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Factors associated with migraine in the general population of Spain: results from the European Health Survey 2014

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Running tittle: Factors associated with migraine.

Abstract

Objective. To identify the modifiable and non-modifiable variables that are associated with and might moderate the presence of migraine in the general population.

Design. Nationally-representative cross-sectional survey

Setting. Non-institutionalized population of Spain.

Subjects. Individuals aged 15 years or older (N = 22,842).

Methods. A secondary analysis of data from the second wave of the European Health Interview Survey conducted in Spain (2014/2015). We estimated the prevalence of migraine and its distribution according to the study variables, and then built a multivariate logistic model encompassing age, sex, depression severity, chronic anxiety, Body Mass Index, physical activity, smoking status, alcohol use and perceived social support to predict migraine.

Results. The one-year prevalence of migraine was 8%. The final multivariate model (Wald $\chi^2 = 693.00$, df = 15, $p < .001$) retained depression severity, chronic anxiety, exercising several times a month or week, and alcohol use as predictors of migraine (odds ratios ranging from 2.1 to 3.5 for positive associations and from 0.4 to 0.9 for negative associations).

Conclusions. Raising awareness among clinicians regarding the fact that many of the variables that potentially contribute to the presence of migraine are modifiable (e.g., psychological problems and lifestyle behaviors) might intensify resources dedicated to assessing and impacting these factors in order to potentially prevent the frequency and severity of migraine.

Key Words: Migraine; psychosocial factors; comorbidities; lifestyle behaviors; general population; multivariate model

Introduction

Migraine is a common condition associated with impaired physical and psychological function [1]. It poses a significant economic burden to individuals and society, estimated to be about €111 billion annually in Europe [2]. The global prevalence of migraine has been estimated to be 11% overall (13% in women and 6% in men) [3], with a higher incidence in middle age [4].

The treatment of migraine is complicated by the fact that there are often accompanying comorbid psychiatric and medical conditions [5,6]. These conditions along with lifestyle behaviors are thought to contribute to the risk of having migraine [7]. The comorbid conditions most often studied in association with migraine have been depression, anxiety disorders and obesity [5,8–13]. The risk of having a disorder in the depression-anxiety spectrum is known to be higher in individuals with migraine [8,9,13]. The link between obesity and migraine is less clear, although the pooled results of multiple studies suggest a non-significant association between migraine and obesity [14].

The lifestyle factors most frequently studied in association with migraine are smoking, alcohol use and physical activity [6,10–12,15,16]. Studies evaluating the association between migraine and smoking provide inconsistent results, with some reporting a higher risk of recurrent headache or migraine in individuals who smoke relative to those who have never smoked [10,15], and others reporting the opposite [6] or a non-significant association [11]. Similarly, some studies have found a decreased prevalence of migraine in those individuals with higher alcohol intake [6,15] whereas others have not found a significant association [11,16]. With respect to regular exercise, although two studies found a

decreased prevalence of migraine in those individuals who endorse more physical activity [10,17] a number of others have not reported such an association [11,18–20].

While the extant research provides some preliminary evidence for a role of a number of biopsychosocial factors as being comorbid with or potential predictors of migraine, there are several obstacles preventing a comprehensive understanding of how these factors are linked to migraine. First, each of the studies published to date have included different sets of predictors and control variables, therefore making a direct comparison among the studies difficult. Second, the definition of migraine and how it has been assessed varies from one study to another, with some studies using simple screening questions [12] and others using a more thorough procedure following the suggestions of the International Headache Society [21]. Third, some studies have included participants with both recurrent headaches or migraine [10]. Finally, most studies have overlooked the moderator effects that some variables might have in increasing or decreasing the strength of the associations between the predictors and migraine. All of these factors might account for the different estimates found with respect to the association between the tested variables and migraine.

In addition, a number of potential predictors of migraine have been understudied. For example, despite the fact that poorer social support was found to be associated with migraine in one population-based study [10], to our knowledge no other study has sought to replicate this finding. Similarly, most of the studies that have examined depression as a predictor have only used dichotomous measures of depression (i.e., being present or absent) [9,13,22]. However, investigators have argued in favor of the use of continuous assessment

that recognizes idiosyncratic differences among those positively diagnosed and among those who fall below the categorical diagnostic cut-point [23].

From a preventive perspective, it is important to increase our understanding of the associations between migraine and the aforementioned biopsychosocial variables in large population-based studies in order to be able to determine the extent to which modifiable factors might reduce (e.g., exercise, improving social support) and others might increase (e.g., depression, anxiety, smoking and being obese) the risk of having migraine.

Given these considerations, the aim of this study was to identify the factors that are associated with and might moderate the presence (or absence) of migraine in a large community sample. Using data from a large scale European health survey, we built a predictive model encompassing a variety of modifiable and non-modifiable personal factors as well as their interactions, as potential predictors of having migraine. Based on previous research, we hypothesized that engaging in more physical exercise and having more perceived social support would be associated with a reduced risk of having migraine, whereas reporting a higher depression severity, having chronic anxiety and reporting a positive smoking status would all be associated with a greater risk for migraine. Also based in previous research, we expected to find a non-significant association between migraine and body mass index (BMI). In addition, we also explored the association between migraine and alcohol use, as well as the potential moderating effect of sex and age on the modifiable factors in the prediction of migraine.

Methods

Design, setting and participants

Secondary data from 22,843 participants (61% participation rate) aged 15 years or older was obtained from the second wave of the European Health Interview Survey (EHIS-2), conducted in Spain between 2014 and 2015. The EHIS-2 is a face-to-face interview surveying a nationally representative sample of 29 countries, including Spain. The EHIS-2 is based on a probabilistic three-stage sampling design, with the primary sampling unit being the census sections, the secondary being the main family dwelling and the tertiary consisting of the individual surveyed. The survey method used was Computer-Assisted Personal Interviews. Further information regarding the survey methodology can be looked up elsewhere (http://www.ine.es/metodologia/t15/t153042014.pdf).

Variables and measures

Self-reported information about variables assessing migraine presence, psychiatric and medical comorbidities, lifestyle behaviors, perceived social support and socio-demographic information were used. The one year-prevalence of migraine was deemed positive for those individuals who answered yes to both of the following questions: "Have you suffered migraine over the past 12 months?" and "Has a doctor confirmed this diagnosis?" Depression severity was measured using the Patient Health Questionnaire-8 (PHQ-8) [24], an 8-item questionnaire which provides a measure of severity that can be *"None", "Mild", "Moderate", "Moderately severe", or "Severe"*. Chronic anxiety was deemed positive for those individuals who answered yes to both of the following questions: "Have you suffered chronic anxiety over the past 12 months?" and "Has a doctor confirmed this diagnosis?" Perceived social support was measured with the Oslo 3-item Social Support Scale (OSS-3) [25], which categorizes the level of support as poor (3-8), moderate (9-11) or strong (12-

14). The amount of physical exercise was measured on a four-point scale ranging from "*No exercise*" to *"Exercising several times a week"*. Current tobacco use was measured dichotomously. Alcohol use was measured as a continuous variable based on participants' report of the average intake of standard alcohol units per week for the last year. For descriptive purposes, alcohol use was dichotomized whereas for the regression analyses it was used as a continuous variable. Participants were also asked to provide their sex, age, educational level, work situation, household monthly income rank and marital status. In order to avoid bias, average age was computed by adding 0.5 years to the age at the last birthday (i.e., it is assumed that individuals, on average, were aged their reported age plus 6 months at the time that they responded the survey). Self-reported height and weight were used to estimate the body mass index (BMI), calculated as weight in kilograms (kg.) divided by the square of height in meters (m^2). Based on the World Health Organization classification [26], participants were defined as being underweight (BMI<18.5 kg/m^2), normal weight (BMI 18.5-24.99 kg/m^2), overweight (BMI 25.0-29.99 kg/m^2) or obese (BMI>30 kg/m^2).

Data analyses

To describe the sample and study variables, we first computed means and standard deviations for continuous variables and number and percentages for categorical variables. We then estimated the one-year prevalence of migraine and its 95% confidence interval (CI) in the sample, as well as its distribution with respect to the socio-demographic variables. Chi-square tests (χ^2) were used to test for the hypothesized univariate associations between the socio-demographic variables and the presence of migraine in the last 12 months. To address the primary study aim, we performed a multivariate logistic

regression analysis predicting migraine from the measures assessing depression severity, chronic anxiety, obesity, physical activity, smoking status, alcohol use and perceived social support. Prior to the regression analysis, we examined the multicollinearity of the predictors and their linearity to the log odds to confirm they met the assumptions for regression [27]. In the regression analysis, migraine presence was the criterion variable. First, we entered the non-modifiable variables, that is, sex and age (centered), in the first step, and squared age (centered) in the second step, to adjust for their potential confounding effect. Squared age was introduced to assess a possible quadratic pattern of migraine prevalence across the life span. We then entered all of the modifiable predictors as a block in step 3 (with the continuous variables centered). For ease of interpretation we decided dummy coding to enter the ordinal predictors [28]. Depression severity, physical activity and BMI status were entered as (dummy coded) categorical variables, the first two of them with their lowest value as the reference value and the last with the category relative to normal weight as the reference value. In step 4, we entered the first order interaction terms between sex and all of the modifiable predictors and age and all the modifiable predictors. In step 5, we entered the first order interaction terms between the age squared and all of the modifiable predictors. In the event that any of the interaction terms were statistically significant, we planned to interpret it considering the multiplicative effects approach suggested by Buis [29]. Statistical significance was set at $p < .05$. The statistical analyses were conducted using STATA 14 (Stata Corp., Texas, USA).

Results

Data from 22,842 individuals were used because there was a large amount of missing data for one of the participants. The mean age of participants was 52.8 years (SD = 18.8, Range

= 15.5 - 102.5). The sample consisted of more women (54%) than men. About half were married (54%) and had completed secondary or higher education (46%). The one-year prevalence of migraine in the sample (n=1,902) was 8% (95% CI 8-9). Table 1 presents the socio-demographic categorical descriptive variables for the sample and migraine's one-year prevalence as a function of these variables. Statistically significant associations for one-year prevalence of migraine were found for sex ($\chi^2 = 421.92$, df = 1, $p = <.001$, Cramer's V = .14), age ($\chi^2 = 21.92$, df = 4, $p <.001$, Cramer's V = .03), educational level ($\chi^2 = 28.30$, df = 3, $p = <.001$, Cramer's V = .14), employment status ($\chi^2 = 110.82$, df = 4, $p <.001$, Cramer's V = .07), family income ($\chi^2 = 39.16$, df = 5, $p <.001$, Cramer's V = .04) and marital status ($\chi^2 = 28.91$, df = 10, $p <.001$, Cramer's V = .04). Based on Cohen's guidelines for labeling the magnitude of effect sizes [30], the relationship between migraine and sex, and between migraine and educational level, were small to medium, whereas the magnitude of the associations between migraine and the other predictors, albeit statistically significant, were very small.

[Insert Table 1 about here]

Controlling for sex, higher one-year prevalence of migraine was found among participants who: (1) endorsed higher depression severity and chronic anxiety; (2) exercised less frequently; (3) reported that they were smokers; (4) had less social support; and (5) reported that they hadn't drank alcohol for the past year (see Table 2). Specifically, weekly average alcohol use was lower among individuals with migraine (M = 2.96, SD = 0.17) compared to those without this condition (M = 5.22, SD = 0.07).

[Insert Table 2 about here]

The results of the logistic regression analysis are presented in Table 3. The assumptions underlying the regression analyses were all met; with respect to multicollinearity, the largest Variance inflation factor was 8.03 for the variable "alcohol consumption," and the assumed linearity to the log odds for the continuous predictors was observed. In model 1, female sex was associated significantly with having migraine whereas age was not. In model 2, sex remained significant and age squared was found to be significant as well. The variables included in both model 1 and 2 accounted for a small percentage of migraine variance (4.5% and 4.9%, respectively).

[Insert Table 3 about here]

The rest of the predictors were included in model 3. The variables that were found to be significantly associated with the presence of migraine were sex, age, age squared, every depression severity level, presence of chronic anxiety, two of the levels of physical activity and alcohol use. Out of these, positive associations with migraine were found for depression severity (the strength of the association increased with each severity level), chronic anxiety, being a woman and being middle aged (as opposed to being younger or older). Conversely, negative associations with migraine were found for exercising several times a month or a week (in comparison with doing no exercise), average alcohol use and age, although the effect sizes for the last two associations were very close to the null value. There were no significant associations between the presence of migraine and obesity, occasional physical activity, smoking status and perceived social support (although perceived moderate social support evidenced a trend [$p = .051$] towards significance). The inclusion of the predictors in model 3 increased the explanatory power of the model

twofold and accounted for 11.8% of the variance. Models 4 and 5, which attempted to test for interactions between age and sex, and the factors hypothesized to be associated with migraine, are not presented because no interaction effects emerged as significant. The value of the Hosmer–Lemeshow goodness of fit statistic was $\hat{C} = 4.67$ (df = 8, $p = .793$), indicating a good fit for the final model (model 3).

Discussion

Migraine is a prevalent neurological disorder with a marked impact on individual's function that may be worsened by comorbid psychiatric or medical conditions. The primary findings from this study are in line with the study hypotheses that (1) higher depression severity and chronic anxiety are associated with an increased risk of migraine, (2) exercising often is associated with a reduced risk of migraine, and (3) there is no association between obesity and migraine risk. On the other hand, and inconsistent with the study hypotheses, being a smoker and the amount of perceived social support were not associated with an increased or decreased risk of migraine. Moreover, more alcohol use was associated with a *reduced* risk of migraine. Also, although sex and age contributed to the prediction of migraine, neither had moderating effects on the other predictors.

Migraine and depression

Prior research has consistently found a link between migraine and the presence of depression [8,9,13]. This study replicated this association and extended this finding by examining the relationship between the severity of depressive symptoms and migraine. Specifically, we found a positive linear relationship between depression severity and migraine, such that individuals with higher levels of depression severity reported a higher

prevalence of migraine. Hence, even individuals reporting mild depression severity had on average 2.5 times the risk of having migraine relative to those with no depressive symptomatology. Related to this, a longitudinal study found that depression severity was a predictor of migraine chronification one year later [31]. Another study found that the presence of depression in individuals with migraine increases the chances of medication overuse, disability and refractoriness to migraine treatment [32]. Overall, these findings argue for the potential importance of assessing and effectively treating depression symptoms – including mild depressive symptoms – in migraine populations. However, given that the current and previous findings are correlational, experimental research is needed to evaluate the causal effects of reductions in depressive symptoms on subsequent migraines.

Migraine and chronic anxiety

Consistent with previous studies [8,9,13], we found that chronic anxiety was also associated with an increased risk of migraine. The measure of chronic anxiety used in this study asked respondents if they have experienced chronic anxiety over the past 12 months and whether a doctor has confirmed this diagnosis. Despite the brevity of the measure used here, a statistically significant effect still emerged. This finding suggests that clinicians and researchers would do well to give greater attention to anxiety symptoms in migraine patients.

Migraine and physical activity

Research on the association between physical activity and migraine has found conflicting results. Some studies have found a non-significant association between migraine and

exercise [11,18–20], but two studies have observed a decreased prevalence of migraine in those individuals endorsing more physical exercise [10,17]. In line with these latter results, we found that individuals that exercised several times in the past week or past month reported a slightly reduced risk of migraine, relative to those who reported that they did not exercise. This is even more important, given that individuals with migraine might tend to exercise less often due to migraine symptoms. However, not every amount of physical activity had the same effect. In this study, exercising occasionally was not associated with a reduced risk of migraine. Given that exercising has been recommended as a prophylactic treatment of migraine mostly based on the findings of case series or observational studies [33], the findings here indicate that well-designed studies are needed to better understand the role that different types of exercise, exercise frequency and exercise intensity all play in reducing the incidence and severity of migraine [34].

Migraine and alcohol use

We found a statistically significant albeit perhaps clinically irrelevant negative association between alcohol use and migraine (e.g., OR=0.988, 95% CI [0.981-0.996], p = .002). Given the model we built, the odds of having migraine in those individuals who drank 5 or 10 standard alcohol units per week compared with those who did not have any drink at all are 0.91 (0.85-0.98; p = .014) and 0.83 (0.72-0.96, p = .014), respectively. Previous cross-sectional studies have also found a similar negative association between migraine and alcohol use [6,15], although the association between alcohol use and reduced risk for migraine was stronger in one of the studies [6] than that found here. The potential reduced risk for migraine with alcohol use does not mean, however, that individuals at risk for migraines should drink more alcohol as a way to treat their migraine, especially given that

headaches are commonly precipitated by alcohol use [18,35]. Rather, the negative association between alcohol use and migraine may reflect the possibility that individuals with migraine tend to avoid or control their alcohol use to prevent or avoid worsening their migraines [15,35]. Experimental research to evaluate the causal role that alcohol use might have on migraine frequency or severity would be useful.

Migraine and smoking

Smoking status failed to show a significant association with migraine in the logistic regression model. This finding is consistent with those from another study [11], and suggest a lack of association between smoking and migraine. However, and given the inconsistency across studies [6,9,10], more research is needed to understand the reasons for the mixed results. For example, it is possible that there may be some other factor which must also be present in order to an association between smoking and migraine to emerge.

Migraine and obesity

We did not find an increased risk of migraine among obese individuals, consistent with a meta-analysis that combined data from 5 cross-sectional studies [14]. However, studies analyzing different subgroups found a positive association between migraine and obesity in women and younger groups. These effects or interactions of age and sex did not emerge in our study, pointing out the need for additional studies to investigate the potential role that obesity may have in migraine. In addition, and as we also considered other BMI levels, neither underweight individuals nor overweight individuals had a higher risk of migraine compared to normal weight individuals.

Migraine and social support

Migraine has been found to affect interpersonal relationships with others in over 75% of individuals with migraine [36]. To our knowledge, only one study has examined the association between social support and migraine, and found an increased risk of migraine among individuals with a poorer social support [10]. Although there was a slightly greater prevalence of migraine in our study among those reporting less social support, this tendency did not translate into a statistically significant association. Overall, it would appear reasonable for future studies to evaluate the role that social support might play in migraine, including the examination of factors that may moderate the importance of social support.

Moderating effects

We failed to find any significant moderating effects of sex or age on the associations between the study predictors and migraine. Of course, it is always possible that other moderators may play a role, and this possibility is worth evaluating further, especially given the inconsistent findings for some of the predictors examined. Moderators worth examining include the presence of a family history of migraine, the use of migraine and/or psychiatric medications and having multiple migraine risk factors, among others.

Limitations

Although this study has a number of important strengths (i.e., adequate sample size, probabilistic sampling), it also has important limitations. First, the cross-sectional nature of the study does not allow for drawing causal conclusions regarding the significant associations found. Longitudinal studies would be useful to evaluate temporal precedence

(a necessary condition for causal effects), and true experiments would be useful to test for possible causal associations. Second, some of the measures used to assess the study variables, while valid, have limited reliability due to the use of just one or two questions in some cases. Also, all measures are self-reported, and we cannot be certain, for example, if individuals who reported "having confirmed their diagnose of migraine by a doctor" were actually diagnosed by one, nor what kind of doctor it was. Although this approach is often necessary in large epidemiological surveys [6,9,10], future studies would benefit from the use of more reliable measures that would ensure an accurate classification of all the participants' migraine status and avoid the potential bias in the results due to the misclassification. In addition to this, many people are not usually aware that they have migraine [37] and it is a condition commonly underdiagnosed [38]. Therefore, we do not know how many migraineurs might be in this sample that have not been diagnosed and if this has had any effect on the results and in what direction. Finally, important characteristics of the migraine such as frequency or severity were not assessed. It is possible that more significant associations between the study predictors and migraine activity would have emerged had these other migraine characteristics been assessed [13].

Conclusions

Despite the study's limitations, our findings provide important new information regarding the associations between migraine and psychological symptoms, medical comorbidities and lifestyle behaviors in Spain. As more is learned regarding the role of these factors in migraine activity, clinicians can start to target those factors that are modifiable to more effectively decrease the severity and frequency of migraine headaches. This may ultimately reduce the need for medication [7,17].

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Table 1. One-year prevalence estimations of migraine as a function of socio-demographic variables.

		Number		% Migraine (95% CI)	*P* [1]
Variable	**Category**	**n**	**%**	**One-year**	
Sex	Female	12,294	54%	12% (11-13)	< .001
	Male	10,548	46%	4% (4-5)	
Age	15-29	2,392	11%	7% (6-8)	
	30-44	5,830	26%	8% (8-9)	
	45-59	6,037	26%	10% (9-11)	< .001
	60-74	4,935	22%	8% (8-9)	
	>75	3,648	16%	8% (7-8)	
Education	No studies	2,912	13%	11% (10-12)	
	Primary	5,194	23%	8% (8-9)	< .001
	Higher	10,476	46%	8% (8-9)	
	University	4,260	19%	7% (7-8)	
Work situation	Unemployed	2,968	13%	11% (10-12)	
	Working	9,719	43%	8% (7-8)	
	Retired	6,435	29%	7% (7-8)	< .001
	Studying	1,223	5%	6% (5-7)	
	Household chores	1,915	8%	13% (12-15)	
Household average monthly income (€)	< 970	5,556	24%	12% (11-13)	
	970-1399	4,224	19%	11% (10-11)	
	1400-2039	4,445	20%	10% (9-11)	< .001
	2040-3279	2,863	13%	9% (8-10)	
	>3280	1,211	5%	8% (7-10)	
Marital Status	Single	5,960	26%	7% (6-8)	
	Married	12,322	54%	9% (8-9)	< .001
	Widow/er	2,939	13%	9% (8-10)	
	Divorced/ Separated	1,599	7%	10% (9-12)	

[1] Chi-square test

Table 2. One-year prevalence estimations of migraine by study variables among the Spanish population.

Variable	Categories	% Migraine (95% CI)		*p* [1]
		Female	Male	
Depression severity	None	9% (8-9)	3% (3-4)	< .001
	Mild	20% (18-22)	11% (9-13)	
	Moderate	27% (23-31)	12% (8-17)	
	Moderately severe	31% (26-36)	14% (9-21)	
	Severe	34% (27-41)	21% (13-31)	
Chronic anxiety	No	10% (9-11)	4% (4-4)	< .001
	Yes	28% (26-31)	17% (13-21)	
BMI categories	Underweight	11% (8-15)	6% (2-13)	< .001
	Normal weight	11% (10-12)	4% (4-5)	
	Overweight	12% (12-13)	4% (4-5)	
	Obese	15% (13-13)	5% (4-6)	
Physical activity	None	14% (13-15)	5% (5-6)	< .001
	Occasional	11% (11-12)	5% (4-5)	
	Several times a month	10% (8-12)	3% (3-4)	
	Several times a week	9% (8-11)	3% (2-4)	
Smoking status	No	12% (11-12)	4% (4-5)	.930
	Yes	13% (12-15)	5% (4-6)	
Perceived social support	Poor	20% (16-23)	8% (5-10)	< .001
	Moderate	12% (11-13)	5% (4-5)	
	Strong	12% (11-13)	4% (4-5)	
Alcohol Consumption [2]	No	13% (12-14)	5% (4-6)	< .001
	Yes	9% (8-11)	4% (3-4)	

[1] Chi-square test; [2] Alcohol consumption is presented dichotomized (No = 0 standard alcohol unit per week for the last year; Yes = At least one standard alcohol unit per week for the last year).

Table 3. Estimated odds ratios and 95 % CI for migraine presence in the European Health Survey.

	Model 1	Model 2	Model 3
Variables	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Sex			
Female (reference)	1	1	1
Male	0.3 (0.3-0.4)***	0.3 (0.3-0.4)***	0.4 (0.4-0.5)***
Age †	1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)***
Age 2 †	-	1.0 (1.0-1.0)***	1.0 (1.0-1.0)***
Depression severity†			
None (reference)	-	-	1
Mild	-	-	2.5 (2.2-2.9)***
Moderate	-	-	2.8 (2.3-3.5)***
Moderately severe	-	-	3.6 (2.7-4.6)***
Severe	-	-	3.5 (2.5-4.9)***
Chronic anxiety			
No (reference)	-	-	1
Yes	-	-	2.2 (1.8-2.5)***
BMI categories†			
Underweight	-	-	0.9 (0.7-1.3)
Normal weight (reference)	-	-	1
Overweight	-	-	1.0 (0.9-1.1)
Obese	-	-	1.0 (0.9-1.2)
Physical activity†			
No exercise (reference)	-	-	1
Occasional	-	-	1.0 (0.9-1.1)
Several times a month	-	-	0.8 (0.6-1.0)*
Several times a week	-	-	0.8 (0.6-0.9)**
Smoking status			
No (reference)	-	-	1
Yes	-	-	1.0 (0.9-1.1)
Alcohol use†	-	-	1.0 (1.0-1.0)**
Perceived Social support†			
Poor (reference)	-	-	1
Moderate	-	-	0.8 (0.6-1.0)
Strong	-	-	0.9 (0.7-1.1)
Nalgerke pseudo r2	4.5%	4.9%	11.8%
Wald χ^2	360.33, df =2, p<.001	38.86, df =1, p<.001	693.00, df =15, p<.001

Note: *p < .05; **p < .01; ***p < .001; † Variables introduced centered.