

Rapid Communication

Stress-Induced Alcohol Consumption in Young Adults

Laessle R*

Department of Clinical and Biological Psychology,
University of Trier, Germany

*Corresponding author: Reinhold Laessle

Department of Clinical and Biological Psychology,
University of Trier, 54290 Trier, Germany

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Abstract

Alcohol misuse and alcohol dependency are frequent in young adults in Germany. The cases have more increased in females than in males. Hypothesized is an association between stress load, stress coping and alcohol consumption for stress relief. A controlled laboratory experiment measured stress-induced beer consumption in 105 young women and men. Usual drinking behavior and stress coping were taken into account. After stress (TSST) beer intake was higher compared to control condition for men as well as for women. Stress coping was more inadequate in women. Alcohol consumption in laboratory is integrated in models of negative reinforcement and proposals of social cognitive learning theory.

Keywords: Stress; Alcohol; Stress coping; Young adults; Treatment

Introduction

Increased alcohol consumption in particular has a stress reducing effect in the sense of negative reinforcement. This is outlined in a review of [1], but also genetic influences in regulation of HPA axis may play an important role.

A non-experimental study of [2] also shows the stress reducing effect of alcohol drinking, when stressors occur at work. Especially lacking competences of stress coping reinforce increased alcohol consumption for stress relief. The authors integrate their results into social cognitive learning theory.

A more recent investigation of [3] has shown, that in workplaces mobbing is frequently present and is perceived as a very negative stressor with the consequence of heightened alcohol consumption. This was valid for men and women.

The prevalence of clinically significant alcohol disorders in the last years has increased by 35% for men, but by 85% for women [4]. There is a close relationship between ovarian hormones and HPA axis. Therefore, health consequences of stress induced alcohol consumption for women may be far more severe.

Sex specific increased alcohol consumption to regulate negative affective states is also reported in [5]. Women more often feel anxious or depressed in association with stress and then react with alcohol drinking. Reward systems in the brain may also be involved.

Daily stress and coping with respect to alcohol consumption is reported in the research of [6]. Young college students consumed alcohol frequently in stress situations for stress reduction although problem focused cognitive coping was also observed.

Binge drinking is an extreme form of excessive alcohol consumption, which may occur in association with acute or chronic stress. A large-scale study from France with more than 3000 college students provides empirical evidence [7].

This result is also found in a longitudinal study from Switzerland with 12,000 students, who mainly felt stress by being isolated from their families. A compensation for stress were regular episodes of binge drinking per week [8].

Affective load by anxiety and depression often produce insecurity about compensation. Under such circumstances 37% of college students in Canada used binge drinking [9,10]. Find increased alcohol consumption in college students, who had high stress load by pain and had no other choice to compensate. Stress was seen as a mediator between pain and increased alcohol consumption.

The same is reported for stress related insomnia. Stress was not only associated to increased alcohol consumption, but also to the diagnosis of an alcohol dependency disorder and reduced regulation of affective states in particular for anxiety and depression [11].

The empirical evidence shows, that several forms of acute and chronic stress contribute to compensatory alcohol consumption in men and women. To explain the drinking behavior models of negative reinforcement as well as models of regulation of affect under stress were considered.

In a controlled laboratory setting the present study tested the effect of an acute psychosocial stressor on alcohol consumption in young adults. Effects of usual drinking behavior and usually stress coping were also evaluated.

Method

The participants were recruited on the University campus in Trier. They were invited to take part in a study to test the taste of a newly developed beer, from which they could taste as much and as long they wanted. Before tasting they had to fill out questionnaires [12,13]. Two experimental conditions were set before drinking: "stress" by Trier Social Stress Test [14] (TSST) "control", which was the reading of newspapers for the same duration as TSST.

Initial beer amount was 500 ml. It was measured, how much beer was tasted from this amount.

105 persons were tested. 73 where female 32 were male. Mean age of participants was 23 ± 4,8. There were no statistically significant differences in age between men and women.

Results

Table 1: Beer amount after stress and control condition.

Alcohol consumption ml	Control condition	Stress
Male	199,6 ± 147,9	323,2 ± 176,3
Female	118,7 ± 119,3	152,9 ± 126,7

Statistical analysis was done by 2 factorial Analysis of variance (Stress, Sex). The main effect of "Stress" was significant with F (1,101) = 7, 2 p<.01. The interaction effect "Stress X Sex" was not significant F (1,101) = 2,3, p =.12. Stress induced an increased alcohol consumption, but the effect was not different between men and women.

Table 2: Sex differences for stress coping measured by coping questionnaire.

SVFscale	Male	Female
Distraction	12,3 ± 3,3	14,5 ± 4,6
Control of situation	15,5 ± 3,3	16,3 ± 3,4
Defense of stress	11,3 ± 4,1	13,7 ± 4,3
Social support	13,8 ± 5,4	17,6 ± 4,1
Resignation	9,5 ± 5,1	10,0 ± 4,5

Means were compared for all subscales imultaneously by MANOVA. The result was F (5, 99) = 5,7 p<.001.

For the subscales distraction, search for social support and defense of stress the means were significantly higher for women in the sense that they do not use this coping strategies adequately.

Multiple linear regression was used to predict drinking after stress. Predictors were usual drinking behavior, usual stress coping and sex of participants. The regression equation was significant with F (7,104) =4,4 and an explained variance of 18%. p<.001. Significant regression co-efficients were found for usual drinking behavior, which influenced drinking after stress positively. Sex was found to influence drinking after stress negative-

ly. Women drank after stress less than men. The stress coping strategy defense of stress also had a significant regression coefficient in the sense of drinking to compensate a stressor.

Discussion

[15] Also described experimental alcohol consumption with depressive emotions as stressor. The authors found an explained variance of 18% which is in line with the present findings. The explanation focuses on the compensation of stress through alcohol which was seen largely independent from sex.

If anxiety is considered as a stress or similar data came from [16] and although the sample size was some what smaller than here, support for our results can be concluded.

A study of anxiety related stressors, however, is in contrast to the present results. But the study exclusively was based on a telephone interview and the validity of the results can be questioned [17].

Our results were further supported by a laboratory study with a comparable stress or to TSST and high usual drinking behavior [18]. Discussed are models of a lack of inhibitory control.

Another laboratory experiment, which also used the TSST for stress induction has replicated our results, although not beer consumption but hard drinks were measured as dependent variable [19]. Social learning theory was suggested as an explanation.

A third laboratory experiment, which used TSST as well as beer consumption confirmed our results with regard to no sex differences in stress induced drinking [20].

When a person is confronted with alcohol cues as stressors this reduces inhibitory control and stimulates an urge for immediate drinking [21].

Not only college students but also older persons are prone to binge drinking in stress situations. Therefore the results of this study may be generalized to some what older people [22].

Treatment recommendations for alcohol misuse and alcohol dependency should focus on improvement of stress coping. Such a program is for example provided by [23].

General practitioners have also been involved in the treatment of stress related excessive alcohol consumption and were trained to use self-monitoring of the patient's drinking behavior by diaries. Significant improvement of alcohol consumption which could be observed upto one year after treatment was the result [24].

The result was confirmed in a web based intervention program of [25] that focused on personalized feedback.

The success of online program scan further be concluded from [26] who investigated self-help groups in comparison to guided intervention.

Not only alcohol, but other substances that lead to dependency such as amphetamine were consumed under stress [27].

For Cannabis this is also reported for stress or sof anxiety and depression by [28].

This study has limitations that have to be considered when interpreting the results. The laboratory setting has the advantage of the control of external variables and standardized stress

induction but the problem of a questionable generalization in natural environment. Only one sort of beer was offered, other alcoholics such as wine or hard drinks were not tested after stress induction. Substances that were used to reduce stress by many people could not be included into the study design. Moreover the sample size was relatively small and was recruited exclusively from University.

Statement of Ethics

All participants gave their written informed consent for participation in the study.

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