Effects of psychological well-being and self-control on alcohol consumption among university students following COVID pandemic: an online survey study

Bachelor Thesis by
Seb Svenstrup
Faculty of Behavioural Management & Social Science
Department of Psychology
Positive Psychology & Technology

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First supervisor: Martha Kreuzberg
Second supervisor: Dr. Marcel Pieterse

Abstract

Introduction: Since the lifting of COVID-19 restrictions in the Netherlands on February 26th, 2022, people's lives have begun to return to normal. Due to the adverse effects that the COVID-19 pandemic has had on mental health, this study aims to assess if there is a relationship between alcohol consumption and psychological well-being since the pandemic has ended. Further, the study also aims to assess whether self-control moderates any such relationship.

Methods: Data was collected through use of an online survey using convenience sampling (n = 113). The survey consisted of the Alcohol Use Disorder Identification Test, the Mental Health Continuum - Short Form, the Brief Self Control Scale, and a section including demographic questions. Linear regression and T-tests were conducted to identify relationships between the variable and a moderation analysis using Andrew Hayes' (2018) PROCESS extension for SPSS. Marginal effects with a significance level greater than .10 were accepted.

Results: Findings did not support the hypothesised relationship between alcohol consumption and psychological well-being, but possible evidence supporting a moderation effect of self-control was found. Exploratory analyses identified some possible relationships between alcohol consumption and age, nationality, and country of residence.

Discussion: The study findings suggest that self-control may moderate the relationship that may exist between alcohol consumption and psychological well-being. This may due to self-control helping regulate impulsivity and psychological volatility, which are often associated with problematic drinking behaviours. Recommendations for future research are centred around the suggested use of a longitudinal design and on the broader distribution of the survey. This study contributes to deepening our understanding of the ways in which COVID-19 may still be impacting peoples' lives.

Keywords: Alcohol consumption, Psychological well-being, Mental health, Self-control, COVID-19, Pandemic, University students

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Effects of Psychological Well-being and Self-control on Alcohol Consumption Among University Students Following COVID Pandemic

Following the worldwide outbreak of the Severe Acute Respiratory Coronavirus-2- commonly referred to as the COVID-19 pandemic- in early 2020, it is important for researchers to investigate the psychological well-being of people following the COVID-19 pandemic. Further, the identification of any relationships between said psychological effects and other behaviours- namely self-control and alcohol consumption- will lead to a better understanding of the broader impact the pandemic has had on public health.

Pandemic Background

The emergence of COVID-19 led to the designation of a state of pandemic around much of the world. Over 2 years since the initial outbreak, statistics show a total of 426 million reported cases and 5.9 million reported COVID-related deaths (Worldometer, 2022). Symptoms of the original COVID-19 strain vary from case-to-case in both symptoms and severity but its most common symptoms include a cough, fever, and shortness of breath and more severe cases can lead to the development of pneumonia (WHO, n.d.; Ciotti et al., 2019). These symptoms generally manifest following a mean incubation period of 6.4 days (95% CI, 5.6-7.7) (Backer et al, 2020). A number of variants would emerge over the course of the ongoing pandemic which progressively trended towards being more transmissible and seeing slight variations in symptoms (Seyed et al, 2021).

This pandemic would lead to the imposition of a variety of public health and safety measures- including medical mask mandates, 1.5m social distancing rules, bans on social gatherings, school closures, curfews, and full lockdowns- in many countries as means to reduce transmission rates among the population (Ritchie et al., 2020). The measures put in place varied by country but, regardless of which measures were deployed, their deployment was intended to reduce the amount of social gatherings and, hence, limit potential transmission of the virus as much as possible. However, the adoption of such measures may have come at the cost of the social and psychological well-being of many in the population (Alkhamees et al., 2020; Cullen et al., 2020; Shi et al., 2020).

Psychological Well-being

Psychological well-being (PWB) is a concept that is defined in a number of ways. Huppert (2009) defines it as simply a combination of feeling good (including emotions like happiness, engagement, confidence, and affection) and functioning effectively (including self-development, feelings of agency, and having a sense of purpose). One of the most

commonly used means of measuring PWB is the Mental Health Continuum (MHC) created by Keyes et al. (2002) which includes PWB as one of three subscales that comprise the greater concept of mental health- alongside emotional wellbeing and social well-being. The subscale of psychological well-being within the MHC characterises the concept as one's ability to function positively in their individual life.

A variety of factors present through the pandemic could have contributed to a decrease in psychological well-being. Findings from Wang et al. (2019), Smith et al. (2020), Ma et al. (2020), and Dubey et al. (2020) suggest that pandemic measures like self-isolation, quarantine, and lockdowns contributed to an increase in rates of poor mental health- including increases in the prevalence of anxiety/anxiety symptoms, depression, and psychological stress. These measures- which were deployed by many governments around the world- limited peoples' access to extracurricular activities with a social component (e.g. team sports, in-person clubs, social events) and social support networks which exacerbated the negative impacts on overall mental health (Finnerty et al., 2021). Additionally, Ma et al. (2020) found that participants with more daily exposure to media coverage were more likely to suffer from acute stress symptoms. Beyond this, the heightened levels of fear/concern due to the risk of contracting COVID-19 (Wang et al., 2019), the economic impact (de Goeji et al., 2015), and the polarisation surrounding the issue (Wardell et al., 2020) are likely to have had an impact on such negative emotions, as well. With such increases in negative mental health symptoms, the potential for an increase in the development of harmful coping strategies warrants concern.

Alcohol Consumption

One such coping strategy might involve an increase in the consumption of alcohol (AC). Such an increase poses an extensive set of potential risks for both individual users as well as those around them (WHO, 2018). Data from the WHO (2018) identified that alcohol consumption contributes to 3 million deaths each year globally while also accounting for 5.1% of the global burden of disease. Further, alcohol's status as a psychoactive substance can lead to its use as a means of coping with stress or poor mental health (WHO, 2018). In cases of coping-motivated drinking (CMD), results from a variety of studies suggest a possible association between increased alcohol consumption and a number of negative mental health outcomes including: anxiety (Anker & Krushner, 2019), depressive disorders (Hogarth et al., 2018; Chow et al., 2021), and stress (Powers & Kutash, 1985; Anthenelli, 2012). Its usage in such contexts is of particular concern due to the fact that alcohol is dependence-forming. As such, it is important to consider which groups of people are at-risk

of adopting such behaviours when faced with difficult circumstances, such as an international pandemic.

Among such at-risk groups are university-aged students. This is potentially due to a skewed perception of the health consequences of such behaviours alongside higher levels of sensation-seeking and impulsivity (Chow et al., 2020; McGowan et al., 2022). Despite this increased risk profile, current evidence has not demonstrated a clear increase in alcohol consumption during the COVID-19 pandemic. On the one hand, findings from Bertrand et al. (2021), Dogan-Sander et al. (2021), and Salerno et al. (2021) suggest that alcohol use among university students has increased since the emergence of COVID-19. These findings are supported by Lechner et al. (2020) who found an increase in alcohol consumption following COVID-related school closures. On the other hand, studies conducted by Goncalves et al. (2021), Jaffe et al. (2021), and White et al. (2020) found that overall alcohol consumption decreased within their samples while days of drinking remained relatively stable during the pandemic. Results from Freuhwirth et al. (2021) and Jackson et al. (2021) support those findings and further identified that binge drinking episodes also declined. Considering the breadth of the existing evidence, it appears as though the impacts of the COVID-19 pandemic are not yet conclusively understood.

However, the inconclusive nature of the existing literature is only the case during the timeframe of the COVID-19 pandemic. Pre-pandemic findings from Brady (2006), Paljärvi et al. (2009), Mäkelä et al. (2014), and Tembo et al. (2017) suggest a negative relationship between heavy AC and PWB, but no such evidence for moderate forms of AC. The existing evidence surrounding moderate drinking is inconclusive in that it may either have no relationship to PWB or it may even have a potentially beneficial effect (Berglund & Ojehagen, 2006; Gea et al., 2012). As the relationship between PWB and heavy drinking is clearly negative and PWB's relationship with moderate drinking is inconclusive, the hypothesised relationship between AC and PWB is assumed to be negative for the purposes of this study. That being said, one must consider that other variables may influence said relationship.

Self-Control

One such variable may be an individual's self-control (SC) which, according to Tangney et al. (2004), refers to one's ability to override one's inner responses and control the manifestation of undesired behaviours- particularly impulses. Findings from studies by Tangney et al. (2004) and Briki (2017) suggest that greater SC is associated with various indices of PWB. Further, a study by Zhang et al. (2019) found a negative relationship

between self-control and trait neuroticism which would suggest that self-control is associated with lower levels of negative emotion and, hence, higher levels of PWB. Additionally, findings from Friese and Hoffman (2009) and Lindgren et al. (2014) suggest that SC may moderate the relationship between impulsivity and problematic alcohol use while Stein and Witkiewitz (2019) found that higher self-control was associated with low-risk drinking outcomes among participants recovering from alcohol addiction-related treatment. This could be because an individual with greater SC may be less susceptible to succumbing to impulsive behaviours (such as binge drinking) during fluctuations in their PWB. Given these established relationships, it may be that the negative relationship between PWB and AC is moderated by participants' SC.

Scope of Study

As COVID-19 measures have been lifted across most of the world, research into how people are experiencing their lives post-pandemic is necessary. In keeping with this, the primary objective of this study will be to determine whether there is a relationship between the PWB and AC of university students following the lifting of COVID-19 measures in the Netherlands (as of 25.02.2022). Further, the study will aim to determine if any relationship between PWB or AC is moderated by SC. In order to meet these objectives, two research questions have been formulated around which the study will be centred:

RQ1: Is there a relationship between university students' psychological well-being and their alcohol consumption following the covid-19 pandemic?

H_1 : There is a negative relationship between university students' psychological well-being and their alcohol consumption following the COVID-19 pandemic.

RQ2: Does self-control moderate the relationship between psychological well-being and alcohol consumption in university students following the COVID-19 pandemic?

H_2 : Self-control does have an attenuating moderation effect on the relationship between psychological wellbeing and alcohol consumption in university students following the COVID-19 pandemic.

Methods

Participants

Participants were recruited using convenience sampling through the use of *SONA Systems,* the University of Twente's (UT) online experiment management system, and through use of social media (WhatsApp, Facebook, & Instagram). Participation in the study

was limited to only university students. In total, 113 participants ranging in age from 18 to 34 (*M* = 22.16 years, *SD* = 2.8) took part in the study, of which 38 (33.6%) were male and 75 (66.4%) were female. Students' nationalities were German (n = 46), Dutch (n = 25), and Other (n = 42) and lived in the Netherlands (n = 62), Germany (n = 25), or Other (n = 26).

Materials

In order to gather the necessary quantitative data to answer the research questions, a survey was constructed using Qualtrics, an internet-based survey program, which consisted of 4 sections: demographics, alcohol consumption, psychological well-being, and self-control.

Demographics

The demographics portion of the survey featured 4 items used as a means of getting information about the participants. The questions that were included were to get information about the participants' age, sex, nationality, and country of residence since COVID measures ended in the Netherlands (see Appendix for full questionnaire).

Alcohol Consumption

The Alcohol Use Disorder Identification Test (AUDIT) questionnaire was used for this study as it is a widely used and validated measure for measuring alcohol consumption. The AUDIT is scored on a 5 point Likert scale and is designed to understand the alcohol consumption habits of participants. A validation study of the AUDIT conducted by Hallit et al. (2020) found that the questionnaire's single factor demonstrated good validity (α = .98). Findings from Aalto et al. (2009) identified scores of 7 and above on the AUDIT constitute heavy drinking. In order to answer the research questions for this study, the questions were revised to fit within the time period of interest (e.g. "Since February 25th, 2022, "How many drinks containing alcohol do you have on a typical day when you are drinking?"). A reliability analysis was conducted using the data gathered for this study which found the scale showed good internal consistency (*a* = .83).

Psychological Well-being

The Mental Health Continuum Short Form (MHC-SF) was chosen to measure the PWB of participants. The MHC-SF is a 14-item scale that is scored on a 6-point Likert scale that measures 3 components of mental wellbeing: emotional (e.g. "During the past month, how often did you feel… 1. happy"), social (e.g. "During the past month, how often did you feel… 4. that you had something important to contribute to society"), and psychological well-being (e.g. "During the past month, how often did you feel… 9. that you liked most parts of your personality"). A validation study conducted by Luijten et al. (2019) assessed the psychometric properties of the MHC-SF and found high internal reliability (α = .91) while a

separate validation study by Lamers et al. (2010) found the scale to have high internal reliability (α = 0.89), moderate test-retest reliability, and both convergent and discriminant validity. Due to the specific aims of the study, the phrasing of this scale was also revised to fit within the time period of interest (e.g. "Since February 25th, 2022, how often did you feel… 1. happy"). A reliability analysis was conducted using the data gathered for this study which found the dataset showed good internal consistency (*a* = .92).

Self-control

The self-control of participants was measured using Tangney et al. (2004)'s Brief Self-Control Scale (BSCS). The BSCS is a 13-item scale that measures responses on a 5-point Likert scale which can be used as either a 1-factor model that measures overall self-control or as a 2-factor model measuring both inhibitory and initiatory self-control. For the purposes of this study, the 1-factor model was chosen due to its higher degree of psychometric quality. The psychometric properties of the BSCS were assessed by Manapat et al. (2021) who found it to have high external validity when assessed against a battery of scales measuring traits associated with low self-control (e.g. alcohol use frequency, cognitive & behavioural impulsivity, number of lifetime arrests, etc). A reliability analysis was conducted using the data gathered for this study which found the dataset showed good internal consistency (*a* = .79).

Procedure

After the selection of the scales and the construction of the survey using Qualtrics, the link was shared using a number of convenience sampling methods involving distribution through the UT's SONA system as well as through the use of various social media and instant messaging platforms (WhatsApp and Instagram) used specifically by students. Prior to taking the survey, participants were made aware of the aim of the study, the average time needed to complete the survey (10-15 mins), and were alerted to both their right to anonymity and right of withdrawal and refusal through the use of an informed consent form that precedes the survey itself. Data collection started on April 18, 2022 and was concluded on May 5, 2022.

Data analysis

The first step to the analysis involved exploring the dataset to assess the need for the exclusion of any of the responses. This was done by parsing through the dataset in Excel and marking and deleting any uncompleted surveys. In total, 131 participants took part in the survey with 18 of the responses being excluded due to not having been completed. This left the dataset with 113 participants. The demographic data was then explored using descriptive statistics to calculate the mean and standard deviations of each variable.

The following step was to check the statistical assumptions of the data that was gathered due to the planned use of parametric tests. Following the tests, the data met the assumptions of linearity (Figure 1, 2, 3 in Appendix), normality of residuals (Figure 4 in Appendix), homoscedasticity (Figure 5 in Appendix), and multicollinearity (PWB & SC, tolerance = 0.92, VIF = 1.09).

The final step before proceeding with the analysis involved the scoring of the three questionnaires that comprised the survey: the AUDIT, the MHC-SF, and the BSCS. As all three questionnaires are scored by summing the responses given, items were reverse coded as necessary (items 1-3 and 7-10 on the BSCS) in order to properly sum the scores from each questionnaire. Subsequently, new variables of the final summed scores of each questionnaire (AC_Score, PWB_Score, and SC_Score) were created as the means by which to perform the final analysis of the data. Additionally, a dichotomous variable dividing the scores on the AUDIT portion of the survey into heavy consumption and moderate-or-below consumption (AC_Dich) was created using the findings of Aalto et al. (2009).

To address RQ1, an independent samples T-test was conducted using participant scores on the dichotomous variable of AUDIT scores (AC_Dich) as the dependent variable and participant scores on the MHC-SF (PWB_Score) as the independent variable. This would assess whether there was a relationship between students' PWB and AC in the time period of interest. In order to address RQ2, a moderation analysis was conducted using Hayes' (2018) PROCESS extension for SPSS. For exploratory purposes, results with a significance level less than .10 were accepted as 'marginal effects'.

Results

Descriptive statistics

The sample of participants reported a mean score of 6.67 (*SD* = 5.17) on the AUDIT, 40.38 (*SD* = 12.58) on the MHC-SF, and 21.04 (*SD* = 6.05) on the BSCS (see Table 4). The mean scores for each subscale of the MHC-SF were 9.77 (*SD* = 3.07) (see Table 5 for all mean scores by group). Through the dichotomous AC variable (AC_Dich), it was found that the sample included 65 participants whose AC was categorised as moderate-or-below and 48 whose AC was categorised as heavy.

Correlations

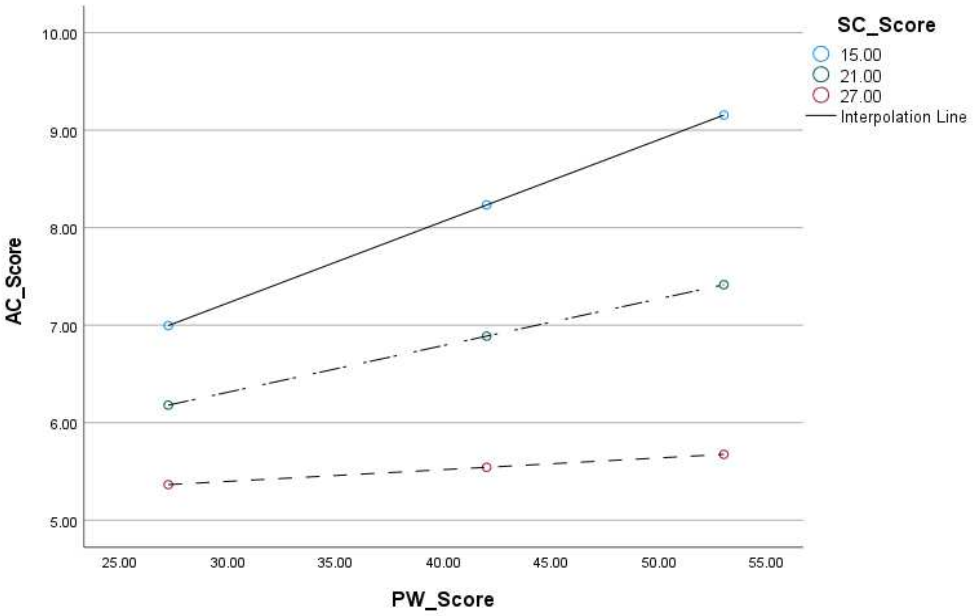
To test H_1, a linear regression analysis was conducted to assess the relationship between the AC (AC_Score) as the dependent variable and PWB (PWB_Score) as the independent variable. No significant relationship was found between the two variables

($R(112) = 0.27$, $p = .518$). A second analysis using an independent samples T-test was performed to assess the relationship between PWB among participants in the moderate-or-below and heavy AC groups using the dichotomous AC variable (AC_Dich). No significant relationship was found between the two variables ($t_{111} = -0.23$, $p = .232$). As a result, H_1 was rejected.

To test H_2, a moderation analysis was conducted in which AC (AC_Score) was the dependent variable, PWB (PWB_Score) was the independent variable, and SC (SC_Score) was the moderator. The model was found to be marginally significant ($R = .260$, $F(4, 108) = 2.63$, $p = .054$) while the interaction effect of SC on the relationship was found to be not significant ($R = -0.01$, $p = .335$). Due to this finding, H_2 was rejected. Following this, the data for the 20th, 50th, and 80th percentile of the moderator variable was plotted on a scatter plot to visualise the results (see Figure 6).

Figure 6

Interaction plot of effects at 20th, 50th, and 80th percentile of moderator



Additional exploratory analyses were conducted involving AC and PWB which each of the demographic questions (age, sex, nationality, and country of residence). Among these analyses, the relationships between AC and age, nationality, and country of residence were found to have negative associations that were at least marginally significant (see Table 4).

Table 4
Associations between demographic details and measured variables

	Age	Sex	Nationality (NL = 0, non-NL = 1)	Country of Res. (NL = 0, non-NL = 1)
AC	-0.16 (p = .090)	0.82 (p = .387)	-2.78 (p = .004)	-2.37 (p = .029)
PWB	-0.18 (p = .163)	1.51 (p = .567)	-1.86 (p = .100)	-2.30 (p = .261)

Discussion

The primary objective of the study was to assess if there was a relationship between alcohol consumption (AC) and psychological well-being (PWB) since COVID-19 restrictions were lifted. The secondary objective of the study aimed to assess if the relationship between AC and PWB was moderated by self-control (SC) and, while the effect was marginal, a possible moderation effect was identified.

Theoretical implications

Despite the initial hypothesis laid out in H_1 assuming a negative relationship between PWB and AC, this study did not find statistically significant evidence to support that hypothesis. This lack of conclusive finding continues a pattern in the existing literature on this association from during the pandemic (Bertrand et al., 2021; Dogan-Sander et al., 2021; Lechner et al., 2020; Goncalves et al., 2021; Jaffe et al., 2021; White et al., 2020). However, the findings around this association pre-pandemic suggested a clearer relationship between the two- particularly surrounding heavy AC (Brady, 2006; Paljärvi et al., 2009; Mäkelä et al., 2014; Tembo et al., 2017). Therefore, the lack of significant finding even within the heavy AC group is surprising. This may be indicative of the continued impact of the COVID-19 pandemic on people and the established understandings of various phenomena.

This result potentially aligns with the hypothesis stated in H_2 that self-control would have an attenuating effect on the relationship between AC and PWB. This finding- as visualised in the interaction plot (see Figure 6)- suggests that participants with higher SC scores saw a lesser degree of variation in their AC at varying levels of PWB while the opposite was true among participants with lower SC scores. In other words, SC may help predict one's change in AC through challenging times when PWB fluctuates. This finding supports the results found by Friese and Hoffman (2009), Lindgren et al. (2014), and Stein and Witkiewitz (2019) that suggest that SC may moderate the relationship between impulsivity and problematic/high-risk alcohol use.

Lastly, the additional exploratory analyses led to a couple of significant findings around AC and the age, nationality, and country of residence of participants as well as PWB and age. Rates of AC were found to be lower among non-Dutch students and students not residing in the Netherlands than in their counterparts. This could be inferred from common sense given that, at the time of the study, Germany was still deploying certain COVID-19 restrictions while the Netherlands had removed all restrictions. The lack of restrictions in the country would facilitate a greater number of social events and gatherings that would involve AC and, as such, would explain the heightened levels of AC. This finding lends support to the findings of research conducted by Stanesby et al. (2019) that AC tends to be more commonly done in social gatherings. The findings pertaining to age and AC are also supported by existing research as Chan et al. (2007) and the WHO (2018) found that AC decreases as one's age increases.

The higher mean scores in PWB among residents of the Netherlands (see Table 5) are also of note. This may be a result of COVID restrictions being lifted in the Netherlands while they remained largely in-place in countries like Germany during the timeframe of the study. However, despite having a higher mean score in PWB than the other countries, the mean score on the MHC-SF of participants living in the Netherlands was still below the scores found by Gloster et al. (2020) among Germans (43.72) during the pandemic. That being said, their mean score was still greater than the worldwide average of 41.04 during the pandemic while participants residing in Germany and Other in this study's sample fared much worse (Gloster et al., 2020). This may be due to issues relating to the sample as Gloster et al. (2020)'s studied a random sample of the general population whereas this study measured only university students, who are generally more susceptible to poor mental health (Naser et al., 2020; Lewis et al., 2021).

Strengths & Limitations

Upon reflection, this study has both strengths and limitations that affected its outcome. Among its strengths are the validity of the tools used to measure each of AC, PWB, and SC as all three of the AUDIT, the MHC-SF, and BSCS are widely used and validated questionnaires. This lends to the overall credibility of the study's design and any results that may be derived from it. Another strength can be identified in the use of a survey and the reach that can be achieved through such methods. While an online survey might be lacking in its ability to objectively measure a construct such as AC, its accessibility and iterability allows for a greater number of participants to be involved which, in turn, improves the reliability of any results that may be found.

First among those limitations is the introduction of sampling bias and self-selection bias through the use of convenience sampling which led to the study population largely consisting of psychology students from the University of Twente- with approximately 20 participants being gained from study participation sharing groups on various social media platforms. While this course of action was reasonable, more steps could have been taken to broaden the reach of the study population. A broader study population would have also contributed to reducing both the gender and nationality imbalance in the sample of participants. This is because the psychology department at the UT is majority female and of German nationality while other departments do not have the same tendency.

A few biases can also be identified stemming from the study's design. Due to time constraints, a cross-sectional design was the only option that was viable but a longitudinal design would have been more suitable for answering the research questions this study is based upon. By using a cross-sectional design, the validity of each of the measures of AC and PWB would be subject to recall bias as they relied upon the participants' recollection of their drinking habits and psychological state dating back approximately two months. Beyond this, the study was also subject to bias through its use of self-report measures rather than objective (AC) or professionally-administered (PWB and SC) measures. However, given that this is a common practice within the existing literature, it is not a significant limiting factor.

A final possible limitation involves the length of the survey. The final survey contained 59 items and was estimated to take approximately 10-15 minutes to complete. While studies by Revilla & Ochoa (2017) and Revilla & Höhne (2020) suggest that this survey's estimated time of completion was within the "ideal" territory of 10-15 minutes, the number of items may have led to less time spent per question and, therefore, lesser quality of responses.

Recommendations for future research

Future research into this subject would be wise to avoid the limitations discussed above. To avoid the limitations surrounding convenience sampling, future research conducted on this subject should place a greater emphasis on deploying a variety of methods of distributing the survey. Methods including canvassing on-campus or throughout the city, offering rewards in exchange for participation, and contacting other departments in order to gain assistance in spreading the survey to a wider audience would be advisable. Doing so may require access to a funding source and more time but would benefit the generalizability of the results. Future studies conducted into a topic such as this would also benefit from employing a longitudinal, repeated measures design and from beginning data collection

closer to the timeframe in-question so as to reduce participants' recall bias and yield more accurate results. Further, a more immediate method of measuring alcohol consumption such as the use of a consumption tracking smartphone application may reduce recall bias and further improve the accuracy of the measure.

Conclusion

In summary, this study could not identify a significant relationship between alcohol consumption and psychological well-being following the end of the COVID-19 pandemic. However, possible evidence supporting a moderating effect of self-control on the relationship between alcohol consumption and psychological well-being was found. The study was also able to identify possible effects of age on alcohol consumption and psychological well-being and nationality (between Dutch and non-Dutch) and country of residence (between Netherlands and non-Netherlands) on alcohol consumption. The primary recommendations for future research are centred around the suggested use of a longitudinal design and on the broader distribution of the survey. This study contributes to deepening our understanding of the ways in which COVID-19 may still be impacting peoples' lives.

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Appendix

Figure 1

Scatterplot of alcohol consumption & psychological wellbeing

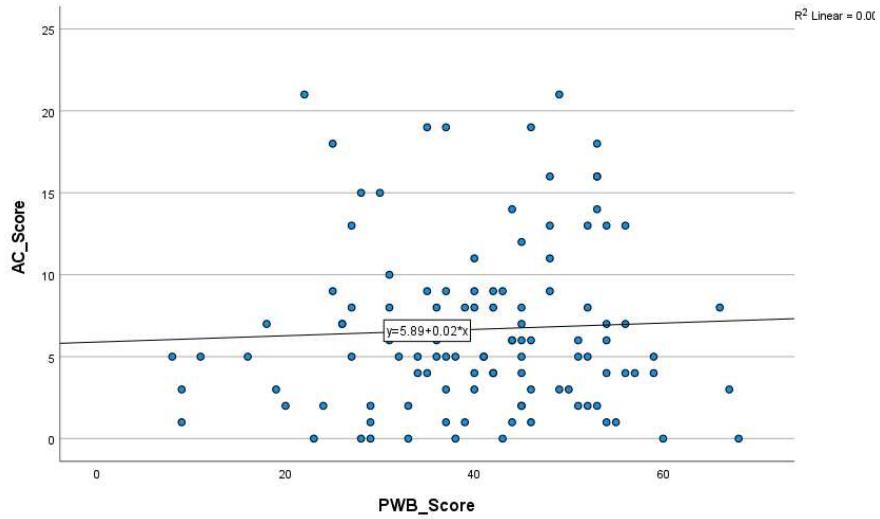

Figure 2

Scatterplot of alcohol consumption & self-control

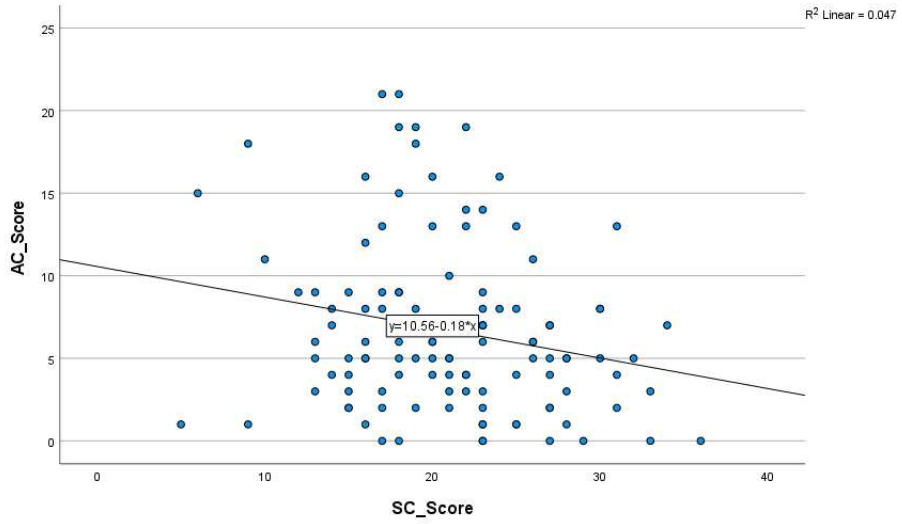

Figure 3

Scatterplot of psychological wellbeing & self-control

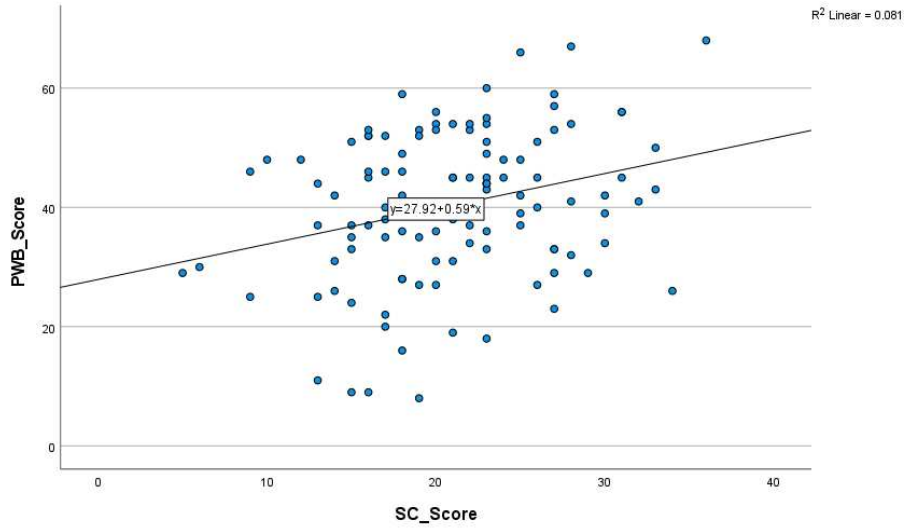

Figure 4

P-P Plot of normality of residuals

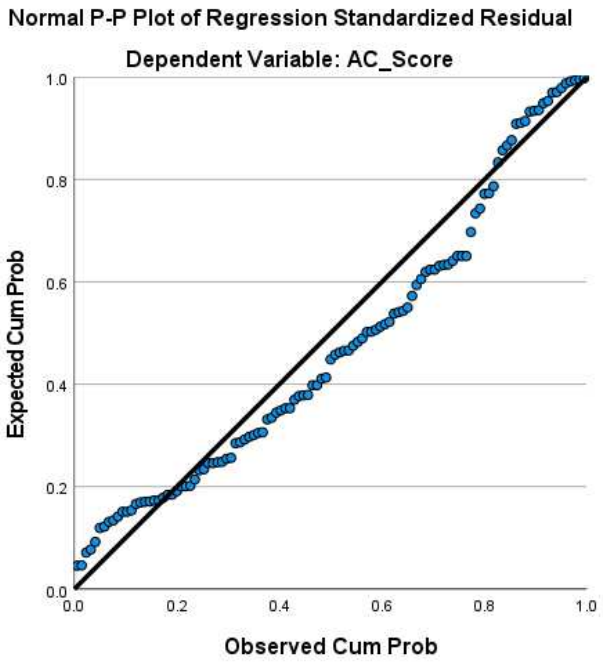

Figure 5

Scatterplot of homoscedasticity

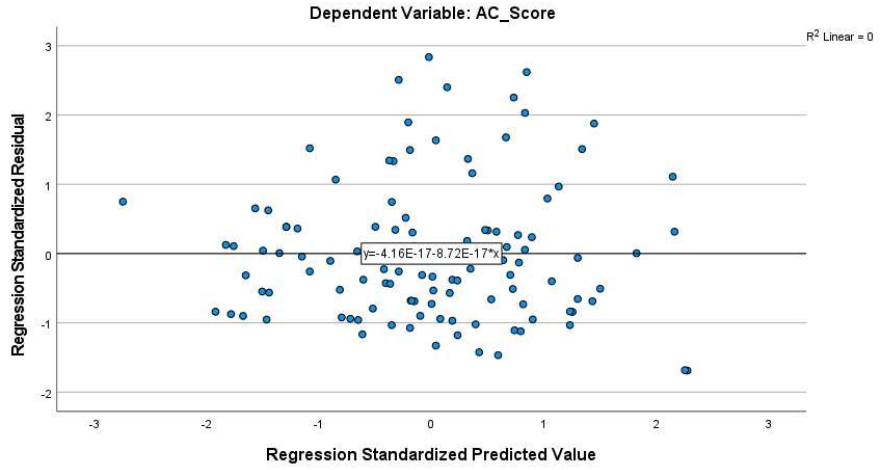

Figure 6

Scatterplot of interaction effects at 20th, 50th, and 80th percentile of moderator

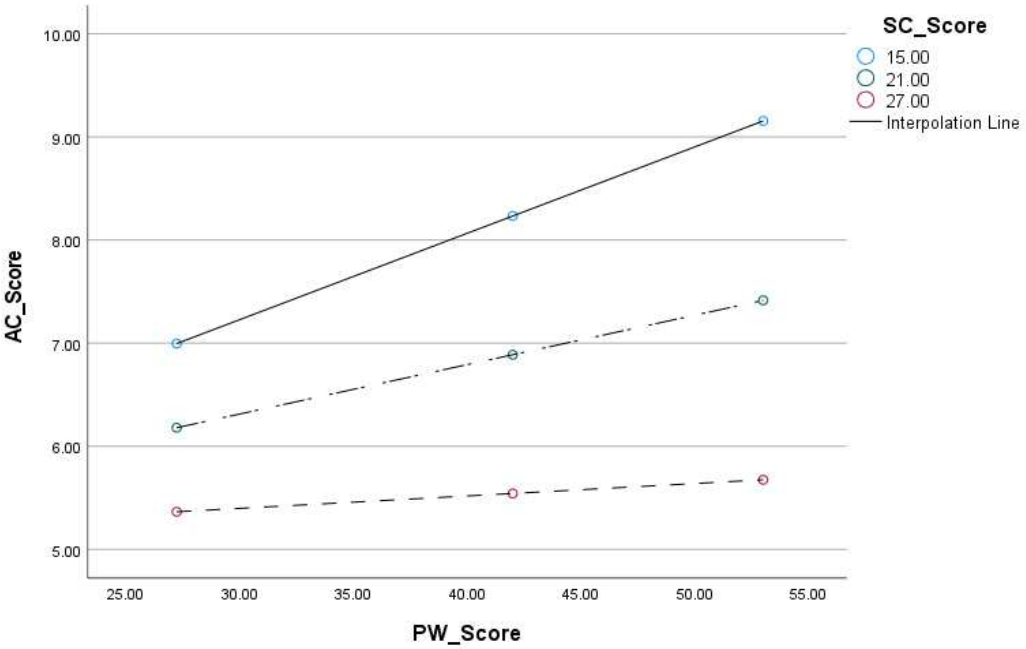

Table 1

Reliability analysis for AUDIT

Item	Corrected Item-Total Correlation	Cronbach's Alpha w/o Item
AC1	0.47	0.83
AC2	0.59	0.81
AC3	0.80	0.78
AC4	0.54	0.82
AC5	0.63	0.81
AC6	0.41	0.83
AC7	0.62	0.81
AC8	0.69	0.80
AC9	0.39	0.83
AC10	0.08	0.84

Table 2

Reliability analysis for MHC-SF

Item	Corrected Item-Total Correlation	Cronbach's Alpha w/o Item
PWB1	0.62	0.91
PWB2	0.68	0.91
PWB3	0.75	0.91
PWB4	0.60	0.91
PWB5	0.61	0.91
PWB6	0.65	0.91
PWB7	0.62	0.91
PWB8	0.66	0.91
PWB9	0.74	0.91
PWB10	0.48	0.91
PWB11	0.60	0.91
PWB12	0.55	0.91
PWB13	0.51	0.91
PWB14	0.81	0.90

Table 3

Reliability analysis for BSCS

Item	Corrected Item-Total Correlation	Cronbach's Alpha w/o Item
SC1	0.48	0.76
SC2	0.44	0.77
SC3	0.25	0.79
SC4	0.43	0.77
SC5	0.54	0.76
SC6	0.51	0.76
SC7	0.41	0.77
SC8	0.56	0.75
SC9	0.53	0.76
SC10	0.41	0.77

Table 4

Results of exploratory analysis

	Age	Sex	Nationality (NL = 0, non-NL = 1)	Country of Res. (NL = 0, non-NL = 1)
AC	-0.16 (p = .090)	0.82 (p = .387)	-2.78 (p = .004)	-2.37 (p = .029)
PWB	-0.18 (p = .163)	1.51 (p = .567)	-1.86 (p = .100)	-2.30 (p = .261)

Table 5

Mean scores on each scale by group

	Male	Female	Dutch	Non-Dutch	Res. in NL	Not res. in NL
AC	7.45	6.52	9.96	5.95	7.89	5.55
PWB	42.89	39.15	44.48	39.24	42.87	37.43
SC	20.68	21.23	20.96	21.06	21.63	20.34