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LATE-LIFE HEALTH CONSEQUENCES OF EXPOSURE TO TRAUMA IN A GENERAL ELDERLY POPULATION: THE MEDIATING ROLE OF RE-EXPERIENCING POST-TRAUMATIC SYMPTOMS

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ABSTRACT *(243 words)*

Objectives: A history of trauma is associated with both poor mental and physical health but the specific impact of post-traumatic stress disorder (PTSD) symptoms on physical health using objective indicators of health status has rarely been evaluated in elderly civilians. This study investigates the long-term consequences of a lifetime exposure to trauma on health in a French elderly general population.

Methods: Psychiatric health, medical history and clinical examination (ICD-10 criteria) were assessed in 1662 subjects (mean (SD) age = 72.5 (5.2) years). Lifetime traumatic exposure, PTSD and psychiatric diagnoses were obtained using the Watson's PTSD Inventory and the Mini International Neuropsychiatric Interview.

Results: We observed an increase in the number and severity of health-related outcomes between groups, non-traumatized subjects having the lowest risk, and those with trauma leading to recurrent re-experiencing of events (non-resilient subjects) having the highest risk. Traumatized persons who did not report re-experiencing symptoms (resilient subjects) showed better current mental health than traumatized subjects who did and non-traumatized subjects. Both groups of traumatized subjects showed a higher rate of cardio-ischemic diseases notably current angina pectoris (multi-adjusted OR=2.27, 95%CI [1.31; 3.91] and 2.34, 95%CI [1.22; 4.49] for resilient and non-resilient groups, respectively). Traumatized persons, specifically those non-resilient, showed a higher waist/hip ratio, higher triglyceride levels and a greater frequency of hypertension.

Conclusion: Our findings suggest that trauma could be associated with cardio-ischemic diseases independently of PTSD symptoms expression. However the presence of these symptoms appears associated with additional metabolic risk factors.

INTRODUCTION

Several psychiatric studies have shown that exposure to a traumatic event induces a high level of psychological distress in a large majority of people. A history of trauma has been associated not only with higher levels of depression and post-traumatic stress disorder (PTSD) but also with poor physical health. Little is currently known about the precise mechanism underlying the relationship between trauma and physical health, particularly the possible intermediary role of PTSD. A number of studies have explored PTSD in relation to self-reported health status, e.g. in veterans and bus drivers who have experienced work-related accidents, sexual assault survivors and primary care patients.[1-4] Such studies are open to a number of bias including secondary gain and the confounding effects of depression. Very few studies to date have used objective indicators of health status. The most important concerned male veterans where PTSD symptoms were associated with risk of onset for several medical problems; arterial, gastrointestinal, musculoskeletal disorders and dermatological problems.[5] However the specific impact of PTSD on physical health has only been examined in a small number of studies of civilians exposed to a much broader array of traumatic events, with inconsistent results.[6, 7] There has been no study to date on the impact of trauma in the elderly, a particularly vulnerable group given their increased vulnerability to disease and disability, and a lifetime accumulation of stressful events. This study addresses two important clinical questions: does the experience of trauma have long-term health effects persisting into old age and are elderly persons who have experienced traumatic events with subsequent PTSD symptoms at particularly high risk of certain physical disorders. In terms of treatment this would require addressing the pathophysiological manifestations associated with trauma and PTSD symptoms.

The present study examines physical and psychiatric health correlates of traumatic exposure in elderly general population taking into account the development of recurrent re-experiencing symptoms, as a central indicator of PTSD while controlling for multiple confounding factors.

METHOD

Study population

The data were derived from a longitudinal study of neuropsychiatric disorders in 1873 community-dwelling French elderly, the ESPRIT study.[8] Participants aged 65 years and over and non-institutionalized were recruited by random selection from electoral rolls of Montpellier between 1999 and 2001. Refusals (27.3%) were slightly older and more likely to be living alone than those who agreed to participate. Ethics approval for the study was given by the National Ethics Committee and all participants gave written consent.

This paper reports results obtained at baseline. Participants underwent a standardized ICD-10[9] criteria-based examination carried out by a neurologist. The present study was conducted on the 1662 dementia-free subjects for whom data on trauma status was available and with no missing data for the main covariates. The subjects included in the analyses did not differ from the whole Esprit cohort with regard to the principal socio-demographic variables.

Medical history and clinical examination

A detailed standardized health interview covered socio-demographic characteristics, height, weight, waist to hip ratio (WHR), smoking and alcohol consumption, medical history, and medication use (participants were asked to bring prescription or drugs used regularly during the preceding month to the centre). Blood samples were collected on the day of the examination after a 12h fast. The health interview covered the self-report history of vascular disease including age of onset with additional medical information obtained from the patient general practitioner. This concerned cardio-ischemic disease (angina pectoris, myocardial infarction and coronary heart disease), stroke and posterior limb arteritis, and non-ischemic pathologies (arrhythmia and congestive heart failure). . Other chronic illnesses were also

recorded, including asthma, diabetes, hypercholesterolemia, elevated triglycerides, hypertension and hyper- or hypo-thyroidism. The metabolic syndrome was defined according to the National Cholesterol Education Program Adult Treatment Panel III criteria.[10-12] Cognitive function was assessed using the Mini-Mental State Examination (MMSE).[13]

Psychiatric interview

The Watson PTSD Inventory (PTSD-I, DSM-IIIR[14], internal consistency, alpha=0.92 and test-retest reliability total score=0.95)[15] was used to obtain lifetime and current (last month) PTSD diagnoses, using the validated French self-report version.[16, 17] The first question identifies past traumatic events spontaneously evoked by the participants. The second question, concerning the subject most frightening lifetime personal experience, is only to be completed if no traumatic event is spontaneously reported. The most severe traumatic event or frightening experience is then explored in the next 17 items which correspond to specific symptoms. Only reported traumatic events or reported frightening personal experiences which are defined according to A1 DSM-IV[18] criterion were considered as "traumatic". The main advantages of PTSD-I are its capacity to provide continuous measures of the severity of the disorder for every symptom and to allow the measurement of subsyndromic PTSD.

Lifetime DSM-IV diagnoses of other Axis I disorders was made using a standardized psychiatric examination, the Mini International Neuropsychiatric Interview (MINI, French version 5.00) validated in the general population (Kappa coefficients for inter-rater and test-retest reliabilities, 0.88-1.0 and 0.76-0.93, respectively)[19] Positive cases were reviewed by a panel of psychiatrists. We explored major depressive disorder, dysthimia, mania-hypomania, phobia, generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, and suicide (current ideation and lifetime attempt). Severity of depressive symptoms was

examined using the Center for Epidemiologic Studies-Depression scale (CES-D; a score ≥16 being considered as severe).[20]

Statistical analysis

Unadjusted analyses were carried out using χ^2 tests. Simple and multinomial logistic regression models were used to study the association between trauma [categorized as "no trauma" (comparison group), "trauma without re-experiencing symptoms", "trauma with re-experiencing symptoms"] and socio-demographic variables, and between trauma and current mental health, physical health and life-style habits, adjusted for age, gender and educational level. Three multivariate analyses were performed to study the association between trauma and angina pectoris (model 1), hypertension (model 2), and depressive symptomatology (model 3). Multivariate logistic regression included covariates that were commonly reported in the literature and found to be associated with each outcome in our sample ($p<0.15$). SAS version 9.1 was used for the statistical analyses with a significance level of $p<0.05$ (SAS Institute, Inc., North Carolina).

RESULTS

PTSD prevalence

The mean (SD) age of the subjects was 72.5 (5.2) years and 59% were women. More than half of the men (59.3%) and women (53.7%) reported a traumatic event. The most frequent traumatic events were linked to war (experiencing bombing, witnessing serious injury or unnatural death of another person due to torture or war combat, death threats; 52.9%), learning of the sudden, unexpected death of a family member or a close friend (20.3%) and serious/near fatal accident of the person or a loved one (8.0%). The interview took place at a median period of 54.6 years (IQR=20.2) after the exposure to the traumatic event.

The lifetime and current prevalence of PTSD in the sample was 2.4% and 1.2%, respectively. These rates were significantly higher in women than in men (3.8% vs. 0.4%, p=0.001 and 2.0% vs. 0.2%, p=0.02, respectively). Due to the low number of PTSD cases in our sample, we focused on the category of subjects having expressed re-experiencing symptoms, the most common PTSD symptoms associated with trauma (16.8%) and one of the most clinically relevant.

Demographic characteristics according to trauma status

Subjects aged 75 years and over reported more traumatic events with or without re-experiencing symptoms than younger participants (Table 1). Among the subjects who were exposed to a traumatic event, women were significantly more likely to have re-experiencing symptoms than men. Persons with a high school education level more frequently reported trauma without re-experiencing symptoms whereas no significant association was observed between education and the presence of re-experiencing symptoms.

Mental health as a function of traumatic event and re-experiencing symptoms

Subjects expressing re-experiencing symptoms were significantly more likely to have depressive symptoms, to be diagnosed with past or current major depression, current anxious disorder and psychiatric co-morbidity than subjects without trauma (Table 2). They also declared more lifetime suicide attempts. In contrast subjects exposed to a traumatic event but who did not report re-experiencing symptoms differ from comparison subjects in having significantly less current suicidal ideation or psychiatric co-morbidity and marginally less global cognitive dysfunction. They were also less cognitively impaired than traumatized subjects with re-experiencing symptoms (OR=0.57, 95%CI [0.37-0.88], p=0.01). By contrast no significant difference in cognitive functioning was observed between subjects with re-experiencing symptoms and comparison subjects.

Physical health as a function of traumatic event and re-experiencing symptoms

Table 3 describes the current physical health of persons having been exposed to a lifetime traumatic event, focusing on vascular diseases and metabolic risk factors. Regardless of the presence of re-experiencing symptoms, exposure to trauma was associated with current cardio-ischemic disease particularly angina pectoris. Re-experiencing symptoms was specifically associated with higher WHR, elevated triglycerides, hypertension and thyroid dysfunction. The subjects who reported a traumatic event without re-experiencing symptoms were more likely to be past or current smokers than the subjects unexposed to trauma. A similar tendency although not significant was observed in the group who reported traumatic events in presence of re-experiencing symptoms.

Association of trauma status with angina pectoris, hypertension and current depressive symptoms

In multivariate model, the association between trauma and angina pectoris persisted for the two traumatized groups (OR=2.27, 95%CI [1.31-3.91] without re-experiencing symptoms and OR=2.34, 95%CI [1.22-4.49] with re-experiencing symptoms), suggesting that trauma is associated with angina pectoris independently of re-experiencing post-traumatic symptoms (Table 4). For all subjects except one, age of the onset of angina pectoris was greater than age at the traumatic event. Likewise, multivariate analyses confirmed the independent and significant association between the exposure to re-experiencing symptoms in traumatized subjects and hypertension and the same marginal association with current depressive symptoms.

DISCUSSION

Exposure to traumatic experiences and PTSD prevalence

This general population survey of community dwelling French elderly reveals that 55.9% of the sample had experienced at least one lifetime traumatic event. This rate is comparable to that recently reported in non-institutionalized elderly general populations in Europe (55.5%-76.5%[21-24]) and Australia (52.5%[25]). Exposure to lifetime traumatic events was associated with a wide range of psychiatric symptoms even long after the traumatic event (median=54.6 years). The rates of lifetime (2.4%) and current (1.2%) PTSD are also in agreement with other studies in elderly people (3.1-3.9%[21, 22] and 0.7-3.4%[22, 24, 26, 27] for lifetime and current prevalence, respectively). In our study women were at 10-fold higher risk of current and lifetime PTSD, although less frequently exposed to traumatic events. This gender difference has been described in adult general populations[21, 23, 28, 29] but the data on elderly populations[22, 25, 26, 30] are less consistent.

Mental health as a function of exposure to trauma and recurrent re-experiencing symptoms

Although the association of trauma with major depressive disorder and anxiety disorders has already been reported[29], the association with suicidal behavior has not been previously examined. We observed a higher rate of lifetime suicide attempts only for subjects exposed to trauma with re-experiencing symptoms. Although the study design did not allow the inclusion of fatal suicides, this finding is consistent with recent data on lifetime suicide attempts in a community sample of American young adults.[31] Interestingly, our results further showed that elderly subjects who have not developed re-experiencing symptoms following trauma had generally a lower rate of current psychiatric comorbidity as well as less suicidal ideation and global cognitive dysfunction (even after adjustment for current depressive symptoms, data not

shown) than the comparison group, suggesting compensatory strategies and resilience capacities. Such compensatory strategies have already been described in neglected children without physical abuse who demonstrate a greater capacity for problem solving, abstraction and planning[32] as well as in foster children whose capacity for everyday functioning has been observed to be positively associated with the number of maltreatment types.[33] In the elderly, we have also reported within the same population that some childhood traumatic experiences could be associated with a lower risk of cognitive impairment.[34] In none of these studies however, has the link with PTSD symptoms been examined.

Physical health as a function of traumatic exposure and re-experiencing symptoms

We were able to distinguish physical disorders such as angina pectoris, associated with exposure to a lifetime traumatic event independently of PTSD symptoms, from disorders such as hypertension and thyroid dysfunction, more specifically associated with the expression of re-experiencing symptoms subsequent to trauma. Some studies have shown an association between full or partial PTSD and cardiovascular disease in male war veterans.[2, 5, 35, 36] Of the four studies in civilian men and women or disaster survivors[6, 7, 37, 38] only two reported a mediating role of PTSD.[7, 37] Sledjeski et al[6] suggested that the relationship between PTSD symptomatology and chronic medical conditions (including cardiovascular disorders) could be explained by the number rather than by the severity of lifetime traumas, as is often considered. Thus the mediating effect of PTSD in the relationship between trauma and physical health, though supported by a dose-response relationship between PTSD symptoms and cardiovascular diseases in some studies[36, 37, 39] remains to be clarified. Our findings suggest that a distinct pattern may coexist according to the type of chronic disorder developed after trauma, which may or may not be mediated by PTSD symptoms; cardio-ischemic disease in elderly persons appearing independently of PTSD symptoms in contrast with other

chronic conditions (thyroid dysfunction) or other vascular factors such higher triglyceride levels, WHR, and hypertension. Overall our findings on anthropomorphic, metabolic and hemodynamic risk factors indicate an increase in cardiovascular risk associated with the expression of post-traumatic symptoms and thus severity.

Mental resilience as protective factor against somatic disorders

To our knowledge very few studies have examined both biological and clinical characteristics of individuals who do not develop post-traumatic symptoms following the exposure to a traumatic event. Our data show that not only do these exposed but non-traumatized persons have better overall mental health than those who re-experience the event but also suggest they may have acquired some form of positive protective effect compared to those who never experienced a traumatic event. Concerning physical health, this "mentally resilient" group had lower rates of hypertension (OR=0.68, 95%CI [0.50-0.93]) compared to other exposed persons. It was not possible to examine the biological mechanisms leading to psychological and physiological protection or dysfunction. It is however interesting to note a dose effect with an increase in the number and severity of health-related outcomes between groups, with non-traumatized subjects having the lowest risk, traumatized subjects without re-experiencing symptoms having an intermediary pattern of risk (lifetime smoking and a tendency for higher WHR) and those with trauma leading to re-experiencing symptoms having the highest risk level (lifetime smoking tendency, higher WHR, hypertension, higher triglyceride levels). In a subsample of 201 elderly subjects from the ESPRIT study, we also observed lower basal cortisol levels specifically in the group of traumatized subjects with re-experiencing symptoms but not in non-traumatized subjects or in traumatized subjects without re-experiencing symptoms.[40] Together these observations suggest that the observed pathophysiological "gradient" as a function of re-experiencing symptom expression and

severity, could reflect an increasing allostatic load which could be considered as a marker of PTSD.[41] Finally, genetic vulnerability associated to certain stress-related genes, notably the glucocorticoid receptor, might also contribute to this resilience profile. Indeed, certain polymorphisms have been associated with a healthier metabolic profile and better cognitive function whereas other functional polymorphisms in the same gene were associated with worse vascular profile and modified cortisol response to a psychosocial stressor.[42] The pleiotropic effects of glucocorticoids on lipid and glucose metabolism, their immunosuppressive and anti-inflammatory actions and their brain function, also support the hypothesis for their involvement in the balance between physical and mental health and in resilience profile which may be modulated by distinct genetic vulnerability.

Limitations and strength

Retrospective reports of traumatic events are subject to recall bias especially when considering that some traumatic events lie in the distant past from the perspective of our elderly sample. There is also a potential bias due to exclusion of demented persons or those with missing data as well as a survival bias, so that some associations might be underestimated. PTSD diagnosis was performed using a DSM-IIIR based questionnaire in which the definition of a traumatic event is linked to a normative objective standard, whereas DSM-IV focuses on a subjective standard, the emotional response of the individual exposed to the event. If this subjective definition, where trauma is defined as any event an individual found intensely distressing, offers an advantage in terms of sensitivity of clinical diagnosis, the objective definition is better adapted to the study of resilience. We did not collect information on the number of lifetime traumatic events and could not study the impact of cumulated burden of lifetime trauma on the long-term development of cardio-ischemic diseases. In addition the data on health symptoms were collected at baseline and we cannot

firmly conclude that a traumatic event is a risk factor for current physical disorders, although, in most cases the trauma occurred more than 50 years before the clinical evaluation. The same results were however obtained including only subjects for whom we could confirm that the traumatic event preceded the onset of cardio-ischemic disease. Finally, multiple analyses have been performed which may have induced some chance associations, and although results are overall consistent with previous studies, our findings require replication within a larger sample.

This research was based on a large, random, community-dwelling elderly sample, for which a large number of biological, clinical and life-style risk factors of vascular and metabolic diseases were collected. The information on physical health used predominantly objective indicators obtained from different sources; standardized clinical examinations, medications validated by prescriptions, blood analysis. Finally we have distinguished the effects of trauma exposure from those of PTSD symptom expression.

Our results suggest that lifetime traumatic exposure may induce long-term vascular consequences which appear to be modulated by mental resilience. In clinical terms our results suggest that elderly persons with a history of exposure to traumatic events should be carefully monitored for vascular pathology, notably where this has led to re-experiencing symptoms. Further large longitudinal studies (ideally birth cohorts) are needed to better understand the biophysiological mechanisms associated with trauma accumulation and mental resilience. Clinical studies are also required to assess the potential protective effect of pharmaceutical and cognitive-behavioral intervention to terminate re-experiencing of traumatic events in exposed subjects in order to reduce their risk of future cardiovascular disorders.

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Table 1: Demographic characteristics according to trauma status (N=1662)

	No Trauma *n=792* *(0)*	*Trauma without reexperiencing* *n=612* *(1)*	*Trauma with reexperiencing* *n=258* *(2)*				
Variable	*%*	*%*	*%*	*p-value*[a] *(global test)*	*(1 vs. 0)*[a,b]	*(2 vs. 0)*[a,b]	*(2 vs. 1)*[a,b]
Age range (years)							
65-69	40.28	32.68	35.66	0.002	-	-	-
70-74	35.23	33.66	32.56		0.226	0.715	0.606
75+	24.49	33.66	31.78		<.0001	0.032	0.398
Gender							
Female	61.94	49.36	72.66	<.0001	<.0001	0.001	<.0001
School education							
≤ 5 years	26.39	18.49	23.60	0.007	-	-	-
6-9 years	30.77	27.01	29.21		0.081	0.964	0.217
> 9 years	42.84	54.50	47.19		0.0003	0.262	0.109

[a]Adjusted for other variables in the table
[b] p value for two-by-two inter-group comparisons.

Table 2: Current mental health according to trauma status (N=1662)

	No Trauma *(0)*	*Trauma without reexperiencing* *(1)*	*Trauma with reexperiencing* *(2)*					
Variable	*%*	*%*	*%*	*p-value*[a] *(global test)*	*OR [95% CI]*[a] *(1 vs.0)*	*p-value*	*OR [95% CI]*[a] *(2 vs. 0)*	*p-value*
Major Depressive Disorder								
never	77.13	78.61	56.97	<.0001				
past	21.54	19.65	36.48		1.01 [0.77; 1.34]	0.924	2.18 [1.57 ; 3.02]	<.0001
current	1.33	1.74	6.56		1.44 [0.59; 3.53]	0.427	6.00 [2.64 ; 13.62]	<.0001
At least 1 current anxious disorder	14.34	9.67	20.66	0.005	0.75 (0.53; 1.07]	0.111	1.52 [1.04 ; 2.22]	0.032
Number of current psychiatric disorders								
0	78.63	82.33	67.22	0.0002				
1-2	15.75	14.87	20.43		1.01 [0.74; 1.38]	0.964	1.46 [1.00 ; 2.15]	0.053
3+	5.62	2.69	11.91		0.52 [0.28; 0.96]	0.035	2.28 [1.35 ; 3.83]	0.002
Current depressive symptoms	26.81	23.43	38.82	0.001	0.88 [0.69; 1.14]	0.338	1.59 [1.17 ; 2.15]	0.003
Current suicidal ideation	9.31	6.09	13.93	0.011	0.66 [0.43; 1.01]	0.054	1.42 [0.91; 2.21]	0.122
Lifetime suicide attempt	2.96	2.46	7.47	0.013	0.94 [0.47; 1.87]	0.851	2.36 [1.23; 4.51]	0.009
Cognitive impairment *:*								
MMSE (<26)	14.97	9.85	18.43	0.033	0.72 [0.51; 1.01]	0.060	1.25 [0.85; 1.85]	0.254

[a]Adjusted for age, gender and education

Table 3: Current physical health according to trauma status (N=1662)

	No Trauma	*Trauma without reexperiencing*	*Trauma with reexperiencing*					
	(0)	*(1)*	*(2)*					
Variable	*%*	*%*	*%*	*p-value*[a] *(global test)*	*OR [95% CI]* [a] *(1 v.0)*	*p-value*	*OR [95% CI]*[a] *(2 v. 0)*	*p-value*
Ischemic diseases								
Cardio-ischemic diseases	6.90	11.65	13.55	0.002	1.55 [1.05; 2.27]	0.026	2.28 [1.43; 3.64]	0.001
Angina pectoris	4.29	8.14	10.59	0.002	1.78 [1.12; 2.83]	0.015	2.56 [1.50; 4.38]	0.001
Myocardial infarction	2.78	4.77	4.30	0.195	1.36 [0.76; 2.43]	0.298	1.72 [0.81; 3.65]	0.157
Coronary heart disease	2.28	4.20	3.45	0.296	1.49 [0.79; 2.81]	0.215	1.87 [0.81; 4.32]	0.144
Stroke	2.28	2.92	2.28	0.986	0.99 [0.50; 1.98]	0.985	1.07 [0.410; 2.77]	0.895
Lower limb arteritis	3.76	2.42	3.08	0.677	0.53 [0.28 ; 1.01]	0.054	0.82 [0.36 ; 1.84]	0.625
Non-ischemic diseases								
Arrhythmia	10.53	12.75	13.15	0.571	1.16 [0.83 ; 1.62]	0.390	1.22 [0.79 ; 1.88]	0.377
Congestive heart failure	1.82	2.33	4.17	0.155	1.23 [0.58 ; 2.64]	0.592	2.25 [0.98 ; 5.17]	0.057
Metabolic risk factors[b]								
Hypercholesterolemia	46.51	44.55	41.80	0.177	1.23 [0.99 ; 1.53]	0.067	1.14 [0.85 ; 1.53]	0.368
Elevated triglycerides	15.88	18.51	20.31	0.144	1.14 [0.86; 1.52]	0.367	1.44 [1.00 ; 2.07]	0.050
WHR (medium or high)	63.14	73.37	63.71	0.071	1.29 [0.96; 1.73]	0.088	1.43 [1.01; 2.03]	0.043
Metabolic syndrome	13.71	13.76	17.23	0.298	1.03 [0.74; 1.42]	0.878	1.36 [0.91; 2.04]	0.132
Glycaemia				0.211				
elevated	3.30	2.47	5.08		0.76 [0.39 ; 1.45]	0.399	0.98[0.56 ; 1.73]	0.173
diabetes	7.50	9.88	6.64		1.28 [0.87; 1.88]	0.208	1.61 [0.81; 3.21]	0.954
Other chronic conditions[c]								
Hypertension	44.83	44.97	52.05	0.054	0.92 [0.74; 1.16]	0.486	1.35 [1.00; 1.81]	0.049
Thyroid dysfunction	6.20	5.94	10.94	0.113	1.14 [0.72; 1.80]	0.565	1.69 [1.03; 2.78]	0.038
Life habits[d]								
Lifetime cigarette smoking	37.67	49.10	38.13	0.038	1.33 [1.05; 1.70]	0.020	1.34 [0.97; 1.86]	0.075
Current heavy alcohol drinking	18.28	21.26	17.21	0.410	1.19 [0.90 ; 1.57]	0.214	0.99 [0.67 ; 1.45]	0.948

[a]Adjusted for age, gender and education

[b] Hypercholesterolemia: total cholesterol ≥236mg/dl or treatment; Elevated triglycerides: ≥ 150mg/dl; WHR is categorized as tertile; Elevated fasting glucose: ≥110mg/dl and Diabetes: fasting glucose ≥126mg/dl or antidiabetic medication. The metabolic syndrome was defined according to the National Cholesterol Education Program Adult Treatment Panel III criteria which requires the presence of three or more alterations among the following: abnormal waist circumference (>88cm for women and >102cm in men), elevated triglycerides (≥150mg/dl), low high-density lipoprotein cholesterol (<50mg/dl in women and <40 in men), elevated fasting glucose (≥110mg/dl), and elevated systolic (≥130mm Hg) or diastolic blood pressure (≥85mm Hg) or use of antihypertensive treatment.[10-12]
[c] Hypertension: resting blood pressure ≥160/95mm Hg or treatment.
[d] Alcohol consumption: heavy drinking >20g/day for women and >40 for men.

Table 4: Multiple logistic regression analyses of trauma status predicting the presence of angina pectoris, hypertension and current depressive symptoms

Outcome	*Trauma status*	*Cases (n)*	*OR [95% CI]*	*p-value*
Angina Pectoris (n= 1281)[a]	No trauma	23	1	0.006
	Trauma without RS	41	2.27 [1.31; 3.91]	
	Trauma with RS	20	2.34 [1.22;4.49]	
Hypertension (n=1424)[b]	No trauma	296	1	0.047
	Trauma without RS	220	0.86 [0.68; 1.10]	
	Trauma with RS	109	1.32 [0.96; 1.82]	
CESD ≥16 (n=1421)[c]	No trauma	183	1	0.061
	Trauma without RS	126	0.91 [0.69; 1.20]	
	Trauma with RS	83	1.39 [0.99; 1.95]	

[a]Model 1: adjusted for age, gender, education, alcohol intake; WHR; hypertension, elevated triglycerides, glycemia; physical activity and living alone. The variables "current CESD ≥16", "lifetime MDD" or lifetime smoking were not associated with the outcome in our sample (p=0.569, 0.563 and p=250, respectively)

[b]Model 2: adjusted for age, gender, education, lifetime smoking, alcohol intake; BMI >25 kg/m^2 and physical activity.

[c]Model 3: adjusted for age, gender, education, lifetime smoking, physical activity; living alone, cognitive impairment; at least one somatic disease, current antidepressant and anxiolytic use

RS= Re-experiencing symptoms