The Relationship between Health-risk Attitudes and Alcohol Use among Higher Education Students and the Moderating Effect of Fear of COVID-19

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Abstract

Background

Excessive alcohol use is especially prevalent among higher education students. In much of the previous research, alcohol use disorders and/or a harmful consumption was found in a large number of students. The consequences can be severe, ranging from poor academic achievement to aggressiveness or social problems up to comorbid (mental) health problems. Attitudes towards health-risks, such as drinking alcohol, are hypothesized to influence behaviour with more adverse, protective attitudes being associated with less engagement in those risky behaviors. Experiencing a fear of COVID-19 was hypothesized to be positively correlated with risk-averse health attitudes and to lead to more alcohol use in order to cope with the fear. Therefore, fear of COVID-19 might have a moderating, weakening effect on the relationship between health-risk attitudes and alcohol use.

Aim

The current study aims at investigating to what extent risk-averse health attitudes are associated with less alcohol use among students and whether a fear of COVID-19 weakens this relationship.

Methods

A cross-sectional within-group design was employed and a questionnaire administered which included scales to measure problematic alcohol use (IV) health-risk attitudes (DV) and level of fear of COVID-19 (moderator). 112 participants with an average age of 22 were included in the study. Pearson correlations and a moderation analysis were conducted.

Results

The results showed that higher health-risk attitudes are associated with less alcohol consumption. A fear of COVID-19 did not significantly moderate this relationship.

Conclusion

Health-risk attitudes are a possible starting point in reducing problematic alcohol use among students. This seems to not be affected by a fear of COVID-19. However, it has to be taken into account that the study took place after COVID-19 restrictions were lifted.

Keywords: Alcohol, students, health-risk attitudes, COVID-19, fear of COVID-19, moderation analysis

Introduction

University students are an especially susceptible group to excessive alcohol consumption and alcohol use disorders (Karam et al., 2007). The present study aims at investigating what can predict problematic alcohol use by testing whether attitudes towards health risks in general correlate with risky drinking behaviour. It is further examined whether fear of COVID-19 moderates this relationship, as a fear towards the virus might on the one hand be increased through certain health-risk attitudes and on the other hand lead to more alcohol use as a coping strategy.

Alcohol Use among Students

Alcohol is one of the most commonly used and abused drugs worldwide. Although it is widely accepted and plays a role in many social contexts, the effects on the individual can be severe. With nearly three million deaths each year, alcohol use remains one of the biggest risk factors for premature mortality (Ritchie & Roser, 2018). A group of people that is widely known to be drinking a lot are college or university students. This phenomenon is not new at all, research about alcohol use among students and its consequences originated in the 1970s (Calderon-Vallejo & Castaño-Perez, 2014). Karam et al. (2007) argued that alcohol use disorders and drinking in general is more common among college students than non-college students. Entering a completely new environment can be very challenging and make up a phase of vulnerability for young people, for example through peer pressure (Karam et al., 2007). For many students, alcohol use is part of attending university and most students drink alcohol when socializing with their peers. A common perception of students is that “partying” and in that context drinking alcohol is expected of them since that is the common stereotype of college students (Willis et al., 2019).

Numbers describing the prevalence of alcohol use among this group differ quite much depending mostly on country and cultural context. From a sample of university students, almost 90% drank alcohol generally, a fifth showed a harmful consumption and 14.9% were at risk of dependence (Calderon-Vallejo & Castaño-Perez, 2014). Another study confirmed that 20 percent of college students match the criteria for having an alcohol use disorder, e.g. alcohol abuse or alcohol dependence (Blanco et al., 2008). A study by Mekonen et al. (2017) about alcohol use among university students showed that at least one tenth of students show problematic use of alcohol on a medium to high level and that this was "associated with social phobia, poor academic achievement, lifetime use of any substance, and peer pressure" (Mekonen et al., 2017).

High alcohol consumption can have a range of harmful consequences for students. From impairments in cognitive abilities and problems with decision making and impulse control to reduced motor skills and as a result an increased chance to be involved in accidents (O'Brien et al., 2006). Students may also experience poor motivation and poor academic results (El Ansari et al., 2013). Other effects that can be found in the literature are memory loss, health problems or physical and sexual assault (White & Hingson, 2013) as well as increased depressive symptoms and suicidal and self-harm behaviours (Lamis & Bagge, 2011). Moreover, students using alcohol excessively may engage in more risky sexual behaviours and exhibit aggression or experience changes in social relationships (Calderon-Vallejo & Castaño-Perez, 2014).

Determinants of Alcohol Use among Students

Influence of Attitudes on Behaviour

Research about the relation between attitudes and behaviour is common in social sciences. For example the Theory of Planned Behaviour identifies attitude as a determinant of behaviour, next to subjective norms and perceived behavioural control (Ajzen, 1991). Those

influence intentions which in turn predict behaviour (Ajzen, 1991). Specific attitudes, for example towards a behaviour that poses a risk, can also influence behaviour. Someone with a rather positive attitude towards risks, will engage in more behaviours that are risky than a person who experiences aversion towards risks (Van Osch & Stiggelbout, 2007). It can be assumed that being risk-adverse or risk-seeking are not stable traits but rather that the individual differences between risk attitudes depend on the specific situation (Van Osch & Stiggelbout, 2007).

Health-Risk Attitudes as a Predictor of Alcohol Use

Health-risk attitudes refer to the likelihood of engaging in preventive health-risk behaviours or health treatments, how people deal with health risks and what value they attribute to their health overall (Van Osch & Stiggelbout, 2007). Risk attitudes seem to be correlated with a range of harmful behaviours, e.g. drinking alcohol or smoking as well as not engaging in preventive health treatments (Huls et al., 2020). On the contrary, being adverse towards risks is expected to be associated with less "unhealthy" behaviours, such as alcohol use.

Fear of Covid as a Predictor of Alcohol Use

The COVID-19 pandemic, although slowly fading out of public awareness, continues to have a tremendous impact on society and did so in the past two years. Especially students suffered from the measures to combat the virus, such as online learning, social distancing and lockdowns (Wang et al., 2020). During the pandemic, a lot of students showed increased mental health problems, for example depression, anxiety and suicidal thoughts. Many reported an inability to cope with the stress caused by the situation (Wang et al., 2020). Students being in quarantine and/or self-isolation reported a much higher level of alcohol consumption than students not being isolated. In general, a much larger amount of alcohol was consumed by students as a result of COVID-19 (Gritsenko et al., 2021; Charles et al., 2021). Other studies

found different results, namely a decrease in alcohol use (Graupensperger et al., 2021), however, it is evident that the pandemic put a strain on student's psychological well-being. Increased alcohol consumption was associated with a stronger fear of the novel virus (Gritsenko et al., 2021). Another study showed that students in particular experienced a significant amount of fear of the virus, which correlated strongly with more self-reported alcohol use (Bonnici et al., 2020). Grigoropoulos and Daoultzis (2022) suggested that alcohol consumption during the pandemic functions as a coping mechanism for covid-related fear and that this relationship is mediated by loneliness during lockdown.

Health Anxiety and Risk Adversity leading to Fear of COVID-19

A study found that general health anxiety is a predictor of fear of COVID-19 (Mertens et al., 2020). Although health anxiety refers more to the misinterpretation of physical symptoms, it is strongly connected to (health) risk attitudes. Perceiving oneself as being at risk of becoming infected with COVID-19 is associated with experiencing symptoms of health anxiety (Mohd Salleh Sahimi et al., 2021). This can likely be generalized, meaning that seeing oneself as being at risk of illness and hence engaging in protective, non-risky behaviours (having risk-adverse health attitudes) is related to experiencing fear or anxiety. Therefore, experiencing risk awareness and risk adversity in general could be a possible predictor of a fear of the virus. As mentioned before, a fear of falling ill from COVID-19 seems to be associated with coping behaviors such as alcohol consumption**.**

Research Questions and Hypotheses

An adverse attitude towards health-risks, which is shown in engaging in "healthy" behaviours and attributing much value to one's health, seems to be associated with less problematic alcohol use. However, at the same time experiencing health anxiety and along with

that risk-adversity, can cause a (stronger) fear of COVID-19 and this might have a moderating effect and lead to more alcohol use after all. Someone who has high health-risk attitudes would usually drink less alcohol - at least on average - but might experience an intense fear of covid and in order to cope with this, drink more alcohol, even tending towards a problematic/hazardous consumption. Hence, this study aims at gaining insight into these seemingly contradicting pathways and investigates whether fear of COVID-19 might have a weakening (moderating) effect on the relationship between health-risk attitudes and the consumption of alcohol. The following research question was formulated: *To what extent do health-risk attitudes explain alcohol use among students and does fear of COVID-19 moderate this relationship?* It is hypothesized that H1) health-risk attitudes negatively correlate with alcohol use, H2) health-risk attitudes positively correlate with fear of COVID-19 and H3) fear of COVID-19 positively correlates with alcohol use. Lastly, it is expected that H4) fear of COVID-19 functions as a moderator and weakens the relationship between health-risk attitudes and alcohol use.

Methods

Participants

To be included in the survey, the respondents had to confirm that they are students. The only requirement to take part in the study was a good command of the English language. In total 131 students from universities or universities of applied sciences responded to the survey. They were aged 18 to 34 with a mean age of 22 (SD = 2.66). 38 participants indicated their gender as male and 74 as female. Approximately 40% of the students were from Germany, 21% from the Netherlands, and the remaining from other countries. Roughly half of the respondents had the Netherlands as their primary country of residence since February 25, 2022 (Table 1).

Table 1

Demographic Characteristics of Sample Population (n=112)

Characteristics	*n*(%)	*M*(*SD*)	Min	Max
Age	112	22(2.66)	18	34
Gender				
Female	74 (66.1)			
Male	38 (33.9)			
Nationality				
German	45 (40.2)			
Dutch	24 (21.4)			
Other	43 (38.4)			
Country of Residence				
Netherlands	60 (53.1)			
Germany	25 (22.1)			
Other	28 (24.8)			

Note. n = population size; M = mean; SD = standard deviation.

Materials

The questionnaire was created in Qualtrics and consisted of an informed consent form (Appendix A), demographic questions (Appendix B) and several different scales. The following demographic factors needed to be indicated by the respondents: age, gender, nationality and primary country of residence since February 25th, 2022 – the date on which all COVID-19 restrictions were lifted in the Netherlands.

Alcohol Use Disorders Identification Test (AUDIT)

The Alcohol Use Disorders Identification Test (AUDIT) (Appendix C) was used as a screening test for alcohol-related issues. It consists of 10 items related to the amount of alcohol that is consumed, individual consequences of drinking behaviour, for example being injured because of it, and whether others have voiced concerns about one's drinking. Most items were to be answered on a 5-point likert scale ranging from "Never" to "Daily or almost daily", some with "Yes" or "No" (e.g. "Since February 25th, 2022, has a relative or friend, doctor or other health worker been concerned about your drinking or suggested you cut down?"). The AUDIT has sound psychometric properties with a good test-retest reliability as well as sensitivity and specificity (Meneses-Gaya et al., 2009). The internal consistency for the scale was very good ($\alpha = .84$). The items of the AUDIT were slightly adjusted from "during the past year" to "since February 25th, 2022" as the main interest was on the participants' behaviour after the Covid regulations were lifted. To give an example, this was the first item of the scale: "Since February 25th, 2022, how often do you have a drink containing alcohol?". The response to each question is scored with either 0, 1, 2, 3 or 4, except for question nine and ten, which were scored with 0 (="no") or 4 ("yes"). Consequently, the lowest possible score is 0 and the highest is 40. A score between 0 and 7 would indicate a low-risk consumption, a score between 8 and 14 hazardous/harmful consumption and a score above 15 can be an indicator of alcohol dependence ("Scoring the AUDIT", n.d.).

Health-Risk Attitude Scale (HRAS-13)

Further included in the survey was the Health-Risk Attitude Scale (HRAS-13) (Appendix D) to measure the participants' attitudes towards overall health-risks with statements like "If it concerns my health, then I see myself as someone who avoids risks". The scale consists of 13

items and showed good internal consistency (α = .74) and convergent validity (Huls et al., 2020). The original 7-point Likert scale was changed to a 5-point Likert scale, ranging from "Strongly disagree" to "Strongly agree", to ease the statistical analyses and make the questionnaire more coherent overall. To obtain the total score for each participant, the scores for each question, ranging from 1-5, were added together. Question 2, 5, 7, 11, 12 and 13 were phrased differently and therefore reverse-scored. A higher score on the HRAS-13 indicates a more risk-avoiding attitude and more attribution of importance to one's health (Huls et al., 2020).

Fear of COVID-19 Scale (FCV-19S)

Lastly, the Fear of COVID-19 Scale (FCV-19S) (Appendix E) was included to measure the level of fear or anxiety each individual experiences with regard to the coronavirus disease. A study among Spanish students showed that the scale is a measuring tool with high validity (Martínez-Lorca et al., 2020). It also has strong internal consistency (7 items; α = .9). Again, the participants had to indicate to what extent they agree with a statement on a 5-point Likert scale ranging from "Strongly disagree" to "Strongly agree" (e.g. "It makes me uncomfortable to think about coronavirus-19"). Each response was scored with a minimum of 1 and a maximum of 5 and the possible sum-scores ranged from 7 to 35 with a higher score corresponding with more fear of COVID-19 (Ahorsu et al., 2020).

Design and Procedure

A cross-sectional within-group design was employed. The independent variable is health-risk attitudes and the dependent variable is alcohol use. A possibly moderating variable in the model is fear of COVID-19. The questionnaire was created in Qualtrics and approved by the BMS Ethics Committee. After that, the respondents were recruited through convenience sampling, partly via the test subject pool Sona as well as social media platforms and through

personal promotion by the researchers. Students who took part in the study through Sona were awarded some credits for their participation. The data was collected over the span of two weeks and the average time spent on the survey was 18 minutes. First, the respondents were welcomed and then informed about the aim and content of the study, how long it would take and then asked to give consent after being informed about voluntariness, confidentiality and anonymity of the study/data. Contact information of the researchers was provided in case of any questions or comments. After answering demographic questions (age, gender, nationality, place of residence), the students were asked questions about their alcohol consumption in the past weeks (AUDIT). In addition, they were asked to indicate their attitudes towards different health-risks (HRAS-13) and their level of fear of COVID-19 (FCV-19S). At the end of the survey, they were thanked for their participation.

Data Analysis

The Statistical Package for the Social Sciences (SPSS, Version 25) was used to conduct the statistical analyses. Out of 131 cases in the data set 19 were excluded because they were partly incomplete (final data set $N = 112$). The scores for each scale for each participant were summed and separate variables created. Then, the statistical assumptions of normality, linearity, homoscedasticity and absence of multicollinearity were tested. The Kolmogorov-Smirnov test indicated that both the AUDIT and the FCV-19S scales, as well as the variable age, follow a non-normal distribution ($p > .05$). To correct this issue, a reciprocal (inverse) transformation for the FCV-19S and age variable and a square root transformation for the AUDIT variable were performed. After the transformations the normality test for the AUDIT and age variable indicated a normal distribution ($p = .189$). The FCV-19S did not, however, after a visual inspection of the

histogram the distribution seemed approximately normal. So, parametric tests could be performed. A table with the untransformed variables can be found in Appendix F.

First, the descriptive statistics, such as mean, standard deviation and minimum/maximum for the variables were calculated. Then, Pearson Correlations with the sum-scores of all variables were used to test hypotheses H1-H3, namely to investigate the relationships between health-risk attitudes, fear of COVID-19 and alcohol use. Gender and age were included in the correlation analysis to identify possible confounding variables. After that, a moderation analysis with version 4.0 of the PROCESS macro extension by Andrew Hayes (Hayes, 2017) was conducted to test the fourth hypothesis. The conceptual moderation model had alcohol use as the independent, health-risk attitudes as the dependent and fear of COVID-19 as the moderator variable. The chosen significance level for the analyses was $p < .05$.

Results

The study was conducted to examine whether higher health-risk attitudes (HR attitudes) predict less alcohol use and whether fear of COVID-19 moderates this relationship. It was hypothesized that H1) health-risk attitudes negatively correlate with alcohol use, H2) health-risk attitudes positively correlate with fear of COVID-19, H3) fear of COVID-19 positively correlates with alcohol use and H4) fear of COVID-19 functions as a moderator and weakens the relationship between health-risk attitudes and alcohol use.

Descriptive Statistics

The student sample showed a mean score of 6.26 (SD = 5.38) for the AUDIT, with the lowest score being 0 and the highest 22 (out of 40). The majority of the participants showed a low-risk consumption but approximately 20% a harmful or hazardous one. The score of 12

students indicated a likelihood of alcohol dependence (Figure 1). The mean for HR attitudes was 42.49 (*SD* = 6.07) and for fear of COVID-19 12.89 (*SD* = 5.26). An overview of the mean, standard deviation, and range for each variable is given in Table 2.

Table 2

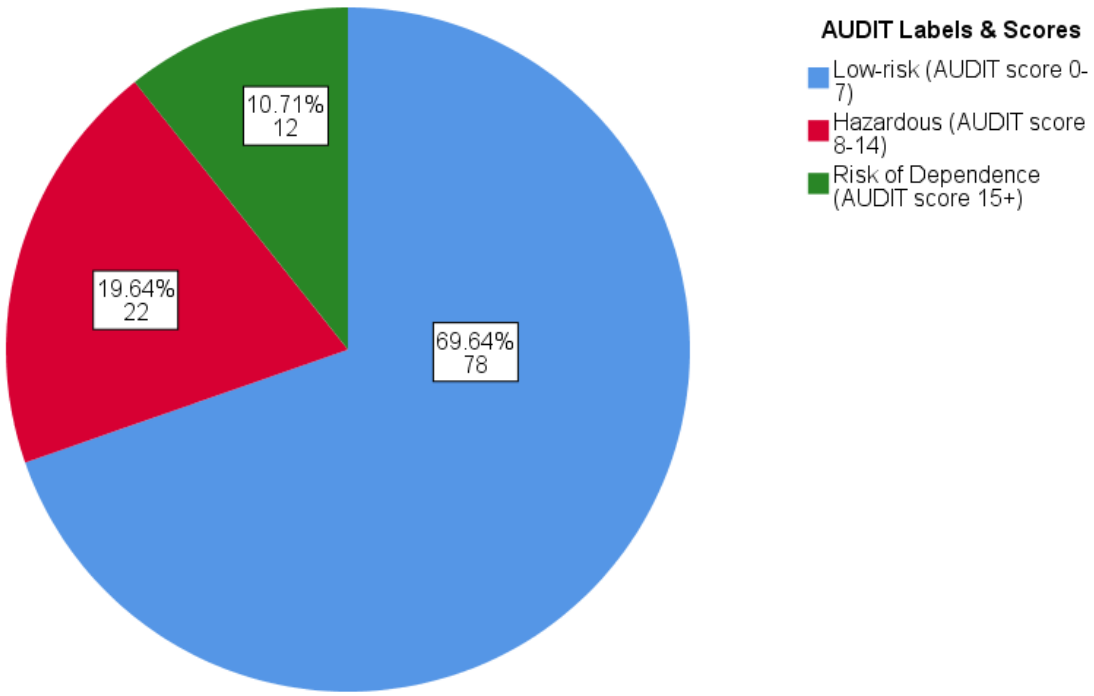
Descriptives of the Variables (N = 112)

Variable	*M*	*SD*	Min	Max
Alcohol Use	6.2589	5.37721	.00	22.00
HR attitudes	42.4911	6.06867	28.00	59.00
Fear of Covid	12.8929	5.25281	7.00	32.00

Note. *N* = population size; *M* = mean; *SD* = standard deviation.

Figure 1

Pie Chart Showing the Frequency of the AUDIT Risk Levels within the Sample (N=112)



Correlation Analyses

Pearson correlation showed that HR Attitudes and Alcohol Use ($r(112) = -.365$; $p < .05$) have a significant negative correlation. Thus, the first hypothesis is accepted. There were no significant correlations between HR attitudes and Fear of COVID-19 or Fear of COVID-19 and alcohol use, which led to the rejection of the second and third hypothesis. Gender showed a significant negative correlation with fear of COVID-19 ($r(112) = -.308$; $p = .001$), which is why it was included as a covariate in the following moderation analysis. A follow-up independent samples t-test showed that female participants experienced significantly higher fear of COVID-19 ($M = 13.74$, $SD = 5.01$) than male participants ($M = 11.24$, $SD = 5.39$), $t(110) = -2.44$, $p = .016$. An overview of all correlations can be found in Table 3 and Pearson correlations performed with the untransformed variables are displayed in Appendix F.

Table 3

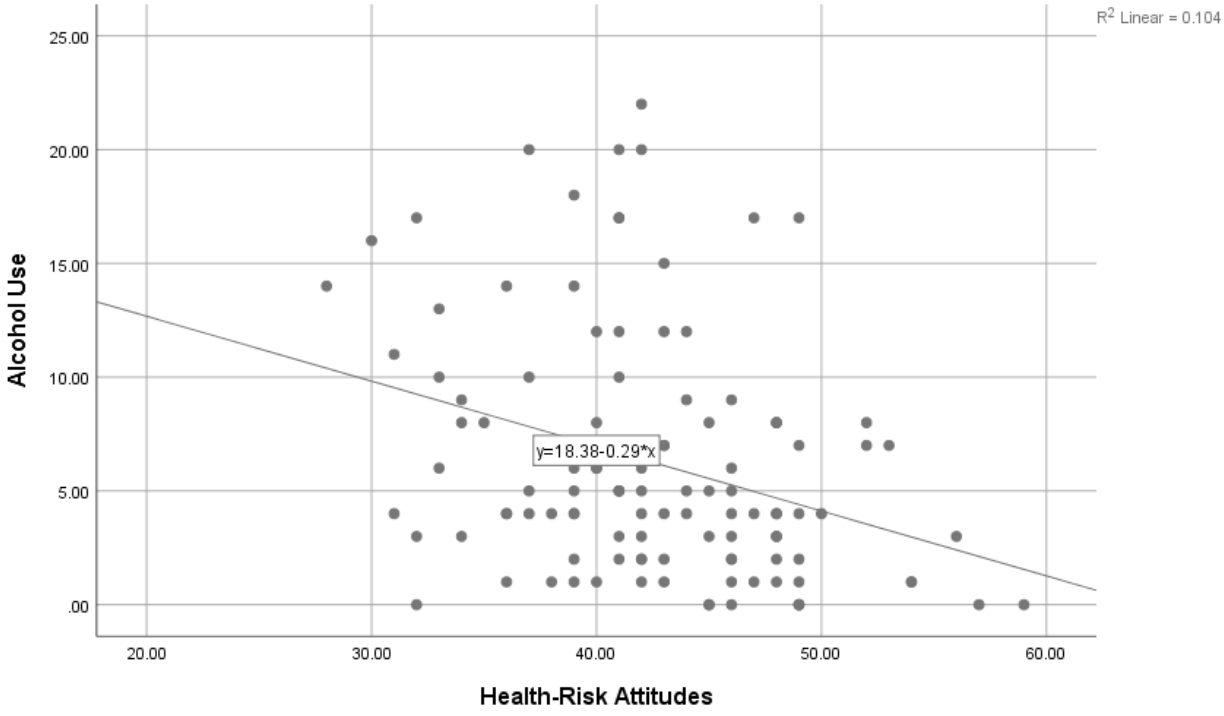
Correlation Matrix

Variable	1	2	3	4
1. Alcohol Use	—			
2. HR Attitudes	-.365**	—		
3. Fear of Covid	.118	-.123	—	
4. Gender	-.073	-.026	-.308**	—
5. Age	.109	-.021	.100	.171

Note. **.Correlation is significant at the 0.01 level (2-tailed).

Figure 2

Scatterplot Depicting the Correlation Between Health-Risk Attitudes and Alcohol Use



Moderation Analysis

In order to examine whether the existing relationship between HR Attitudes and Alcohol use is moderated through Fear of COVID-19, a moderation analysis was conducted using the PROCESS macro model number 1 (Hayes, 2017). Gender was included as a covariate in the moderation model. The full model was found to be significant ($F(4,107) = 4.6$; $p < .001$; $R^2 = .15$). However, the interaction term was not statistically significant ($b = -.39$; s.e. = .53; $p = .47$), suggesting that the relationship between HR Attitudes and Alcohol Use is not moderated by the level of fear of Covid. Neither did gender have a confounding effect ($b = -.18$; s.e. = .23; $p = .44$). Thus, the fourth hypothesis is rejected as well.

Discussion

The current study aimed at investigating whether higher health-risk attitudes are related to lower alcohol consumption among students and whether a fear of COVID-19 weakens this relationship. The first hypothesis, namely that health-risk attitudes negatively correlate with alcohol use, is confirmed. The other three hypotheses could not be supported through the results: There was neither a significant correlation between health-risk attitudes and fear of COVID-19 nor between fear of COVID-19 and alcohol use. Moreover, fear of COVID-19 did not significantly moderate the relationship between health-risk attitudes and alcohol use.

First of all, the current study showed that problematic, risky alcohol consumption is prevalent in a population of students. More than one quarter of the respondents showed a harmful consumption, a tenth was at risk of alcohol dependence, meaning developing an alcohol use disorder ("Scoring the AUDIT", n.d.). These numbers are similar to those from previous studies about the prevalence of alcohol among higher education students (Calderon-Vallejo & Castaño-Perez, 2014; Blanco et al., 2008; Mekonen et al., 2017). The similarity between these numbers suggests that since the research was conducted shortly after the end of the lockdown in the Netherlands, students had already gone back to their "normal", pre-covid drinking habits.

Second, health-risk attitudes are associated with alcohol use in this study. The higher the health-risk attitudes are, the lower the likelihood of harmful alcohol use. This was expected as previous research showed that risk attitudes are often connected to risk behaviours (Van Osch & Stiggelbout, 2007; Huls et al., 2020). A study by McCarty (2016) suggested that risk-seeking individuals did not differ in their drinking behaviour itself compared to risk-averse people but had to face more consequences of alcohol, e.g. problems at work/school. They also showed more symptoms of depenence and a higher likelihood to engage in other risky behaviours, such as

unprotected sex (McCarty, 2016). Thus, health-risk attitudes can be an indicator of whether and to what extent and individual engages in behaviors that pose a risk to one's health.

On the other hand, a higher fear of COVID-19 was not associated with higher alcohol consumption in this study. This was unexpected as other studies have found that alcohol might be used as a way to cope with fear and loneliness during the pandemic (Grigoropoulos & Daoultzis, 2022). Alcohol consumption is only one possible (maladaptive) coping strategy. There are adaptive ways of coping too, of course (Javed & Parveen, 2021). So, it might be that the amount of fear which was experienced by the participants was dealt with in other ways, not with more alcohol use. A study by Javed and Parveen (2021) found that the most frequently used coping mechanisms during the pandemic were having a positive attitude, religiosity and trust in modern medicine. Especially young adults seem to often use cognitive and behavioral strategies such as a healthy diet, physical fitness and mindfulness to deal with the stress caused by the pandemic (Javed & Parveen, 2021). Besides, it is also likely that any fear of COVID-19 that the participants had before, dropped to a minimum after the pandemic restrictions ended. It should be noted that although COVID-19 rates are still relatively high at the moment, most people do not experience any severe impact (e.g. a lockdown) in their daily life anymore and also the pandemic topic is not covered by the media as much as before. As people's focus shifted from the pandemic to other things again, their level of fear might have become less and less.

Third, fear of COVID-19 did not correlate with health-risk attitudes, which was unexpected. Some previous research suggests that health-anxiety predicts or at least correlates with fear of COVID-19 (Mertens et al., 2020) and in turn, seeing it as a risk for one's health induces fear and anxiety. There are several possible explanations for the fact that this was not supported by the current study. For one, health-anxiety is not exactly the same as health-risk

attitudes, as it refers more to a cognitive-emotional construct. It seems likely that there is a connection between the two but there was no adequate research found about this. Perhaps, people who experience health anxiety (and additionally anxiety because of covid), might not necessarily be highly risk-averse and engage in more health protective behaviours than others. Secondly, age might play a role in the results as well. The sample population only consisted of students with a mean age of 22, thus, a group of people that is unlikely to have very severe symptoms or long-term effects when infected with the coronavirus (Verity et al., 2020). This could explain why their level of fear was relatively low in comparison with other student samples in the literature (e.g. $M = 16.79$; Martínez-Lorca et al., 2020). Also, it should be noted that the FCV-19S included quite a few questions about physical symptoms of anxiety, such as heart palpitations or insomnia (Appendix E) and might not adequately detect psychological symptoms or being worried but not having physical reactions.

What was not part of the research question but a noteworthy result nevertheless was the small but significant difference in the levels of fear of COVID-19 that male and female participants reported. This finding is substantiated by literature as well (McLean & Anderson, 2009). Generally, women consistently show higher rates of anxiety disorders compared to men (McLean et al., 2011).

Overall, the study demonstrates that problematic alcohol use is common among students. High health-risk attitudes seemingly are associated with less alcohol consumption. This is an important finding as it provides a starting point for interventions aiming to reduce alcohol use disorders and overall alcohol consumption in students but perhaps in other populations as well. Promoting positive health-risk attitudes, for example with campaigns on campuses, could reduce the problem of harmful alcohol use. Moreover, the relationship between health-risk attitudes and

alcohol use seems to be largely unaffected by the recent pandemic, which affected drinking-related habits and routines. This is an important finding, as even during a global crisis, changing risk attitudes might be a way to reduce problematic alcohol use in the population.

Strengths & Limitations

The level of fear of COVID-19 was relatively low in comparison to other studies. This could be explained by the fact that at least at the moment, covid rates are low and there are little to no restrictions (the last lockdown ended approximately four months ago). If the study would have been conducted at another point in time, e.g. during a lockdown, the results might have been different - the level of fear might have been higher and as a result, alcohol consumption as well. Thus, the cross-sectional study design is an obvious limitation. Another limitation is the non-normality of the FCV-19S scale, although the histogram had an approximately normal distribution curve. There is no certainty that this did not affect the results. It should also be noted that there is little research about health-risk attitudes in particular, many studies focused on either risk attitudes in general or health-risk behaviours instead of attitudes. On the one hand, it is beneficial that the current study explores a concept which is not well known so far. On the other hand, there is little research to compare the current findings to, which makes up a small limitation. Of course, there is always the risk of self-report bias in online questionnaires, which could have affected the results in some way. Participants might answer questions about alcohol use more favorably (social desirability bias).

A strength of this study is that it includes fear of COVID-19 as a variable, which not many other studies did so far - logically due to the lack of covid-related research in general. It is of great importance to find out how a global crisis like a pandemic affects the individual or not, especially with regard to mental well-being (e.g. increases in anxiety/fear) and behaviour change

(e.g. increase in unhealthy behaviours). The findings of the current study suggest that the impact of the pandemic is limited when it comes to risk attitudes and alcohol use - this should be substantiated by further studies in order to draw inferences from it.

Directions for Further Research and Practical Implications

As mentioned before, consuming alcohol is just one possible coping strategy to deal with fear of the coronavirus, thus, further research could investigate whether there was an increase in other (unhealthy) behaviours during the pandemic, e.g. smoking or excessive social media use. Moreover, it could be researched whether there is a relationship between health-risk attitudes and fear of COVID-19 or fear of COVID-19 and alcohol use in other populations, which are more at risk of becoming seriously ill, such as elderly people. Another possibility for future research which builds up on this and other studies, is a longitudinal study which explores to what extent a manipulation of health risk attitudes influences alcohol consumption. This would also provide more information on what other factors could moderate or mediate this relationship. Lower scores on health-risk attitude measures might be associated with other health risk behaviours in student populations - a possible direction for future research. Researching other possible determinants of alcohol use are surely a suitable aim for further studies as well.

Conclusion

Excessive alcohol consumption continues to be a problem among students. Thus, identifying what explains whether someone exhibits an unproblematic or a harmful consumption is of great importance**.** Health-risk attitudes influence alcohol-related behaviours and could therefore be a possible factor in reducing alcohol consumption. A fear of COVID-19 did not impact the relationship between health-risk attitudes and alcohol use which suggests that addressing health-risk attitudes as a possible way to reduce drinking on campuses might work

during a pandemic as well. It is open whether health-risk attitudes also affect other behaviours, for example whether someone who is risk-averse is more likely to get vaccinated. If this is the case, health-risk attitudes might be an important way for policy makers to reduce unhealthy behaviours and promote health-protection in the population.

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Appendix A

Informed Consent

Researchers:

This study is being done by third year bachelor students from the Faculty of Behavioural, Management and Social Sciences at the University of Twente. Contact information can be found below.

Purpose, Content, and Procedure of the Study:

The purpose of this research study is to identify what influences alcohol use among students and will take you approximately 15 minutes to complete. You will answer a range of questions about your alcohol consumption, certain attitudes & personality traits you have, and about general demographic information. The data will be used in the context of a bachelor thesis.

Participant Rights, Confidentiality, Possible Risks & Benefits:

Your participation in this study is entirely voluntary and you can withdraw at any time without any consequences. The study is completely anonymous and your answers will remain confidential and can in no way be traced back to your person. The data will be stored for five years after the end of the research study.

We believe there are no risks associated with this research study; however, as with any online related activity the risk of a breach is always possible. We will minimize any risks by storing the

data safely. There are no other risks known to us. You benefit from the study by receiving SONA credits if you are a psychology student from the University of Twente.

By agreeing to take part in this study, you will consent to your answers being used for research purposes in the context of a bachelor thesis.

In case you have any questions or comments, please contact:

Seb Svenstrup, s.svenstrup@student.utwente.nl or
Fiora Schroeder, f.schroeder@student.utwente.nl

I have read the aforementioned information and consent to participate in this study.

- ○ Yes
- ○ No

Appendix B

Demographic Questions

Are you a student? (you must be a student in order to take part in this study)

- ○ Yes
- ○ No

How old are you?

_____

What is your sex?

- ○ Male
- ○ Female
- ○ Prefer not to say

What is your nationality?

- ○ Dutch
- ○ German
- ○ Other

What is your primary country of residence since February 25th, 2022?

- ○ The Netherlands
- ○ Germany
- ○ Other

Appendix C

Alcohol Use Disorders Identification Test (AUDIT)

Since February 25th, 2022, how often do you have a drink containing alcohol?

- Never
- Less than once per month
- Monthly
- Weekly
- Daily or almost daily

Since February 25, 2022, how many drinks containing alcohol do you have on a typical day when you are drinking?

- None
- 1 or 2
- 3 or 4
- 5 or 6
- 7, 8 or 9
- 10+

Since February 25th, 2022, how often do you have six or more drinks on one occasion?

- Never
- Less than once per month
- Monthly
- Weekly
- Daily or almost daily

Since February 25th, 2022, how often have you found that you were not able to stop drinking once you had started?

- Never
- Less than once per month
- Monthly
- Weekly
- Daily or almost daily

Since February 25th, 2022, how often have you failed to do what was normally expected of you because of drinking?

- Never
- Less than once per month
- Monthly
- Weekly
- Daily or almost daily

Since February 25th, 2022, how often have you needed a drink in the morning to get yourself going after a heavy drinking session?

- Never
- Less than once per month
- Monthly
- Weekly
- Daily or almost daily

Since February 25th, 2022, how often have you had a feeling of guilt or remorse after drinking?

- Never

- Less than once per month
- Monthly
- Weekly
- Daily or almost daily

Since February 25th, 2022, how often have you been unable to remember what happened the night before because you had been drinking?

- Never
- Less than once per month
- Monthly
- Weekly
- Daily or almost daily

Since February 25th, 2022, have you or someone else been injured as a result of your drinking?

- No
- Yes

Since February 25th, 2022, has a relative or friend, doctor or other health worker been concerned about your drinking or suggested you cut down?

- No
- Yes

Appendix D

Health-Risk Attitude Scale (HRAS-13)

I think I take good care of my body.

I don't want to have to consider the consequences for my health in everything that I do.

It is important to me that I organize my life so that I will later enjoy good health.

If it concerns my health, then I see myself as someone who avoids risks.

Uncertainty about the consequences of a medical intervention is, in general, part of the game.

My health means everything to me.

When I look back at my past, I think that, in general, I did take risks with my health.

If the doctor cannot offer me certainty about the possible consequences of a medical intervention, then I would rather not undergo it.

Safety first, where my health is concerned.

To enjoy good health now and in the future, I am prepared to forego a lot.

People say that I take risks with my health because of my habits.

I'm not very fussy about my health.

In general I would estimate that I would not have much of a problem with undergoing a high risk operation.

The response options for all 13 questions were as follows:

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Appendix E

Fear of COVID-19 Scale (FCV-19S)

I am most afraid of coronavirus-19.

It makes me uncomfortable to think about coronavirus-19.

My hands become clammy when I think about coronavirus-19.

I am afraid of losing my life because of coronavirus-19.

When watching news and stories about coronavirus-19 on social media, I become nervous or anxious.

I cannot sleep because I'm worrying about getting coronavirus-19.

My heart races or palpitates when I think about getting coronavirus-19.

The response options for all 13 questions were as follows:

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Appendix F

Pearson Correlations with Untransformed Variables

Table F

Correlation Matrix with Untransformed Variables

Variable	1	2	3	4
1. Alcohol Use	—			
2. HR Attitudes	-.322**	—		
3. Fear of Covid	-.015	.095	—	
4. Gender	-.096	-.026	.227*	—
5. Age	-.137	-.004	.163	-.129

Note. **.Correlation is significant at the 0.01 level (2-tailed).
*.Correlation is significant at the 0.05 level (2-tailed).