

# Effect of Gender And Marital Status on Somatization Symptoms of Immigrants From Various Ethnic Groups Attending a Primary Care Service

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## Abstract

**Objectives:** Population studies in Western cultures agree that gender differences influence somatization, while available data on marital status are more conflicting. Previous surveys on immigrants found high levels of somatization, particularly in South/Central Americans, gender effect deserving further research. This study investigates the effect of gender and marital status on somatization in immigrants of four ethnic groups (Caucasians, Asians, South/Central Americans, and Africans).

**Methods:** We studied 360 consecutive outpatients attending a primary care unit for immigrants. 301 completed the 21 item Bradford Somatic Inventory (BSI-21). The BSI-21 total score and the relative risk for any single symptom were studied, adjusting for major intervening variables.

**Results:** Female gender predicted the frequency of 12 out of 21 symptoms and was associated with the total score at the BSI-21. BSI-21 scores were significantly higher in married subjects. Differences were found among the four groups, only Caucasian and South/Central American women and Caucasian married subjects having a significantly increased risk for somatization. Significant ethnic differences were also found in the number and kind of reported symptoms.

**Conclusion:** These differences among ethnic groups suggest that cultural influences might be more relevant than biological factors for the understanding of gender and marital differences in somatization. Future studies should focus on the role of cultural gender differences in social roles and construction of identity as possible basic factors influencing somatization (German J Psychiatry 2008; 11: 64-72).

**Keywords:** migration, ethnicity, somatization, somatoform disorders, transcultural psychiatry, epidemiology

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## Introduction

Symptoms such as back pain, fatigue, headache, dizziness, musculoskeletal pain, gastrointestinal disturbances and other physical complaints are reported to be the leading reason for outpatient visits to primary care

physicians (Kroenke et al., 1990) and are associated with significant distress, disability and utilization of health care facilities (Kroenke et al., 1994). Previous research (Kroenke and Spitzer, 1998) showed that clinicians judge the symptom to be somatoform in a significant number of cases (about 20%) with headache, fatigue and nausea/indigestion as the most frequent somatoform symptoms. Women have consistently been shown to report more somatic symptoms than

men do (Kroenke and Spitzer, 1998; Gijbers van Wijk and Kolk, 1997; Nakao et al., 2001; Hiller et al., 2006) and a possible influence of the marital status was reported in some cases (Nakao et al., 2001). However, in primary care a multicenter study reported higher levels of somatic symptoms in women but concluded that gender had no significant effect on, when the effects of central and emotional distress were controlled for (Piccinelli and Simon, 1997).

In cross-cultural primary care settings for immigrants somatoform complaints are frequent but they are often misclassified as somatic problems. Accordingly, previous research showed that the very low rates of somatoform disorders in official epidemiological data sets (Aragona and Colosimo, 2000) contrasted with the high prevalence of somatizations (35,2%) found in epidemiological surveys on the same primary care population (Aragona et al., 2005). Previous studies on immigrants showed that being woman and married (Tarsitani et al., 2005) and coming from South/Central America (Aragona et al., 2005) were significant risk factors for somatization. However, the reciprocal influences of these and other variables (e.g. age and scholarship) were not studied in detail. Moreover, the above mentioned previous researches on immigrants analyzed total scores at the Bradford Somatic Inventory (Mumford et al., 1991a) without providing details on individual symptoms. Accordingly, it is presently unclear whether women, married and South/Central American immigrants are more likely to report all or most symptoms or only certain specific somatoform symptoms.

In this study, we investigated the role of somatization in a primary care outpatient service for immigrants to answer three questions:

First, what is the independent effect of gender and marital status on somatizations among immigrants after adjusting for confounding effects?

Second, is the role of these variables different in different ethnic groups?

Third, are differences restricted to specific symptoms or are they generalized among all or most types of symptoms?

## Material and Methods

This study was conducted in the outpatients primary care unit for immigrants, of the “Caritas” Health Service of Rome (Italy).

Patients attending the surgeries were consecutively approached to enter the study. To reduce possible selection bias, we included outpatients attending the Service across the entire work day and those seen for the first time or attending for follow-up.

To analyze ethnic differences, the sample was divided into four major groups: Caucasians, Asians, Africans, and South-Central Americans.

All participants were asked to complete two self-assessment questionnaires: one designed *ad hoc* to collect main sociode-

mographic data as well as to investigate some risk factors specifically linked to immigration (Aragona and Colosimo, 2000) and the 21-item Bradford Somatic Inventory (BSI-21), a widely validated questionnaire specifically designed for use in transcultural research (Mumford et al., 1991a; Mumford et al., 1991b), and deemed appropriate for this type of study (Colosimo and Aragona, 2000). In this research scores at the BSI-21 were considered dimensionally (as “tendency to somatize”) and thus analyzed as continuous variables, without the introduction of a cut-off score.

Both questionnaires were translated into 9 languages, namely Arabic, Bengali, Chinese, French, Italian, Polish, Rumanian, Russian, and Spanish. Content comparability was verified through back-translation procedures. Both instruments were self-administered, but were read out to patients with reading difficulties.

Statistical analyses were conducted with Stata 9.1. Student’s t-test and ANOVA were used to compare mean scores. Potential predictors of BSI total score have been identified using a multiple linear regression model. Covariates in such model included age, gender, marital status, educational level and duration of stay in Italy. Adjusted odds ratios were derived from logistic regression models to estimate the effect of age, marital status and gender on the risk of individual somatic symptoms enlisted in the BSI-21 questionnaire. Somatic symptoms were introduced in the model as dichotomic variables with 1 indicating the presence and 0 indicating the absence of the symptoms. Age was categorized in a two level category variable using 35 years of age as cut-off. Marital status was categorized in a two level category variable with 1 indicating that the subject was unmarried and 0 indicating that he/she was married.

Subgroup analyses were conducted in different ethnic groups.

## Results

Of the 360 consecutive patients who originally agreed to participate in the study, 301 completed the questionnaires and were included in the statistical analysis. Main sociodemographic variables are reported in Table 1.

Of the 301 participants, 134 subjects (44.5%) were new patients, while the others were regularly followed-up in our outpatient service. Mean BSI-21 scores did not significantly differ between “new” and “old” patients ( $11.8 \pm 8.5$  vs  $12.7 \pm 9.4$ ,  $t = 0.76$ ;  $p = 0.44$  by two-tailed Student’s t-test). Immigrants came from 34 countries and were categorized in four major groups: Caucasians (104; 34.5%), Asians (73; 24.2%), South/Central Americans (90; 29.9%), and Africans (34; 11.3%). The mean duration of stay in Italy was  $23.1 \pm 42.3$  months; the majority of patients had no permit of sojourn (282, 93.7%); mean years of education were  $12.07 \pm 4.0$ ; and 160 patients (53.16%) were married.

Statistical analysis showed that BSI-21 scores are significantly higher in women and in married subjects compared to, respectively, men and unmarried (Table 2). A significant dif-

**Table 1. Demographic characteristics in males and females**

		Total sample		Males		Females	
		n	%	n	%	N	%
		301	100	148	49.17	153	50.83
<b>Mean age</b>		35.85		33.5		38.12	
<b>Marital status</b>	Married	160	53.16	78	52.70	82	53.59
	Unmarried	136	45.18	68	45.95	61	44.44
<b>Ethnicity</b>	Africans	34	11.30	25	16.89	9	5.88
	Asians	73	24.25	58	39.19	15	9.80
	Caucasians	104	34.55	35	23.65	69	45.10
	South/Central Americans	90	29.90	30	20.27	60	39.22
<b>Mean of years of study</b>		12.07		11.79		12.35	
<b>Mean duration of stay in Italy (months)</b>		23.11		24.16		22.10	

ference was also found among the four ethnic groups considered (Table 2).

After adjusting for age, marital status, education, stay in Italy, women showed a higher risk of somatization relative to men (coefficient = 5.00, CI= 2.98/7.03). Subgroup analysis of the ethnic groups showed that being a woman was a significant risk factor only for Caucasians and South/Central Americans, in other ethnic groups women and men being comparable (Table 3).

After adjusting for age, gender, education, stay in Italy, unmarried subjects showed a lower risk of somatization relative to married (coefficient = -3.28, CI= -5.37/-1.18). However, subgroup analysis of the ethnic groups showed that being married was a significant risk factor only for Caucasians (Table 4).

In the whole sample the five most common symptoms were tiredness, weakness, neck and shoulders pain, dry mouth/throat, and headache (Table 5).

Twelve symptoms (Table 6) were significantly more common in women than in men. However, this evidence was not replicated in every ethnic group: Africans did not show any significant difference, while the symptoms showing an increased risk in women widely varied within other ethnic groups: “fluttering/something moving in the stomach” (OR: 6.15), “head constriction” (OR: 3.45), “dry mouth/throat” (OR: 2.65), “chest or heart pressure/tightness” (OR: 2.66), “trembling or shaking” (OR: 6.09), “tiredness” (OR: 3.08), “weak/sinking heart” (OR: 5.05), and “feeling cold” (OR: 2.76) were all more common only in Caucasians. On the contrary, “neck and shoulders pain/tension” (OR: 3.38) and

“aches/pains all over the body” (OR: 4.47) were more common only in South/Central Americans. Finally, “heavy head” was the symptom more commonly high in women of three ethnic groups (Asians, Caucasians and South/Central Americans) while increased risk for “headache” and “chest/heart pain” was found in both Caucasians and South/Central Americans (Table 6).

Seven symptoms (Table 7) were significantly less common in unmarried than in married subjects: “headache” (OR: 0.46), “dry mouth/throat” (OR: 0.43), “lack of energy (weakness)” (OR: 0.58), “throat choking sensation” (OR: 0.57), “heavy head” (OR:0.50), “constipation” (OR: 0.51), and “weak/sinking heart” (OR: 0.43). However, even in the case of marital status there were significant differences among ethnic groups: “palpitations” (OR: 0.25), “trembling or shaking” (OR: 0.24), and “excessive wind (gas) or belching” (OR: 0.24) were more common among Asians; “headache” (OR: 0.39) and “constipation” (OR: 0.16) were more frequent among Caucasians; finally, “dry mouth/throat” (OR: 0.27) was more frequent in South/Central Americans.

## Discussion

In the present study, we examined the effect of gender and marital status on somatic symptoms listed in a questionnaire (BSI-21) formerly used to assess somatizations among immigrants (Colosimo and Aragona, 2000; Aragona et al., 2005).

**Table 2. Mean BSI-21 Total Scores ( $\pm$ SD)**

Gender*	Men	10.08 ( $\pm$ 8.40)
	Women	14.63 ( $\pm$ 8.94)
Marital Status**	Unmarried	11.06 ( $\pm$ 8.55)
	Married	13.74 ( $\pm$ 9.07)
Ethnic group***	Africans	11.44 ( $\pm$ 9.17)
	Asians	10.32 ( $\pm$ 7.71)
	Caucasians	11.76 ( $\pm$ 8.63)
	South/Central	
	Americans	15.15 ( $\pm$ 9.64)

\*p=0.000; \*\*p=0.010; \*\*\*p=0.004

**Table 3. Adjusted risk of somatization in women relative to men in the whole sample and in ethnic groups**

	C	SE	CI	P
<b>Whole sample</b>	5.00	1.02	2.97–7.03	<0.001
<b>Africans</b>	-3.98	3.66	-11.51–3.54	0.287
<b>Asians</b>	1.38	2.51	-3.64–6.42	0.584
<b>Caucasians</b>	6.44	1.81	2.83–10.05	0.001
<b>South/Central Americans</b>	6.31	2.07	2.18–10.44	0.003

C= Coefficient. Estimates were derived from multiple linear regression model, including age, marital status, educational level and duration of stay in Italy as covariates.

SE=standard error

CI=95% Confidence intervals

p=probability score

Our results indicated that female gender was a significant predictor of the frequency of 12 out of 21 symptoms and was also associated with the total score at the BSI-21. These findings parallel those reported in previous studies, confirming that in general females somatize more than males (Kronke and Spitzer, 1998; Gijsbers van Wijk and Kolk, 1997; Nakao et al., 2001; Hiller et al., 2006) and that they are more likely than men to have high scores at the BSI-21 even in specific ethnic groups living in remote developing areas (Mumford et al., 1996). However, previous studies that compared gender differences in different ethnic groups found that primary care attenders from less developed centrals presented with more somatic symptoms and showed greater gender differences than individuals from more developed centrals, but inter-central differences were small and it was concluded that these data did not support the common belief that females somatize more than males or the traditional view that somatization is a basic orientation prevailing in developing countries (Piccinelli and Simon, 1997). In our study the possible bias of having compared patients with different social condition (e.g. Western patients compared to patients from developing countries) was avoided because all the primary care patients considered herein were immigrants from developing countries and the large majority of them had no permission to stay in Italy. Hence, to our knowledge our study was the first one that systematically compared gender differences in immigrants of various ethnic groups with similar social conditions attending at the same primary care service. Interestingly, we found that the effect of gender on somatizations was not alike in all the ethnic groups considered, supporting previous mail surveys that had reported that the frequency of medically unexplained somatic symptoms differ across cultures, and that some of the somatic symptoms that are frequent or indicative of somatization in one cultural group are rare or atypical in other groups (Janca et al., 1995). In our study, female gender was a significant predictor of somatizations only for Caucasians and South/Central Americans, in other ethnic groups women and men being comparable. Likewise, while in the whole sample twelve symptoms resulted to be significantly more common in women than in men, considerable differences were found among ethnic groups. The frequency of symptoms in African men and women did not show differences at

all, while the symptoms showing an increased risk in women appeared to be different in the other ethnic groups: Caucasian and South/Central American women presented with an increased risk in many symptoms while the only gender-influenced symptom in Asians was heavy head. Moreover, between Caucasians and South/Central Americans there were only some symptoms in common, American women showing an additionally increased risk for body pain while Caucasian women were more likely to report additional vague symptoms like something moving in the stomach, dry mouth, chest tightness, trembling, tiredness, weak heart and feeling cold.

Previous studies reporting a significant increase of somatizations among women considered as a possible factor responsible for this phenomenon the presence of physiological differences between males and females (Nakao et al., 2001). Accordingly, gender differences in brain function, hormones and reproductive processes were considered as possible factors related to the increased risk to complain for somatic symptoms in women. Having found significant gender differences between ethnic groups in both the general tendency to report somatizations and the number/kind of somatic symptoms reported, our study was in advantaged position to discuss this topic. In fact, although physical characteristics like hormonal profiles may be ethnically influenced independently from other sociodemographic and biomedical factors (Glynn et al., 2007), ethnic groups are still largely more similar in their body structure than in their cultural norms/values, and cultural differences are so powerful that frequently they are the source of lifestyle attitudes secondarily leading to somatic pathology (e.g. Moran et al., 2007; Perez-Escamilla and Putnik, 2007). Accordingly, our finding of ethnic differences in the reporting of somatizations in women is more likely to be linked to socio-cultural differences than to physiological differences, supporting previous claims that “the huge difference between men and women suggests that powerful social factors are operating” (Mumford et al., 1996). For instance, this should allow to discard previous explanations like that suggesting that women’s reproductive processes (menstrual cycle, pregnancy, menopause) generate a host of internal information that is absent in men (Verbrugge and Wingard, 1987). While previous studies were unable to give a direct answer to this hypothesis, suggesting the need of future more specific studies (Nakao et al., 2001), our finding of ethnical differences suggests that it is not the biological event “pregnancy” (or “menstrual cycle”, or “menopause”) that is involved *per se*, but more plausibly the different way of living and processing it in different cultures.

**Table 4. Adjusted risk of somatization in unmarried relative to married subjects in the whole sample and in ethnic groups**

	C	SE	CI	P
Whole sample	-3.27	1.06	-5.37– -1.17	0.002
Africans	-2.52	3.87	-10.46– -5.41	0.520
Asians	0.90	2.24	-4.39– 4.57	0.968
Caucasians	-3.62	1.68	-6.98 – -0.27	0.035
South/Central Americans	-3.30	2.11	-7.51– 0.91	0.123

C= Coefficient. Estimates were derived from multiple linear regression model, including age, marital status, educational level and duration of stay in Italy as covariates.

SE=standard error

CI=95% Confidence intervals

p=probability score

**Table 5: Relative frequency of symptoms in the whole sample (%)**

Tiredness	60.80
Lack of energy (weakness)	57.81
Dry mouth/throat	55.15
Neck and shoulders pain/tension	55.15
Headache	54.49
Heavy head	53.16
Sweating a lot	52.16
Aches/pains all over the body	47.84
Passing urine more frequently	47.84
Chest/heart pain	46.51
Pressure inside the head (as if it is going to burst)	45.51
Fluttering/something moving in the stomach	45.51
Palpitations	45.18
Excessive wind (gas) or belching	44.52
Head constriction	44.19
Feeling cold	43.19
Chest or heart pressure/tightness	41.53
Constipation	40.20
Trembling or shaking	37.87
Throat choking sensation	35.88
Weak/sinking heart	34.22

Having ruled out the biological hypothesis, another possible explanation for differences in somatization prevalence in different countries was proposed to be the patient-doctor relationship (Gureje, 2004). Accordingly, cross-national differences in somatic distress did not lend themselves to a neat cultural explanation (even though the role of culture could not be excluded), this variation being mainly related to the nature of patient-doctor relationship in different sites (Gureje, 2004). Our study was able to exclude this possibility, because different ethnic groups were evaluated in the same primary care service, diagnostic inventories were self-administered and the investigators who helped patients in case of difficulties of reading were the same for all groups.

Being the biological and the patient-doctor hypotheses not supported from our findings, and in accordance with earlier research that stressed that "cross-cultural differences in psychiatric disorders and health complaints are substantially correlated with cultural values" (Maerker, 2001), we suggest that cultural factors might be particularly relevant for the understanding of ethnic gender differences in somatizations among immigrants. This indirectly confirms previous indications that perceptual and cognitive-behavioral factors involved in bodily distress, impaired coping, inappropriate use of health services, chronicity and disability of somatizers (Duddu et al., 2006; Kirmayer and Looper, 2006) are likely to be related to socio-cultural factors like parental emotion socialization (Le et al., 2002), idioms of distress (Keyes and Ryff, 2003), developmental adversities and parental modeling of illness behaviour in childhood (Kirmayer and Looper,

2006), cultural models of illness and social stigma (Kirmayer and Looper, 2006). Further research should investigate these factors in women and men of different ethnic groups and consider their correlation with somatizations in general and specific symptoms in particular.

Marital status was the other factor considered in this paper. In accordance with the usual fate of other psychiatric disorders like schizophrenia, it might have been expected that having somatizations could negatively affect the possibility to marry and/or to maintain satisfying communal relationships with an increased rate of marital separation. Actually, previous research showed that in general "married patients are less likely to report physical and psychological distress" than singles but it did not found significant differences at the SCL-90 "somatization" subscale (Nakao et al., 2001). Similarly, another study reported that being single, separated, divorced or widowed women compared to married women is associated with a significantly increased likelihood of any mental disorders, except for somatoform disorders (Klose and Jacobi, 2004). Furthermore, it was hypothesized that in rural cultures young married women making adjustments to their new families could be more distressed and thus they could score higher at the BSI-21, but in point of fact their BSI-21 scores were only slightly and non significantly higher than single women of the same age (Mumford et al., 1996). Our study found a lower risk of somatization in unmarried than in married subjects, suggesting that somatizations are less related than other psychopathological symptoms to the unmarried condition and/or that married subjects could be more prone to report somatizations than unmarried ones. Nevertheless, this effect of the marital status was significant only in the Caucasian subgroup and the relative risk for specific symptoms was also different in different ethnic groups, suggesting that the role of marriage appears significantly different in different cultures. Anyhow, our study did not consider in detail how many unmarried subjects were single, separated, divorced or widowed; thus, further studies exploring more thoroughly this topic in different ethnic groups are needed.

Before concluding, the following main limitations of this study have to be considered.

First, we divided our sample into four major ethnic groups, without taking into account the wide cultural and ethnical heterogeneity of each geographical area. Accordingly, further studies should use narrower and more culturally meaningful definitions of ethnic groups.

Second, the sample size of some ethnic subgroups (particularly Africans) was quite small and this could have biased some statistical analyses. Accordingly, research on larger samples of immigrants in primary care are needed to confirm our preliminary results.

**Table 6: Adjusted risk of presenting individual BSI-21 symptoms in women relative to men in the whole sample and in ethnic groups\***

	Whole sample	Africa	Asia	Caucasian	South/Central America
Headache	<b>2.33</b> <b>(1.41-3.87)</b>	0.72 (0.11-4.52)	1.46 (0.35-6.09)	<b>4.40</b> <b>(1.66-11.70)</b>	<b>3.92</b> <b>(1.46-10.55)</b>
Fluttering/something moving in the stomach	<b>2.18</b> <b>(1.31-3.65)</b>	0.73 (0.09-6.18)	0.66 (0.16-2.72)	<b>6.15</b> <b>(1.85-20.44)</b>	1.50 (0.59-3.84)
Neck and shoulders pain/tension	<b>2.72</b> <b>(1.65-4.48)</b>	0.84 (0.10-7.00)	1.16 (0.29-4.57)	2.47 (0.99-6.16)	<b>3.38</b> <b>(1.20-9.46)</b>
Head constriction	<b>2.45</b> <b>(1.46-4.11)</b>	0.43 (0.06-3.05)	2.26 (0.53-.61)	<b>3.45</b> <b>(1.31-9.07)</b>	2.43 (0.90-6.53)
Chest/heart pain	<b>2.55</b> <b>(1.52-4.29)</b>	0.99 (0.12-7.96)	0.63 (0.16-2.55)	<b>6.04</b> <b>(1.83-20.00)</b>	<b>5.55</b> <b>(1.98-15.57)</b>
Dry mouth/throat	<b>2.39</b> <b>(1.43-3.32)</b>	1.41 (0.21-9.28)	4.12 (0.78-21.77)	<b>2.65</b> <b>(1.06-6.65)</b>	2.00 (0.70-5.71)
Lack of energy (weakness)	<b>2.19</b> <b>(1.32-3.62)</b>	0.66 (0.11-3.93)	4.05 (0.82-19.88)	2.35 (0.96-5.81)	2.50 (0.98-6.36)
Sweating a lot	1.48 (0.90-2.45)	3.21 (0.38-26.69)	0.99 (0.22-4.39)	2.52 (0.99-6.41)	1.05 (0.41-2.69)
Chest or heart pressure/tightness	1.39 (0.83-2.32)	0.29 (0.02-3.28)	1.21 (0.31-4.74)	<b>2.66</b> <b>(1.01-7.04)</b>	2.18 (0.72-6.60)
Throat choking sensation	1.05 (0.62-1.79)	0.20 (0.02-2.17)	3.60 (0.57-22.83)	1.37 (0.48-3.94)	1.07 (0.42-2.76)
Aches/pains all over the body	1.64 (1.00-2.70)	0.30 (0.04-2.23)	1.41 (0.37-5.36)	0.90 (0.35-2.29)	<b>4.47</b> <b>(1.61-12.37)</b>
Palpitations	<b>1.76</b> <b>(1.06-2.92)</b>	0.95 (0.15-5.98)	0.54 (0.11-2.62)	2.23 (0.86-5.78)	2.26 (0.85-6.00)
Trembling or shaking	<b>2.01</b> <b>(1.16-3.48)</b>	0.48 (0.04-5.86)	0.24 (0.04-1.46)	<b>6.09</b> <b>(1.64-22.60)</b>	2.34 (0.86-6.34)
Passing urine more frequently	1.31 (0.80-2.15)	2.14 (0.33-13.78)	0.53 (0.11-2.46)	1.23 (0.50-3.03)	1.63 (0.62-4.30)
Heavy head	<b>3.82</b> <b>(2.25-6.50)</b>	0.66 (0.11-4.09)	<b>5.18</b> <b>(1.07-25.09)</b>	<b>9.26</b> <b>(2.88-29.79)</b>	<b>3.02</b> <b>(1.15-7.89)</b>
Tiredness	<b>1.73</b> <b>(1.05-2.86)</b>	0.96 (0.16-5.69)	1.14 (0.28-4.58)	<b>3.08</b> <b>(1.20-7.89)</b>	1.79 (0.70-4.55)
Pressure inside the head (as if it is going to burst)	<b>2.09</b> <b>(1.25-3.49)</b>	0.44 (0.04-5.27)	2.49 (0.58-10.61)	1.98 (0.75-5.21)	2.26 (0.88-5.77)
Constipation	1.61 (0.95-2.74)	1.36 (0.19-9.74)	1.14 (0.23-5.74)	2.79 (0.86-9.06)	1.27 (0.50-3.22)
Weak/sinking heart	1.60 (0.92-2.79)	0.26 (0.02-2.98)	3.01 (0.74-12.19)	<b>5.05</b> <b>(1.32-19.27)</b>	1.49 (0.51-4.37)
Excessive wind (gas) or belching	1.05 (0.64-1.73)	0.83 (0.14-4.82)	1.78 (0.41-7.80)	1.55 (0.57-1.12)	0.64 (0.25-1.64)
Feeling cold	1.65 (1.00-2.73)	0.50 (0.07-3.70)	1.22 (0.31-4.72)	<b>2.76</b> <b>(1.01-7.56)</b>	2.07 (0.79-5.40)

\*= Estimates were derived from multiple logistic regression model including age and marital status as covariates. 95% Confidence intervals

Third, we assessed somatization with the BSI-21 alone without confirming a somatoform disorder with a psychiatric diagnosis, a difficult undertaking in a large study sample from a primary care service for immigrants.

Fourth, we did not consider possible mental comorbidity. In particular, somatoform symptoms are often reported in outpatient cases of depression and/or anxiety (Fava et al., 2006), depressive and anxiety disorders are more frequent in women than in men (Afifi, 2007), and somatic depression is much higher among women than men (Silverstein, 2002), suggesting that this could consequently raise the related rate of somatizations. Although previous research found that

gender has an independent effect on somatoform symptoms that persist even after adjusting for psychiatric comorbidity (Kroenke and Spitzer, 1998; Nakao et al., 2001) and two large studies in primary and secondary care found that medically unexplained symptoms were not directly associated with anxiety and mood disorders (Nimnuan et al., 2001; Jackson and Passamonti, 2005), in our study the possibility of anxious-depressive comorbidity biasing results cannot be completely excluded. Therefore, further studies on the correlation between somatizations and other psychopathological features in immigrants of various ethnic groups are needed, and they should consider diagnostic distinctions of anxiety-

**Table 7: Adjusted risk of presenting individual BSI-21 symptoms in unmarried relative to married subjects in the whole sample and in ethnic groups.\***

	Whole sample	Africa	Asia	Caucasian	South/Central America
Headache	<b>0.46</b> <b>(0.27-0.78)</b>	0.88 (0.14-5.60)	0.57 (0.18-1.84)	<b>0.39</b> <b>(0.16-0.95)</b>	0.38 (0.14-1.02)
Fluttering/something moving in the stomach	0.74 (0.44-1.25)	0.37 (0.04-3.10)	0.38 (0.11-1.38)	0.53 (0.20-1.41)	2.29 (0.87-6.04)
Neck and shoulders pain/tension	0.76 (0.45-1.27)	0.11 (0.01-1.29)	0.52 (0.16-1.71)	0.80 (0.34-1.88)	2.44 (0.76-7.84)
Head constriction	0.85 (0.50-1.45)	1.60 (0.24-10.86)	0.56 (0.15-2.14)	0.88 (0.51-2.11)	0.98 (0.37-2.58)
Chest/heart pain	0.61 (0.36-1.04)	0.46 (0.07-3.15)	0.78 (0.24-2.49)	0.40 (0.15-1.09)	0.93 (0.32-2.70)
Dry mouth/throat	<b>0.43</b> <b>(0.25-0.74)</b>	0.28 (0.04-1.73)	0.97 (0.28-3.35)	0.48 (0.20-1.13)	<b>0.27</b> <b>(0.09-0.81)</b>
Lack of energy (weakness)	<b>0.58</b> <b>(0.34-0.97)</b>	1.50 (0.27-8.44)	0.31 (0.09-1.10)	0.48 (0.20-1.15)	0.79 (0.30-2.04)
Sweating a lot	0.69 (0.41-1.16)	0.29 (0.04-2.40)	0.60 (0.19-1.91)	0.68 (0.28-1.66)	1.08 (0.41-2.82)
Chest or heart pressure/tightness	0.60 (0.35-1.03)	0.28 (0.04-1.91)	0.59 (0.17-2.09)	0.55 (0.23-1.33)	0.90 (0.31-2.62)
Throat choking sensation	<b>0.57</b> <b>(0.33-0.99)</b>	0.52 (0.09-3.09)	0.43 (0.12-1.57)	0.66 (0.24-1.80)	0.63 (0.24-1.62)
Aches/pains all over the body	0.63 (0.37-1.05)	2.36 (0.37-15.17)	0.46 (0.14-1.49)	0.46 (0.18-1.19)	0.73 (0.26-2.05)
Palpitations	0.59 (0.35-1.00)	1.62 (0.25-10.57)	<b>0.25</b> <b>(0.07-0.91)</b>	0.65 (0.27-1.56)	0.60 (0.22-1.61)
Trembling or shaking	0.67 (0.38-1.18)	2.45 (0.26-23.16)	<b>0.24</b> <b>(0.06-0.98)</b>	0.81 (0.31-2.12)	0.78 (0.29-2.13)
Passing urine more frequently	0.93 (0.56-1.55)	1.10 (0.16-7.59)	0.56 (0.16-1.88)	1.09 (0.46-2.55)	0.83 (0.32-2.17)
Heavy head	<b>0.50</b> <b>(0.29-0.85)</b>	1.03 (0.16-6.82)	0.45 (0.13-1.50)	0.39 (0.15-1.01)	0.72 (0.26-1.99)
Tiredness	0.60 (0.36-1.00)	1.22 (0.20-7.49)	0.30 (0.09-1.05)	0.63 (0.27-1.50)	0.69 (0.26-1.81)
Pressure inside the head (as if it is going to burst)	0.61 (0.36-1.03)	0.64 (0.09-4.81)	0.34 (0.10-1.20)	0.79 (0.32-1.93)	0.68 (0.26-1.77)
Constipation	<b>0.51</b> <b>(0.29-0.88)</b>	2.39 (0.32-18.11)	0.64 (0.17-2.46)	<b>0.16</b> <b>(0.05-0.56)</b>	0.70 (0.28-1.79)
Weak/sinking heart	<b>0.43</b> <b>(0.24-0.78)</b>	0.42 (0.06-3.09)	0.77 (0.21-2.82)	0.36 (0.12-1.06)	0.41 (0.14-1.20)
Excessive wind (gas) or belching	0.61 (0.37-1.03)	1.40 (0.22-8.84)	<b>0.24</b> <b>(0.07-0.85)</b>	0.42 (0.16-1.12)	1.13 (0.45-2.83)
Feeling cold	0.69 (0.41-1.16)	1.19 (0.18-7.77)	0.57 (0.17-1.87)	0.47 (0.19-1.17)	1.22 (0.86-5.72)

\*= Estimates were derived from Multiple logistic regression model including age gender as covariates. 95% Confidence intervals.

depression related somatizations from pure somatizations (Creed, 2006).

Fifth, because we did not collect data on patients' somatic health we did not investigate the possible influence of physical diseases in the onset and course of the reported somatic complaints. Our findings therefore call for larger studies designed to include complete assessment of immigrants' physical and psychiatric status.

In conclusion, our study found that being woman and married are significant risk factors for somatization but that this risk as well as the number/type of involved symptoms are probably dependant from ethnic/cultural differences. If confirmed in future studies, our findings might suggest that

the psychological mechanisms underlying somatization are not universal but culturally mediated. Accordingly, those responsible for interviewing immigrants in primary care settings should pay special attention to possible cultural explanations influencing reported somatic symptoms in different ethnic groups. Finally, future studies should focus on the role of cultural gender differences in social roles and construction of identity as possible basic factors influencing different symptom perception and style of reporting somatic sufferance between men and women in different cultures.

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