Affect, Affective Variability and Physical Health:

Results from A Population-based Investigation in China

Derwin K. C. Chan
Institute of Human Performance, University of Hong Kong
Email: derwin.chan@hku.hk

Xin Zhang
Department of Psychology and Beijing Key Laboratory of Behavior and Mental Health
Peking University, Beijing, China
Email: zhang.x@pku.edu.cn

Helene H. Fung
Department of Psychology
Chinese University of Hong Kong
Hong Kong SAR, China
E-mail: hhlfung@psy.cuhk.edu.hk

Martin S. Hagger
Health Psychology and Behavioural Medicine Research Group
School of Psychology and Speech Pathology
Curtin University
Perth, Australia
Email: martin.hagger@curtin.edu.au

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Author Note
Correspondence regarding this article should be addressed to Dr. Xin Zhang, Department of Psychology and Beijing Key Laboratory of Behavior and Mental Health, Peking University, Beijing, China, 100871. Email: zhang.x@pku.edu.cn.
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Abstract

Background There is good evidence linking positive affect with adaptive psychological and physical health outcomes, and negative affect with maladaptive outcomes, in multiple contexts and samples. However, recent research has suggested that the fluctuation of emotions, known as affective variability, may also be an important correlate of individuals' health.

Purpose The present study examined the relationship between affect, affective variability, and self-reported health status in a large representative sample of adults in China.

Method We analyzed cross-sectional data retrieved from the World Health Organization's study on global ageing and adults' health. A total of 15,050 Chinese adults (aged between 18 and 99) from China reported their affective experiences during the previous day, perceived health, and their history of multiple chronic illnesses from their medical records (stroke, angina, diabetes, chronic lung disease, depression, and hypertension). Hierarchical multiple regression and logistic regression analyses were employed to analyze the data.

Results Independent of individuals' mean levels of affect, affective variability was negatively related to subjective health conditions, and positively related to diagnosed illness status, after controlling for demographic variables. Results suggest that affective variability increases the likelihood of reported impaired health and diagnosis of affect-related illnesses such as angina and depression.

Conclusion The present study highlighted the importance of studying the impact of affective variability, in addition to that of mean affect levels, on health.

Keywords Emotion, fluctuation of affect, mood, physical health, chronic illnesses

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Numerous studies have observed both direct and indirect relationships between affect and physical health [1-4]. For example, negative affective variables, such as anger, anxiety and depression, have been associated with a heightened risk of chronic illness including cardiovascular disease [5], arthritis [6], and cancer [7], while positive affective variables, such as happiness, could buffer against stress and reduce the risk of problems [1, 8]. Researchers have proposed that affective variability, defined by the fluctuation of emotional experience over time, is an important factor for health. However, relatively few studies have investigated the relationship between affective variability and health, and their findings have been inconclusive. Some researchers have proposed that affective variability is positively associated with psychological health and well-being [7], whereas others consider the fluctuations in affect to be maladaptive [9]. The present study aimed to further investigate the relationship between affect, affective variability, and physical health with representative data from a large-scale population-based survey in China.

Affect and Physical Health

The relationship between affect and health has been studied extensively [3]. Research has identified both direct and indirect effects of affect on health. For instance, studies examining the affect-health relationship revealed that affect may exert a direct effect on health through its impact on the immune system and neuroendocrine function [10]. Negative affect, in particular, could be a key factor contributing to distress-related immune dysregulation, which might further lead to increased health risks. For example, Kubzansky, Park, Peterson, Vokonas, and Sparrow [7] found that negative affect was strongly associated with cardiovascular

disease. Meanwhile, the beneficial effect of positive affect was also evident. Positive affect was found to buffer against stress [11] and ameliorate the risks of cardiovascular diseases [1, 8].

Aside from direct effects, indirect relations between affect and health outcomes have also been observed. A number of social psychological theories have specified the indirect effect of emotion on health [3, 4, 10, 12-14]. For example, Cohen and Rodriguez [15] proposed a framework in which negative affect would lead to the onset and progression of physical disorders through multiple pathways: biological, behavioral, cognitive, and social. Moreover, cognitive-motivational-relational theories of emotion also suggest that interpretation of negative affect would change motivation in accordance with the appraisals of affect. For example, negative appraisals towards negative affect, like fear, could lead to avoidance responses and maladaptive health outcomes [16, 17]. Another line of research by Fredrickson [12, 18], and Scheier and Carver [19] also provided theoretical explanations of how affect could influence health through personal resources, attitudes, and capacity for coping. These propositions have been supported by empirical studies showing that the effects of affect on health and well-being could be mediated by enhanced social interaction [12], improved persuasion [20, 21], risk perception [22], and adaptive decision-making [2, 23].

Affective Variability and Health

It is argued that affect could vary or fluctuate over time [24]. Hence, rather than simply understand the association between affect and health in terms of the overall levels, it is also important to take the fluctuation of affects across time or events, also known as affective variability, into consideration. In the literature, the association between affect and health is relatively well established, however, the

association between affective variability and health is more controversial. Whether greater affective variability is beneficial or harmful is still a topic of considerable debate. Theoretically speaking, if one has a stable affective state, even if it is negative, one can adapt to it and make it predictable and controllable, which could predict better health [25]. In the stress and coping literature, predictability and controllability of stress are often more important than the avoidance of stress [26, 27], while affective variability makes it hard for individuals to adapt to any particular affective state. For example, Eid and Diener [28] reported that the variability of negative affective variables, such as anger, fear, shame and sadness, was the strongest correlate of neuroticism. In the domain of mental health, the variability of negative affect was consistently associated with depressive symptoms [9, 29], borderline personality disorder [30], and suicidal ideation [31]. Analogously, Gruber, Kogan, Quoidbach, and Mauss [25] found that variability in positive affect was associated with poorer psychological health.

However, other research has observed that affective variability was associated with improved psychological health. For instance, Waugh, Thompson, and Gotlib [32] found that flexible emotional responsiveness (i.e., the ability to change one's emotional responses in accordance with the emotional context) was a significant predictor of greater resilience, a widely known index of psychological adjustment. Nelson and Meyvis [33] also found that variability in positive affect might elevate the sensation of enjoyment during pleasant experiences. These studies suggested that the variation of affect over time and context could be an important contributor to adaptive mental health outcomes.

These contrasting findings could be attributed to several factors. For example, previous studies have typically included only one type of affective variability,

positive or negative [25], so the relative effects of positive and negative affective variability on health could not be formally examined. In addition, the sizes of the samples involved in previous studies were relatively small and confined to specific groups (e.g., younger adults) [9, 34], so the representativeness of these previous findings could not be ascertained. Moreover, previous studies have only examined the impact of affective variability on mental health, including major depressive disorders [9, 29, 34], suicidal ideation [31], borderline personality disorder [30], and life satisfaction [25], whereas studies on the impact of affective variability across various types of illness and diseases are lacking. Nevertheless, previous studies have suggested a strong link between affect and cardiovascular and cerebrovascular diseases [3, 35, 36]. Also, affect and affective variability have been consistently shown to be strong positive predictors of affective disorders like depression [25, 29]. We seek to further test the association between affect, affective variability and different types of diseases such as affect-related diseases including angina, stroke and depression, and chronic diseases including diabetes, chronic lung disease and hypertension in the present investigation.

The Present Study

To address these research gaps, the present study aimed to provide a large-scale, highly-powered test of the relationship between affective variability and self-reported health status, and incidence of illnesses such as stroke, angina, diabetes, and depression. The study will contribute to the literature by providing robust evidence for these proposed relations in a representative sample of the Chinese population. In terms of specific hypotheses, we expected that (1) positive and negative affect would be positively and negatively associated with adaptive health outcomes, respectively, and (2) affective variability would predict health outcomes independent to the effects

of affect. Moreover, we speculated that affect and affective variability would positively predict stroke, angina and depression with larger effect sizes relative to their prediction of other chronic diseases such as diabetes, lung diseases, and hypertension.

Method

Data Source

We obtained data from a subset of World Health Organization's Study on global AGEing and adult health (SAGE) wave 1, which was carried out from 2007 to 2010 in China by Shanghai Municipal Center for Disease Control and Prevention (SCDC). A total of 15,050 individuals from 8 major cities or provinces in China (Guangdong, Shandong, Zhejiang and Shanghai are developed provinces of China that are located in the east, whereas Shaanxi and Yunnan provinces are less developed and located in Western China. Hubei and Jilin are developing provinces located in the middle region of China) were interviewed. The mode of data collection was face-to face paper and pencil interviews as well as face-to-face computer-assisted personal interviews. The interview was conducted in Chinese, the native language of the participants. A stratified, multistage cluster sampling design was implemented to make sure that the sample was nationally representative, and the response rate was 93%. The data is publically available on the WHO website (http://apps.who.int/healthinfo/systems/surveydata/index.php/catalog/13).

Materials and Measurements

Demographic information. Participants reported their sex (1 = male, 2 = female), age, marital status (0 = currently no spouse, 1 = currently with spouse), level of education, household income, cigarette consumption, alcohol consumption, and diet (the number of servings of fruit and vegetables consumed in a typical day). Their

weight and height were measured and used to compute Body Mass Index (BMI). These demographic variables were used as covariates in the present study.

Participants reported the average number of cigarettes they smoked in a day, and the number of months (and years) they had been smoking. Based on this information, cigarette consumption was calculated based on the total number of cigarettes participants consumed since they started smoking. Similarly, participants reported the frequency of alcohol consumption occasions on a 5-point Likert scale from "None per week" (0) to "more than 5 times per week" (4) and the amount of alcoholic beverages consumed per session. Total alcohol consumption was computed by multiplying the drinking frequency by the drinking amount.

Health. Participants were asked to give a subjective rating of their health. Participants rated their present perception of their overall health on a five-point Likert-scale ranging from 1 (very good) to 5 (very bad)[1]. To aid interpretation, we reversed the scoring of this item such that higher scores indicated better health conditions. In addition, participants reported whether or not they have been diagnosed with the following chronic illnesses or suffering from a respective symptom: stroke, angina, diabetes, chronic lung disease, depression, and hypertension. The responses were made on a dichotomous scale with either 1 (diagnosed with the disease or suffering from any related symptoms) or 0 (did not diagnosed with the disease or suffering from any related symptoms).

Affect. Daily affect was measured by a daily reconstruction method in which participants were asked to recall the emotions they experienced in the previous day. In the list that displayed 23 different categories of daily activities (e.g., working, shopping, chatting with someone), participants were asked to rate the emotions they experienced during these activities in the previous day. In each activity, participants

rated the extent to which they experienced the seven types of emotions, including two positive emotions (i.e., calmness and enjoyment), and five negative emotions (i.e., worry, rush, irritation, depression, and stress), on a three-point Likert-scale ranging from 1 (not at all) to 3 (very much). The emotions reported by participants were quite similar to the emotions used in Kahneman and colleagues' original study [29, 37]. We further followed Kahneman and colleagues' recommendation to compute an overall positive and negative level of affect. Although these sub-types of affect exhibited acceptable reliability (α_{calm} = .92, α_{enjoy} = .91, α_{worry} = .83, α_{rush} = .76, $\alpha_{irritation}$ = .80, $\alpha_{depression}$ = .83, and α_{stress} = .77), we used the mean score of all positive emotions and the mean score of all negative emotions to represent positive affect and negative affect respectively[2], for two reasons: first, grouping emotions into categories based on their valence (i.e., positive vs. negative) is a more economical approach (e.g., the circumplex model of affect proposed by Russell [38]); second, theoretically speaking, positive and negative emotions could have different functions, different behavioral expressions, and these function may give rise to different physiological reactions directly related to health [3, 4, 10, 12-14]. The reliability of the positive (α = .94) and negative (α = .90) affect scales is consistent with published norms [29, 37].

Affective Variability. Affective variability was defined as the change of affect over a single day. We computed affective variability scores according to the recommendations of previous literature [28, 29, 39]. First, we computed positive affect and negative affect indexes by taking the averaged scores of the corresponding items for each activity. Then, indices of positive and negative affective variability were developed by computing the standard deviation of each type of affect across different activities [15]. As it was not possible to compute affective variability for

participants who reported emotions for fewer than two daily activities, these values were input as missing data.

Analysis

Hierarchical linear multiple regression analyses were conducted to investigate whether affect and affective variability could predict self-reported health status. Logistic regression analyses were employed to examine whether affect and affective variability were significant predictors of diagnosed diseases (i.e., angina, depression, diabetes, hypertension, lung disease, and stroke). In these regression analyses, demographic variables (e.g., age, gender, marital status, education level, income, body mass index (BMI), cigarette-consumption, alcohol-consumption, and dieting) were included in the first step to control for their potential confounding effects [29], while the positive and negative affect variables were added in the next step, and affective variability were entered in the final step.

Results

Preliminary Analysis and Selection of Covariates

Table 1 presents the descriptive statistics of the variables in the present study. Zero-order correlations among demographic, health-related and affect-related variables are also presented in Table 2. Results indicated that all demographic variables were statistically significantly associated with some of the health-related outcome variables. As a consequence, these variables were included as covariates in the regression models.

Associations between Affect, Affective Variability, and Health

Results of the hierarchical linear multiple regression analyses are presented in Table 3. Results indicated that both affect and affective variability exerted independent predictive effects on perceived health condition after controlling for the

demographic variables. Overall, self-reported health status was positively related to positive affect, $B = .03$, $t = 2.62$, $p < .01$, and negatively associated with negative affect, $B = -.09$, $t = -9.56$, $p < .01$, and positive affective variability, $B = -.04$, $t = -3.85$, $p < .01$, but its proposed negative association with negative affective variability was not significant.

Results of the logistic regression analyses are presented in Table 4. Overall, positive affect was a positive predictor of depression (odds ratio = 1.22, $p < .01$). Negative affect was a positive predictor of angina (odds ratio = 2.93, $p < .01$), depression (odds ratio = 7.71, $p < .01$), lung disease (odds ratio = 2.49, $p < .01$), and stroke (odds ratio = 4.67, $p < .01$). Positive affective variability was a positive predictor of depression (odds ratio = 2.23, $p < .01$) and angina (odds ratio = 1.48, $p < .01$), while negative affective variability was not associated with any type of diseases.

Discussion

The present study investigated the relationships between affect, affective variability, health status, and the incidence of illness in a representative population-based sample in China. Findings revealed that certain forms of affect and affective variability were associated with individuals' self-reported health status and some chronic illnesses. Specifically, independent of mean-level affect, positive affective variability appeared to be related to poor physical (angina) and mental (depression) health.

Theoretical Implications for Affect and Health

First of all, we observed a positive association between positive affect and risk of depression, which appeared to be in contrast to previous findings that positive affect was a protective factor for depression [12, 18]. One explanation for this association might be that emotional suppression is highly valued in China [19].

Meanwhile, according to cultural norm hypothesis [12], which predicted that depressed individuals exhibited patterns of positive emotional reactivity that differed from their culturally ideal ways of expressing emotions, Chinese depressed individuals might be less likely to suppress their positive emotions. For example, Chentsova-Dutton and colleagues [14] indeed found that Asian Americans who were depressed showed even increased positive emotional responses compared to healthy controls.

On the other hand, we obtained consistent predictions for negative affect, which were found to be consistently and positively associated with the risk of chronic illnesses. The pattern of results is consistent with cognitive-motivational-relational theories of motivation and emotion [17] and common sense model of illness perceptions [40], which suggests that negative affect and its appraisal, particularly negative forms of affect such as fear, usually motivates individuals to engage in coping behaviors. However, these coping behaviors usually involve avoidance and denial, which may be maladaptive in terms of illness outcomes [41].

More interestingly, the findings regarding the association between positive affective variability and health highlight the importance of examining the effect of affective variability [29, 42]. Even after controlling for affect, positive affective variability still has a statistically significant and negative effect on physical health. While previous work has largely focused on the relationship between momentary emotions and health [2], a handful of studies have examined the association between affective variability and physical health. The inconclusive results from these studies might possibly be due to inconsistency in the type of affect or diseases studied, and characteristics of the populations from which the samples were drawn. For example, affect and affective variability have been shown in previous investigations to be

related to stroke [43], angina [35, 36], and depression [25, 29], but not to diabetes [44], while the evidence in relation to chronic lung disease, or hypertension has been lacking. The large and representative sample recruited for the current investigation allowed us to investigate how various types of affect and affective variability were linked to the likelihood of a series of common illnesses after controlling for disease-related demographic factors. Hence, the findings advance the knowledge and understanding of the nexus between affect and health [25] by providing more compelling and comprehensive evidence that greater affective variability is associated with poorer self-reported physical health and higher risks of chronic health conditions like angina and depression.

Another explanation for the inconclusive results regarding the effect of affective variability on health might be the inconsistent conceptualization and operationalization of affective variability in previous studies. For instance, emotional flexibility reflects individuals' ability to generate emotional responses according to situations [32], whereas affective variability, represents individuals' inability to regulate emotions on a daily basis regardless of situation [25]. Sometimes these two terms are used interchangeably [25], despite the fact that they are conceptually different and have demonstrated discriminant validity. The day reconstruction method [29, 37] used in the present study showed that the activities reported by most participants (e.g., preparing food, watching TV, and doing housework) were held within the same environment (i.e., home), so the fluctuations of emotions should rather reflect affective variability instead of emotional flexibility. Our findings confirm that affective variability, regardless of valence, is a predictor of poorer health, particularly for chronic illnesses that are closely related to emotions, such as depression and angina.

That positive affect variability, rather than negative affect variability, was predictive of maladaptive health outcomes is somewhat counterintuitive. To speculate, a possible theoretical explanation for this finding might lie in theories of emotion and coping [12, 18, 19]. Specifically, individuals are able to appraise threatening situations according to their capacity to cope with the adversity [26, 27]. A mismatch between the stress and perceived capacity to cope, may lead to reduced positive affect, increased negative affect, and concomitant adverse emotional responses. Over time, the inability to cope may be manifested in consistent stress responses which have been shown to adversely affect health [12, 18, 19]. Positive affective variability may, therefore, be indicative of an individual's lack of coping resources and inability to cope with stress-coping mismatches. This explanation is only speculative as we do not have measures of coping resources and sources of stress in the current study. Furthermore, it was not clear why this pattern of results was only applied to positive affective variability, but not to negative affective variability. Future research should investigate if coping resources and stressors mediate the relationship between negative affective variability and health outcomes.

Overall, findings suggest that affect and affective variability were both important predictors of health and incidence of chronic illness, but positive affective variability seem to be a negative predictor of individuals' overall health status. In general, our findings support the view that affective variability has significant negative relations with health status independent of the mean affect. These findings tend to corroborate with the general trend of recent findings with respect to the link between affective variability and health, and they may contribute further to the literature by providing the first robust evidence in a large, representative population-based sample [25].

Practical Implications for Affect and Health

The present study may offer implications for promoting physical health by enhancing emotional experiences. First, the bidirectional relationships between affect, and health and illness have been well accepted and evidenced in health psychology and behavioral medicine research [41, 45]. In other words, while illness could have a negative impact on individuals' emotional patterns, affect may also have a similarly pervasive impact on illness incidence. So emotional regulation and effective coping strategies that reduce affective variability might play important roles in illness prevention [45, 46]. Second, the links between affective variability and health may imply that health-promoting interventions should not solely focus on enhancing positive emotions and reducing negative emotions. More emphasis should be placed on minimizing affective variability. It has been reported that individuals with better emotion regulatory abilities have lower risk of heart disease [32]. Hence, the development of psychological interventions and therapeutic procedures of emotional regulations might be beneficial for health due to their effects on stabilizing one's emotion. For instance, Dialectical Behavioral Therapy [47] may help reduce the variability of negative emotions by placing increased emphasis on emotional regulation. Similarly, mindfulness, a mental training technique that requires individuals to focus on the present moment and to be nonjudgmental [48], could plausibly be useful in managing affective variability. Previous studies have also showed that mindfulness is a positive predictor of physical and mental health, such as cardiovascular health and psychological well-being [48, 49]. Therefore, investigating whether emotional regulation and mindfulness techniques are effective in achieving better health condition, and whether the effects of these techniques on health are

mediated by reduced affective variability, will be interesting avenues for future research.

Limitations and Future Directions

It is important to acknowledge some limitations of the present study. First, the data and analysis were cross-sectional in nature, so the results do not permit the inference of any causal mechanisms regarding relationships between affect and health. Although our analyses attempted to correlate participants' present health to their emotions experienced the previous day, the correlations could not be regarded as prospective links because the measure was a retrospective one. Future longitudinal studies using cross-lagged panel designs or latent growth models are required to address the causal relationships between affective variability and physical health, as well as the underlying mechanisms [50, 51]. Second, the negative affective variability was not associated with any health outcomes, which might be due to the relatively lower level of reported negative affective variability. Moreover, the effect sizes of affect and affective variability on other outcome variables were generally small. Although the present of a number of demographic controlling variables (e.g., education, age, sex) could be one of the reasons of small effect sizes, we should cautiously interpret the significance of the research in the reality. In addition, other confounding factors such as lifestyle and geographical region could also have contributed to physical health [29]. Interventions using fully factorial and randomized controlled designs might examine the prospective and causal impacts of affective variability on health when controlling for other confounding factors to gain a better understanding of the mechanisms that link affective variability to health. Finally, the present study only examined the hypotheses in the Chinese population. Although the hypothesized effects of affect and affective variability on health are expected to be

culturally universal, it is strongly recommended that future studies could look at whether the findings could generalize to other cultural groups [29, 52].

Conclusion

In conclusion, the current population-based survey revealed that affective variability was a negative predictor of health, regardless of the type of affective variability, and the effects were comparable to that of negative affect. Individuals, who experience substantial variability in their affect, especially positive affect, were more likely to have impaired health and suffer from a chronic illness. We conclude that affective variability is negatively related to physical health independent of overall levels of emotional status. The results suggested that fostering emotional stability might be as beneficial as fostering positive affect for health promotion and disease prevention.

Authors' Declaration

Xin Zhang, Derwin K. C. Chan, Helene H. Fung, and Martin S. Hagger declare that they have no conflict of interest associated with the content of this paper.

The data in the present study was obtained from a public survey conducted by World Health Organization, and the treatment of human participants associated with the data was in accordance with the ethical standards of APA. WHO conformed to the Helsinki Declaration concerning human rights and informed consent, and that they followed correct procedures concerning treatment of humans in research.

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Footnote

1. Single-item measure of self-rated health was widely used in health research, which intended to get an overall assessment or self-rating of participant's health in general. Numerous studies have demonstrated that self-reported health is a valid and reliable indicator of one's overall health status. It is a strong predictor of mortality [53-55], subsequent disability [56, 57], morbidity [58] and utilization of medical care [55, 59, 60].
2. Exploratory factor analysis (EFA) was conducted to explore the factor structure of daily affect, and a two-factor-solution emerged when an eigenvalue higher than 1.00. After a principal component analysis with varimax rotation, two items loaded highly on one factor named *positive affect* (mean factor loading = .75), and 5 items loaded highly on another factor named *negative affect* (mean factor loading = .93). The item content clearly reflected the factor label in each case and the two-factor model accounted for 68.02% of the total variance. Therefore, we used positive affect and negative affect to represent two different types of affect in our study.

Table 1

Characteristics of the Participants (N = 15050).

Characteristic	Mean (SD)
Sex (% Female)	53 %
Age	60.53 (11.91)
Marital Status (% with spouse)	84 %
Duration of Education (years)	7.51 (3.93)
Income Quintile	3.04 (1.41)
BMI	23.94 (4.86)
Cigarette-Consumption	22.14 (81.23)
Alcohol-Consumption	2.39 (8.38)
Dieting	9.20 (5.05)
Positive Affect	2.43 (.57)
Negative Affect	1.04 (.15)
Positive Affective Variability	.20 (.27)
Negative Affective Variability	.04 (.11)
Health Today	3.20 (.84)
Stroke Symptoms (% Yes)	5 %
Angina Symptoms (% Yes)	13 %
Depression Symptoms (% Yes)	14 %
Diabetes Symptoms (% Yes)	6 %
Chronic Lung Disease Symptoms (% Yes)	12 %
Hypertension Symptoms (% Yes)	24%

Table 2
Zero-order Correlations among Measurements (N = 15050).

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	1												
2. Sex (% Female)	**-.02***	1											
3. Marital Status (% Married)	**-.36****	**-.17****	1										
4. Years of Education	**-.17****	**-.06****	**.11****	1									
5. Income Quintile	**-.18****	.00	**.16****	**.31****	1								
6. BMI	-.01	**.06****	**.03****	**.03****	**.08****	1							
7. Cigarette-Consumption	-.00	**-.27****	**.02****	**-.07****	**-.06****	**-.07****	1						
8. Alcohol-Consumption	**-.05****	**-.26****	**.05****	**-.07****	**-.02***	**-.04****	**.18****	1					
9. Dieting	**-.12****	-.01	**.08****	**.09****	**.16****	**.05****	.01	**.05****	1				
10. Positive Affect	**.04****	**-.03****	**.04****	**.15****	**.19****	**.04****	**-.03****	-.00	**.15****	1			
11. Negative Affect	**-.07****	**.03****	-.01	**-.06****	**-.11****	**-.03****	.01	.00	**-.05****	**-.31****	1		
12. Positive Affective Variability	**-.04****	.01	.00	**-.05****	**-.09****	-.02	.02	-.00	**-.05****	**-.25****	**.18****	1	
13. Negative Affective Variability	**-.07****	.01	.01	**-.08****	**-.11****	**-.03****	.02	.00	**-.06****	**-.28****	**.68****	**.31****	1
14. Health Condition	**-.27****	**-.08****	**.13****	**.15****	**.21****	-.01	.00	**.05****	**.06****	**.10****	**-.11****	**-.06****	**-.09****

* $p < .05$, ** $p < .01$

Table 3

Emotional status, affective variability and subjective health ratings.

		Dependent Variable = Health Condition	
	Variables	*B*	*t*
Block 1	Age	**-.23**	**-22.86****
	Sex	**-.08**	**-7.57****
	Marital Status	.00	.45
	Education	**.07**	**6.62****
	Income	**.15**	**14.81****
	BMI	**-.02**	**-2.32***
	Cigarette-Consumption	-.01	-1.32
	Alcohol-Consumption	**.02**	**2.48***
	Dieting	.01	.91
		R^2 = .10 **	
Block 2	Positive Affect	**.03**	**2.62****
	Negative Affect	**-.09**	**-9.56****
		ΔR^2 = .01 **	
Block 3	Positive Affective Variability	**-.04**	**-3.85****
	Negative Affective Variability	.02	1.11
		ΔR^2 = .001 **	

* $p < .05$, ** $p < .01$

Table 4. *Emotional status, affective variability and diseases.*

	Exp (B)	Stroke	Angina	Depression	Diabetes	Lung Disease	Hypertension
Block 1	Sex	.95	**1.63****	**1.24****	**1.24***	**.80****	**1.17****
df = 9	Age	**1.06****	**1.05****	**.99****	**1.06****	**1.05****	**1.07****
	Marital	1.02	.99	**.91****	1.04	1.00	1.00
	Education	1.10*	**1.11****	**.94***	**1.16****	1.05	**1.12****
	Income	1.03	**.94****	**.76****	**1.21****	**.90****	**1.10****
	BMI	**1.02***	**1.02****	**.98****	**1.04****	1.01	**1.09****
	Cigarette-	1.00	1.00	**1.01****	1.00	**1.01***	**1.01****
	Alcohol-	.99	1.00	1.00	.99	1.00	.99
	Dieting	**.97***	1.00	1.00	.99	1.00	.99
R^2		**.06****	**.07****	**.04****	**.08****	**.07****	**.16****
Block 2	Positive	.97	1.06	**1.14***	1.00	1.05	.99
df = 11	Negative	**4.67****	**2.93****	**7.71****	.76	**2.49****	1.00
R^2		**.08****	**.07****	**.07****	.08	**.07****	.16
Block 3	PAV	.88	**1.48****	**2.23****	1.03	1.19	1.17
df = 13	NAV	1.65	1.22	1.06	.56	.56	1.34
R^2		.08	**.07****	**.08****	.08	.07	.16

Note. PAV = Positive Affective Variability, NAV = Negative Affective Variability. * $p < .05$, ** $p < .01$