The impact of COVID-19 on the academic performances of International Students

Bachelor Thesis by
Student number:
Institution:
Date:
Supervisor:
Word Count (text only):

Gijs Burghgraef
s3508552
University of Groningen
11-06-2021
Dr. A. P. P. Remund
6404

Abstract

COVID-19 had made impact on human life all around the world. In the Netherlands, students were obliged by the government to attend so-called 'remote teaching'. Remote teaching implies that students stayed in their homes while following their education behind their own desks. This thesis looks for possible relations between academic stress and a deteriorated mental health following COVID-19 on the one hand and the study progress of international students on the other hand. The data analysis method that has been used is secondary quantitative research. Data was gathered by means of an online survey and afterward transformed into six different multiple linear regressions. Two regressions were run per category: first year students, more advanced students, and combined. Although it was found that some stressors influencing mental health during a stay-at-home order did influence the perceived academic stress of international students, there is no evidence that the study progress of these same students is influenced because of COVID-19.

Table of Contents

1. Introduction

The world is currently in the grip of a worldwide pandemic. The WHO (2021) published today, May 9, that there are 157.2 million confirmed cases of COVID-19 and almost 3.3 million deaths as a result of COVID-19. To combat the COVID-19 virus, several countries have implemented lockdowns, curfews, and other stringent interventions. This implies that people all over the world are trapped within their homes, being isolated, and have little or no social contact with the outside world. This condition also applies to students who are now completing their education in their dorms behind their desks. According to De Man et al. (2020), depressive symptoms severity scores for students were on average 0.009 higher for every extra day of following a stay-at-home order. The second edition of the Beck Depression Inventory is used to calculate the scores. The scores vary from 0 to 63, where a score closer to zero implies that an individual has minimal depressive symptoms. If an individual has a score of between 29 or 63, his or her depressive symptoms are severe (Kneipp et al., 2011).

Although an average rise of 0.009 on a scale of 63 does not seem to be a significant increase, it is vital to keep in mind that this rise is calculated for every single day of stay-at-home order. If the rise of 0.009 is considered stable, the average annual rise will be 3.285. Since this is an average, some students will experience higher severity scores than others and might thus be struggling with depressive symptoms to a greater extent. Furthermore, de analysis of De Man et al. was undertaken at an early stage of the COVID-19 pandemic, and this number of average daily increase in depressive severity scores may have risen considerably in recent months due to the lasting COVID-19 pandemic.

Several other reports have linked COVID-19 to students' worsening mental health. The earlier discussed research by De Man et al. is looking at whether academic stress or general stressors impacting people's mental well-being during quarantine are to blame for the rise in depressive symptoms among students. These general stressors are composed by Brooks et al. (2020) as potentially influencing people's mental health during quarantine. These stressors will be further analyzed in the literature review. Next to that, prior to COVID-19, international students were already a disadvantaged population due to financial and health care problems, challenges adjusting to new culture and traditions, homesickness, a lack of cultural awareness, and language issues (Sherry et al., 2009).

Therefore, this research will examine whether the study progress of international students is influenced by either Brooks' stressors affecting people's mental health or academic stress, both of which are a result of the current COVID-19 pandemic. The pandemic is considered to be a life-course event, which could be critical for international students for a variety of reasons. For starters, most students are not attending physical lectures due to COVID-19. Students are instead sitting in their dorms, attending online lectures. This could be a justification for foreign students to remain in, or to return to, their country of origin. As a result, distinguishing between first-year students and students at a later stage of their education is important. This is due to the fact that first-year students began their studies during the pandemic, while more advanced students have undergone 'normal' student life, although second years only experienced this 'normal' student life for six months. This disparity between the two groups can result in very different outcomes in terms of students' academic progress.

For starters, students who are familiar with studying at a university location will be less likely to quit their education. Not only because they are in a more advanced stage of their studies, but also because first-year students may perceive stay-at-home studying to be more tedious or less appealing than they had expected. As a result, they could opt to drop out sooner compared to more advanced students.

Second, as a result of the COVID-19 pandemic, social contacts between students have decreased dramatically. Students are less likely to communicate with peers or attend other social events if a country has implemented a lockdown policy to battle the COVID-19 pandemic. International students are largely affected by this since they cannot always rely on a social network that is based in the country-of-study. This problem might even be greater for first year students since they did not have had the opportunity to create a social network in the country-of-study. This lack of social interactions can lead to isolation among foreign students, which can result in study delays or other detrimental consequences such as academic stress (De Man et al., 2020).

To study the relationship between COVID-19 and the study progress of international students, the following research question is established:

To what extent is the COVID-19 pandemic affecting the academic progress of international students studying in the Netherlands?

In order to establish an accurate answer to the research question, several sub-questions will be used to explore and analyze patterns within the context of international students, academic stress, and mental health issues. These are:

- How was the situation regarding mental health for international students prior to COVID-19?
- What are the effects of COVID-19 on (international) students?
- What causes academic stress and mental health issues?
- Is there a relation between academic stress and the stressors of Brooks?
- What differences exist regarding academic progress between first year- and more advanced students?

This research will be structured in the following way. First, a literature review will be conducted to explore consequences of COVID-19, mental health and academic stress on (international) students. In the remaining sections of this thesis, multiple linear regressions will be run, in order to estimate the association between stressors influencing mental health of international students and the perceived academic stress during COVID-19 of those same students. Next to that, another multiple linear regression will be performed to explore possible relations between the stressors influencing students' mental health, academic stress and the academic progress of international students during COVID-19. In this study, academic progress is measured as a percentage of missed ECTs during COVID-19. Finally, a conclusion will be established in which an attempt is made to answer the main research question.

2. Literature review

2.1| Prior to COVID-19 |

International students are a vulnerable population. Yeh & Inose (2003) found that international students face difficulties regarding language barriers, financial possibilities, homesickness, racial discrimination and a loss of social support. Moreover, adjusting to a new culture, anxiety about their current place of study and their place of origin are other difficulties a student studying abroad might face (Hsu, 2003). Moreover, international students are vulnerable for exploitation on both the academic and financial level (Altbach & Teichler, 2001). Exploitation means that an international student does not have the same equal opportunities compared to a student who follows an education in his or her country of origin. According to Altbach and Teichler (2001), this implies less opportunities for earning an income and a poorer standard of education. The latter meaning that an educational organization considers internationalization as nothing more than a way to sell products to 'foreigners'. A possible solution to tackle these inequalities is a more welcoming academic and community environment, which will improve the mental health of international students (Sümer, 2008).

Financial strains were already the most problematic issue for international students in research conducted 30 years ago. For instance, both Arubayi (1980) and Marville (1981) found that international students encounter the most difficulties when it comes to finances. Next to that, international students' adaption in the place of study is closely interlinked with the language difficulties they encounter (Lewtwaite, 1996). When students face language barriers in their country of study, there might be a possibility that those same students have a higher change of depression (Sam & Eide, 1991). In the study of Sam & Eide (1991) it was found that academic strains can also influence the mental health condition of international students, both positively and negatively.

Issues regarding the mental health of students were existing also prior to COVID-19. For instance, in 2014 the number of students who were looking for mental health services during their educational career was growing. This because students have a propensity to put a massive burden on themselves in some study aspects, while they disregard their personal well-being or relationships with other students (Iarovici, 2014). However, the occurrence of a widespread epidemic of an infectious disease is associated with higher levels of psychological anxiety and signs of mental illness, this does not only apply to students, but to all human beings (Bao et al., 2020). For instance, social distancing may result in social alienation, excessive stress, and an increased chance of mental illness (Torales et al., 2020). This phenomenon might result in increased debt (Richardson et al., 2013), unemployment (Chang et al., 2013), and homelessness (Culhane et al., 2019). In the end, the effects of a global pandemic like COVID-19 can result in an intensified risk of suicide for individuals (Elbogen et al., 2021).

2.2| Effects and consequences of COVID-19 |

Due to the COVID-19 pandemic, the possibilities for an academic institution to generate a more 'welcoming environment' are limited. As a result of national lockdowns, academic institutions are forced to rely on 'remote practical teaching' (Bowen, 2020). Remote practical teaching means no less than lectures delivered "from lecturers' kitchen tables" to students' homes. According to Daniel (2020), the most critical challenge for schools and universities during the transition from on-site studying to remote practical teaching is to reassure their students. This because in Daniel's opinion, teachers and school counsellors have a better position at assuaging the anxieties of students in deprived situations.

In response to the COVID-19 pandemic, the government of Canada developed financial and social programs for Canada's most marginalized individuals (Friesen, 2020). However, despite international students being a vulnerable population, they are considered as non-permanent residents and thus excluded from participating in such federal programs. As a direct consequence, since foreign students were already facing difficult life conditions in their place of education prior to COVID-19 (McGill, 2013), lockdowns and campus closures are more likely to cause extreme anxiety among international students. (Firang, 2020).

This extreme anxiety state is characterized by emotional depression, a diminished sense of personal self-worth, a lack of intimate contacts, and academic delays (Miller, 2011). This becomes visible from a statement of a student interviewed by Firang (2020), 'Our university was unexpectedly shut down in mid-March... at the time when we weren't prepared. With no money on me, I am starving, I panic and experience anxiety every day'.

The financial implications for foreign students who are unable to return to their home country can be enormous. For example, international students in Australia often depend on precarious employment to supplement their income; but, due to a national lockdown, working on jobs to earn an income is no longer possible. Along with the inability to return to their native country and the inability to receive federal COVID-19 stimulus packages, this has resulted in a major crisis in Australia (Parkes, 2020). Students are forced to sleep in front of their student

accommodation, resulting in piles of mattresses and piled-up furniture outside the student houses.

Besides financial consequences, deteriorated social contacts are also influencing the mental health of (international) students. Academic institutions in Manchester (Grove, 2020) and the University of Cambridge (Bennett, 2020) have already confirmed that they will continue remote teaching in the 2021-2022 academic year. As a result, it will be difficult for new students to establish a social network in the place of study. Moreover, international students are facing a period of quarantine when entering the country of study, and thus creating a social network is even more difficult for international students (Smith, 2020). Smith argues that besides the lack of a social network, not having the opportunity of saying goodbye to former peers and friends can also result in a deteriorated mental health of students. That social relationships and mental health are interlinked with each other was already found in several studies. Both Kagan & Cohen (1990) and Sewell & Davidson (1961) found that the general satisfaction with academic experiences and overall adaption in the new culture of international students is dependent whether the international student has made an adequate social network in their place of education.

2.3.1| Implications of COVID-19 on mental health of students |

As discussed in the sections above, international students are considered as a vulnerable population for different reasons. The next part of this literature review will explore the first findings on COVID-19 and its influence on the well-being of students. Since COVID-19 is a relatively recent phenomenon, there is a relative scarcity of literature on the topic. However, several articles have already suggested that this worldwide pandemic is affecting people's mental health. For example, during the first national stay-at-home order, a Greek study of 1000 university students found an alarming rise in suicidal thoughts, depression, and anxiety symptoms among those students. (Kaparounaki et al., 2020). A similar research was conducted in China, where 7143 medical students were observed, and those students showed a high degree of anxiety, which was correlated with COVID-19-related stress factors such as economic stressors, effects on everyday life, and academic delays (Cao et al., 2020). Moreover, Elbogen (2021) concluded that loneliness, financial strain, and changed mental health conditions due to COVID-19 are interlinked with thoughts of self-harm.

Next to that, studies that imply future medical employment, such as dental and healthcare educations, have a higher percentage of students who face higher anxiety due to changing personal hygiene and social habits (Lingawi, 2020). Nursing students are on the front line of the healthcare professionals who are dealing with the COVID-19 patients. As a result, in combination with a changed teaching format, nursing students are more vulnerable for stress and anxiety (Gallego-Gómez et al., 2020). Another reason for higher anxiety among healthcare students is because they share many risk factors with the staff, and medical students are also affected by shortages of personal protective equipment (Smith, 2020). This is combination with the more general anxiety causing factors such as finances and academic stress, the change of increased stress and anxiety levels among healthcare students is higher compared to non-healthcare students.

2.3.2| Stressors of Brooks |

Brooks identified the following stressors as influential on people's mental health during quarantine. Duration of quarantine, which means that if the period of quarantine last longer, there is a higher possibility that post-traumatic stress symptoms can occur (Hawryluck et al., 2004). The second stressor, fear of infection, implies that an individual is afraid of his or her own health and of infecting others, this especially applies to pregnant women and mothers with young children (Braunack-Mayer et al., 2013). 'Frustration and boredom' is the next stressor. Frustration caused by not being able to do one's everyday routine or day-to-day activities can cause distress among people, this frustration and following distress increases by time (Cava et

al., 2005). The fourth stressor is inadequate supplies, not being able to buy day-to-day groceries is frustrating. However, being unable to acquire medical care and prescriptions is which mostly causes anxiety among individuals during a period of quarantine (Blendon et al., 2004). The last stressor which affects people mental well-being during quarantine, is a lack of adequate information. When people do not receive adequate transparency regarding the dangers and extent of the pandemic, they can become frightened of the pandemic, which can than result in anxiety. (Desclaux et al., 2017).

Brooks' remaining two stressors are finances and stigma, these stressors can both influence mental health during and after a period of quarantine. Finances means that any financial loss as a consequence of quarantine could cause severe socioeconomic deprivation which has been identified as a trigger factor for symptoms of psychiatric disorders (Mihashi et al., 2009). Lastly, with stigma is meant that people who went in quarantine received rejection and observed stigmatization from people in their local neighborhoods. This implies being avoided, withdrawn social invitations, being treated with fear and suspicion, and receiving critical comments as a result of being quarantined (Lee et al., 2005).

2.4| Conceptual model & hypothesis |

Concluding from the existing literature it can be stated that a loss of financial means and a decrease in the number of social interactions are the main consequences of a stay-at-home order in general. It has also become clear that international students can be considered as a vulnerable population, also prior to COVID-19. Therefore, the next sections of this research will be analyzing whether international students in the Netherlands have struggled with their academic obligations as a result of COVID-19. Brooks' stressors influencing mental health of people during quarantine and de Man's academic stress will be used as a scale to measure possible patterns in the study progress of international students and whether this is affected by the ongoing COVID-19 pandemic. The hypothesis for this study is that international students experience both a deteriorated mental health and academic stress as a consequence of COVID-19 and as a result, they experience a delay in their academic progress. This is visualized in the conceptual model displayed in figure 1.
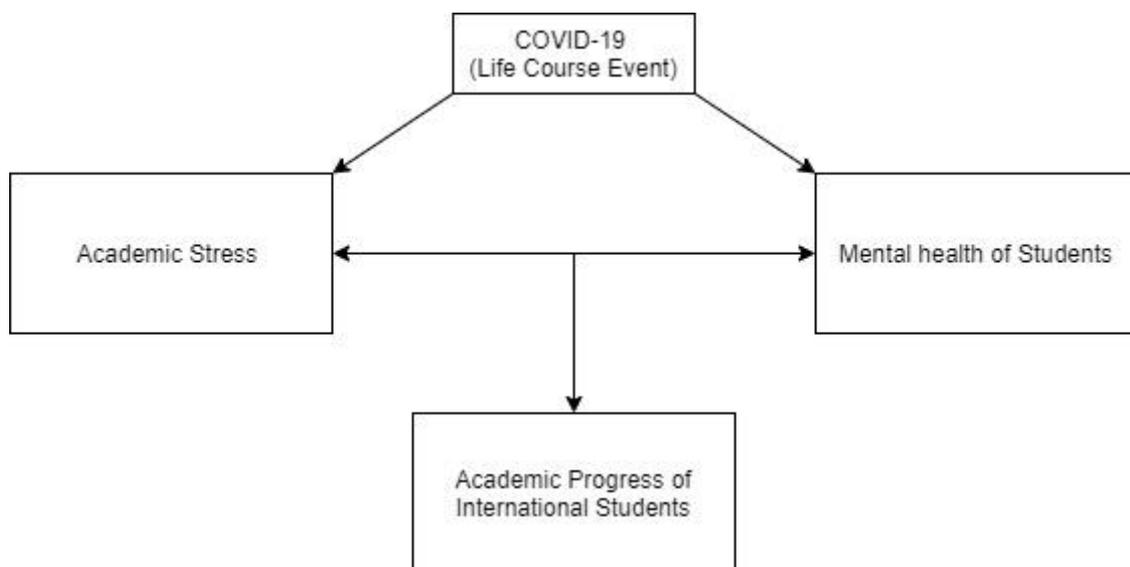

Figure 1: Conceptual model (Source: this paper)

3. Methodology

3.1| Data Collection & Quality of Data |

The relevant issues found in the literature, namely Brooks' stressors and De Man's Academic Stress, will be examined further in this thesis. First, a survey was designed in which respondents had the opportunity to answer questions regarding their educational experiences during COVID-19. A survey was chosen since it offers the benefit of acquiring primary quantitative data quickly and efficiently, compared to other types of primary data. Furthermore, survey data can be easily examined, and there is a higher likelihood of collecting significant quantities of data (Denscombe, 2010).

The target population for this research was international students studying at a Dutch university or academy. One of the survey questions was utilized to exclude cases that were ineligible for the purposes of this study. The dataset contained 77 respondents, four of whom were invalid because they were not international students pursuing their education at a Dutch institution. To answer the sub-question of whether there are differences between first year and more advanced students, a question in the survey was implemented that required respondents to fill in their year of study at the time of filling out the survey. The group of first-year students consisted of 29 respondents, whereas the group of advanced students had 44 respondents. Both groups and the dataset can be assumed as normally distributed, which is a prerequisite for running linear regression on the dataset (Burt et al., 2009).

The last two questions in the survey involve the gathered ECTs in the 4 semesters since COVID-19 occurred in the Netherlands in March 2020. Therefore, the last semester of previous academic year is also taken along in this question (semester 2B 2019-2020 and semester 1A, 1B and 2A of 2020-2021). The survey contains one question where the respondent must fill in how many ECTs he or she gathered during these four semesters. The last question is about the total ECTs that could have been gathered if a respondent would have passed all courses during these semesters mentioned above. These two questions are computed into one variable of the percentage of missed ECTs. This variable will be the dependent variable which is influenced by the independent variables academic stress, stressors that influence people's mental health, or dissatisfaction with one's current education. The independent variables are gathered through a different question in the survey.

To gather a sufficient amount of data, the survey was distributed among international students from own social networks, several Facebook groups, and associations for international students. Due to COVID-19, the data gathering process is restricted to online services. Even though surveys allow for the collection of large amounts of data in a relatively simple manner, this data set had difficulty obtaining a sufficient number of respondents due to COVID-19. More than 50 international student associations in the Netherlands received an email with a link to the survey and project details. Unfortunately, the bigger portion of associations did not respond, had an invalid email address or stated that they do not disseminate surveys among their members. As a result, the majority of respondents were obtained via broader social networks and by distributing the poll link among foreign students' Facebook groups. An overview of the Student Associations that were reached out to and whether they responded can be found in Appendix B.

3.2| Data analysis |

To use multiple linear regressions in order to analyze the answers of respondents, certain questions need to be established to create different variables. First, study progress is measured by gathered ECTS of a respondent. A ratio variable was created by calculating the percentage of ECTs a respondent missed during COVID-19. Second, the stressors of Brooks' were analyzed by one of the questions, this question created a nominal variable since there is a category (the stressors) but no ranking between the categories (Burt et al., 2009). However, in the statistical

analysis, the stressors of Brooks have all been transformed into different ratio variables, this makes analysis of every individual stressors less difficult. Finally, academic stress and satisfaction with one's current education will be analyzed by providing an ordinal scale to both. This implies that the survey contains of questions with a 1-10 scale on how much academic stress is experienced because of stay-at-home studying and how satisfied respondents are with their current study. Other questions are shown in the questionnaire guide in appendix A.

Concluding from the passage above, the variables that will be used are *'satisfaction with current education'*; *'academic stress'*; *'percentage of ECTs not gathered during period of COVID-19'*; and *'stressors that influence people's mental health'*. The stressors of Brooks are all converted into ratio variables, or 'scale' as it is called in SPSS, which causes that all can be used as an individual variable. For this thesis, four linear regressions will be run. The first regression will be used to see which stressors have a relationship with academic stress. *'Academic stress'* will be the dependent variable, *'Stressors of mental health'* will be the independent variables. The second regression will use *'percentage ECTs not gathered'* as a dependent variable and *'stressors of mental health'*; *'academic stress'*; and *'satisfaction with current education'* as dependent variables. The last four regressions will examine possible differences between first year- and more advanced students by performing a regression for both groups separately.

3.3| Ethical Considerations |
The respondent's identity must be kept secret when gathering respondents for a survey. Furthermore, when participating in such a study, the participant has specific privileges. The respondent's anonymity is secured during this study. Furthermore, the survey's initial question notifies the participant of their rights. The question provides a summary of the survey as well as the purpose of the study. Following that, one is notified of the ability to resign from involvement at any moment, as well as the fact that participation is entirely optional. Finally, permission to utilize the data for this thesis is requested. Respondents were required to answer either 'yes' or 'no' to allow the researcher for using their input. If a respondent marked 'no' at the first answer, the data of this participants would be removed from the data set. However, this was not the case for any of the 77 respondents.

4. Results

4.1| Academic Stress and Satisfaction with current education |
The data gathering process produced a sample of 73 valid respondents. Of those 73 respondents, 29 are first year students and 44 are in a later stage of their education. This sample will be used for statistical tests to find answers on the sub-question: 'is there a relation between academic stress and the stressors of Brooks regarding study progress of international students?' and 'What differences exist regarding academic progress between first year- and more advanced students?'

In this section, with the use of descriptive statistics and multiple linear regression, possible relations between the study progress on the one hand and factors influencing this study progress on the other are explored. First, the means of the variables 'satisfaction with current education' and 'academic stress' are displayed in Table 1. Although COVID-19 has asked a lot of international students, which can be seen from the average academic stress (6.99), the overall satisfaction with the participants' current education was relatively high (6.33). The discrepancy between students regarding their academic stress was higher compared to satisfaction with current education. This implies that academic stress has more outliers, and the general satisfaction is more centered around the mean.

	N	Min.	Max.	Mean	Std. Deviaton
Academic Stress	73	2	10	6,99	2,469
Satisfaction with current education	73	1	10	6,33	1,772
Valid N	73				

Table 1: Variable means (source: this paper)

4.2| the Stressors of Brooks and their influence on academic stress |

To assess whether the stressors of Brooks have an influence on academic stress experienced by international students during COVID-19, linear regressions for the sample as a whole, first year students and more advanced students have been run. In these linear regressions, *'academic stress'* was the dependent variable and the independent variables were the seven stressors introduced by Brooks. All regressions had a lower significancy than 0.05 and as a result, one might suggest that a relationship exist between the stressors and perceived academic stress of international students. The Adjusted R-square, which states how many of the variance is covered with each model, and the p-values are displayed in table 2. An overview of all results of the linear regression can be found in appendix C, D, E, F, G, and H.

Group	*Adjusted R-Squared*	*Sig.*
Students of all years	,315	,000
First Year Students	,502	,001
More Advanced Students	,264	,010

Table 2: Relevant output of stressors causing academic stress (source: this paper)

It could be deduced from the p-values that there are relations between stressors and academic stress. Table 3 displays the various stressors and their corresponding unstandardized coefficients. This table shows which stressors influence academic stress and what kind of effect each stressor has for either all students, first-year students, or more advanced students.

	All students		First year		More advanced students	
Stressor	Sig.	Coefficients	Sig.	Coefficients	Sig.	Coefficients
Duration of lockdown	,002	,018	,549	,006	,001	,026
Fear of getting infected	,103	,009	,260	,008	,410	,006
Frustration and boredom	,060	,012	,003	,030	,668	-,004
Inadequate supplies	,263	,017	X	X	,181	,021
Inadequate information	,567	-,004	,272	-,011	,997	-2,784E-5
Loss of Finances	,000	,022	,050	,023	,016	,017
Stigma	,199	,009	,106	,018	,988	,000

Table 3: Stressors and their possible effect on academic stress (source: this paper)

A brief glance at table 3 reveals that the stressors that induced academic stress among students of all grades were the 'duration of a lockdown' and 'loss of finances.' According to Hawryluck et al., the duration of a stay-at-home order might increase the likelihood of post-traumatic stress symptoms, which is consistent with the findings of this study. Videlicet, every additional day of quarantine caused a 0.018-point increase in experienced academic stress (on a 10-point scale). In other words, if a stay-at-home order would last 6 months, an international student's academic stress increases by 3.24 points, and as the scale of academic stress ranges from 0 to

10, one might conclude that a half year of quarantine raises one's academic stress by 32.4 percent. The other stressor that affected academic stress was financial loss as a result of a stay-at-home order. Parkes explained how, as an overseas student, not being able to acquire supplementary finances caused a complicated scenario in Australia. Furthermore, Firang discovered that students were experiencing extreme anxiety as a result of, among other things, financial resource losses. The impact of losing any extra valuta due to COVID-19 is 0.022 point. This indicates that for every valuta lost, one's academic stress rises by 0.022 point. This rise, however, cannot be seen as a linear effect since the scale of perceived academic stress is peaked at 10, and if a person loses, say, 500 euros, he or she will not experience a level of academic stress of 11.

When first-year students and advanced students are examined independently, it becomes clear that both groups are feeling academic stress as a result of lost income. Anxiety as a result of financial strains is in line with the findings of Arubayi and Marville, who concluded that students encounter the most difficulties, and thus possible anxiety, when it comes to income reductions. First-year students appear to struggle more when it comes to losing financial resources. Every additional lost valuta raises academic stress among first-year students by 0.023 point, compared to 0.017 point for a more advanced student, which is a 1.35-fold increase. One possible explanation is that more advanced students had the chance to settle in their place of study and find employment prior to COVID-19. As a result, losing financial resources may have less of an impact on advanced students than it does on first-year students. However, because this study lacks sufficient relevant data to draw correct conclusions regarding this difference, it may be an intriguing issue for future investigation.

Another distinction between first year and more advanced students is that first-years are impacted by 'frustration and boredom', whereas advanced students are more influenced by the length of lockdown. Frustration and boredom can be caused by a lack of a suitable social network on which to rely. Based on Smith's premise, a possible argument is that first-year students did not have the opportunity to establish a trustworthy social network in their place following from the stay-at-home order. Smith, however, argues that not being able to say goodbye to former friends and colleagues can increase anxiety levels among students, but this claim is not supported by data since more advanced students do not experience frustration and boredom in such a way that it impacts their level of academic stress. Contrary, the duration of lockdown impacting more advanced students may be the result of having a reliable social network but not being able to see them as frequently as one would like. Cao et al. suggested that changes in everyday life, among other things, corresponded with increased levels of anxiety among students, which supports the results of this linear regression. In this study, a participant experienced a 0.026-point increase in academic stress for each successive day of a stay-at-home order. Since first-year students do not regard the duration of a lockdown as a probable determinant of increased academic stress, the effect of the duration of lockdown is about one-and-a-half times greater than the overall population, including first-year students. Graph 1 depicts all stressors that have a substantial influence on the experienced academic stress of students from all degrees, first-year students, or more advanced students.
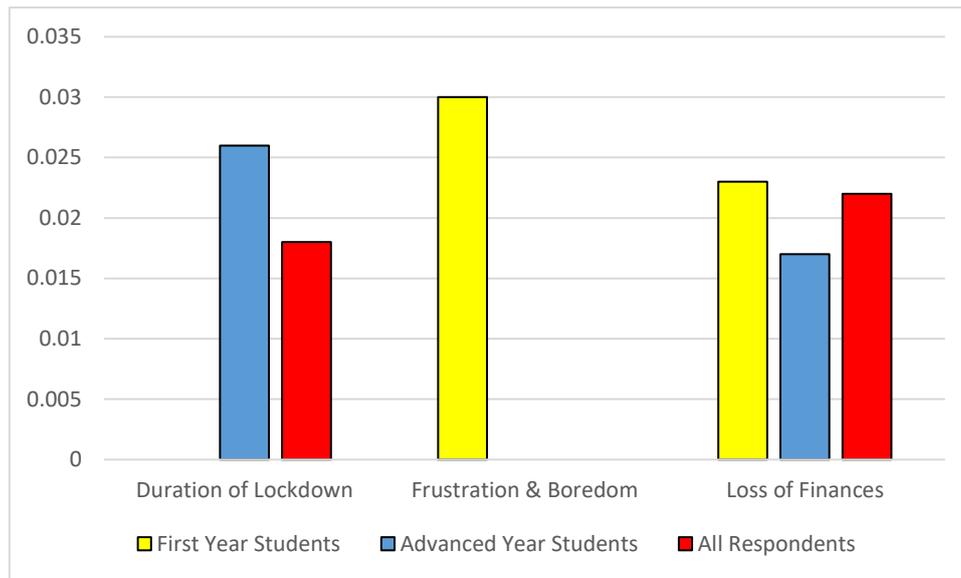
Graph 1: Stressors causing academic stress (Coefficients) (source: this paper)

4.3| **Study progress of international students** |

For the remaining three linear regressions, '*percentage of ECTs missed*' has been used as the dependable variable. '*Academic stress*', '*satisfaction with current education*,' and '*stressors of Brooks*,' were the explaining independent variables in these regressions. Tables 4 and 5 provide the R-squared, P-values, and coefficients of these linear regressions.

Group	Adjusted R-Squared	Sig.
Students of all years	,083	,820
First Year Students	,464	,167
More Advanced Students	,141	,816

Table 4: Relevant output study progress of international students influenced (source: this paper)

	All students		First year		More advanced students	
Stressor	Sig.	Coefficients	Sig.	Coefficients	Sig.	Coefficients
Duration of lockdown	,445	-,001	,107	-,002	,087	,002
Fear of getting infected	,349	,001	,167	-,001	,926	,000
Frustration and boredom	,569	,000	,312	-,001	,945	,000
Inadequate supplies	,831	,000	,075	-,002	,968	5,138E-5
Inadequate information	,473	-,001	,864	,000	,789	,000
Loss of Finances	,472	,001	,818	,000	,621	,001
Stigma	,737	,000	,107	-,002	,969	-5,088E-5
Satisfaction with education	,798	,005	,823	,006	,520	-,020
Academic stress	,577	,010	,251	,028	,969	-5,088E-5

Table 5: Study progress influenced and their possible effect on percentage missed ECTs (source: this paper)

The p-values of the linear regressions provided in table 4 indicate that the conducted regressions are not significant, thus we accept the null hypothesis and cannot conclude that any of the parameters impact the percentage of missed ECTs. When the coefficients and p-values of the various factors, or independent variables, are examined, it becomes clear that there is no one factor that influences the academic progress of foreign students. However, when a 90% confidence interval is employed instead of the customary 95% confidence interval, some of the stressors do have a measurable effect and may therefore be affecting the academic progress of international students. However, since the confidence intervals are broadened, this assertion is less trustworthy.

With a 90% confidence interval, 'inadequate supplies' becomes a factor influencing first-year students' academic achievement. More advanced students, on the other hand, are more affected by the length of the lockdown, which is consistent with the findings of previous multiple regressions, which indicated that more advanced students experience greater academic stress as a result of the length of a stay-at-home order. The coefficient for 'inadequate supplies' equals -.002. This inverse relationship means that for every unit of disrupted supplies, such as pharmaceuticals, nutrition, and other daily necessities, the percentage of missed ECTs increases by 0.2 percent (take into account that the dependent variable is no longer on a 10-point scale, instead a scale of 0 to 100 percent is used). Blendon addressed how being unable to acquire materials needed in one's daily life might create dissatisfaction and, as a result, anxiety levels to rise.

The coefficient for 'duration of lockdown,' which affects more advanced students, is equivalent to .002. In other words, for every day that a stay-at-home order is increased, the rate of missed ECTs among advanced foreign students increases by 0.2 percent. This means that if a lockdown lasts another six months, the percentage of ECTs missed will be 36%. However, because the regression models themselves produced insignificant results, making these statements is risky since they are less reliable. Furthermore, by extending the confidence intervals, the assumptions made become less trustworthy.

When the adjusted R-squares of the different models are evaluated, it becomes evident that the variance explained in these models ranges from weak to moderate. This means that by including more components, the variance covered by these models may be enhanced. One plausible alternative is to include levels of anxiety, depressive symptoms, or suicidal thoughts in future research, which is consistent with Kaparounaki's findings that COVID-19 resulted in a worrisome increase of these three factors among Greek university students. However, due to ethical concerns and the mental well-being of all participants, these were not interpreted in this thesis.

Finally, Grove and Bennet declared that universities in England will continue to use remote teaching for the upcoming academic year. Based on that premise, it is possible to conclude that the overall image of 'remote teaching' is pleasing to both teachers and students. A student may feel better at ease taking an exam in his or her own private space. As an outcome, the percentage of missed ECTs may not be the greatest metric for predicting foreign students' academic progress. In fact, it is possible that students pass the majority of their tests and hence do not experience impacts on their academic progress. However, as revealed by the initial linear regressions, students are experiencing increasing academic stress as a result of the COVID-19 epidemic. As a result, it is vital to prioritize international students' mental health over their academic development in follow-up research.

5. Conclusion

5.1| Answer research questions |

This research attempted to discover a probable relation between international students' academic achievements and indicators of mental health and academic stress as a result of COVID-19. According to the literature review, foreign students were already a vulnerable population prior to COVID-19. Financial difficulties and language barriers are two factors that impact this population's mental health and can lead to academic stress. Several studies have indicated that a lack of funds and a lack of social interactions might lead to a deterioration of students' mental health. Furthermore, when a student is generally satisfied with their education and living environment, the adaptation to a new education and culture in a foreign nation might be accelerated.

As a result of COVID-19, the factors that could produce anxiety and high stress levels are intensified. The major causes of heightened stress among students are national lockdowns, university campus closures, and loss of income. Students' mental health is deteriorating owing to a variety of causes, which are concisely represented in Brooks' stressors. First-year students are most impacted by 'frustration and boredom,' on the one hand, and 'loss of financial resources,' on the other. More advanced students are also impacted by the 'loss of financial resources,' but instead of 'frustration and boredom,' they are facing more academic stress as a result of an extended quarantine period. This addresses the sub-question of whether or not there are distinctions between first year- and more advanced students. One possible explanation is that students who began their education during the worldwide epidemic did not have the same opportunity to form a reliable social network, whilst students who started their education in an earlier stage, struggle to see their social network as a consequence of a national lockdown.

Following several linear regressions, the hypotheses derived from the literature could not be supported, and thus no assertions regarding relationships between academic stress or stressors impacting people's mental health during quarantine and the study progress of international students can be made. Although foreign students were experiencing academic stress, the evidence does not indicate that this had an impact on their academic performance. However, there are many other opportunities for additional investigation on this topic. For example, one may conduct the same experiment again at a later stage of the pandemic to determine if stressors such as 'duration of lockdown,' 'frustration and boredom,' 'loss of income,' and 'inadequate supplies' played a greater role in the everyday lives of foreign students. If this is the case, it will be important to observe if a stay-at-home order would have any effect on the academic progress of international students.

One possible explanation for the research's hypotheses being rejected is that students perceive 'remote teaching' to be more enjoyable or less demanding compared to following classes onsite. As a result, this thesis suggests that more research should be conducted on the effect of remote teaching on the academic performance of overseas students.

In conclusion, the answer to the research question 'to what extent is the COVID-19 pandemic affecting the academic progress of international students studying in the Netherlands?' cannot be offered with the help of the data acquired for this study. Although the data set employed yielded some intriguing findings, this study cannot prove that the COVID-19 pandemic is impacting the academic progress of international students studying in the Netherlands.

5.2| Limitations and weaknesses |

Due to COVID-19, the data gathering process have been difficult. As a result, the number of valid cases for this research have remained limited. A larger data set gives possibilities to explore more patterns in the academic behavior of international students. Next to that, this

research focused only on missed ECTs as a characteristic for academic progress. Although ECTs give a fair impression about one's academic progress, other factors, such as personal development or happiness, might play a role as well. Next to that, one can gather all ECTs one could achieve during the period of COVID-19 but can still suffer from a deteriorated mental health and still struggling with, for example, depressive symptoms or even suicidal thoughts. However, these factors are probably better analyzed with means of a qualitative research methods like interviews, where one has the possibility to analyze behavior in a much more thorough manner.

6. Bibliography

Altbach, P. G., & Teichler, U. (2001). Internationalization and exchanges in a globalized university. *Journal of Studies in International Education, 5*(1), 5–25.

Arubayi, E. (1980). Identification of problems experienced by Nigeria students enrolled in Kansas State universities. Nigeria. ERIC Database.

Bao, Y., Sun, Y., Meng, S., Shi, J., & Lu, L. (2020). 2019-nCoV epidemic: Address mental health care to empower society. *The Lancet*, 395(10224), 37-38.

Bennett, R. (2020). *All lectures at Cambridge University to be online-only next year.* The Times. Retrieved on April 9, 2021 from https://www.thetimes.co.uk/article.

Blendon, R. J., Benson, J. M., DesRoches, C. M., Raleigh, E. & Taylor-Clark, K. (2004). The public's response to severe acute respiratory syndrome in Toronto and the United States. *Clin Infect Dis,* 38(7), 925-931

Bowen, M. (2020). Covid-19 has changed how we teach students. *Veterinary Record,* 186, 461-461

Braunack-Mayer, A., Tooher, R., Collins, J. E., Street J. M. & Marshall H. (2013). Understanding the school community's response to school closures during the H1N1 2009 influenza pandemic. *BMC Public Health*, 13, 344.

Brooks, S., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N. & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*, 395, 912-920.

Burt, J. E., Barber, G. M., & Rigby, D. L. (1996). *Elementary Statistics for Geographers.* 2nd edition. New York: Guilford Publications.

Cao, W., Fang, Z., Han, M., Xu, X., Dong, J. et al. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Changzhi. Psychiatry Research*, 287.

Cava, M.A., Fay, K.E., Beanlands, H.J., McCay, E.A. & Wignall, R. (2005). The experience of quarantine for individuals affected by SARS in Toronto. *Public Health Nurs*, 22, 398–406.

Chang, S., Stuckler, D., Yip, P. & Gunnell, D. (2013). Impact of 2008 global economic crisis on suicide: Time trend study in 54 countries. *British Medical Journal*, 347.

Culhane, D., Szymkowiak, D., & Schinka, J. A. (2019). Suicidality and the onset of homelessness: Evidence for a temporal association from VHA treatment records. *Psychiatric Services*, 70(11), 1049–1052.

Daniel, S. J. (2020). Education and the COVID-19 pandemic. Vancouver, Canada. Acsenda School of Management.

Denscombe, M. (2010). *The Good Research Guide for Small-Scale Social Research Projects.* 4th edition. London: Butterworth-Heinemann.

Desclaux, A., Badji, D., Ndione, A. G. & Sow, K. (2017). Accepted monitoring or endured quarantine? Ebola contacts' perceptions in Senegal. *Soc Sci Med*, 178, 38–45.

Elbogen, E. B., Lanier, M., Blakey, S. M., Wagner, H. R. & Tsai, J. (2021). Suicidal ideation and thoughts of self-harm during the COVID-19 pandemic: The role of COVID-19-related stress, social isolation, and financial strain. *Depression and Anxiety*, 1–10.

Firang, D. (2020). The impact of COVID-19 pandemic on international students in Canada. *International Social Work*, 63(6), 820–824.

Friesen, J. (2020). *Universities, Colleges Face Potential Budget Crunch as they Assess the Impact of COVID-19 on International Student Enrolment*. The Globe and Mail. Retrieved on April 15, 2021 from https://www.theglobeandmail.com.

Gallego-Gómez, J. I., Carrión-Martinez, A., Balanza, S., Rodríhuez-González-Moro, M. T., Simonelli-Muñoz, A. J. & Rivera-Caravaca, J.M. (2020). The Covid-19 Pandemic and Its Impact on Homebound Nursing Students. *International Journal of Environmental Research and Public Health*, 17(7383).

Grove, J. (2020). *Coronavirus: Manchester to keep lectures online in autumn*. Times Higher Education. Retrieved on April 9, 2021 from https://www.timeshighereducation.com/.

Hawryluck, L., Gold, W. L., Robinson, S., Pogorski, S., Galea, S. & Styra, R. (2004). SARS control and psychological effects of quarantine. *Emerg Infect Dis*, 10, 1206–1212.

Hsu, P. Y. (2003). An assessment of counseling needs of international students at University of Wisconsin-Stout. WI University of Wisconsin-Stout.

Iarovici, D. (2014). Mental health issues and the university student. Baltimore. *Johns Hopkins University Press*.

Kagan, H. & Cohen, J. (1990). Cultural adjustment of international students. *Psychological Science*, 1, 133–137.

Kaparounaki, C. K. et al. (2020). University students' mental health amidst the COVID19 quarantine in Greece. *Psychiatry Research*, 290.

Kneipp, S. M, Kairalla, J. A., Stacciarini, J. M., Pereira, D., & Miller, M. D. (2010). Comparison of depressive symptom severity scores in low-income women. *Nursing research*, 59(6), 380-388.

Lee, S., Chan, L. Y., Chau. A. M., Kwok, K. P. & Kleinman, A. (2005). The experience of SARS-related stigma at Amoy Gardens. *Soc Sci Med*, 61, 2038–2046.

Lewthwaite, M. (1996). A study of international students' perspectives on cross-cultural adaptation. *International Journal for the Advancement of Counselling*, 19, 167–185.

Lingawi, H. S. & Afifi, I. K. (2020). COVID-19 Associated Stress Among Dental Students. *Open dentistry journal*, 14, 554 – 562.

Man de, J. et al. (2020). Disentangling depression in Belgian higher education students amidst the first COVID19 lockdown (April-May 2020). *Archives of Public Health*, 79(3).

Marville, A. (1981). The case of international students: A foreign student reports. *College Board Review*, 120, 23–26.

McGill, J. (2013) International Student Migration: Outcomes and Implications. *Journal of International Students,* 3, 167–181.

Mihashi, M., Otsubo, Y., Yinjuan, X., Nagatomi, K., Hoshiko, M. & Ishitake. T. (2009). Predictive factors of psychological disorder development during recovery following SARS outbreak. *Health Psychol*, 28, 91–100.

Miller, G. (2011). Fundamentals of Crisis Counseling. Hoboken, John Wiley & Sons.

Parkes, Z. (2020). COVID-19: International students must not be abandoned. Greenleft, 1263.

Richardson, T., Elliott, P. & Roberts, R. (2013). The relationship between personal unsecured debt and mental and physical health: A systematic review and meta-analysis. *Clinical Psychology Review*, 33(8), 1148–1162.

Sam, D. L. & Eide, R. (1991). Survey of mental health of foreign students. *Scandinavian Journal of Psychology*, 32, 22–30.

Sewell, W. H. & Davidson, O. M. (1961) Scandinavian Students on an American Campus. University of Minnesota Press, Minneapolis.

Sherry, M., Thomas, P. & Chui, W.H. (2010). International students: a vulnerable student population. *Higher Education*, 60, 33–46.

Smith, C. A. (2020). Covid-19: healthcare students face unique mental health challenges. BMJ, 369.

Sümer, S., Poyrzli, S. & Grahame, K. (2008). Predictors of depression and anxiety among international students. *Journal of Counseling & Development, 86*(4), 429–437.

Torales, J., O'Higgins, M., Castaldelli-Maia, J. M. & Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. *International Journal of Social Psychiatry*, 66(4), 317–320.

WHO. (2021). WHO Coronavirus (COVID-19) Dashboard. Retrieved on May 9, 2021 from https://covid19.who.int/

Yeh, C. J. & Inose, M. (2003). International students' reported English fluency, social support satisfaction, and social connectedness as predictors of acculturative stress. *Counselling Psychology Quarterly, 16*(1), 15–28.

Appendix A: Questionnaire Guide: *Questions* [Answer possibilities]

This questionnaire intends to provide data about the study progress of international students in the Netherlands. The data is used to make claims whether COVID-19 has influenced the study progress of international students. These claims are used for a bachelor thesis from the Faculty of Spatial Sciences at the University of Groningen. The data is in form of short open and closed questions and will only be used for the purpose of the Bachelor Thesis. The data will only be used by the student and his supervisor and participation is completely anonymous. After the completion of the Bachelor thesis, the data will be destroyed. If you have any further comments, suggestions or other things regarding this survey, do not hesitate to send a mail to: gijsburghgraef@icloud.com

Q1) I have read the information about the research project. I had enough time to decide to participate in the research. My participation is completely voluntary. I can withdraw from the research at any time, without having to give a reason. I give my permission for using the questionnaire data for the following purposes: Analyzing my answers for the purpose of a Thesis about study progress of international students. I agree to fill in this survey and that my answer can be used for this Bachelor Thesis

Q2) *Are you a non-Dutch student who follows an education at a Dutch University/Academy?* [Yes/No]

Q3) *In which year of your study are you currently?* [1/2/3/4+]

Q4) *Have you lived in the Netherlands during your education?* [Yes/No]

Q5) *Do you currently live in the Netherlands?* [Yes/No]

Q6) *If you are not living in the Netherlands at this moment, in which country do you live currently?* [Open Question]

Q7) *On a 1 to 10 scale, how satisfied are you with your current education?* [1 to 10]

Q8) *On a 1 to 10 scale, have you encountered academic stress as a result of stay-at-home studying? (1 = no academic stress, 10 = very many academic stress) (think of study delay, fatigue, unhappiness with current education, financing of study)* [1 to 10]

Q9) *Which of the following stressors have applied to you during the last year of stay-ay-home studying? (multiple answers allowed)* [stressors mentioned in the literature + none of the above]

Q10) *How many ECTS have you gathered last year? (semester 2B 2019/2020 + Semester 1A, 1B and 2A 2020/2021)* [Open Question]

Q11) *How many ECTS you could have gathered during this period if you passed all courses?* [Open Question]

Appendix B: *List of International Student Associations that were reached out to in order to gather more participants for Thesis' survey.*

Categories = Is email address valid? Has the student association responded? Did they distribute the survey, suggested to use their Facebook, or did they respond by saying that they could not distribute the survey?

Student Associations		Name/Mail Address	Address Valid?	Responded?	Distributed/FB/Not Distributed
	1	Board@aegee-groningen.nl	YES	NO	
	2	ASC Groningen asc@rug.nl	YES	YES	Facebook
	3	groningen@aiesec.nl	YES	NO	
	4	Delft@aiesec.nl	YES	NO	
	5	Amsterdam@aiesec.nl	YES	NO	
	6	Leiden@aiesec.nl	YES	NO	
	7	Maastricht@aiesec.nl	YES	NO	
	8	Nijmegen@aiesec.nl	YES	NO	
	9	Rotterdam@aiesec.nl	YES	NO	
	10	Tilburg@aiesec.nl	YES	NO	
	11	Twente@aiesec.nl	YES	NO	
	12	Utrecht@aiesec.nl	NO	NO	
	13	Wageningen@aiesec.nl	YES	NO	
	14	Alasgroningen@gmail.com	YES	NO	
	15	groningen.acssg@gmail.com	YES	NO	
	16	Info@esn-groningen.nl	YES	YES	Facebook
	17	Gutsagroningen@gmail.com	YES	NO	
	18	Hostifes@gmail.com	YES	YES	Facebook
	19	Bestuur@ifmsa.nl	YES	NO	
	20	Info@ppigroningen.nl	YES	YES	Distributed
	21	Saudistudentclub@rug.nl	YES	YES	Distributed
	22	Info@sib-groningen.nl	YES	YES	Not Distributed
	23	Visogboard@gmail.com	YES	NO	
	24	Office@eagee-amsterdam.nl	NO	NO	
	25	Aegee@student.ru.nl	YES	NO	
	26	Info@jfvnijmegen.nl	YES	NO	

27	Info@unitednetherlands.nl	NO	NO	
28	Info@esn-utrecht.nl	YES	NO	
29	Info@isma-amsterdam.org	YES	NO	
30	Info@isn-amsterdam.nl	YES	NO	
31	Info@esnthehague.nl	YES	NO	
32	Info@inter-access.nl	YES	NO	
33	Info@sib-utrecht.nl	YES	NO	
34	Info@esn-rotterdam.nl	YES	YES	Facebook
35	Info@ema-eur.nl	NO	NO	
36	Info@csa-eur.nl	YES	YES	Distributed
37	Italianerasmussociety@gmail.com	YES	NO	
38	Info@asah-eur.nl	YES	NO	
39	rotterdam.ppi@gmail.com	YES	YES	Distributed
40	hague.nl@jef.eu	YES	NO	
41	Eusaleiden@gmail.com	YES	YES	Distributed
42	Info@cirosthehague.com	YES	YES	Not Distributed
43	Irsa@ffga.leidenuniv.nl	NO	NO	
44	Maastricht@ifmsa.nl	NO	NO	
45	Aegee-maastricht@aegee.eu	YES	NO	
46	Hr@enactusmaastricht.nl	YES	YES	Distributed
47	Info@aegee-tilburg.nl	YES	YES	Not Distributed
48	Info@iesntilburg.nl	YES	NO	
49	Info@awakeinternational.nl	NO	NO	
50	Cosmos@tue.nl	YES	YES	Facebook
51	Innovum@fontys.nl	YES	NO	
52	Isow@wur.nl	YES	NO	
53	Info@ixesn-wageningen.nl	NO	NO	
54	Ppiwageningen@yahoo.nl	NO	NO	
55	Info@olah.nl	YES	NO	
56	Info@hsfn.nl	YES	NO	
57	Ucas@wur.nl	YES	YES	Distributed

Appendix C1: *Model Summary¹*

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	,618	,382	,315	2,043

Appendix C2: ANOVA (dependent variable = academic stress)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	167,712	7	23,959	5,741	,000
	Residual	271,274	65	4,173		
	Total	438,986	72			

Appendix C3: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	11,762	1,762		6,676	,000
	Duration of Lockdown	,018	,006	,337	3,176	,002
	Fear of getting infected	,009	,005	,170	1,653	,103
	Frustration and Boredom	,012	,006	,203	1,913	,060
	Inadequate Supplies	,017	,015	,113	1,129	,263
	Inadequate Information	-,004	,006	-,059	-,576	,567
	Loss of Finances	,022	,005	,420	3,978	,000
	Stigma	,009	,007	,129	1,299	,199

---

¹If a numeric value begins with a zero, the zero is not shown in statistical analysis. For instance, the adjusted R Square of ,315.

Appendix D1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	.289	,083	-,064	,272329410764749

Appendix D2: ANOVA (Dependent Variable: Percentage missed ECTs)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,377	9	,042	,565	,820
	Residual	4,153	56	,074		
	Total	4,530	65			

Appendix D3: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	,082	,365		,225	,823
	Satisfaction with Education	,005	,021	,037	,258	,798
	Academic Stress	,010	,018	,096	,561	,577
	Duration of Lockdown	-,001	,001	-,123	-,769	,445
	Fear of getting infected	,001	,001	,130	,944	,349
	Frustration and Boredom	,000	,001	-,081	-,573	,569
	Inadequate Supplies	,000	,002	-,029	-,214	,831
	Inadequate Information	-,001	,001	-,097	-,722	,473
	Loss of Finances	,001	,001	,117	,724	,472
	Stigma	,000	,001	,046	,338	,737

Appendix E1: *Model Summary*

Model	R Year of Study = 1	R Square	Adjusted R Square	Std. Error of the estimate
1	,783ᵃ	,613	,502	1,835

Appendix E2: ANOVA (Dependent Variable: Academic Stress, Year of Study = 1)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	111,929	6	18,655	5,537	,001
	Residual	70,749	21	3,369		
	Total	182,679	27			

Appendix E3: Coefficients (Inadequate Supplies removed from analyses because of invalidity, Year of Study = 1)

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	Constant	10,490	1,675		6,263	,000
	Duration of Lockdown	,006	,009	,103	,610	,549
	Fear of getting infected	,008	,007	,162	1,157	,260
	Frustration and Boredom	,030	,009	,533	3,334	,003
	Inadequate Information	-,011	,010	-,162	-1,129	,272
	Loss of Finances	,023	,011	,350	3,978	,050
	Stigma	,018	,011	,251	1,299	,106

Appendix F1: *Model Summary*

Model	R Year of Study = 1	R Square	Adjusted R Square	Std. Error of the estimate
1	,681ª	,464	,196	,190306567271689

Appendix F2: ANOVA (Dependent Variable: Percentage of ECTs missed, Year of Study = 1)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,501	8	,063	1,730	,167
	Residual	,579	16	,036		
	Total	1,081	24			

Appendix F3: Coefficients (Inadequate Supplies removed from analyses because of invalidity, Year of Study = 1)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	-,482	,334		-1,442	,169
	Satisfaction with Education	,006	,028	,057	,228	,823
	Academic Stress	,028	,024	,342	1,190	,251
	Duration of Lockdown	-,002	,001	-,438	-1,708	,107
	Fear of getting infected	-,001	,001	-,310	-1,448	,167
	Frustration and Boredom	-,001	,001	-,267	-1,044	,312
	Inadequate Supplies	-,002	,001	-,401	-1,902	,075
	Inadequate Information	,000	,001	-,046	-,174	,864
	Loss of Finances	,000	,002	-,056	-,234	,818
	Stigma	-,002	,001	-,438	-1,708	,107

Appendix G1: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	,619	,384	,264	2,017

Appendix G2: ANOVA (Dependent Variable: Academic Stress, Year of Study = 2, 3, or 4+)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91,113	7	13,016	3,200	,010
	Residual	146,432	36	4,068		
	Total	237,545	43			

Appendix G3: Coefficients (Year of Study = 2, 3, or 4+)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	11,229	1,869		6,007	,000
	Duration of Lockdown	,026	,007	,514	3,668	,001
	Fear of getting infected	,006	,007	,127	,834	,410
	Frustration and Boredom	-,004	,009	-,065	-,432	,668
	Inadequate Supplies	,021	,015	,187	1,365	,181
	Inadequate Information	-2,784E-5	,008	-,001	-,003	,997
	Loss of Finances	,017	,007	,375	2,538	,016
	Stigma	,000	,009	,002	,015	,988

Appendix H1: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	,375	,141	-,109	,297104455102312

Appendix H2: ANOVA (Dependent Variable: percentage of ECTs missed. Year of study = 2, 3, or 4+)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,448	9	,050	,564	,816
	Residual	2,736	31	,088		
	Total	3,184	40			

Appendix H3: Coefficients (Year of study = 2, 3, or 4+)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	,612	,520		1,176	,249
	Satisfaction with Education	-,020	,030	-,122	-,650	,520
	Academic Stress	-5,088E-5	,001	-,008	-,039	,969
	Duration of Lockdown	,002	,001	,349	1,767	,087
	Fear of getting infected	,000	,001	-,019	-,094	,926
	Frustration and Boredom	,000	,002	,013	,069	,945
	Inadequate Supplies	5,138E-5	,001	,008	,041	,968
	Inadequate Information	,000	,001	,057	,269	,789
	Loss of Finances	,001	,001	,089	,500	,621
	Stigma	-5,088E-5	,001	-,008	-,039	,969