Wen, 1998). The notion of an “emotional body” transcends the mind-body dualism of the western construction of self and constructs a different experience of depression, anxiety, and emotions in general (Squire, 2000). Mind-body divisions are understood within a biomedical context, whereas integrative practices of understanding the self are suggested by holistic medical approaches where body and mind are interconnected in the experience and expression of all forms of suffering, including physical, mental, and emotional (Wen, 1998). Considering the culture-specific explanatory models of somatization described by Rohlof and colleagues (2014), thus far, the conceptual approaches have led us from the mind to the body, however construed. It may also be the case that there is a relationship between somatization and other sociodemographic characteristics of the patients, including nativity since context of growing up shapes how we view the mind and body connection.

Soon after arriving in their new country, immigrants typically demonstrate lower rates of common mental health problems than the native population; however, over time, rates increase to become like those in the native-born population (Kirmayer et al., 2011). These observations support the “healthy immigrant effect,” which refers to the fact that foreign-born immigrants are typically healthier than the native-born population

(Constant et al., 2017; Vang et al., 2017; Cunningham et al., 2008). Cunningham and colleagues' review (2008) of 71 studies on US migrant health demonstrated that foreign-born individuals are healthier than non-Latino Whites and are less likely to suffer from mental disorders. However, immigrants' health advantage declines with time spent in the host country and converges toward (or even falls below) the health status of native residents (Constant et al., 2017; McDonald et al., 2004). Consistent with this "healthy immigrant effect," increased acculturation (measured by proxy through personal and parental nativity, English proficiency, and years in the United States) has been strongly associated with greater physical symptom burden among both Latinos and Asians in the United States (Alegría, 2009; Bauer, Chen, Alegría, 2012; Thomson & Hoffman-Goetz, 2009). We would then hypothesized that in contrast with general physical health, somatization rates among immigrants might demonstrate an opposite trend, such that immigrants—particularly those from Asian cultures—might initially demonstrate higher rates of somatization compared to the native-born population, but that these rates likely decrease with time spent in the host nation.

Differences Based on Education and Other Demographic Variables

The National Institute of Mental Health (NIMH) Epidemiological Catchment Area (ECA) study in the United States indicated that lower levels of education, together with lower socioeconomic status, correlated with higher rates of somatization (Simon & Vonkorff, 1991). The World Health Organization's (WHO) Psychological Problems in General Health Care (PPGHC) study across 15 nations (N=5438) corroborated the moderate inverse relationship between level of education and prevalence of somatization (Simon, Gater, Kisely, & Piccinelli, 1996). Exploring the independent effects of race and ethnicity

on somatization may result in a suppression or a magnification of such an effect. Racial/ethnic differences related to somatization may be more pronounced among people with fewer or more years of education. This interactive perspective may allow more precise estimations in the effect of race/ethnicity and education on somatization.

Swartz and colleagues (1989) have explored the interaction between education and rural/urban residence on somatization in a community sample derived from the National Institute Epidemiologic Catchment Area Project (Holzer et al., 1986). According to their findings, because of the interaction of education with urban residence, the education effect was larger in rural areas. Among rural residents, those with fewer than 12 years of education report approximately one more symptom than high school graduates in rural neighborhoods. To our knowledge, there has been no previous examination of how education and race/ethnicity might interact with each other to impact the presentation of GPS/MUPS.

The effect of gender and age on somatization has also been explored widely in the past. Investigations into gender differences in somatic symptoms presentation suggests that these symptoms are more common among women than men. For example, a systematic review of 47 studies examining the epidemiology of somatization disorder and hypochondriasis illustrated a clear female predominance in both disorders; this review also observed a consistent relationship between these disorders and few years of education and frequent comorbidity with anxiety and depressive disorders (Creed & Barsky, 2004). Additionally, somatization has often been linked to older age (Escobar et al., 1989; Gureje, Simon, Ustun, & Goldberg, 1997). The WHO PPGHC study illustrated that both somatization disorder, as assessed per the DSM-IV-TR, and somatization, as measured by the Somatic Symptom Index (SSI, Escobar et al., 1989),

tend to be associated with older age of the respondent. Individuals above 45 years demonstrated a higher risk for somatization symptoms and disorders than those 31 to 44 years of age (Gureje et al., 1997).

Somatic Symptoms and Physical/Mental Health Conditions

Individuals with symptoms of somatization often meet criteria for other psychiatric disorders and medical conditions. Although these MUPS may be attributable to underlying mood and anxiety disorders, studies have suggested that as many as one third of somatizing patients do not have a co-morbid psychiatric disorder (Creed, 2006). Thus, it remains unclear to what degree the relationship between race/ethnicity and somatization is mediated by co-morbid psychiatric disorders, such as depression and anxiety disorders, or to what degree it is confounded by medical co-morbidity. Few studies have adjusted for psychiatric and medical comorbidity when examining somatization in relation with other variables. When such adjustments between psychiatric and medical comorbidity were considered, study results have not demonstrated a significant effect, at least on the association of somatization with disability (Harris et al., 2009) and of somatization with medical care utilization or annual medical costs (Barsky, Orav, & Bates, 2005).

Current Study

The current study seeks to build on previous research (Escobar et al., 2010) that examined the connection between GPS and MUPS with psychopathology and service use in a US community-based population of individuals from various ethnic/racial backgrounds. Further, it intends to address the interaction effect of race/ethnicity and

education on the experience of such symptoms while controlling for mental and physical comorbidities. The scope of the present study was to explore whether there are racial/ethnic differences in somatization, as understood by the culture-specific explanatory models of somatization (Rohlf, Knipscheer & Kleber, 2004), and whether education is an important part of that relationship, dependent on and independently of age, gender, and mental and physical comorbidities.

METHODS

Sample and Participants

This study analyzed data from the National Latino and Asian American Study (NLAAS), a nationally representative survey of noninstitutionalized Latino and Asian adults (above 18 years of age) in the coterminous United States, carried out as part of the National Institute of Mental Health Collaborative Psychiatric Epidemiological Studies (Alegría et al., 2004; Heeringa et al., 2004). More details on the survey design and sampling procedure can be found in previous publications (Alegría et al., 2004; Heeringa et al., 2004; Pennell et al., 2004). The current sample (N = 4864) consisted of 2554 Latino/Latino American participants (Mexican, Puerto Rican, Cuban, and other Latino), 2095 Asian/Asian American participants (Chinese, Vietnamese, Filipino, and other Asian), and 251 non-Latino Whites. Surveys were conducted in-person in participants' preferred languages (i.e., English, Spanish, Chinese, Tagalog, or Vietnamese) by trained bilingual interviewers. Table 1 displays demographic and health characteristics of the examined sample by racial/ethnic group.

Table 1.*Weighted sociodemographic & health characteristics by race/ethnicity*

	Latino (N = 2,554)		Asian (N = 2,095)		Non-Latino White (N = 215)		Test for Group Differences <i>F</i> (df1, df2); <i>p</i>
	Unweighted N	Weighted %	Unweighted N	Weighted %	Unweighted N	Weighted %	
Gender							
Female	1,427	48.5	1,097	52.5	110	51.8	1.8 (1.6, 108.6); <i>p</i> = .173
Male (ref)	1,127	51.5	998	47.5	105	48.2	
Age							
18-34 (ref)	1,068	49.0	799	39.5	57	27.9	8.5 (3.6, 245.9); <i>p</i> < .001
35-49	801	30.1	716	32.2	89	31.0	
50-64	454	13.4	416	18.0	42	21.6	
65 and older	231	7.5	164	10.3	27	19.4	
Educational attainment							
Less than 6 years	204	10.3	87	4.8	4	1.9	34.7 (4.3, 298.9); <i>p</i> < .001
6-11 years	789	34.2	229	10.4	16	6.1	
12 years	633	24.5	372	17.7	47	19.5	
13-15 years	567	20.8	529	25.3	68	31.5	
16 or more years (ref)	361	10.2	878	42.0	80	40.9	
Any chronic physical condition	1,075	37.3	822	38.8	100	50.4	5.9 (1.4, 99.4); <i>p</i> = .009
Any mood disorder	254	8.8	101	4.9	17	5.8	7.1 (1.9, 128.9); <i>p</i> = .002
Any anxiety disorder	252	8.4	114	5.5	25	10.6	3.8 (1.4, 99.0); <i>p</i> = .040
Any substance disorder	65	2.9	28	1.3	10	3.9	3.2 (1.5, 101.8); <i>p</i> = .060
	Latino		Asian		Non-Latino White		Test for Group Differences <i>F</i> (df1, df2); <i>p</i>
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	
Total GPS count	0.76	0.04	0.55	0.03	0.99	0.13	10.5 (2, 68); <i>p</i> < .001
Total MUPS count	0.49	0.06	0.53	0.04	0.88	0.11	3.4 (2, 68); <i>p</i> = .040

Measures

General physical symptoms (GPS). Survey respondents were asked whether they experienced 14 examples of common physical symptoms (i.e., stomach pain; diarrhea; loose bowels or constipation; pain in arms, legs, or joints; chest pain; heart racing or pounding; shortness of breath or trouble breathing; back pain; nausea, gas, or indigestion; pain or problems related to menstruation; pain or problems during sex; dizziness; fainting; trouble swallowing; or numbness or tingling in body or extremities) that consist the Somatic Symptom Index (SSI) introducing an abridged somatization construct that has been linked to psychopathology and disability (Escobar et al., 1987; Escobar et al., 1989). Symptoms were identified as present for the purposes of this study if a respondent described the symptom as “frequent or severe” and had sought medical help for the symptom during the previous 12 months. Endorsed symptoms were then summed to create a total number of physical symptoms. Finally, total scores were adjusted (i.e., scores for women were multiplied by 13/14) to account for the fact that women could report up to 14 symptoms, whereas men could only report up to 13 symptoms, given that they were not asked about pain or problems related to menstruation.

Medically unexplained physical symptoms (MUPS). For each positively endorsed GPS item, respondents were asked to provide a description of the symptom and any health professionals’ explanation for that symptom. All responses were recorded verbatim and later independently reviewed by two medical doctors to assess whether the physical symptoms were likely medically explained or unexplained. Symptoms were counted as medically unexplained when they were coded by both reviewers as either “medically unexplained” or “possibly medically unexplained”; if there was disagreement

about a symptom it was not labeled “medically unexplained.” The two reviewers agreed in approximately 80% of cases. After this procedure, the number of identified MUPS was summed for each respondent.

Variables of Interest and Covariates

The variables of interest included race (Latino, Asian, White; White as reference category), and years of education (less than 6 years, 6-11, 12, 13-15, 16 years or more; 16 years or more as reference category). Across the course of the analysis process, we adjusted for several covariates, including age and gender (male, female; male as reference category). We also controlled for physical morbidity by incorporating the number of chronic physical conditions (i.e., arthritis or rheumatism, gastrointestinal ulcer, hypertension, heart disease, stroke, diabetes, cancer, asthma, lung disease, tuberculosis, or HIV/AIDS) endorsed by respondents into the model and controlled for whether respondents endorsed any past-year mood disorder (i.e., dysthymia or major depressive disorder), any past-year anxiety disorder (i.e., social phobia, panic disorder, agoraphobia, or generalized anxiety disorder), or any past-year substance use disorder (alcohol or drug abuse or dependence). Any behavioral health diagnoses were identified through the use of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) Version 3.0 (Kessler & Üstün, 2004).

Data Analysis

Analyses were conducted using Stata Version 14.2 (StataCorp, 2015). First, we generated descriptive statistics of the sample and determined whether racial/ethnic differences emerged for any of our independent or dependent variables; these results

are displayed in Table 1. We then conducted bivariate analyses with each independent variable to determine whether it was significantly related to number of GPS and/or number of MUPS in the examined sample. Then, we utilized two series of multiple regressions—one with number of GPS as the outcome and the second with number of MUPS as the outcome—to evaluate the relationships between our variables of interest and our outcome variables when controlling for other covariates, such as gender, age, chronic physical conditions and past-year mental comorbidities. Given our use of count variables as outcomes and the high frequency of respondents reporting zero GPS and MUPS, we used zero-inflated Poisson regression models for these final analyses (Lambert, 1992). Both series occurred in the following order: first, we examined the relationship between race/ethnicity and reported symptoms while controlling for age and gender (Model 1). Then, we incorporated educational attainment into the model as an additional independent variable (Model 2). We also tested an interaction of race/ethnicity and educational attainment to determine whether the relationship between race/ethnicity and reported symptoms varied by education. Finally, we incorporated physical health and mental health variables into the model, including: number of physical conditions, diagnosis of any mood disorder (no, yes), diagnosis of any anxiety disorder (no, yes), and diagnosis of any substance disorder (no, yes); this analysis comprised Model 3. After completion of these analyses, an additional sensitivity analysis was conducted for each outcome such that nativity status (US-born, foreign-born) was added to Model 3 to determine whether observed relationships remained significant. These analyses were conducted to explore whether significant racial/ethnic differences in nativity status would explain apparent racial/ethnic differences in general and medically unexplained physical symptom count.

RESULTS

Descriptive Statistics

In the examined sample, 1,649 (33.9%) respondents endorsed at least one frequent and severe general physical symptom and, within that group, 1,124 (68.2%) individuals endorsed symptoms that were designated “medically unexplained.” Further descriptive information, organized by racial-ethnic group, is displayed in Table 1. Significant racial/ethnic differences were observed in general physical symptoms ($p < .001$) and medically unexplained symptoms ($p = .040$). Racial/ethnic differences were also observed in age ($p < .001$), educational attainment ($p < .001$), and whether participants endorsed any chronic physical condition ($p = .009$), any mood disorder ($p = .002$), or any anxiety disorder ($p = .040$).

Bivariate Analyses

Prior to conducting multivariate regression analyses, we conducted bivariate regression analyses with each of our independent variables and each of our two outcome variables (i.e., GPS, MUPS). Results of these bivariate analyses are displayed in Table 2.

General physical symptoms (GPS). As noted above, race/ethnicity demonstrated a significant relationship with GPS, such that Asian respondents endorsed fewer GPS than White respondents (IRR = 0.67, 95% CI: [0.52, 0.85]). Female respondents reported more GPS than male respondents (IRR = 1.32, 95% CI: [1.09, 1.62]). Significant age group differences in GPS were also observed, as respondents in each older age group (i.e., 35-49, 50-64, and 65 and older) endorsed more GPS than respondents between the ages of

18 and 34. Finally, number of chronic physical conditions, any past-year mood disorder, and any past-year anxiety disorder were all also significantly related to GPS. No significant relationship between educational attainment and self-reported GPS was observed. These results are displayed in more detail in Table 2.

Medically unexplained symptoms (MUPS). Like for GPS, bivariate analyses investigating the relationship between race/ethnicity and identified MUPS produced a significant result; here, both Latino (IRR = 0.63, 95% CI: [0.42, 0.93]) and Asian (IRR = 0.67, 95% CI: [0.49, 0.93]) respondents demonstrated fewer MUPS than White respondents. Unlike the results of bivariate GPS analyses, no gender or age group differences were observed for identified MUPS. Although one educational attainment comparison appeared significant, because the overall F-test did not suggest a significant relationship between educational attainment and identified MUPS, we have not interpreted this finding. Finally, once again, number of chronic physical conditions, any past-year mood disorder, and any past-year anxiety disorder each demonstrated a significant bivariate relationship with our outcome of interest—in this case, identified MUPS. These results are displayed in more detail in Table 2.

Table 2.

Bivariate analyses examining links to general physical symptoms (GPS) and medically unexplained symptoms (MUPS) (N = 4,864)

	GPS			MUPS		
	IRR	95% CI	F (df1, df2); p	IRR	95% CI	F (df1, df2); p
Race/ethnicity						
White (reference)	--	--	10.52 (2, 68) <i>p</i> < .001	--	--	3.38 (2, 68) <i>p</i> = .040
Latino	0.90	[0.72, 1.14]		0.63*	[0.42, 0.93]	
Asian	0.67**	[0.52, 0.85]		0.67*	[0.49, 0.93]	
Gender						
Male (reference)	--	--	8.01 (1, 69) <i>p</i> = .006	1.10	[0.78, 1.55]	0.29 (1, 69) <i>p</i> = .590
Female	1.32**	[1.09, 1.62]				
Age group						
18-34 (reference)	--	--	17.77 (3, 67) <i>p</i> < .001	1.30	[0.94, 1.79]	0.95 (3, 67) <i>p</i> = .423
35-49	1.70***	[1.41, 2.05]		1.03	[0.75, 1.41]	
50-64	2.02***	[1.66, 2.46]		1.03	[0.76, 1.41]	
65 and older	1.85***	[1.41, 2.43]				
Educational attainment						
Less than 6 years	1.07	[0.79, 1.45]	2.05 (4, 66) <i>p</i> = .097	0.64**	[0.46, 0.90]	1.82 (4, 66) <i>p</i> = .135
6-11 years	1.09	[0.87, 1.37]		0.91	[0.61, 1.34]	
12 years	0.88	[0.64, 1.21]		1.00	[0.67, 1.48]	
13-15 years	0.84	[0.67, 1.04]		0.86	[0.61, 1.20]	
16 or more years (reference)	--	--		--	--	
Number of chronic conditions	1.42***	[1.31, 1.53]	--	1.15**	[1.05, 1.25]	--
Any mood disorder	1.78***	[1.53, 2.08]	55.79 (1, 69) <i>p</i> < .001	1.70***	[1.31, 2.19]	16.87 (1, 69) <i>p</i> < .001
Any anxiety disorder	1.82***	[1.55, 2.14]	55.83 (1, 69) <i>p</i> < .001	1.78**	[1.29, 2.44]	13.02 (1, 69) <i>p</i> = .001
Any substance disorder	1.27	[0.96, 1.70]	2.83 (1, 69) <i>p</i> = .097	1.15	[0.66, 2.01]	0.26 (1, 69) <i>p</i> = .613

* *p* < 0.05; ** *p* < 0.01; *** *p* < 0.001

Multiple Regression Analyses: GPS

Our initial zero-inflated Poisson regression (Model 1) demonstrated that race/ethnicity, gender, and age were significantly related to number of reported general physical symptoms. Specifically, Asian respondents reported significantly fewer symptoms than White respondents (IRR = 0.74, 95% CI: [0.59, 0.93])—no significant differences were observed between Latino and White respondents. Additionally, female respondents reported significantly more symptoms than male respondents (IRR = 1.32, 95% CI: [1.08, 1.61]) and, compared to respondents between the ages of 18-34, respondents from each other age group reported significantly more GPS (IRR ranged from 1.67 to 1.99). Results for these analyses—and all GPS analyses—are displayed in Table 3.

Next, we incorporated respondent's educational attainment into the analysis (Model 2). Similar results emerged, as race/ethnicity, gender, and age were once again significantly related to self-reported GPS. As displayed in Table 3, the incident rate ratios for these relationships were strikingly like those observed in Model 1. However, we failed to observe a significant relationship between educational attainment and GPS when controlling for age, gender, and race/ethnicity. We then examined whether the relationship between race/ethnicity and GPS count varied by educational attainment, but observed no significant interaction effect ($F(8, 69) = 0.69, p = .701$).

Our final model added several variables related to physical and mental health, including number of reported chronic physical conditions, past-year mood disorder, past-year anxiety disorder, and past-year substance use disorder (Model 3). Results of this analysis are also displayed in Table 3, and suggest that race/ethnicity, gender, age, physical health, and mental health are all significantly related to number of self-reported

GPS. Specifically, even when controlling for physical and mental health conditions, Asian respondents reported significantly fewer symptoms than White respondents (IRR = 0.77, 95% CI: [0.61, 0.97]), women reported significantly more symptoms than men (IRR = 1.37, 95% CI: [1.14, 1.64]), and respondents in the 35-49 (IRR = 1.36, 95% CI: [1.13, 1.63]) and 50-64 (IRR = 1.35, 95% CI: [1.14, 1.61]) age groups both reported significantly more symptoms than respondents in the 18-34 age group; however, respondents ages 65 and older did not demonstrate a significant difference from the 18-34 age group in number of reported general physical symptoms once we controlled for physical and mental health conditions (IRR = 1.21, 95% CI: [0.94, 1.56]).

Additionally, in our final model, number of chronic physical conditions demonstrated a significant positive relationship with self-reported GPS (IRR = 1.39, 95% CI: [1.29, 1.50]), such that an increase in the number of chronic physical conditions was linked to an increase in the number of GPS reported. Moreover, respondents who met criteria for any past-year mood disorder (IRR = 1.46, 95% CI: [1.23, 1.73]) or any past-year anxiety disorder (IRR = 1.59, 95% CI: [1.37, 1.84]) endorsed significantly more general physical symptoms than those who did not meet the same diagnostic criteria. No significant differences in GPS count were observed based on past-year substance disorder diagnosis (IRR = 1.22, 95% CI: [0.94, 1.61]).

Table 3.

Examining factors linked to general physical symptoms (GPS) among NLAAS respondents (N = 4,864)

	Model 1		Model 2		Model 3	
	IRR	95% CI	IRR	95% CI	IRR	95% CI
Race/ethnicity						
White (reference)	--	--	--	--	--	--
Latino	1.02	[0.83, 1.25]	1.02	[0.82, 1.23]	1.01	[0.81, 1.26]
Asian	0.74*	[0.59, 0.93]	0.74*	[0.59, 0.94]	0.77*	[0.61, 0.97]
Gender						
Male (reference)	--	--	--	--	--	--
Female	1.32**	[1.08, 1.61]	1.32**	[1.08, 1.61]	1.37**	[1.14, 1.64]
Age group						
18-34 (reference)	--	--	--	--	--	--
35-49	1.67***	[1.37, 2.04]	1.67**	[1.36, 2.06]	1.36**	[1.13, 1.63]
50-64	1.99***	[1.65, 2.41]	1.99**	[1.65, 2.41]	1.35**	[1.14, 1.61]
65 and older	1.82***	[1.41, 2.46]	1.82**	[1.37, 2.42]	1.21	[0.94, 1.56]
Educational attainment						
Less than 6 years	--	--	0.88	[0.63, 1.23]	0.80	[0.55, 1.16]
6-11 years	--	--	1.00	[0.78, 1.27]	0.80	[0.64, 1.01]
12 years	--	--	0.92	[0.67, 1.26]	0.92	[0.69, 1.21]
13-15 years	--	--	0.86	[0.68, 1.09]	0.87	[0.72, 1.06]
16 or more years (reference)	--	--	--	--	--	--
Number of chronic conditions						
Any mood disorder	--	--	--	--	1.39**	[1.29, 1.50]
Any anxiety disorder	--	--	--	--	1.46**	[1.23, 1.73]
Any substance disorder	--	--	--	--	1.59***	[1.37, 1.84]
	--	--	--	--	1.22	[0.94, 1.61]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Note: Model 1 simultaneously examined race/ethnicity, gender, and age group; Model 2 examined race/ethnicity, gender, age group, and educational attainment; Model 3 examined race/ethnicity, gender, age group, educational attainment, number of chronic physical condition, any past-year mood disorder, any past-year anxiety disorder, and any past-year substance use disorder.

Multiple Regression Analyses: MUPS

After conducting the above-described analyses, we repeated the same series of zero-inflated Poisson regression analyses using number of reported symptoms identified by physicians as “medically unexplained” (i.e., MUPS) as the outcome variable. Our initial analysis, which examined race/ethnicity, gender, and age (Model 1), indicated that Latino (IRR = 0.60, 95% CI: [0.41, 0.87]) and Asian (IRR = 0.64, 95% CI: [0.46, 0.89]) respondents demonstrated significantly fewer MUPS than White respondents. No other characteristic demonstrated a significantly relationship with number of MUPS. Results for these analyses—and all MUPS analyses—are displayed in Table 4.

Next, we incorporated respondent educational attainment into the analysis (Model 2). Similar results emerged, as Latino (IRR = 0.59, 95% CI: [0.41, 0.85]) and Asian (IRR = 0.65, 95% CI: [0.46, 0.91]) respondents presented with significantly fewer MUPS than White respondents, even when controlling for educational attainment. No significant relationships emerged between MUPS count and gender, age group, or educational attainment. We then examined whether the relationship between race/ethnicity and MUPS count might vary by educational attainment, but observed no significant interaction effect ($F(8, 69) = 0.75, p = .651$).

Our final model, which added number of chronic physical conditions, any mood disorder diagnosis, any anxiety disorder diagnosis, and any substance use disorder diagnosis (Model 3), indicated that race/ethnicity, number of chronic conditions, past-year mood disorder, and past-year anxiety disorder were all significantly related to number of MUPS. Specifically, even when controlling for physical and mental health conditions, Latino (IRR = 0.54, 95% CI: [0.39, 0.75]) and Asian (IRR = 0.65, 95% CI: [0.49, 0.86]) respondents still presented with significantly fewer MUPS than White

respondents. Additionally, number of chronic physical conditions demonstrated a significant positive relationship with number of MUPS (IRR = 1.18, 95% CI: [1.07, 1.31]), such that an increase in the number of chronic physical conditions was linked to an increase in the number of MUPS identified. Respondents who met criteria for any past-year mood disorder (IRR = 1.52, 95% CI: [1.11, 2.08] or past-year anxiety disorder (IRR = 1.43, 95% CI: [1.03, 1.98]) presented with significantly more medically unexplained symptoms than those respondents who did not meet diagnostic criteria for these disorders. Once again, no significant differences were observed based on past-year substance disorder diagnosis (IRR = 0.79, 95% CI: [0.49, 1.28]).

Table 4.

Examining factors linked to medically unexplained physical symptoms (MUPS) among NLAAS respondents (N = 4,864)

	Model 1		Model 2		Model 3	
	IRR	95% CI	IRR	95% CI	IRR	95% CI
Race/ethnicity						
White (reference)	--	--	--	--	--	--
Latino	0.60**	[0.41, 0.87]	0.59**	[0.41, 0.85]	0.54***	[0.39, 0.75]
Asian	0.64**	[0.46, 0.89]	0.65*	[0.46, 0.91]	0.65**	[0.49, 0.86]
Gender						
Male (reference)	--	--	--	--	--	--
Female	1.09	[0.77, 1.54]	1.09	[0.79, 1.54]	1.07	[0.78, 1.49]
Age group						
18-34 (reference)	--	--	--	--	--	--
35-49	1.24	[0.92, 1.66]	1.27	[0.94, 1.72]	1.08	[0.84, 1.39]
50-64	0.94	[0.70, 1.26]	0.97	[0.72, 1.31]	0.84	[0.63, 1.12]
65 and older	0.85	[0.65, 1.12]	0.88	[0.67, 1.16]	0.72	[0.51, 1.01]
Educational attainment						
Less than 6 years	--	--	0.86	[0.59, 1.25]	0.87	[0.58, 1.31]
6-11 years	--	--	1.13	[0.80, 1.59]	1.05	[0.76, 1.46]
12 years	--	--	1.15	[0.83, 1.60]	1.24	[0.91, 1.70]
13-15 years	--	--	0.93	[0.66, 1.33]	1.00	[0.70, 1.43]
16 or more years (reference)	--	--	--	--	--	--
Number of chronic conditions						
Number of chronic conditions	--	--	--	--	1.18**	[1.07, 1.31]
Any mood disorder	--	--	--	--	1.52**	[1.11, 2.08]
Any anxiety disorder	--	--	--	--	1.43*	[1.03, 1.98]

Any substance disorder	--	--	--	--	0.79	[0.49, 1.28]
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* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Note: Model 1 simultaneously examined race/ethnicity, gender, and age group; Model 2 examined race/ethnicity, gender, age group, and educational attainment; Model 3 examined race/ethnicity, gender, age group, educational attainment, number of chronic physical condition, any past-year mood disorder, any past-year anxiety disorder, and any past-year substance use disorder.

Sensitivity Analyses: Nativity Status

Sensitivity analyses were also conducted to investigate whether incorporating nativity status into the final regression model for each outcome would alter the significant relationships observed. These analyses were conducted to determine whether racial/ethnic differences in nativity status ($F(1.98, 136.57) = 107.72, p < .001$) would explain apparent racial/ethnic differences in general and medically unexplained physical symptom counts. After incorporating nativity status into the GPS version of Model 3, significant differences between White and Asian respondents were no longer observed (IRR = 0.91, 95% CI: [0.70, 1.18]). However, in the MUPS version of Model 3, incorporating nativity as a predictor variable did not change any observed racial/ethnic differences; both Latino (IRR = 0.49, 95% CI: [0.34, 0.69]) and Asian respondents (IRR = 0.55, 95% CI: [0.39, 0.79]) continued to display fewer MUPS than White respondents.

DISCUSSION

Somatization was measured in terms of rates of general physical symptoms (GPS) and medically unexplained physical symptoms (MUPS). The differentiation between GPS and MUPS in the study analysis allows us to review culture-specific elements of the experience and expression of physical symptoms. Our study findings challenge the universalist framework of diagnostics, while engaging in an emic approach examining

how somatic symptom endorsement may be related to culture, education level, gender, or physical and mental health.

General Physical Symptoms

Asian respondents reported fewer GPS than non-Latino Whites, even when controlling for educational attainment (Model 2) as well as physical and mental health conditions (Model 3); however, no significant differences were observed between Latino and non-Latino White respondents. The culture-specific explanatory models of somatization, introduced by Rohlf and colleagues (2014), apply to medically unexplained symptoms and not to medically explained ones. The endorsed GPS symptoms though were attributed to physical medical conditions. Therefore, our finding suggesting that Asians report fewer GPS than non-Latino Whites and that Latinos do not differ in the GPS counts from White respondents, supports the argument that the ethnic minority group of Asians in the US consists of a generally healthy population group, often referred to as the “minority model” (Leong & Lao, 2001). Of note, most Asian respondents (76.9%) were born outside the US and, when nativity was introduced into the regression model, GPS differences between non-Latino White and Asian respondents were no longer observed. Taken together, these findings seem to support the “healthy immigrant effect” hypothesis (Constant et al., 2017; Vang et al., 2017; Cunningham et al., 2008).

Consistent with previous studies, female respondents reported significantly more GPS symptoms than males, even when controlling for physical and mental health conditions (Creed & Barsky, 2004). Women report more intense, numerous and more frequently bodily symptoms than men. Some potential contributing factors to such

differences include gender differences in somatic and visceral perceptions, differences in symptom labeling, descriptions and reporting as well as differences in acknowledging and disclosing discomfort in specific social contexts (Barsky, Peekna & Borus, 2001).

Contrary to previous studies suggesting that older age is associated with more somatization, the youngest age group included in the study, 18-34 years, showed significantly more GPS than the rest. However, when adjusting for physical and mental health conditions, all respondents, apart from those aged above 65 years, showed more GPS than the respondents in the 18-34 age group. According to the systematic review by Hilderink and colleagues (2013), prevalence rates of unexplained physical symptoms and somatoform disorders decline after the age of 65 years of age. Based on the findings of our study, younger adults seem to report fewer GPS, since they might be less likely to seek medical help for any experienced physical symptoms. A wide range of studies, nationally and internationally, attest to young people's reluctance to seek professional health care, and particularly mental health care (Gulliver et al., 2010; Rickwood et al., 2007). Gulliver et al. (2010) have commented that younger adults show a preference for self-reliance, social support, and encouragement from others as help-seeking processes to suffering.

As expected, chronic physical conditions were positively associated with GPS counts. Moreover, any past-year mood disorder and any past-year anxiety disorder were positively associated with GPS, that is with medically explained physical symptoms, indicating the strong link between physical and mental health.

Medically Unexplained Physical Symptoms

Both Latino and Asian respondents demonstrated significantly fewer MUPS than non-Latino Whites, even when adjusting for educational attainment (Model 2), physical and mental comorbidities (Model 3), and nativity status (sensitivity analysis). These results partially support the neutral/expressive continuum of cross-cultural interaction introduced by Mendez (2010). According to this continuum, Asians may be more likely to report somatic symptoms and Latinos may be more likely to express psychological symptoms when describing their suffering. In alignment with this hypothesis, Latinos did appear to express fewer MUPS than non-Latino Whites, however Asian respondents did not report more MUPS than non-Latino Whites, contrary to expectations. Variations in social and contextual circumstances are correlated to potential intra-ethnic differences in the expression of symptoms and manifestation of disorders (Alegría et al., 2004). In other words, minorities in their countries of origin are likely to report, qualitatively and quantitatively, different types of symptoms related to their physical and mental conditions, considering the environmental context as sociogenic to corresponding symptoms (Angel & Guarnaccia, 1989). This gives rise to the fact that stigma, in specific cultural contexts, conditions the experience and expression of symptoms within the framework of the “idiom of stress” hypothesis (Kleinman, 1977).

No significant relationships were observed between MUPS and other sociodemographic characteristics, such as age, gender, and educational attainment. Further, educational attainment did not affect the association between race/ethnicity and MUPS count.

MUPS counts are positively related with chronic physical conditions, any past-year mood disorder and any past-year anxiety disorder diagnosis, suggesting the link

between physical health and mental health and the somatic aspects of common mental disorders, such as mood and anxiety disorders.

GPS, MUPS, and Educational Attainment

Although prior research has suggested links between education and somatization (e.g., Simon et al., 1996; Simon & Vonkorff, 1991), in the current study, both bivariate and adjusted analyses failed to demonstrate a significant relationship between educational attainment and either GPS or MUPS. Further, educational attainment did not seem to significantly impact the relationship between race/ethnicity and GPS or MUPS. Beyond health literacy as a determinant of racial/ethnic health disparities (Lie et al., 2014), and while separating education from socio-economic status as a dimensional composite (Escobar et al., 2010; Winkleby et al., 1992), the respondents' educational attainment does not influence the experience and expression of physical symptoms reported by them.

It may be that cultural explanations for somatization differences are more useful and appropriate than hypotheses based on education as playing a role in these expressions. Instead, physical idiomatic expressions of suffering may be driven by cultural understandings of the self (Wen, 1998; Squire, 2000), rather than of educational attainments. Therefore, educational attainment is an acquired sociodemographic status that does not seem to interfere with cultural expressions of self and perceived health status.

Study Implications and Future research

Our study holds implications at clinical and at epidemiological levels. Our results may inform transcultural clinical practice both at primary care and mental health specialist care settings. Towards the accurate assessment of medically explained and unexplained physical symptoms, health professionals need to be aware of how patients' cultures address emotional expression and meaning-making of physical symptoms. Additionally, at an epidemiological level, the definitions of somatization need to be exact, clear, and culture-sensitive so that they can inform applied methodologies.

With a view to better understand the observed racial/ethnic differences in somatization patterns, future research of qualitative design may be implemented. This would permit an understanding of how individuals from various racial/ethnic backgrounds and educational backgrounds make meaning of physical symptoms in describing mental and physical suffering. Future research studies may also compare the importance members of different racial/ethnic groups place on such somatic symptoms. The underlying significance these symptoms may have for the individual can provide useful information in understanding how he or she prioritizes the experienced symptoms overall.

Conclusion

Our study results challenge some previous findings on somatization while adding specificity. This is mainly because somatization was defined and innovatively measured on two levels, i.e. in terms of expressed general physical symptoms (GPS) and physical symptoms for which medical explanations were not clear (MUPS). Latinos and Asians presented fewer MUPS than non-Latino Whites and educational attainment had no

effect on somatization. Such results widen the perspective of understanding the self, symptom characteristics, and their meanings for every individual in relationship to his/her sociocultural background.

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