TURUN YLIOPISTO

Change in Alcohol Consumption and Physical Activity During COVID-19 Pandemic Amongst 76 Medical Students

Fysiatrian oppiaine

Syventävien opintojen kirjallinen työ

Laatija:

Christina Sandell

Ohjaaja:

Professori Mikhail Saltychev

29.1.2025

Turku

Oppiaine: Fysiatria

Tekijä: Christina Sandell

Otsikko: Change in alcohol consumption and physical activity during COVID-19 pandemic amongst 76 medical students

Ohjaaja: Professori Mikhail Saltychev

Sivumäärä: 20 sivua

Päivämäärä: 29.1.2025

Tiivistelmä

Tutkimuksen tarkoitus: Selvittää, onko COVID-19-pandemia vaikuttanut lääketieteen opiskelijoiden liikunnan määrään ja alkoholinkäyttöön.

Käytetyt tutkimusmenetelmät: Kyselyn avulla toteutettu poikittaistutkimus, johon osallistui 76 toisen vuoden lääketieteen opiskelijaa. Wilcoxon merkittyjen sijalukujen testiä ja Kruskal-Wallis H -testiä käytettiin ryhmien välisten erojen määrittämiseen.

Tutkimustulokset: 76:sta vastaajasta 68 % oli naisia, 66 % yksinasuvia ja 34 % asui yhdessä jonkun kanssa. Mediaani-ikä oli 21 vuotta. Kokonaisuudessaan alkoholinkäyttö väheni 12 g /viikko pandemiavuoden aikana. Liikunnan määrä ei merkittävästi muuttunut. Alkoholinkäytön väheneminen johtui suurelta osalta muutoksesta ylimmässä tertiilissä, jossa muutos oli -96 g/viikko. Alkoholinkäyttö väheni enemmän naisilla kuin miehillä, p=0,0001.

Päätelmät: Vaikuttaa siltä, että lääketieteen opiskelijoiden alkoholinkäyttö on vähentynyt COVID-19-pandemian aikana mahdollisesti johtuen sosiaalisten kontaktien vähenemisestä. Tämä muutos näkyi erityisesti naisten ja ennen pandemiaa enemmän alkoholia käyttävien keskuudessa. Vaikuttaa myös siltä, että opiskelijat olivat löytäneet keinoja pysyä aktiivisena pandemian aikana, sillä vapaa-ajan liikunnan määrä ei merkittävästi muuttunut.

Abstract

Objective: To investigate whether the COVID-19 pandemic has affected physical activity and alcohol consumption among medical students.

Methods: Cross-sectional survey study among 76 students in their second year of medical school. The Wilcoxon sign-rank test and Kruskal-Wallis H test were used to assess the difference between groups.

Results: Of 76 respondents, 68% were women, 66% were single and 34% were co-habiting. The median age was 21 years. Overall alcohol consumption decreased during the pandemic year by 12 g/week. Overall physical activity did not significantly change. The decrease in alcohol consumption was mostly caused by a change seen in a high tertile, change was -96 g/week. Alcohol consumption decreased more in women than in men, p=0.0001.

Conclusions: It seems that alcohol consumption among medical students has decreased during the COVID-19 pandemic probably due to reduced social contacts and negative effect of social isolation. This decrease was seen especially among women and among students with higher alcohol consumption before the pandemic. Also, it seems that students had found their ways to remain active during the pandemic since the amount of leisure-time physical activity had not changed significantly.

Keywords: covid-19, alcohol, physical activity, modifiable risks

Sisällysluettelo

1 Introduction 1

2 Methods 2

3 Statistical analysis 3

4 Results 4

5 Discussion 9

6 Conclusions 11

References 12

1 Introduction

Since March 2020, societies all around the globe have started to shut down their activities due to the COVID-19 pandemic. Social distancing has played an integral part in controlling the spread of coronavirus. Many universities have switched to telecommuting and social gatherings have been restricted meaning a drastic change in the lifestyle of students (Tasso, Hisli Sahin & San Roman, 2021), affecting their overall health behaviors, and even escalating their mental health problems (Elmer, Mepham & Stadtfeld, 2020; Copeland et al., 2021; Okado et al., 2021; Charles et al., 2021). Physical exercise has been shown to be interconnected with good mental health during the COVID-19 pandemic (Pieh, Budimir & Probst, 2020; Caputo & Reichert, 2020).

Some studies have reported increased alcohol consumption among adults during the COVID-19 pandemic (Pollard, Tucker & Green, 2020; Grossman, Benjamin-Neelon & Sonnenschein, 2020). Two other studies have reported a decrease in alcohol consumption during the early stages of the pandemic (Kilian et al., 2021; Prestigiacomo et al., 2021). Prestigiacomo et al. have also found a change in drinking motives – social, enhancement and conformity drinking motives had decreased and coping motives increased. Physical activity among adults seems to have decreased during the COVID-19 pandemic (Ammar et al., 2020; Meyer et al., 2020; Caputo & Reichert, 2020). Respective previous observations among students have been inconsistent. Bertrand et al. have reported the decreased level of physical activity and increased alcohol consumption among students during the COVID-19 pandemic (Lechner et al., 2020; Bertrand et al., 2021). Also, another study reported increase in alcohol use among students at the beginning of the pandemic (Lechner et al., 2020). Some other studies have observed increased physical activity (Romero-Blanco et al., 2020; Gallego-Gómez et al., 2020) and decreased alcohol consumption among students during the COVID-19 pandemic (White et al., 2020; Jaffe et al., 2021; Bollen et al., 2021; Ryerson et al., 2021; Bonar et al., 2021). University students are known for occasional “social” excessive drinking (Carter, Obremski Brandon & Goldman, 2010), which might be the reason for decrease in alcohol consumption when social life is strictly limited. In normal circumstances students tend to maintain or increase drinking through the college years (Hultgren et al., 2019).

The objective was to investigate whether the COVID-19 pandemic has affected physical activity and alcohol consumption among medical students.

2 Methods

This was a cross-sectional online survey among students in their second year of medical school. In May 2021, invitations to participate in an anonymous survey through the Google Forms platform were sent by email to 150 students. Of them, 76 (51%) responded. The participants were asked about their weekly alcohol consumption and physical activity before and during the pandemic. The research was part of a pre-graduate training (CS) and no approvement by an ethical board was sought. Due to the functionality of Google Forms, no personal identifiers of the respondents (including meta-data like IP- or email addresses) were obtained. Also, no register of any kind was created.

The weekly amount of pure alcohol was calculated by multiplying a frequency (times a week) by the number of alcohol portions per time multiplied by 12. One portion,12 g of pure alcohol, was defined as 12cl of wine, or one beer, or 4cl of strong liquor. The data on weekly physical activity (leisure-time and commuting) were collected from a multiple-choice chart defining four levels of vigorousness comparable to walking, brisk walking, jogging, and running. Each activity was graded as “not at all”, “less than 30 min”, “1 hour”, “2 to 3 hours”, or “4 or more hours”. The responses were converted into metabolic equivalent of task (MET) using a scheme shown in Table 1.

Some background information on factors, which might potentially influence physical activity or alcohol consumption, was collected. Age was defined in full years at the time of response. Living arrangements were recorded as single vs. cohabiting. The participants were also asked whether they: own a dog; have small children; have had suffered an injury or illness during the pandemic, which might have affected their abilities to exercise; and are they competitive athletes – all the items were dichotomized as yes vs. no.

Table 1. Defining the level of physical activity in the survey. The responses were converted into MET units according to a following scheme:

Intensity	Amount per week, MET units				
	None	<½ hour	1 hour	2 – 3 hours	≥ 4 hours
Normal walking or respective	0	69	138	345	550
Brisk walking or respective	0	99	198	495	792
Light jogging or respective	0	210	420	1.050	1.680
Brisk jogging or respective	0	240	480	1.200	1.920

3 Statistical analysis

Due to the abnormal distribution, the results were reported as medians and interquartile ranges (IQRs), and non-parametric tests were employed. When appropriate, two-tailed p-values were reported considering p<=0.05 significant. The Wilcoxon sign-rank test and Kruskal-Wallis H test were used to assess the difference between groups. Such variables as having a dog for a pet and being a competitive athlete were excluded from the analysis due to their rareness among the respondents. All analyses were performed using Stata/IC Statistical Software: Release 16. College Station (StataCorp LP, TX, USA).

4 Results

Of 76 respondents, 52 (68%) were women and 24 (32%) were men, 50 (66%) were single and 26 (34%) were co-habiting. Only five (7%) had a dog for a pet and only six (8%) were competitive athletes. The median age was 21 (IQR 22 to 23) years without a difference between genders. None had children. During the year of pandemic, 16 (21%) respondents experienced some disease or trauma.

Overall alcohol consumption decreased during the pandemic year (Table 2 and Figure 1) by 12 (IQR -54 to 0) g/week. Instead, overall physical activity did not significantly change. As shown in Table 2, the decrease in alcohol consumption was mostly caused by a change seen in a high tertile, -96 (IQR -168 to -54) g/week, with no substantial change in low and mid tertiles. Concerning the changes in physical activity, tertiles demonstrated a regression to mean (Table 2). A Kruskal-Wallis H test was conducted to determine if changes in alcohol consumption and physical activity was different for three tertiles (low, mid, and high). A Kruskal-Wallis H test showed that there was a statistically significant difference in changes in alcohol consumption between the three groups, $\chi2(2) = 23.719$, $p = 0.0001$, and in physical activity, $\chi2(2) = 12.013$, $p = 0.0025$. Alcohol consumption decreased more in women than in men, $p=0.0001$ (Table 3 and Figure 2). There was not significant difference in change in physical activity level between genders.

Table 2. Alcohol consumption and physical activity before and during COVID-19 pandemic grouped by tertiles.

Tertiles	n	Women, n (%)	Co-habiting, n (%)	Before pandemic				During pandemic				Change			
				Median	IQR		*p*-value	Median	IQR		*p*-value	Median	IQR		*p*-value
Alcohol consumption, g/week															
Low	28	22 (79%)	10 (35%)	12.0	0.0	24.0		0.0	0.0	12.0		0.0	-24.0	0.0	
Mid	28	19 (68%)	12 (43%)	72.0	60.0	78.0	0.0001	66.0	24.0	102.0	0.0001	0.0	-30.0	12.0	0.0001
High	20	11 (55%)	4 (20%)	156.0	120.0	216.0		48.0	24.0	84.0		-96.0	-168.0	-54.0	
Total	76	52 (68%)	26 (34%)	60.0	24.0	108.0	-	24.0	0.0	72.0	-	-12.0	-54.0	0.0	<0.0001
Physical activity, MET/week															
Low	26	16 (62%)	8 (31%)	22.0	13.8	24.9		23.5	12.6	36.1		9.8	-5.2	13.9	
Mid	25	17 (68%)	11 (44%)	32.0	29.5	36.5	0.0001	32.0	24.1	38.8	0.0003	-1.6	-9.0	7.7	0.0025
High	25	19 (76%)	7 (28%)	51.5	46.6	54.9		45.8	31.1	53.6		-4.8	-22.5	0.0	
Total	76	52 (68%)	26 (34%)	31.6	24.9	46.6	-	32.2	20.0	44.9	-	0.0	-11.0	8.8	0.4487

Figure 1. Change in alcohol consumption and physical activity before and during COVID-19 pandemic.

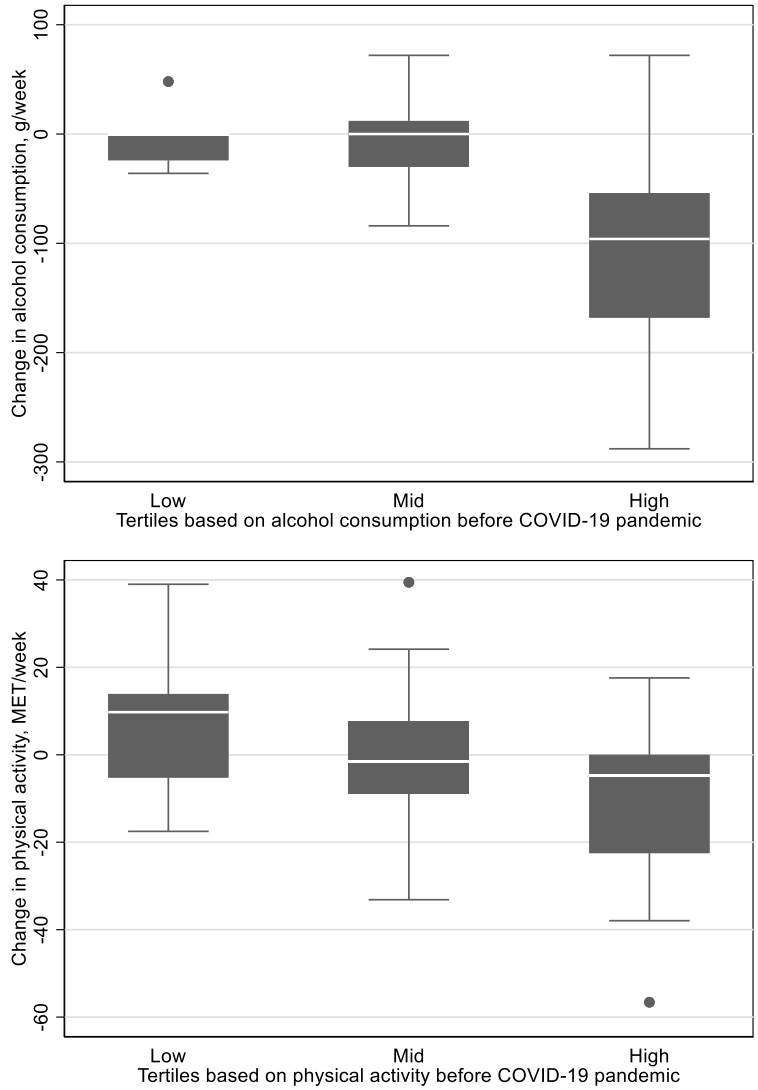

Figure 2. Alcohol consumption and physical activity before and during COVID-19 pandemic grouped by gender.

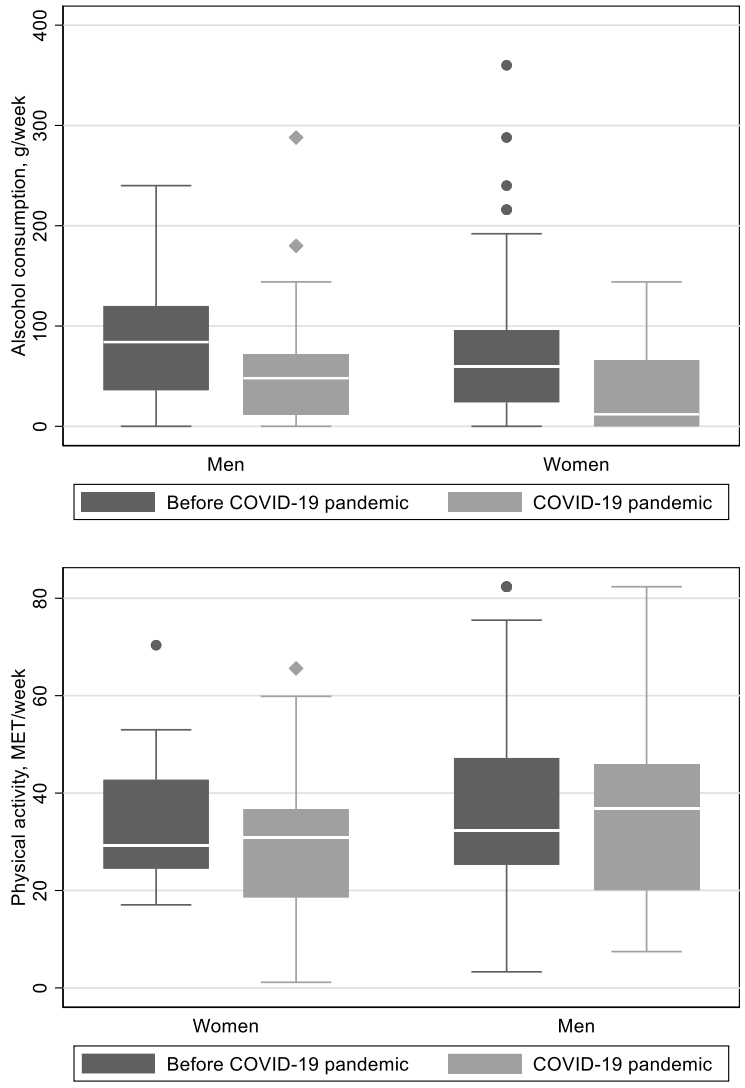

Table 3. Alcohol consumption and physical activity before and during COVID-19 pandemic grouped by gender.

Variable	Men			Women			Total		
	Median	IQR		Median	IQR		Median	IQR	
Alcohol consumption, g/week									
Before pandemic	84.0	36.0	120.0	60.0	24.0	96.0	60.0	24.0	108.0
During pandemic	48.0	12.0	72.0	12.0	0.0	66.0	24.0	0.0	72.0
Change	0.0	-66.0	0.0	-12.0	-42.0	0.0	-12.0	-54.0	0.0
p-value	0.0516			0.0001			<0.0001		
Physical activity, MET/week									
Before pandemic	29.2	24.5	42.7	32.4	25.3	47.2	31.6	24.9	46.6
During pandemic	30.8	18.6	36.7	36.8	20.0	45.9	32.2	20.0	44.9
Change	-4.1	-13.8	9.8	0.0	-8.1	8.8	0.0	-11.0	8.8
p-value	0.157			0.9235			0.4487		

5 Discussion

The results showed that alcohol consumption among medical students has decreased significantly during the COVID-19 pandemic. This decrease was associated with higher alcohol consumption before the pandemic and with female gender. The amount of physical activity did not significantly change during the COVID-19 pandemic.

This study was limited by a small sample size and a response rate of 51%. There was no possibility to analyze non-respondents. The generalizability of the results might be affected by the fact that the respondents represented a narrow age range and a specific stage of their training – second-year medical students. The responses concerning the time before the COVID-19 pandemic required a year-long recall, which might affect the preciseness of responses. Physical activity and alcohol consumption of the respondents might vary during a year, which might cause difficulties when approximating health behaviors over such a long period. Overall, this study can be understood as an oversized online survey-based case series rather than a full-scale cohort investigation. However, even if limited, the study might show some trends existing amongst medical students. At least, the study might show that pandemic-related restrictions may affect some health behaviors.

The results were in line with previous reports on significantly decreased alcohol consumption among college students during a pandemic lockdown (White et al., 2020; Jaffe et al., 2021; Bollen et al., 2021; Ryerson et al., 2021; Bonar et al., 2021). Also, it has earlier been reported that alcohol consumption might decrease more substantially among heavy drinkers with social drinking motives (Bollen et al., 2021) and among those students, who had moved back in with their parents (White et al., 2020; Jaffe et al., 2021; Ryerson et al., 2021) as heavy drinking with peers had changed to drinking lighter with family (Jackson et al., 2021). Extreme drinking among students is known to be associated with social, enhancement and coping motives (White et al., 2016). Loneliness, difficulty with goal-directed behavior, COVID-19-related worry and reading COVID-19-related news have been associated with drinking to cope with the pandemic (Buckner et al., 2021; Mohr et al., 2021). There is also evidence that increased drinking during the COVID-19 pandemic has been more common among people with symptoms of anxiety and depression (Tran et al., 2020; Lechner et al., 2020). Previous reports on the changes in physical activity among students during pandemic have been inconsistent. Earlier observations on significant decrease (Bertrand et al., 2021) or increase in leisure-time physical activity

(Romero-Blanco et al., 2020; Gallego-Gómez et al., 2020) could not be confirmed by the present study, which observed no significant change in physical activity among students. Also, the results contradict the reports on increasing alcohol consumption among students during the COVID-19 pandemic (Lechner et al., 2020; Bertrand et al., 2021). These differences might be explained by different age distributions, specificities of medical pre-graduate training, or other unknown confounders.

Further research among larger samples representing different training programs in longitudinal designs may provide valuable information on the changes in major modifiable risks (e.g., drinking, physical inactivity, obesity, and smoking) among university students during the COVID-19 pandemic. It might be important to assess the consistency of the changes after the pandemic is ended.

6 Conclusions

It seems that alcohol consumption among medical students might decrease during the COVID-19 pandemic. It can only be speculated that the reason might lay in reduced social contacts and negative effect of social isolation. This decrease was seen especially among women and among students with higher alcohol consumption before the pandemic. Also, it seems that students had found their ways to remain active during the pandemic since the amount of leisure-time physical activity had not changed significantly.

References

Ammar A, Brach M, Trabelsi K, Chtourou H, Boukhris O, Masmoudi L, Bouaziz B, Bentlage E, How D, Ahmed M, Müller P, Müller N, Aloui A, Hammouda O, Paineiras-Domingos LL, Braakman-Jansen A, Wrede C, Bastoni S, Pernambuco CS, Mataruna L, Taheri M, Irandoust K, Khacharem A, Bragazzi NL, Chamari K, Glenn JM, Bott NT, Gargouri F, Chaari L, Batatia H, Ali GM, Abdelkarim O, Jarraya M, el Abed K, Souissi N, van Gemert-Pijnen L, Riemann BL, Riemann L, Moalla W, Gómez-Raja J, Epstein M, Sanderman R, Schulz SVW, Jerg A, Al-Horani R, Mansi T, Jmail M, Barbosa F, Ferreira-Santos F, Šimunič B, Pišot R, Gaggioli A, Bailey SJ, Steinacker JM, Driss T, Hoekelmann A. 2020. Effects of COVID-19 home confinement on eating behaviour and physical activity: Results of the ECLB-COVID19 international online survey. Nutrients 12. DOI: 10.3390/nu12061583.

Bertrand L, Shaw KA, Ko J, Deprez D, Chilibeck PD, Zello GA. 2021. The impact of the coronavirus disease 2019 (Covid-19) pandemic on university students' dietary intake, physical activity, and sedentary behaviour. Applied Physiology, Nutrition and Metabolism 46:265–272. DOI: 10.1139/apnm-2020-0990.

Bollen Z, Pabst A, Creupelandt C, Fontesse S, Lannoy S, Pinon N, Maurage P. 2021. Prior drinking motives predict alcohol consumption during the COVID-19 lockdown: A cross-sectional online survey among Belgian college students. Addictive Behaviors 115. DOI: 10.1016/j.addbeh.2020.106772.

Bonar EE, Parks MJ, Gunlicks-Stoessel M, Lyden GR, Mehus CJ, Morrell N, Patrick ME. 2021. Binge drinking before and after a COVID-19 campus closure among first-year college students. Addictive Behaviors 118. DOI: 10.1016/j.addbeh.2021.106879.

Buckner JD, Lewis EM, Abarno CN, Morris PE, Glover NI, Zvolensky MJ. 2021. Difficulties with emotion regulation and drinking during the COVID-19 pandemic among undergraduates: the serial mediation of COVID-related distress and drinking to cope with the pandemic. Cognitive Behaviour Therapy 50:261–275. DOI: 10.1080/16506073.2020.1861084.

Caputo EL, Reichert FF. 2020. Studies of Physical Activity and COVID-19 during the Pandemic: A Scoping Review. Journal of Physical Activity and Health 17:1275–1284. DOI: 10.1123/jpah.2020-0406.

Carter AC, Obremski Brandon K, Goldman MS. 2010. The College and Noncollege Experience: A Review of the Factors That Influence Drinking Behavior in Young Adulthood*. Journal of studies on alcohol and drugs 71:742–750.

Charles NE, Strong SJ, Burns LC, Bullerjahn MR, Serafine KM. 2021. Increased mood disorder symptoms, perceived stress, and alcohol use among college students during the COVID-19 pandemic. Psychiatry Research 296. DOI: 10.1016/j.psychres.2021.113706.

Copeland WE, McGinnis E, Bai Y, Adams Z, Nardone H, Devadanam V, Rettew J, Hudziak JJ. 2021. Impact of COVID-19 Pandemic on College Student Mental Health and Wellness.

Elmer T, Mepham K, Stadtfeld C. 2020. Students under lockdown: Comparisons of students' social networks and mental health before and during the COVID-19 crisis in Switzerland. PLoS ONE 15. DOI: 10.1371/journal.pone.0236337.

Gallego-Gómez JI, Campillo-Cano M, Carrión-Martínez A, Balanza S, Rodríguez-González-moro MT, Simonelli-Muñoz AJ, Rivera-Caravaca JM. 2020. The COVID-19 pandemic and its impact on homebound nursing students. International Journal of Environmental Research and Public Health 17:1–10. DOI: 10.3390/ijerph17207383.

Grossman ER, Benjamin-Neelon SE, Sonnenschein S. 2020. Alcohol consumption during the covid-19 pandemic: A cross-sectional survey of us adults. International Journal of Environmental Research and Public Health 17:1–10. DOI: 10.3390/ijerph17249189.

Hultgren BA, Turrisi R, Cleveland MJ, Mallett KA, Reavy R, Larimer ME, Geisner IM, Hospital MM. 2019. Transitions in drinking behaviors across the college years: A latent transition analysis. Addictive Behaviors 92:108–114. DOI: 10.1016/j.addbeh.2018.12.021.

Jackson KM, Merrill JE, Stevens AK, Hayes KL, White HR. 2021. Changes in Alcohol Use and Drinking Context due to the COVID-19 Pandemic: A Multimethod Study of College Student Drinkers. Alcoholism: Clinical and Experimental Research 45:752–764. DOI: 10.1111/acer.14574.

Jaffe AE, Kumar SA, Ramirez JJ, DiLillo D. 2021. Is the COVID-19 Pandemic a High-Risk Period for College Student Alcohol Use? A Comparison of Three Spring Semesters. Alcoholism, clinical and experimental research. 45:854–863. DOI: 10.1111/acer.14572.

Kilian C, Rehm J, Allebeck P, Braddick F, Gual A, Barták M, Bloomfield K, Gil A, Neufeld M, O'Donnell A, Petruželka B, Rogalewicz V, Schulte B, Manthey J. 2021. Alcohol consumption during the COVID-19 pandemic in Europe: a large-scale cross-sectional study in 21 countries. Addiction. DOI: 10.1111/add.15530.

Lechner W v., Laurene KR, Patel S, Anderson M, Grega C, Kenne DR. 2020. Changes in alcohol use as a function of psychological distress and social support following COVID-19 related University closings. Addictive Behaviors 110. DOI: 10.1016/j.addbeh.2020.106527.

Meyer J, McDowell C, Lansing J, Brower C, Smith L, Tully M, Herring M. 2020. Changes in physical activity and sedentary behavior in response to covid-19 and their associations with mental health in 3052 us adults. International Journal of Environmental Research and Public Health 17:1–13. DOI: 10.3390/ijerph17186469.

Mohr CD, Umemoto SK, Rounds TW, Bouleh P, Arpin SN. 2021. Drinking to Cope in the COVID-19 Era: An Investigation Among College Students. J Stud Alcohol Drugs 82:178–187.

Okado Y, Scaramella C, Nguyen HM, Mendoza B, Watarastaporn T. 2021. Psychosocial adjustment of U.S. college students in the early months of the COVID-19 pandemic. Journal of American college health.:1–12. DOI: 10.1080/07448481.2021.1926268.

Pieh C, Budimir S, Probst T. 2020. The effect of age, gender, income, work, and physical activity on mental health during coronavirus disease (COVID-19) lockdown in Austria. Journal of Psychosomatic Research 136. DOI: 10.1016/j.jpsychores.2020.110186.

Pollard MS, Tucker JS, Green HD. 2020. Changes in Adult Alcohol Use and Consequences During the COVID-19 Pandemic in the US. JAMA Newt Open 3. DOI: 10.1001/jamanetworkopen.2020.22942.

Prestigiacomo CJ, Liu MA, Plawecki MH, Cyders MA. 2021. Early Impact of the U.S. COVID-19 Pandemic on Drinking Motives and Alcohol Use. Substance use & misuse. 56:1383–1386. DOI: 10.1080/10826084.2021.1928210.

Romero-Blanco C, Rodríguez-Almagro J, Onieva-Zafra MD, Parra-Fernández ML, Prado-Laguna MDC, Hernández-Martínez A. 2020. Physical activity and sedentary lifestyle in university students: Changes during confinement due to the covid-19 pandemic. International Journal of Environmental Research and Public Health 17:1–13. DOI: 10.3390/ijerph17186567.

Ryerson NC, Wilson OWA, Pena A, Duffy M, Bopp M. 2021. What happens when the party moves home? The effect of the COVID-19 pandemic on U.S. college student alcohol consumption as a function of legal drinking status using longitudinal data. Translational behavioral medicine 11:772–774. DOI: 10.1093/tbm/ibab006.

Tasso AF, Hisli Sahin N, San Roman GJ. 2021. COVID-19 disruption on college students: Academic and socioemotional implications. Psychological Trauma: Theory, Research, Practice, and Policy 13:9–15. DOI: 10.1037/tra0000996.

Tran TD, Hammarberg K, Kirkman M, Nguyen HTM, Fisher J. 2020. Alcohol use and mental health status during the first months of COVID-19 pandemic in Australia. Journal of affective disorders 277:810–813. DOI: 10.1016/j.jad.2020.09.012.

White HR, Anderson KG, Ray AE, Mun EY. 2016. Do drinking motives distinguish extreme drinking college students from their peers? Addictive Behaviors 60:213–218. DOI: 10.1016/j.addbeh.2016.04.011.

White HR, Stevens AK, Hayes K, Jackson KM. 2020. Changes in Alcohol Consumption Among College Students Due to COVID-19: Effects of Campus Closure and Residential Change. J Stud Alcohol Drugs 81:725–730.