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# COVID-19 Lockdown Effects on Academic Functioning, Mood, and Health Correlates: Data from Dutch Pharmacy Students, PhD Candidates and Postdocs

Pauline A. Hendriksen<sup>1</sup>, Agnese Merlo<sup>1</sup> , Elisabeth Y. Bijlsma<sup>1</sup> , Ferdi Engels<sup>1</sup> , Johan Garssen<sup>1,2</sup> , Gillian Bruce<sup>3</sup>  and Joris C. Verster<sup>1,4,\*</sup> 

<sup>1</sup> Division of Pharmacology, Utrecht Institute for Pharmaceutical Sciences, Utrecht University, 3584 CG Utrecht, The Netherlands; p.a.hendriksen@students.uu.nl (P.A.H.); a.merlo@uu.nl (A.M.); e.y.bijlsma@uu.nl (E.Y.B.); g.m.h.engels@uu.nl (F.E.); j.garssen@uu.nl (J.G.)

<sup>2</sup> Global Centre of Excellence Immunology, Nutricia Danone Research, 3584 CT Utrecht, The Netherlands

<sup>3</sup> Division of Psychology and Social Work, School of Education and Social Sciences, University of the West of Scotland, Paisley PA1 2BE, UK; gillian.bruce@uws.ac.uk

<sup>4</sup> Centre for Human Psychopharmacology, Swinburne University, Melbourne, VIC 3122, Australia

\* Correspondence: j.c.verster@uu.nl

**Abstract:** Mixed results have been published on the impact of the 2019 coronavirus (COVID-19) pandemic and its associated lockdown periods on academic functioning, mood, and health correlates such as alcohol consumption. Whereas a number of students report an impaired academic performance and increased alcohol intake during lockdown periods, other students report no change or an improvement in academic functioning and a reduced alcohol consumption. This data descriptor article describes the dataset of a study investigating the impact of the COVID-19 pandemic on academic functioning. To investigate this, an online survey was conducted among Dutch pharmacy students, PhD candidates and postdoctoral researchers (postdocs) of Utrecht University, the Netherlands. Compared to before the COVID-19 pandemic, the survey assessed possible changes in self-reported academic functioning, mood and health correlates such as alcohol consumption, perceived immune functioning and sleep quality. Retrospective assessments were made for four periods, including (1) the year 2019 (the period before COVID-19), (2) the first lockdown period (15 March–11 May 2020), (3) summer 2020 (no lockdown) and (4) the second lockdown (November 2020–April 2021). This article describes the content of the survey and corresponding dataset. The survey had a response rate of 24.3% and was completed by 345 participants.

**Dataset:** The dataset is submitted as Supplementary File.

**Dataset License:** CC0

**Keywords:** COVID-19; lockdown; online education; academic performance; social interactions; mood; sleep; quality of life; alcohol consumption; hangover



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## 1. Summary

Since the World Health Organization (WHO) declared the worldwide spread of the 2019 coronavirus (COVID-19) a pandemic [1], lockdowns have been implemented to reduce and control the spread of the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) virus. These lockdowns included the closure of restaurants and businesses, travel restrictions, curfews and the closure of schools and universities [2].

The lockdowns and stay-at-home orders were successful in reducing the spread of the SARS-CoV-2 virus. However, there is also a growing body of scientific literature pointing at associated negative psychological and health effects, which were also evident

among university students, including increased levels of stress, anxiety, depression and loneliness [3–9].

Around the world, universities switched to online education platforms to continue educational activities [10]. For Dutch higher education, this meant an immediate shift to fully online education at the start of the first lockdown (March 2020), which continued until summer break. After summer (September 2020), limited on-campus education was reinstated, where universities aimed at welcoming students on campus for practical course work, research internships and once a week for regular course work. During the second lockdown (November 2020–April 2021), regular classes switched to online education again, whereas practical course work and research internships continued on campus.

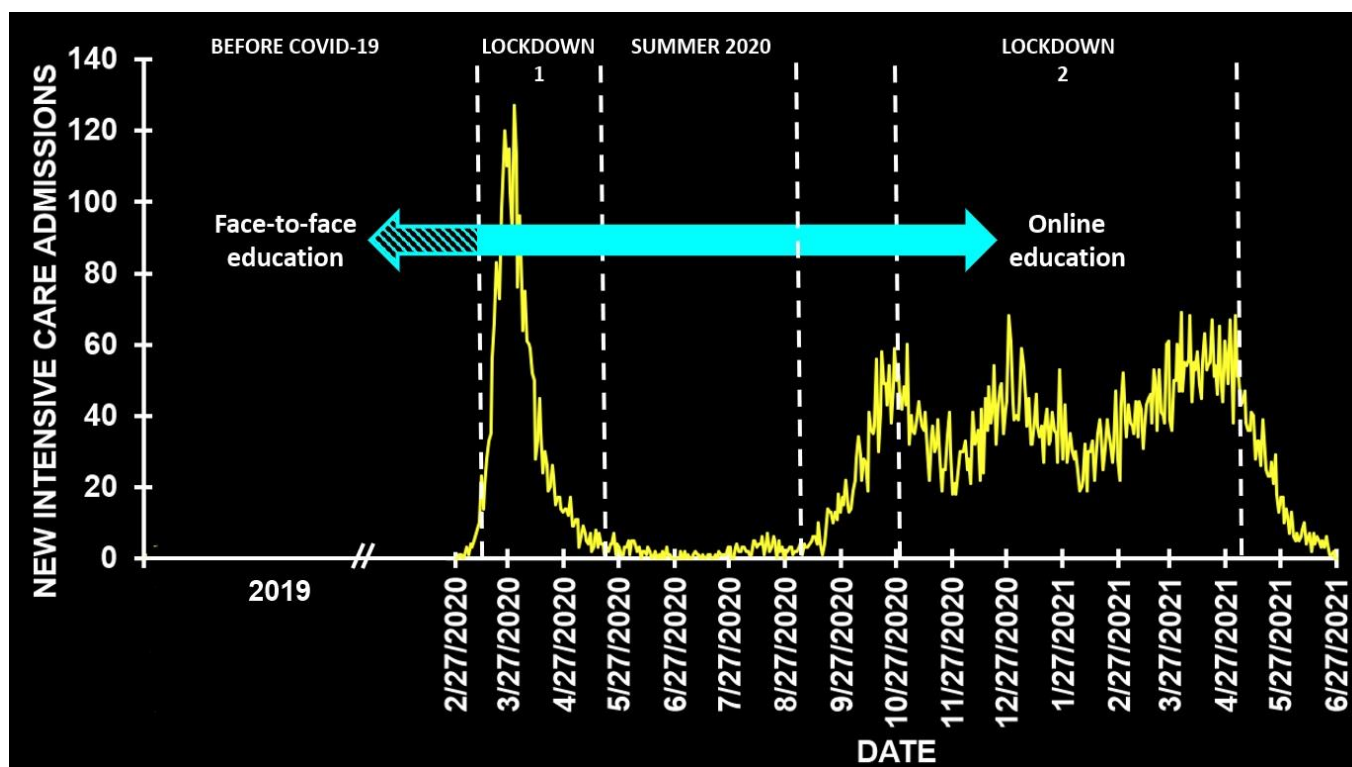
Mixed results have been published on the impact of the transition to online education. That is, whereas some studies reported that this transition was associated with an improved mood and academic functioning [5,11–14], other studies reported increased distress, decreased well-being and a worsened academic performance after the transition [2,3,6,8,9,15,16]. An experimental study comparing face-to-face and online problem-based learning sessions suggests that poorer online academic performance during lockdown is related to decreased participation, communication, preparation, critical thinking and group skills [16]. Another factor that seems to negatively impact academic performance is the lack of structure and routine [15]. Within the Netherlands, studies on the impact of this transition also show mixed results. Both decreased [17] and unaltered academic performance [18] have been reported. With respect to student mental health, both a negative impact on mood, feelings of loneliness and the ability to concentrate [19], and no impact on mental health [20], have been reported.

Studies further reported that online education was associated with being less motivated [3,7,17]. Research has shown that other factors such as sex [21–23], the living situation [5,8] and the successfulness of coping strategies to adapt to the COVID-19 lockdown constraints may play a role in how students experienced the change to online education and coped with lockdown-associated mood changes.

Various coping strategies have been adopted to adapt to the lockdown situation. For example, to maintain a healthy lifestyle, people became more physically active or adopted a healthy diet. Other coping mechanisms included participating in unhealthy behaviors such as smoking and drinking alcohol, and, for example, while a substantial number of people did not alter their alcohol consumption, both decreased alcohol consumption (to maintain a healthy lifestyle) and increased alcohol consumption (as a mechanism to cope with stress) have been reported during the COVID-19 pandemic [24–26]. It is known from research conducted prior to the pandemic that increased alcohol consumption is related to next-day negative effects on academic performance [27,28]. These studies also reported that an alcohol hangover was the most frequently reported negative consequence of alcohol consumption [27,28]. A hangover is defined as the combination of negative mental and physical symptoms which can be experienced after a single episode of alcohol consumption, starting when blood alcohol concentration (BAC) approaches zero [29,30]. Until now, research on alcohol hangover in relation to academic performance during the COVID-19 pandemic has been limited to one study that did not find an effect on academic functioning [31]. Further research is therefore warranted.

The current study aimed to evaluate the impact of the COVID-19 pandemic on academic functioning, mood and health correlates such as alcohol consumption. For this purpose, an online survey was conducted via SurveyMonkey among Dutch pharmacy students, PhD candidates and postdocs of Utrecht University, the Netherlands. Retrospectively, data was collected for (1) the year 2019 (the period before COVID-19), (2) the first lockdown period (15 March–11 May 2020), (3) summer 2020 (no lockdown) and (4) the second lockdown (November 2020–April 2021). These periods, shown in Figure 1, were implemented as a response to the level of intensive care admissions in the Netherlands [32]. It is important to keep in mind that, as described above, the transition to online education was established in March 2020 and continued until summer. In the academic year 2020–2021,

only limited on-campus education was reinstated, and it was restricted again during the second lockdown.



**Figure 1.** Number of COVID-19 intensive care patients in the Netherlands and related lockdown periods. Data from reference [32].

This data descriptor article describes the survey and forthcoming dataset. Several publications are in preparation based on the current dataset. In addition, other researchers may benefit from the methodological background given in this article, be inspired by the study set-up and use of single item assessments [33], and use the dataset for additional analyses.

## 2. Data Description

### 2.1. Informed Consent

Before the start of the survey, a webpage was displayed that explained the purpose of the study, information about ethics, the anonymity of participants and the contact details of the investigators. At the end of this page, participants could indicate whether they wished to participate in the study, and electronic informed consent was obtained from those who answered affirmative. In the dataset, the unique participant identification number is listed in column 1.

### 2.2. Demographics

The first question concerned the education level. Participants could indicate whether they were (a) a bachelor student in pharmaceutical sciences or a bachelor student as part of the College for Pharmaceutical Sciences (CPS), a research-oriented bachelor, (b) a master student in pharmaceutical sciences, (c) a PhD candidate, (d) a postdoctoral researcher (postdoc) or (e) none of the above (in case they were diverted to the end of the survey). The next two questions assessed the age (in years) and sex (male or female). Question four assessed ethnicity. Participants could choose one of three categories, according to the definitions set by the Statistics Netherlands (Centraal Bureau voor de Statistiek, CBS) [34]. They could choose between “Dutch”, “Western migration background” or “non-Western migration background”. A “Western migration background” was defined as descending

from European countries (excluding Turkey), North America, Oceania, Indonesia or Japan, and a “non-Western migration background” was defined as descending from Africa, Latin America and Asia (excluding Indonesia and Japan, and including Turkey). Question five concerned the living situation of the participants. The answering possibilities included “I live alone”, “I live together with other students/people in a home with shared facilities” and “I live together with family”. In the dataset, demographic data is listed in columns 2 to 6.

### 2.3. COVID-19 Test

Question six assessed whether participants have been tested for COVID-19. They could choose between five answering possibilities, including “No”, “Yes, I tested negative (no coronavirus)”, “Yes, I tested positive and I have been hospitalized”, “Yes, I tested positive and I have been sick at home” and “Yes, I tested positive but I did not feel (very) sick”. In the dataset, the outcome of question six is listed in column 7.

### 2.4. Immune Status Questionnaire (ISQ)

Question seven assessed general immune status during the pandemic for the period March 2020 to March 2021. To this extent, the Immune Status Questionnaire (ISQ) was completed [35]. The ISQ consists of seven items, including “common cold”, “diarrhea”, “sudden high fever”, “headache”, “muscle and joint pain”, “skin problems (e.g., acne and eczema)” and “coughing”. On a 5-point Likert scale, participants indicated how often they experienced each item. Answering possibilities comprised “never”, “sometimes”, “regularly”, “often” and “(almost) always”. The sum-score across the 7 items was computed. This score (0–28) was recorded following the instructions by Wilod Versprille et al. [35] to yield a final ISQ score ranging from 0 (poor) to 10 (excellent). Two items were added for this study, i.e., “slow healing wounds” and “wound infection”. In the dataset, the ISQ items are listed in columns 8 to 14. The overall ISQ score is listed in column 15, and the two additional items are listed in columns 16 and 17.

### 2.5. Mood and Being Active

Question eight assessed mood. Mood items included “stress”, “anxiety”, “depression”, “fatigue”, “lonely”, “optimistic” and “happy”. All items were scored on a scale ranging from 0 (absent) to 10 (extreme). In a similar way, “being active” was assessed. The use of 1-item scales has been validated previously [33], and these mood ratings have been applied successfully in previous studies [36–38]. Additionally, the 1-item assessment of ‘being active’ has been successfully applied in previous research [39,40]. The items were rated for (1) the year 2019 (the period before COVID-19), (2) the first lockdown period (15 March–11 May 2020), (3) summer 2020 (no lockdown) and (4) the second lockdown (November 2020–April 2021). In the dataset, mood items are listed in columns 18 to 45, and ratings on ‘being active’ are listed in columns 46 to 49.

### 2.6. Quality of Life and Health Correlates

Question 9 assessed perceived immune fitness, quality of life and sleep quality. This was done with 1-item scales from 0 (very poor) to 10 (excellent). The use of these 1-item scales has been validated previously [33], and they have been applied successfully in previous research assessing quality of life [36], perceived immune fitness [38,41] and sleep quality [42,43]. The items were rated for (1) the year 2019 (the period before COVID-19), (2) the first lockdown period (15 March–11 May 2020), (3) summer 2020 (no lockdown) and (4) the second lockdown (November 2020–April 2021). In the dataset, quality of life ratings are listed in columns 50 to 53, perceived immune fitness in columns 54 to 57, and sleep quality in columns 58 to 61.

### 2.7. Smoking

Question 10 comprised two items concerning the smoking of tobacco. The items comprised “How many days per week do you smoke?” (answering possibilities 0 to 7 days) and “On average, how many cigarettes do you smoke per day?” (answering possibilities 0 to >100). The two questions were answered for (1) the year 2019 (the period before COVID-19), (2) the first lockdown period (15 March–11 May 2020), (3) summer 2020 (no lockdown) and (4) the second lockdown (November 2020–April 2021). In the dataset, smoking assessments are listed in columns 6 to 70.

### 2.8. Alcohol Consumption and Hangovers

Question 11 first asked whether or not participants consume alcohol. If they answered ‘no’, the questions on alcohol consumption and hangovers were skipped. If they answered ‘yes’, participants were asked to report the ‘average number of alcoholic drinks per week’ that they consumed (answer possibilities 0 to >100) and ‘the number of drinking days per week’ (answer possibilities 0 to 7 days). Guidance was provided on serving sizes and how to convert these into standard alcoholic drink sizes (units). In particular, they were instructed that for liquor and mixed drinks, one shot equaled one unit. One glass of beer (250 mL) equals one glass of wine and one shot of liquor. One bottle of wine (750 mL) equals 6 units, and one bottle of liquor (750 mL) equals 20 units. Participants further reported ‘the number of hangovers per month’ that they experienced (answer possibilities 0 to 31 days) and the ‘average hangover severity’ (rated on a scale ranging from 0 (absent) to 10 (extreme)) [44]. The questions were answered for (1) the year 2019 (the period before COVID-19), (2) the first lockdown period (15 March–11 May 2020), (3) summer 2020 (no lockdown) and (4) the second lockdown (November 2020–April 2021). In the dataset, alcohol consumption and hangover assessments are listed in columns 71 to 87.

### 2.9. Academic Functioning

In question 12, participants rated, compared to before corona, their study or work performance during corona lockdown on scales ranging from –5 (extremely worse) to +5 (extremely improved), around a midpoint of 0 (unchanged). The items included “general performance quality”, “amount of time invested in study/PhD-candidate/postdoc project”, “study grades/output”, “academic achievement/amount of knowledge gained”, “reading articles/text books” and “writing assignments/ articles”. In addition to academic performance, two items rated social interactions, including “contact with teachers or supervisors” and “interactions with other students/PhD candidates/postdocs”. Finally, the items “balance work/study and private life” and “the extent you enjoy being a student/PhD candidate/postdoc” were assessed. In the dataset, academic functioning outcomes are listed in columns 88 to 97.

### 2.10. Concluding Questions and Remarks

Question 13 asked participants whether they granted permission to be invited to participate in future research and whether they wished to enter a prize draw to win one of two 100 euro vouchers. There was also space provided to leave any comments with regard to the survey. At the end of the survey, participants were advised to consult their physician if they experienced COVID-19 symptoms. For further information on COVID-19, they were referred to the COVID-19 website of the Dutch government (<https://www.rijksoverheid.nl/onderwerpen/coronavirus-covid-19>, accessed on 14 October 2021). For more information on alcohol or drug use, they were referred to the website of the Trimbos Institute ([www.trimbos.nl](http://www.trimbos.nl), accessed on 14 October 2021). Finally, for questions about COVID-19 and the situation at Utrecht University, participants were invited to send an email to [coronavirus@uu.nl](mailto:coronavirus@uu.nl).

### 3. Methods

An online survey was conducted in the first week of June 2021 among students, PhD candidates and postdocs of the department of pharmaceutical sciences of Utrecht University, The Netherlands. The study was reviewed and approved by the Science-Geo Ethics Review Board of Utrecht University (protocol code: S-21525, date of approval: 19 May 2021).

All participants gave electronic informed consent, and the study was carried out following the rules of the Declaration of Helsinki of 1975 (<http://www.wma.net/en/30publications/10policies/b3/>, accessed on 14 October 2021), revised in 2008. As an incentive, participants could enter a prize draw to win one of two 100 euro vouchers.

#### 3.1. Participants, Sample Size and Response Rate

Participants of the study were students, PhD candidates and postdocs from the department of Pharmaceutical Sciences of Utrecht University, the Netherlands. Students from other departments were excluded because other, different departments may have different education methodologies and pedagogies, and combining these participants into one dataset would significantly reduce the ability to interpret the study outcomes on academic functioning. The department of Pharmaceutical Sciences is responsible for one of the three Pharmacy programs in the Netherlands. Pharmacy students first follow a three-year Bachelor program, most often followed by a Master program comprising three more years of education, resulting in a PharmD degree. Within the Bachelor of Pharmaceutical Sciences, the department hosts a research-oriented international program, the College of Pharmaceutical Sciences (CPS). In addition, the Utrecht Institute of Pharmaceutical Sciences (UIPS), the research institute of the department, offers a PhD program in Drug Innovation and is responsible for the further development of postdoctoral researchers. In the academic year 2020–2021, 662 students followed the bachelor in pharmaceutical sciences, and 142 students were in the College of Pharmaceutical Sciences. N=458 masters students were registered, and 190 PhD candidates and 30 postdocs were affiliated with UIPS. The total number of possible participants (students/PhD candidates/postdocs) was 1482.

Of the 1482 people that were invited to complete the survey, 360 viewed the informed consent page survey (response rate 24.3%). Of them, 358 participants provided informed consent (24.2%), and data from 341 participants were included in the final dataset. While the response rate could be viewed as low, it is sufficient for the planned statistical analysis. Further, the response rate is higher than the response rates of 7–15% of comparable international student surveys [3,45–49].

#### 3.2. Data Collection

Participants were all invited via email to complete the survey. The survey was designed via SurveyMonkey and took about ten minutes to complete. Given that the department comprises a considerable number of international students, participants could choose to complete the survey in the English or Dutch language.

#### 3.3. Data Handling

Data were downloaded in an Excel format and prepared for transferal to SPSS (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp.). Of the 358 participants that gave informed consent, one participant was excluded because her age was out of range (60 years old), and 16 others did not start the survey. In total, data from 341 participants was used for the statistical analysis. The dataset is attached as Supplementary Materials.

### 4. User Notes

The dataset is given in the SPSS file accompanying this article as Supplementary Materials. The variable names listed in the column 'Name' are described in more detail in the

'label' column, and answering possibilities are given in the column 'Values'. Abbreviations in the variable names refer to the period that was assessed and include (1) '2019' (the period before COVID-19), (2) 'LD1' (the first lockdown period, 15 March–11 May 2020), (3) NL (no lockdown, summer 2020) and (4) LD2 (the second lockdown, November 2020–April 2021). Finally, please note that not all participants completed the entire survey. The number of completers per question are listed in Table 1.

**Table 1.** Assessments.

Question	Variable	Number of Items	Completers
1	Education level	1	341
2	Age	1	341
3	Sex	1	341
4	Ethnicity	1	339
5	Living situation	1	341
6	Tested for COVID-19	1	331
7	ISQ	9	331
8	Mood and being active	8	261
9	QoL, health correlates	3	254
10	Smoking	2	254 (17)
11	Alcohol consumption	4	254 (162)
12	Academic functioning	10	250

Number of completers are listed. The number of participants that reported being smokers or consuming alcohol and answered the corresponding questions is given in brackets. Abbreviations: COVID-19 = 2019 coronavirus, ISQ = immune status questionnaire, QoL = quality of life.

**Supplementary Materials:** The following are available online at <https://www.mdpi.com/article/10.3390/data6110120/s1>, dataset.

**Author Contributions:** P.A.H., A.M., E.Y.B., F.E., J.G., G.B. and J.C.V. contributed to the conceptualization, design and methodology of the study; J.C.V. conducted the statistical analysis; P.A.H. and J.C.V. prepared the original draft. All authors have read and agreed to the published version of the manuscript.

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**Data Availability Statement:** The data is available as Supplementary Materials. The dataset is licensed under CC0, which means that it is open data free for anyone to use, reuse and distribute, for both commercial and non-commercial purposes. In the event of using the dataset, it is appreciated if the current data descriptor article is cited.

**Conflicts of Interest:** Over the past 3 years, J.C.V. has acted as a consultant/advisor for KNMP, More Labs, Red Bull, Sen-Jam Pharmaceutical, Toast!, Tomo, and ZBiotics. J.G. is a part-time employee of Nutricia Research and received research grants from the Nutricia research foundation, Top Institute Pharma, Top Institute Food and Nutrition, GSK, STW, NWO, Friesland Campina, CCC, Raak-Pro, and EU. The other authors have no potential conflicts of interest to disclose.

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