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To cite this version:

Aymery Constant, David Val-Laillet, Anthony Joubert, Katia Foret, Ronan Thibault, et al.. Depressive symptoms are related to boredom proneness in patients receiving hospital care, regardless of alcohol status, lifestyle, or social support. Journal of Health Psychology, 2021, 26 (10), pp.1674-1683. 10.1177/1359105319886049 . hal-02387590

HAL Id: hal-02387590
https://hal.science/hal-02387590

Submitted on 13 Feb 2020

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Depressive symptoms are related to Boredom Proneness in patients receiving hospital care, regardless of alcohol status, lifestyle or social support

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The authors declare no conflict of interest

The authors received no specific funding for this work.

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Abstract

We examined the relationship between Boredom Proneness (BP) and psychological distress in patients receiving hospital care due either to excessive alcohol consumption (AC) or to gastro-intestinal diseases. Sociodemographic data were collected together with BP subscales (internal/external lack of stimulation), psychological distress, physical activity and social support. BP due to a lack of external stimulation seemed to constitute a prominent personality trait in patients with AC. But depressive symptoms were related only to BP due to a lack of internal stimulation in all patients, regardless of alcohol status, lifestyle or social support. Potential implications for practice and future research are discussed.

Keywords: Alcohol; Depression; Social Support; Boredom Proneness; Hepato-Gastroenterology.

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Introduction

The causal relationship between psychiatric manifestations and alcohol-related issues is often unclear in patients with alcohol dependence/abuse (Hodgins et al., 1999). Alcohol might induce mental health issues or be used as self-medication for pre-existing or concomitant social and psychological issues (Brower et al., 2001; Swendsen et al., 2000; Strowig, 2000). Consequently, psychiatric symptoms could be due to alcohol misuse and may reflect an inability to cope with withdrawal, psychological distress, and/or life events; in addition, the symptoms could stem from a combination of these factors. In addition, alcohol dependence includes the impairment of functional status, activity limitations, and restrictions in social interaction in work, family life and physical and leisure activities (Levola et al., 2014; Vancampfort et al., 2015). This is all the more concerning that social support and physical activity positively affects health status through diverse mechanisms that have been extensively documented (Umberson et al., 2010; Mowbray, 2014). But personality traits may also account for the relationship between excessive alcohol consumption and psychological distress. For instance, patients with high neuroticism/negative emotionality are vulnerable to both alcohol misuse and depression (Mulder, 2002; Mellos et al., 2010; Weijers et al., 2003). But other than the substantial amount of literature examining propensity for negative affectivity, little research has specifically targeted personality traits in relation to psychological distress among excessive drinkers.

Boredom Proneness, in particular, could be involved in both alcohol and psychological disorders. Boredom occurs when an individual experiences both the neurological state of low arousal, and the psychological state of dissatisfaction, frustration, or disinterest in response to low arousal (Vogel-Walcutt et al., 2012), and is consistently related to negative affect, task-unrelated thought, over estimation of elapsed time, reduced agency, as well as to under-

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stimulation (Raffaelli et al., 2018). Escape from boredom is one of the most prominent expectancies for alcohol consumption in adolescents (Gordon and Caltabiano, 1996; Biolcati et al., 2016), and the association between boredom-driven drinking and high-intensity drinking increases with age (Patrick et al., 2017). Boredom may result from external circumstances, and considered as situation-dependent, or from an individual susceptibility to experiencing boredom (Boredom Proneness, BP), that varies in degree across individuals (Todman, 2007). Boredom-prone individuals tend to report frequently psychological and physical impairments, and a negative social orientation that may impair social relationships (Sommers and Vodanovich, 2000). They also experience varying degrees of hopelessness, loneliness, distractibility, lack of motivation, and general dissatisfaction (Farmer and Sundberg, 1986), and may use unhealthy and potentially addictive behaviours as a coping strategy (Chou et al., 2018; Wegmann et al., 2018; Biolcati et al., 2018; Crockett et al., 2015).

Researchers have suggested that information on BP could be useful in a variety of medical settings, including hospitals (Sommers and Vodanovich, 2000). The aim of this study was to investigate BP in patients with AC receiving hospital care, and to assess its relationship with psychological distress. Patients with digestive diseases were included as comparison group to control for the effect of impaired health status (Chang, 2004; Samokhvalov et al., 2010; Strine et al., 2009) and patient management (Steele and Linsley, 2018). Objectives were 1) to compare BP and psychological distress levels between patients with AC and diseased controls, 2) to investigate the relationship between psychological distress, boredom proneness, social support and active lifestyle, and 3) to control for the effect of AC on these relationships.

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Materials and Methods

Participants

The study protocol was approved by the local research ethics committee, and informed consent was obtained from all participants. Patients aged >18 years admitted in the Addiction unit of the hepato-gastroenterology department of the Rennes University Hospital were eligible. In the addiction unit, patients were referred to the detoxification program by their primary care practitioners or by outpatient addiction treatment facilities. Inpatient detoxification was indicated in case of severe alcohol withdrawal symptoms, including history of seizures or delirium, or more often in case of failure in community-based alcohol withdrawal. Detoxification lasted one to two weeks and consisted of treatment of alcohol withdrawal symptoms using personalized treatment with diazepam, careful multidimensional evaluation of the patient, psychosocial support, care of other addictions and alcohol-related diseases and the establishment of a treatment plan for aftercare. A group of patients with chronic disease, hospitalized in the same department, but without current excessive alcohol consumption, was included as a control group. They were attending medical exams or ambulatory care and were chosen to match the average age of alcoholic patients.

Procedure and assessment

Patients were interviewed by clinical psychologists using tablet computer-based questionnaires. The following data were collected: gender, age in years, and employment status (professionally active or unemployed/retired).

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Boredom Proneness

The Boredom Proneness Scale (BPS) was developed as a measure of the tendency to become bored in a true/false format (Farmer and Sundberg, 1986). In the French validation study, factorial analyses yielded a two-factor structure including 26 items out of 28 (Gana and Akremi, 1998). The boredom proneness due to a lack of internal stimulation, or "internal BP" subscale includes 14 items related to one's inability to generate interesting activities, while the boredom proneness due to a lack of external stimulation, or "external BP" subscale includes 12 items related to the perception of low environmental stimulation. These two dimensions found support in the majority of studies on BP (Vodanovich and Watt, 2016).

Psychological distress

The Hospital Anxiety Depression Scale (HADS) was developed in 1983 for assessing emotional problems [23], such as anxiety and depression, of temporarily ill patients in general outpatient clinics [23, 24]. HADS is a simple, reliable, and valid tool aiming for use in clinical screening, and has been applied in many studies around the world. This scale consists of 14 items, including the two subscales of anxiety (7 items) and depression (7 items). A 0–3 scale is used for scoring, and anxiety and depression are scored separately. Higher scores in the respective scales are indicative of higher levels of symptoms.

Physical activity and Sedentarity time

The Global Physical Activity Questionnaire (GPAQ) was developed by the World Health Organization to systematically monitor global Physical Activity (PA) levels (Bull et al., 2009)

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and specifically tested in European French speakers (Wanner et al., 2017). This questionnaire collects information on the duration and frequency of moderate- and vigorous-intensity PA during work, active transportation (walking or using a bicycle to get to and from places), and leisure time (recreational activities, sports, and fitness). Participants were asked only to report activities lasting 10 minutes or longer. Moderate/vigorous intensity activities are described as activities that require moderate/hard physical effort and cause small/large increases in breathing or heart rate. Average sitting and/or reclining time in hours per day is reported as a proxy for sedentary behaviour.

Social support

The Social Support Questionnaire - Short Form (Sarason et al., 1987) yields scores for (a) perceived number of social supports and (b) satisfaction with social support that is available. Respondents are asked to list the individuals that are available to them for help in specific situational circumstances, namely: N1: Whom can you really count on to be dependable when you need help?; N2: Whom can you really count on to help you feel more relaxed when you are under pressure or tense?; N3: Who accepts you totally, including both your worst and your best points?; N4: Whom can you really count on to care about you, regardless of what is happening to you?; N5: Whom can you really count on to help you feel better when you are feeling down in the lumps?; and N6: Whom can you really count on to console you when you are very upset?. For each item, they have to indicate how satisfied they are with the support available using a 6-point scale (from 1= not satisfied at all; to 6= very satisfied). In the French validation study (Rascle et al., 2005), the patient population reported on average 20.4 (10.5) support providers with a 30.6 (4.3) satisfaction score.

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Statistical and data reduction analyses

Categorical data were expressed as numbers (N) and percentages (%), while numerical data were expressed as means (M) and standard deviations (SD). Guttmann split-half coefficients were computed for each factor found in the Boredom Proneness Scale validation study in French, and revealed good internal consistencies for the "lack of internal stimulation" (coefficient= 0.81) and "the lack of external stimulation" (coefficient = 0.71). Two sub-scores were generated by summing up relevant items, and transformed to a 0–100 scale. Higher scores in the respective internal/external scales are indicative of significant lack of internal/external stimulation. In addition, an exploratory factorial analysis was performed on the SSQ6 items using an Unweighted Least-Square factorial analysis. This method was found to provide accurate and conservative parameter estimates when using ordinal data (Forero, Maydeu-Olivares, & Gallardo-Pujol, 2009). Factorial analyses confirmed the 2-factor structure found in the original validation study in French. The first factor (eigenvalue: 4.4; explained variance: 40.2%; Cronbach alpha: 0.86) included items from N1 to N6 (correlations >0.40) and was interpreted as assessing the number of available support providers *i.e.* "availability". The second factor (Eigenvalue: 1.9; explained variance: 17.7%; Cronbach alpha: 0.80) included items from S1 to S6 (correlations >0.40) and was interpreted as assessing the satisfaction toward social support, *i.e.* "satisfaction". A summary score was computed for each factor. Since our study outcome was a linear variable, we used generalized linear regression model to estimate the strength of the association between scores of psychological distress and each covariate. Significant estimates ($p<0.05$) from univariate model were entered in a multivariate model, with and without adjustment on AC. Statistical analyses were performed using the SPSS statistical package, version 19 (SPSS, Chicago, Illinois, United States).

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Results

Study sample characteristics

Of the 101 patients included (Table 1), 71 (70.3%) were men, the average age was 47.4 years. Active (41.6%) and unemployed (38.6%) patients accounted for the same proportion, while 1 in 5 was retired. Three patients out of four (77.2%) reported active transportation on a daily basis, but only 22.8% and 36.6% reported vigorous and moderate recreational activities, respectively. In addition, 4 in 10 patients reported being sedentary more than 3 hours a day, while only 1 in 4 reported sedentary less than 2 hours a day. HADS Scores ranging from 0 to 21 were 7.5 (4.3) for anxiety, and 4.7 (4.0) for depressive symptoms (Table 2), while Boredom Proneness Z-scores (ranging from on a 0 to 100) were 27.7 (22.4) for internal and 45.5 (23.6) for external BP. Patients reported on average 19.1 available support providers in their network, with a satisfaction score of 25.1 (5.1).

When it comes to medical condition, 57 attended a detoxification program and presented with heavy alcohol consumption, 20 had inflammatory bowel diseases (mainly Crohn's disease), 15 attended a liver transplant checklist and 9 attended a liver biopsy. Patients with inflammatory bowel disease were coming in day hospital for maintenance therapy, excluding acute exacerbation of the disease. Excessive alcohol consumption concerned the 57 patients from the detoxification program, so they were all allocated to the ‘Excessive Alcohol Consumption” group. It must be noted that 7 in 15 patients attending a liver transplant were suffering of cirrhosis from alcoholic origin, but were abstinent from any alcohol consumption for at least more than 6 months at the time of interview. They therefore were considered as controls with the other 37 ambulatory patients (N=44).

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Sex distribution and mean age (standard deviation) were similar between patients with AC (46.0 (10.9)) and controls (49.2 (14.6), p=NS). Patients with AC were significantly overrepresented in unemployed participants (59.6% *vs*. 11.4%; p<0.001); and underrepresented in those reporting vigorous recreational activities (10.5% *vs*. 38.6%; p=0.001). They reported, as compared to controls, higher scores of internal (39.2 (22.3) vs. 12.8 (10.8), p<0.001) and external BP (58.8 (18.5) *vs*. 28.2 (17.5), p<0.001), as well as higher scores of depressive symptoms (6.0 (2.7) *vs*. 3.1 (2.7), p=0.001). Conversely, social support components and anxiety symptoms were similar between groups. Accordingly, only scores of depressive symptoms were used as outcome in further analyses.

In univariate analysis (Table 3, Univariate Model), depressive symptoms score correlated positively with internal and external BP scores, and excessive alcohol consumption, and negatively with social support subscales and vigorous physical activity. When variables significantly related to depressive symptoms score in univariate analysis were entered into a multivariate model (Table 3, Model 1), depressive symptom score was only related to internal BP score. When AC was entered in the model (Table 3, Model 2), depressive symptoms score remained significantly related to internal BP, but no longer to AC.

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Discussion

Findings showed that depressive symptoms and BP scores were higher in patients with excessive alcohol consumption as compared to patients with digestive diseases, although groups were broadly similar in terms of anxiety, social support, sedentary time and lifestyle. In univariate analysis, depressive symptoms score correlated positively to excessive alcohol consumption and to external and internal BP subscales, and negatively to social support and vigorous physical activity. In multivariate analysis, it correlated to internal BP subscale only, even when AC was entered in the model.

Many studies evidenced the relationship between excessive alcohol consumption, psychological distress and social limitations (Storbjörk and Room, 2008; Constant et al., 2017; Trudeau et al., 1998). Health problems, which may impair the ability to be physically active, are also extremely common in people with alcohol use disorders (Vancampfort et al., 2015). In the present study, however, patients with AC were compared with age- and sex-matched patients with digestive diseases, which possibly attenuated some differences as regards to general population, or healthy controls. Foremost, somewhat limited levels and between-groups differences were found as regards to psychological distress. Anxiety symptoms scores were slightly above the cut-off value, but similar between groups. And, while depressive symptoms were significantly higher in patients with AC as compared to controls, they remained below the cut-off value. This probably reflects the particular situation of patients in detoxification programs, where mental health and withdrawal symptoms are carefully monitored and managed (Giorgi et al., 2015; Sander and Jux, 2006), albeit relapse is still possible afterwards (Constant et al., 2015). When it comes to active lifestyle, patients with AC were less likely to be employed (Storbjörk and Room, 2008), and to practice vigorous activity, but matched controls otherwise. And while severe alcohol problems may

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affect social networks size and diversity (Mowbray et al., 2014), patients with AC were not isolated as compared to others patients, in the present study or elsewhere (Rascle et al., 2005).

The picture is quite different when it comes to BP, since this personality trait differentiated markedly patients with and without AC, which adds up to findings on the relationship between boredom and drinking among adolescents, young (Biolcati et al., 2016; Windle and Windle, 2018), and older adults (Kuerbis et al., 2018; Patrick et al., 2017). But differences in scores on BP subscales also reflect distinct reasons for the occurrence of boredom (Vodanovich et al., 2005). In the present study, they underscored the high level of BP due to a lack of external stimulation in patients with AC. This perception, which reflects a constant need for variety and change, could constitute a personality trait typical of these patients, which concurs with the general dissatisfaction towards most things in life found in persons with alcohol disorders (Akerlind and Hornquist, 1992). It is not yet possible to characterize BP as a cause of excessive drinking rather than a mere associated personality trait. It could constitute a critical personality risk factor for the onset of alcohol problems in moderate drinkers, or for relapse in patients treated for alcohol dependence (Constant et al., 2015) but this hypothesis warrants further prospective investigations.

In univariate analysis, depressive symptoms score correlated positively to BP subscales and excessive alcohol consumption and negatively to vigorous physical activity and social support components, which confirms research into the clustering of social, physical and psychological components of health (Brunes et al., 2013; De Mello et al., 2013; Augestad et al., 2008; Allgower et al., 2001). But only internal BP score remained associated with the outcome in a multivariate analysis, even when alcohol status was entered in the model. This relationship between BP and depressive states was documented in previous studies (Sommers and Vodanovich, 2000; Newell et al., 2012). However, our results indicate that depressive

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symptoms in patients receiving hospital care are more related to one's inability to generate interesting activities than to the perception of low environmental stimulation, alcohol status, or any others socio-behavioral factors. Personality traits are defined as the relatively enduring patterns of thoughts, feelings, and behaviors, although some changes may occur during life course (Roberts and Mroczek, 2008). The developmental origins of BP remain unclear, but this personality trait seems to be related to cognitive and affective dysregulation, and to lesser self-control (Isacescu et al., 2017). Further studies are necessary to investigate the impact of under- or over-stimulation during critical developmental stages, and especially the complex relationship existing between BP and the development of addictive behaviours early in life (Wegmann et al., 2018; Biolcati et al., 2018). Our findings have nevertheless some therapeutic implications. Indeed they suggest that not only the implementation of stimulating environment and activities (Steele and Linsley, 2018), but also the provision of self-control training (Friese et al., 2017) to boredom-prone individuals could alleviate some detrimental outcomes such as depressive symptoms in patients under therapy.

This study must be interpreted in light of its limitations. Firstly, the cross-sectional design does not allow causal inferences about relationships between variables to be determined. As a personality trait, however, BP could have theoretically preceded addictive and mental disorders. Secondly, the relatively small size of the clinical sample (N=101) may explain the lack of relationships between some covariates, as in-depth determinant analyses may not be feasible on this sample size. Finally, most vulnerable patients received the state-of-the-art mental healthcare provided in university hospitals, which limits the generalizability of the results. The inclusion of patients with gastrointestinal diseases has nevertheless offered an interesting opportunity to control for disease-related impairments when assessing BP and psychological distress in patients with heavy alcohol intake.

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Overall, boredom proneness due to a lack of external stimulation seemed to constitute a prominent personality trait in patients with excessive alcohol consumption. But depressive symptoms were related only to boredom proneness due to a lack of internal stimulation in all patients, regardless of alcohol status, lifestyle or social support. Addressing boredom through the provision of stimulating activities could therefore be of interest for alleviating depressive symptoms in patients receiving hospital care. Prospective studies are necessary to assess whether a causal relationship exists between BP and affective and/or addictive disorders, but also investigate implications for daily life, for partnership, and for psychosomatic functioning. A better understanding of the neurobiological and neurocognitive mechanisms underlying BP through neuroimaging studies could also improve therapeutic interventions addressing the negative health outcomes that are associated to this influential personality trait.

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Table 1: Characteristics of patients (N= 101) with and without excessive alcohol consumption (AC)

Variables		All	Patients		p-value †
			AC	Controls	
		N (%)	N (%)	N (%)	
		101 (100)	57(56.4)	44 (43.6)	
Male Sex		71 (70.3)	43(75.4)	28 (63.6)	NS
Employment status	Active	42 (41.6)	16 (28.1)	26 (59.1)	<0.001
	Retired	20 (19.8)	7 (12.3)	13 (29.5)	
	None	39 (38.6)	34 (59.6)	5 (11.4)	
Recreational activity	Vigorous	23 (22.8)	6 (10.5)	17 (38.6)	0.001
	Moderate	37 (36.6)	20 (35.1)	17 (38.6)	NS
Active Transportation		78 (77.2)	44 (77.2)	34 (77.3)	NS
Sedentary time (h/day)	3 < S	41 (40.6)	25 (43.9)	16 (36.4)	NS
	2< S ≤ 3	32 (31.7)	19 (33.3)	13 (29.5)	
	S ≤ 2	28 (27.7)	13 (22.8)	15 (34.1)	

Note: NS=Non Significant

†: Data were compared using Chi-Square Test for categorical data and Mann-Whitney non parametric comparison test for age

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Table 2: Mean scores (standard deviation) of Boredom Proneness, Social support, and psychological distress components in patients with and without excessive alcohol consumption (AC)

		All	Groups		p-value
			AC N=57	Controls N=44	
Boredom Proneness (BPS)	Internal	27.7 (22.4)	39.2 (22.3)	12.8 (10.8)	<0.001
	External	45.5 (23.6)	58.8 (18.5)	28.2 (17.5)	<0.001
Social support (SSQ6)	Availability	19.1 (11.7)	17.8 (11.7)	20.7 (11.7)	NS
	Satisfaction	25.1 (5.1)	24.5 (4.9)	25.9 (5.2)	NS
Psychological distress (HADS)	Anxiety	7.5 (4.3)	8.0 (5.2)	6.9 (2.7)	NS
	Depression	4.7 (4.0)	6.0 (2.7)	3.1 (2.7)	0.001

Note: NS= Non-Significant; BPS= Boredom Proneness Scale; SSQ6= Social support Questionnaire; HADS= Hospital Anxiety and Depression Scale

†: Data were compared using Mann-Whitney non parametric comparison test

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Table 3: Standardized Estimates of Depressive symptoms adjusted on Sex and Age (N=101), linear regression

	Univariate	Multivariate	
		Model 1	Model 2
Boredom Proneness			
Internal	0.52***	0.39***	0.37**
External	0.40***	0.16	0.14
Active lifestyle			
Professionally active †	-0.06		
Vigorous recreational activity ‡	-0.26*	-0.04	-0.03
Moderate recreational activity ‡	-0.01		
Active transportation ‡	-0.08		
Sedentarity time (in hours/day)	0.07		
Social support			
Availability	-0.29*	-0.09	-0.09
Satisfaction	-0.21*	-0.09	-0.09
Excessive Alcohol Consumption (vs. controls)	0.36***		0.05

Note: * p<0.05 ; **p<0.01 ; ***p<0.001; AC= excessive alcohol consumption

†: coded as 1=professionally active and 0=retired or unemployed

‡ coded as 1= yes; 0 = no

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