

Bachelor thesis

To what extent is the change of social participation associated with the change of psychological wellbeing and depressive mood and loneliness of Dutch and German university students during the COVID-19 pandemic?

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Abstract

Background: Due to the COVID-19 pandemic, social distancing measures were applied to prevent the virus from further spreading. Although these measures are one of the most important public health instructions, they cause a rupture in the daily lives of all people. Especially the young population is affected by the drastic changes during the pandemic, particularly in terms of social participation. Social participation is an important component of good mental health. This study aims to explore whether there is a difference in social participation, psychological wellbeing, depressive mood, and loneliness, as well as possible associations between the change of social participation and changes of psychological wellbeing, depressive mood and loneliness.

Methods: A cross-sectional design was used. Recruitment was done via snowball sampling. Social participation was measured with the 'Social participation Questionnaire' (SPQ), psychological wellbeing with the 'Psychological Wellbeing Scale', depressive mood and feelings with the 'Short Mood and Feelings Questionnaire' (SMFQ), and loneliness using 'Loneliness Scale' for two recall periods. Wilcoxon signed-rank tests were used to explore the change in social participation, psychological wellbeing, depressive mood, and loneliness between 'before' and 'during' social distancing measures. Spearman's correlation was used to assess correlations between the change ('before-during social distancing measures') of social participation and changes ('before-during social distancing measures') of psychological wellbeing, depressive mood and feelings and loneliness.

Results: The sample included 120 participants. The results showed that social participation decreased significantly during social distancing measures ($p < .001$). Psychological wellbeing ($p < .001$) worsened whereas depressive mood ($p < .001$) and loneliness ($p < .001$) increased during social distancing measures. Reduction in social participation significantly correlated with increased depressive mood and feelings ($p < .001$) and deteriorated psychological

wellbeing ($p = .001$). However, reduced social participation was not significantly correlated with loneliness.

Conclusion: As the student's psychological wellbeing, depressive mood and loneliness worsened during COVID-19 social distancing measures and an association between reduction of social participation and worsened psychological wellbeing and increased depressive mood in German and Dutch university students was found, a balance between sufficient social participation and adherence to social distancing measures could be the key to reduce student's mental health consequences.

Keywords: COVID-19 pandemic, social participation, mental wellbeing, university students

Introduction

In December 2019, China experienced an outbreak of a novel virus. This virus, also known as SARS-CoV-2, caused the infectious coronavirus disease (COVID-19) in Wuhan City, China (Shi, 2020). By March 11, 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic as the virus has spread rapidly to many other countries after the first outbreak in China (Cucinotta & Vanelli, 2020). More specifically, the WHO reported 223 countries with corona cases. Worldwide, there have been more than 113 million confirmed cases and 2.5 million deaths (WHO, 2021a, 2nd of March). Symptoms of COVID-19 can range from mild to more severe symptoms. In most cases, people infected with COVID-19 experience mild symptoms like fever, dry cough and fatigue. However, 20% experience severe symptoms such as shortness of breath or chest pain and are dependent on medical care in the hospital. In the worst case, complications like respiratory or kidney failure can arise, leading to death (WHO, 2021b, 2nd of March). Because the virus SARS-CoV-2 can be easily transmitted from one person to another (Shi, 2020), public health measures were globally set in place to help to defeat the pandemic.

To prevent the virus from further spreading, the Netherlands and Germany have established several containment policies, including social distance and hygiene rules. Specifically, these involve keeping a distance of 1.5 meters from other people, washing hands regularly and accurately, wearing a face mask in public, limiting contact with other people and staying home when feeling ill (Bundesregierung, 2021; RIVM, 2021). The government applied these containment policies to diminish the current number of infections and prevent the virus from further spreading. Besides, these measures are essential to hinder new variants of the coronavirus from entering the Netherlands (Government of the Netherlands, 2021). Of all these public health policies, social distancing is one of the most important rules to follow. Social distancing measures have already been implemented in the past to prevent further

transmission of viruses (Huremović, 2019). For instance, in earlier pandemics like the Ebola outbreak or the H1N1 epidemic, social distancing has already been applied (Leung et al., 2018). Although social distancing measures are an essential method to ensure protection for everyone, they cause a rupture in the daily lives of all human beings.

Although all people are affected by the COVID-19 public health policies, the lives of university students have changed most drastically compared to other groups during the COVID-19 pandemic. To be more precise, physical education was shifted to online classes, online exams were introduced, non-essential jobs were shortened drastically or ultimately cancelled and going abroad was blocked. Apart from the study life, their leisure time also completely changed due to lack of sports activities and restrictions to meet friends and family (Berg-Beckhoff et al., 2021). Since almost all COVID-19 social distancing measures include interactions with social contacts, the government requires the entire population to reduce their engagement in social activities. However, the life span of university students is mainly characterized by social contacts, which help them to ‘develop a deeper awareness of personal responsibility and interdependence as members of society’ (Berg-Beckhoff et al., 2021, p.3). Another study by Koning and colleagues (2021) reported that the young population is involved in a complex social network essential for their identity development. Thus, all these social distancing measures could lead to a decrease in social participation among students.

Social participation addresses ‘how actively a person takes part in social activities such as with religious, hobby, volunteer, and political groups’ (Lee et al., 2008, p.1043). Social participation is an important component of good mental health. This is supported by the Self- Determination Theory (SDT), which highlights the importance of psychological needs, including autonomy, competence and relatedness for good mental health and psychological functioning (Ng et al., 2012). Another model that stresses the importance of social participation is Maslow’s hierarchy of needs. According to Maslow and Lewis (1987),

social connectedness is a psychological need of human beings. Individuals who do not satisfy this need lack social interactions with other people, and might suffer negative consequences such as loneliness and depression (Taormina, & Gao, 2013). As existing literature indicated that a reduction of social participation can negatively impact mental wellbeing, reduced engagement in social activities during the COVID-19 pandemic might also lead to mental health consequences.

A few studies supported the association between decreased social participation and reduced mental wellbeing during the first wave of the covid-19 pandemic. A study of Ammar et al. (2020) has shown that there is an association between decreased social participation during home confinement and decreased mental wellbeing, increased depressive mood and decreased satisfaction of life among the wider population. Similar findings were reported by Pancani et al. (2021), who explored the association between social disconnectedness and decreased psychological wellbeing in Italy among the general population.

Interestingly, most of the studies that examined the association between negative effects of home confinement and individuals' mental well-being, focused on the general population. Only a few studies looked at university students even though they are most socially active in this age span, thus likely most affected by the social distancing measures. According to van Zyl (2013), 'university students are three times more likely to the onset of psychopathology and mood disorders due to social isolation and loneliness than the general public' (p. 3). Generally, 75% of all serious mental problems occur before the age of 24 and students are more vulnerable to mental health problems than the rest of the population (Fried, 2020). Those studies that took a closer look at the mental health of university students during the pandemic were mostly conducted in China, the US and Italy. Compared to German and Dutch containment policies, public health instructions e.g., in China or Italy, were more strict. China integrated contact tracking technologies (Lu et al., 2021), meaning that people

living there were way more supervised than in Germany. Besides, most studies were conducted during the first wave of the covid-19 pandemic and the first social restriction measures. Hence, it might be interesting to gain knowledge at a later stage of the pandemic (second wave).

The present study aims to provide more insight into the effects of social distancing measures on social participation and mental well-being (psychological well-being, depressive mood and feelings and loneliness) of German and Dutch university students. In case a change in social participation is found, the present study explores possible associations between the change in social participation and possible changes in mental wellbeing during the second wave of the COVID-19 pandemic.

The current study will explore

- 1) Is there a difference in social participation, psychological wellbeing, depressive mood and loneliness before and during social distancing measures of students from the Netherlands/ Germany?
- 2) To what extent is the change of social participation associated with the change of psychological wellbeing, depressive moods and loneliness of Dutch/German

.

Method

Design

A cross-sectional online survey design was used to investigate perceived differences in social participation of Dutch and German university students since the COVID-19 containment policy social distancing, the perceived difference in student's psychological wellbeing, depressive mood and loneliness before and during social distancing measures as well as the association between the change in social participation and the change in student's psychological wellbeing, depressive mood and loneliness.

Participants

Inclusion criteria entailed participants above 18 years studying in the Netherlands or Germany and having a proficient understanding of English. Respondents who did not fulfil these criteria were excluded. The program g*power was used to calculate the required sample size for the study. Using the Wilcoxon signed-rank test as statistical analysis to achieve a power of .80, 2-sided tested and an α err probability of .05, the program calculated N= 82 as needed sample size and assumes a moderate effect size ($d = .30$). Recruitment was achieved via a non-probability sampling procedure. More specifically, the respondents represented a convenience sample as recruitment was done via the SONA system of the University of Twente. This institution's recruitment portal is used by students from the faculty of behavioural, management and social sciences (BMS). They will be awarded with SONA credits in exchange for their participation. Additionally, snowball sampling was used as the link to the survey was shared via the app 'what's app' and social media platforms by other people.

Materials

Socio-demographics

At the beginning of the online survey, participants were asked about their age, sex and nationality. Besides, demographics about the participant's living situation and financial situation were collected. The living situation was divided into 'living alone' and 'living with others (roommates, partner, family member etc.)' and the financial situation was divided into 'better', 'situation stayed the same', 'worse' before the COVID-19 social distancing measures applied and 'not applicable'.

Questionnaires

To measure a possible change in the respondent's social participation, psychological wellbeing, depressive mood and feelings and loneliness, each item of the scales requested two answers of two recall periods, one regarding the period 'before' social distancing measure (March 2020) were applied and the second one regarding the period 'during' the current social distancing situation (last six weeks).

Social participation

The 14-item Social participation Questionnaire (SPQ) by Densley, Davidson and Gunn (2013) assessed the social participation of the participants and used a 5-point scale ranging from '1 = never' to '5 = all time'. For the last four items, participants could give a binary 'yes = 5' or 'no = 1' response. A high score means that the participants are 'all times' socially active. To give an example, one item of this scale is: '*Gone to café/ restaurant, bar or party*'. In the present study, the Social participation scale showed an acceptable reliability coefficient of .60 ('before') and .70 ('during') social distancing measures.

Psychological wellbeing

Psychological wellbeing was measured with the Psychological Wellbeing Scale of Ryff & Keyes (1995) which consists of 18 items and measures six subscales. The first subscale measures the participant's autonomy (*'I tend to be influenced by people with strong opinions'*), environmental mastery (*'In general, I feel I am in charge of the situation in which I live'*), personal growth (*'For me, life has been a continuous process of learning, changing, and growth'*), positive relations with others (*'I have not experienced many warm and trusting relationships with others'*), purpose in life (*'Some people wander aimlessly through life, but I am not one of them'*), and self-acceptance (*'In many ways I feel disappointed about my achievement in life'*). To be in accordance with the original scale, all item scores from the Likert scale were reversed coded. This instrument entails reversed items which had to be recoded. The participants rate on a 7-point Likert Scale from '1 = strongly agree' to '7 = strongly disagree'. A high score means that the participant has a high psychological wellbeing. In this study, the Cronbach's alpha is .74 ('before') and .75 ('during') social distancing measures which can be categorized as good.

Depressive mood and feelings

The participant's depressive mood and feelings were assessed using the Short Mood and Feelings Questionnaire (SMFQ) by Ancold and Stephen (1995). This instrument contains 13 items and participants could respond on a 3-point Likert Scale ranging from '1 =disagree' to '3 =agree'. A higher mean score indicates a higher level of depressive mood. An example of an item of the scale is: *'I felt so tired I just sat around and did nothing'*. The Cronbach's alpha regarding this scale is .85 and can be classified as highly reliable (Ancold & Stephen, 1995). In this study, the Cronbach's alpha is .88 ('before') and .87 ('during') social distancing measures which can be categorized as high.

Loneliness

To measure the feelings of loneliness of the participants, the Loneliness Scale by De Jong Gierveld and colleagues was used (Manuel Loneliness Scale, n.d.). This instrument consists of 11 items and uses a 7-point Likert scale ranging from '1 =strongly disagree' to '7 = strongly agree'. An example item is: '*There is always someone I can talk to about my day-to-day problems*'. A higher mean score indicates a higher level of loneliness. The scale entails five reversed items which had to be recorded. This questionnaire showed an acceptable reliability coefficient of .67 ('before') and .70 ('during') social distancing measures. The item scores were recalculated into dichotomous scores '1-3 = not lonely' and '4-7 = lonely', thus the total score ranges from 0 to 11. Cut-off scores from '0-2 = not lonely'; 3-8 = moderately lonely; 9-10 = severely lonely; 11= very severely lonely' by De Jong Gierveld and Van Tilburg (2010) were used in order to categorize the total scores.

Procedure

Ethical approval was given by the ethical committee of the University of Twente (request number 210380). The survey was placed on the platform *Qualtrics Research Suits* and the data collection started at the 13th of April 2021. First, all participants received an informed consent which informed the respondents about the study purpose, the duration of the online survey, that participation in this study is voluntary and that they could withdraw at any time without giving an explanation. Additionally, they were informed that their data will be treated anonymously. Prior starting with the first questionnaire of the survey, respondents had the opportunity to ask further questions via the mail of the researcher. Further, the participants were provided with the contact details of the Ethics Committee of the Faculty of Behavioural Sciences at the University of Twente in case of any complaints. After they agreed to proceed with the survey, they were provided with the first questions. An a-priori

estimate of the time required to answer the requested items was approximately 20 minutes. At the end of the survey, they were thanked for their participation.

Data analysis

To analyze the data, the software IBM SPSS statistics v26.0 was used. Participants who did not indicate 'student' as educational status were excluded from the data. Besides, respondents who did not finish the SPQ, the Psychological Wellbeing Scale, the Loneliness scale and SMFQ were also removed so that 120 participants remained for analysis.

Descriptive statistics were performed to summarize the demographic statistics of the study sample such as participant's gender, age, nationality, living situation and financial situation.

The Shapiro-Wilk W test was executed to test the normality of social participation, psychological wellbeing, depressive mood and feelings and loneliness. To test whether there were differences in social participation, psychological wellbeing, depressive mood and loneliness 'before' and 'during' social distancing measures of students from the Netherlands and Germany, paired sample t- test was used when data were normally distributed. The Wilcoxon test was used when not all variables were normally distributed.

To assess whether the change ('before-during') in social participation is associated with changes from 'before' to 'during' social distancing period in psychological wellbeing, depressive moods and loneliness of Dutch/ German students, delta scores of social participation, psychological wellbeing, depressive mood and loneliness were calculated at a first step. These scores represent the difference between the 'before' and 'during' situation. For correlation analyses, Pearson's correlation test was chosen and when normality was not observed, a Spearman's correlation test was used.

Results

The study was conducted with 226 participants of which 120 remained due to exclusion criteria. As seen in Table 1, the sample for analysis consisted of 43 male and 77 female university students between the ages 18 and 29 years ($M_{age} = 22$ years, $SD_{age} = 2$ years). 102 respondents were from Germany, nine from the Netherlands and nine from other countries. As of their living situation, the majority of the participants reported to live with others (83%) whereas only 17% stated to live alone. Of the 83% who lived with others, 43% lived together with other students in a student home, 18% responded to live with their family, 13% with their parents and the remaining 9% with their partner. For the majority of students (54%), the financial situation stayed the same during the social distancing measures, 19% experienced a better situation, 18% a worse and 8% answered that the situation is ‘not applicable’.

Table 1

Demographic characteristics of the sample.

Category	<i>N</i>	%
Age in years *	22 (2)	
Sex		
Male	43	36
Female	77	64
Nationality		
German	102	85

Dutch	9	8
Other	9	8
Living situation		
Living alone	20	17
Living with others	100	83
With a partner	11	9
With my parent(s)	16	13
With my parent(s)/brother(s)/sister(s)	21	18
With other student(s) in a student home	52	43
Financial situation		
Better**	23	19
Situation stayed the same	65	54
Worse**	22	18
Not applicable	10	8

*M (SD). **during social distancing than before March 2020

Social participation, psychological wellbeing, depressive mood and feelings and loneliness before and during social distancing measures

Table 2 shows the scores on social participation, psychological wellbeing, depressive mood and feelings and loneliness ‘before’ and ‘during’ social distancing measures. A Wilcoxon signed-rank test displayed that social participation there were significantly decreased with a large effect size as the scores in social participation ‘before’ social distancing measures ($Mdn = 44$) were higher than ‘during’ social distancing measures ($Mdn = 28$), $z = -9.472$, $p < .001$, $r = -.611$. The sample’s psychological wellbeing scores significantly decreased with a small effect size from ‘before’ social distancing measures ($Mdn = 97$) to ‘during’ ($Mdn = 95$), $z = -3.675$, $p < .001$, $r = -.237$. Besides, there was a significant increase from ‘before’ social distancing ($Mdn = 15$) to ‘during’ social distancing ($Mdn = 19$) in the levels of depressive mood with a moderate effect size, $z = -5.342$, $p < .001$, $r = -.345$. Similarly, the median scores for loneliness significantly increased with a moderate effect size from ‘before’ social distancing ($Mdn = 2$) to ‘during’ ($Mdn = 4$), $z = -6.895$, $p < .001$, $r = -.445$. Before social distancing measures were applied, the majority of the sample did not feel lonely (66%) whereas the majority felt moderately lonely during social distancing measures (85%).

Table 2

Effects of COVID-19 measures on social participation, psychological wellbeing, depressive mood and feelings and loneliness.

Variable	Range	Total	Δ	Within-Subjects Effects		
	Before Social Distancing Median (IQR)	During Social Distancing Median (IQR)		z-value	p-value	Effect size r

Social participation	14-70	44.00 (9)	28.00 (5.75)	-16.00	-9.472	.000	-.611
Psychological wellbeing	7-126	97.00 (15.00)	95.00 (17.5)	-2.00	-3.675	.000	-.237
Depressive mood and feelings	13-39	15.00 (6.75)	19.00 (9.00)	+2.00	-5.342	.000	-.345
Loneliness	0-11	2.00 (4.00)	4.00 (3.00)	+2.00	-6.895	.000	-.445

Note. N=120. *IQR* = *Interquartile Range*.

Association of social participation with psychological wellbeing, loneliness and depressive mood and feelings of Dutch and German university students during COVID-19 social distancing measures

Table 3 shows that a spearman's correlation was run to assess the associations between the changes 'before-after' of the variables social participation, psychological wellbeing, depressive mood and feelings and loneliness. Statistical analysis showed that social participation correlated positively with psychological wellbeing ($r_s = .26, n=120, p=.01$) but negatively with depressive mood and feelings ($r_s = -.25, n=120, p=.00$). Thus, individuals scoring low on social participation experienced a deterioration in psychological wellbeing and an increase in depressive mood and feelings. In contrast, social participation was not significantly correlated with changes in loneliness ($r_s = -.18, n=120, p=.13$).

Table 3

Relationship between delta scores in social participation and psychological wellbeing, depressive mood and feelings and loneliness.

	Social participation
Psychological wellbeing	.26**
Depressive mood and feelings	-.25**
Loneliness	-.18

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

Discussion

This study investigated perceived changes in social participation, psychological wellbeing, depressive moods and loneliness of Dutch and German university students during the COVID-19 social distancing measures compared to the period before the pandemic. Further, this study explored whether the reduction in social participation was associated with the changes in psychological wellbeing, depressive mood and loneliness. The results showed that social participation significantly decreased when comparing social participation before social distancing measures were applied by the government and social participation during the social distancing measures in the second wave period in a sample of students from Germany and the Netherlands. Next to this, psychological wellbeing significantly worsened during social distancing measures, whereas depressive mood and feelings of loneliness increased during social distancing measures compared to before. Besides, the decrease in social participation showed significant correlations with worsened psychological wellbeing and depressive mood and feelings. Interestingly, changes in social participation and changes in loneliness were not significantly correlated.

Existing literature found that people did not engage in social activities with other people during the COVID-19 measures of the government as much as usual (Ammar et al., 2020). This study confirms the study by Ammar et al. (2020) as the results also showed a reduction in social participation. In contrast to Ammar et al. (2020), who mainly included participants from non-western countries, the present study included Dutch and German participants. Interestingly, even though the COVID-19 public health restrictions were stricter in non-western countries than in western countries (Lu et al., 2021), Dutch and German university students also reduced their engagement in social activities, thus adhering to the distancing rules.

Earlier literature has already shown that COVID-19 social distancing measures negatively affected mental wellbeing among the general population (Wang et al., 2021). This study replicates the findings of Wang et al. (2020) partly. The current study confirms the previous finding as the results showed increased depressive mood, loneliness and deteriorated psychological wellbeing during COVID-19 social distancing measures. In contrast to the study by Wang et al. (2020) who focused on the general population, this study highlighted university students. The difference between students and the general population is that students are the most vulnerable group during the pandemic for drastic life changes. Their reduction of social contacts impacted all areas of their lives. In contrast, some individuals of the wider population were still able to visit their workplace (Commodari & La Rosa, 2020). Besides, university students are more vulnerable to develop mental health problems than the older population (van Zyl, 2013). This underlines that the group under investigation, namely university students, need special attention because of their vulnerability developing mental health problems during this age span and the massive changes in their daily lives.

Previous research based on the Self-determination theory model of health behaviour has shown that social relatedness as one important component of three needs of satisfaction

and predicts positive mental health outcomes such as less depression, anxiety and somatization. (Ng et al., 2012). This study also found similar results as an association between reduced social participation and deteriorated psychological wellbeing and increased depressive mood and feelings from 'before' to 'during' COVID-19 social distancing measures was reported. A promising study by Ammar et al. (2020) found a correlation between the decline in mental wellbeing and reduced social participation which supports the findings of this study even though it focuses on the general population and not specifically on university students. Thus, this study indicates that this association, also found in existing studies also accounts for university students.

Interestingly, there was no correlation found between reduced social participation and increased loneliness during social distancing measures among Dutch and German university students. This is in contrast to the findings of Taormina and Gao (2013) who state that individuals who feel lonely suffer from a lack of social interactions. Existing literature showed that social media became an even more present communication tool than it was before the pandemic for the young generation (Lisitsa et al., 2020). Besides, Lisitsa et al. (2020) provide evidence that individuals who feel lonely use social media to find a way to socialize. Thus, it might be the case that the sample of this study engaged in social activities via social media, hence explaining the missing association between social participation and loneliness. Another explanation might be that women often use the internet to cope with loneliness (Correa, Hinsley, & De Zuniga, 2010). As the majority of this sample is female, it might be the case that they also used the internet as coping strategy for loneliness. Another reason for the missing association might be explained by taking a closer look at the demographics of this sample which displayed that the majority of respondents lived together with others (especially in a student home). Although university students reduced their social activities during the second wave of the pandemic, they probably could socially interact with

others due to their living situation.

There are two strengths of the present study. First, a strong point of this study is that it explores the association between the reduction in social participation and the deteriorated mental wellbeing during COVID-19 social distancing measures in a young population which is in contrast to most other studies that assessed this association in the general population. Thus, one more study focused on a target group which is often overlooked during the current pandemic event though they seem to be at risk for mental health consequences. Second, this study was performed approximately one year after the first outbreak, during the second wave of the pandemic, whereas other studies often were conducted during the first wave. Hence, the added value of this study is that it allowed evaluating the change of the mental wellbeing of students between before and during social distancing measures that is in contrast to earlier studies which only explored the mental health status of people during the first wave of the pandemic.

Apart from the strengths, this study also has a limitation. Recall bias might have influenced participants in their responses regarding their mental wellbeing before social distancing measures. More precisely, participants needed to think retrospectively about their psychological wellbeing, depressive mood and feeling of loneliness before social distancing measures were applied by the government, which was approximately one year ago. Hence, the participants might be victims of recall bias. According to Raphael (1987), recall bias are most pronounced in cross-sectional studies with retrospective elements as they can occur ‘whenever historical self-report information is elicited from respondents’ (p.167).

The study results indicated that even though the reduction of contacts is one of the most important strategies to ensure protection for everyone during the COVID-19 pandemic, it is equally important that students stay mentally healthy. Hence, this study provides deeper knowledge into the mental health status of university students during the second wave of the

pandemic. The findings underline the importance of social participation among the young population during pandemics which is an important insight for the government and universities as the pandemic is still ongoing. It could be helpful to find the golden mean between enough social participation for students by organizing physical education and adherence of social distancing measures so that the mental health consequences could be reduced.

As the COVID-19 pandemic is still ongoing, future research is needed to investigate the associations between the change in social participation and psychological wellbeing, depressive mood and loneliness with a longitudinal study which was not possible with this study due to a short time framework. As longitudinal studies can examine relationships between variables repeatedly over time, recall bias can be excluded. This can be achieved with e.g. a cohort study which is one type of longitudinal studies.

References

- Ammar, A., Trabelsi, K., Brach, M., Chtourou, H., Boukhris, O., Masmoudi, L., ... & Batatia, H. (2021). Effects of home confinement on mental health and lifestyle behaviours during the COVID-19 outbreak: insights from the ECLB-COVID19 multicentre study. *Biology of sport*, 38(1),9. doi: 10.5114/biolsport.2020.96857
- Ancold, A. D. R. I. A. N., & Stephen, C. (1995). Development of a short questionnaire for use in epidemiological studies of depression in children and adolescents. *Age (years)*, 6(11), 237- 249. Retrieved from: [http://www.scalesandmeasures.net/files/files/Short%20Mood%20and%20Feelings%20Questionnaire%20\(1995\).pdf](http://www.scalesandmeasures.net/files/files/Short%20Mood%20and%20Feelings%20Questionnaire%20(1995).pdf)
- Berg-Beckhoff, G., Dalgaard Guldager, J., Tanggaard Andersen, P., Stock, C., & Smith Jervelund, S. (2021). What Predicts Adherence to Governmental COVID-19 Measures among Danish Students?. *International journal of environmental research and public health*, 18(4), 1822. doi: 10.3390/ijerph18041822
- Bundesregierung (2021). Corona-Impfung: Die wichtigsten Fragen und Antworten. Retrieved on 17th March, 2021, from: <https://www.bundesregierung.de/breg-de/themen/coronavirus/coronavirus-impfung-faq-1788988>
- Correa, T., Hinsley, A. W., & De Zuniga, H. G. (2010). Who interacts on the Web?: The intersection of users' personality and social media use. *Computers in human behavior*, 26(2), 247-253. doi: 10.1016/j.chb.2009.09.003
- Commodari, E., & La Rosa, V. L. (2020). Adolescents in quarantine during COVID-19 pandemic in Italy: Perceived health risk, beliefs, psychological experiences and expectations for the future. *Frontiers in Psychology*, 11, 2480. doi: 10.3389/fpsyg.2020.559951
- Cucinotta, D., & Vanelli, M. (2020). WHO declares COVID-19 a pandemic. *Acta Bio Medica: Atenei Parmensis*, 91(1), 157. doi: 10.23750/abm.v91i1.9397
- Densley, K., Davidson, S., & Gunn, J. M. (2013). Evaluation of the Social Participation Questionnaire in adult patients with depressive symptoms using Rasch analysis. *Quality of Life Research*, 22(8), 1987-1997. doi: 10.1007/s11136-013-0354-4

- De Jong Gierveld, J., & Van Tilburg, T. (2010). The De Jong Gierveld short scales for emotional and social loneliness: Tested on data from 7 countries in the UN generations and gender surveys. *European Journal of Ageing*, 7(2), 121–130. <https://doi.org/10.1007/s10433-010-0144-6>
- Huremović, D. (2019). Social distancing, quarantine, and isolation. In *Psychiatry of Pandemics* (pp. 85-94). Springer, Cham.
- Koning, N., Hagedoorn, N., Stams, G. J. J., Assink, M., & van Dam, L. (2021). What makes Dutch youth comply with preventive COVID-19 measures? An explorative study. *Journal of Community Psychology*.
- Lee, H. Y., Jang, S. N., Lee, S., Cho, S. I., & Park, E. O. (2008). The relationship between social participation and self-rated health by sex and age: A cross-sectional survey. *International journal of nursing studies*, 45(7), 1042-1054. doi: 10.1016/j.ijnurstu.2007.05.007
- Leung, K. Y., Ball, F., Sirl, D., & Britton, T. (2018). Individual preventive social distancing during an epidemic may have negative population-level outcomes. *Journal of The Royal Society Interface*, 15(145), 20180296. doi: 10.1098/rsif.2018.0296
- Lisitsa, E., Benjamin, K. S., Chun, S. K., Skalsky, J., Hammond, L. E., & Mezulis, A. H. (2020). Loneliness among young adults during covid-19 pandemic: The mediational roles of social media use and social support seeking. *Journal of Social and Clinical Psychology*, 39(8), 708-726. doi: 10.1521/jscp.2020.39.8.708
- Lu, G., Razum, O., Jahn, A., Zhang, Y., Sutton, B., Sridhar, D., ... & Müller, O. (2021). COVID-19 in Germany and China: mitigation versus elimination strategy. *Global health action*, 14(1), 1875601. doi: 10.1080/16549716.2021.1875601
- Manual Loneliness Scale (n.d.) Retrieved 21 April 2021, from https://home.fsw.vu.nl/TG.van.Tilburg/manual_loneliness_scale_1999.html#psychometric_properties
- Maslow, A., & Lewis, K. J. (1987). Maslow's hierarchy of needs. Salenger Incorporated, 14, 987. Retrieved from: <https://www.researchhistory.org/2012/06/16/maslows-hierarchy-of-needs/>

- Government of the Netherlands (2021). Lockdown measures tightened in response to concerns about new variants of the virus. Retrieved on 17th March, 2021, from: <https://www.government.nl/latest/news/2021/01/20/lockdown-measures-tightened-in-response-to-concerns-about-new-variants-of-virus>
- Ng, J. Y., Ntoumanis, N., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Duda, J. L., & Williams, G. C. (2012). Self-determination theory applied to health contexts: A meta-analysis. *Perspectives on Psychological Science*, 7(4), 325-340. doi: 10.1177/1745691612447309
- Pancani, L., Marinucci, M., Aureli, N., & Riva, P. (2021). Forced Social Isolation and Mental Health: A Study on 1,006 Italians Under COVID-19 Lockdown. *Frontiers in Psychology*, 12, 1540.
- RIVM (2021). Coronavirus disease COVID 19. Retrieved on 17th March, 2021, from: <https://www.rivm.nl/en/novel-coronavirus-covid-19/coronavirus-disease-covid-19>
- Raphael, K. (1987). Recall bias: a proposal for assessment and control. *International journal of epidemiology*, 16(2), 167-170. Retrieved from: <https://www.alnap.org/system/files/content/resource/files/main/bias.pdf>
- Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, 69(4), 719–727. doi: 10.1037/0022-3514.69.4.719
- Shi, Y., Wang, G., Cai, X. P., Deng, J. W., Zheng, L., Zhu, H. H., ... & Chen, Z. (2020). An overview of COVID-19. *Journal of Zhejiang University. Science. B*, 1. doi: 10.1631/jzus.B2000083
- Taormina, R. J., & Gao, J. H. (2013). Maslow and the motivation hierarchy: Measuring satisfaction of the needs. *The American journal of psychology*, 126(2), 155-177.
- van Zyl, L. E. (2021). Social Study Resources and Social Wellbeing Before and During the Intelligent COVID-19 Lockdown in The Netherlands. *Social Indicators Research*, 1-23. doi: 10.1007/s11205-021-02654-2
- Wang, Y., Shi, L., Que, J., Lu, Q., Liu, L., Lu, Z., ... & Shi, J. (2021). The impact of quarantine on mental health status among general population in China during the COVID-19 pandemic. *Molecular psychiatry*, 1-10. doi: 10.1038/s41380-021-01019-y

World Health Organisation (2021a). Coronavirus disease (COVID-19) Dashboard. Retrieved on 2nd of March, 2021, from: <https://covid19.who.int/>

World Health Organisation (2021b). Coronavirus disease (COVID-19). Retrieved on 2nd of March, 2021, from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19>

Appendix A

Bachelor thesis survey

Start of Block: Consent form

Q1 The aim of this research is to detect the relationship between threat appraisal, adherence to COVID- 19 containment measures and factors that might be associated with mental wellbeing of young adults.

In this survey we kindly ask you to answer multiple questions regarding your adherence to COVID- 19 containment measures, daily life changes, wellbeing, personality and some social demographic background characteristics. The questionnaire will take approximately 20 minutes to complete. Your participation in this survey is completely voluntary and all your responses are treated anonymously. None of the responses will be connected to identifying information. Data will only be used for statistical analyses. However, you can withdraw from the survey at any time.

If you want to get more information about the outcome of the research, you can contact the researchers Julia Jörgens (j.j.joergens@student.utwente.nl), Fabiola Ruiz Alfranca (f.ruizalfranca@student.utwente.nl) and Lea Ganzer (l.ganzer@student.utwente.nl).

If you have any complaints about this research, please direct them to the secretary of the Ethics Committee of the Faculty of Behavioural Sciences at the University of Twente, Drs. L. Kamphuis-Blikman P.O. Box 217, 7500 AE Enschede (NL), telephone: +31 (0)53 489 3399; email: l.j.m.blikman@utwente.nl).

I read and understood all the above mentioned and agreed to participate in the study. Further, I partake out of my own free will and I am informed that I can withdraw from the study at any time without providing a reason. By proceeding the study, I consent to participate.

☐ Proceed (1)

☐ Do not proceed (2)

End of Block: Consent form

Start of Block: Background information

Appendix B

Q2 What is your gender?

- ☐ Male (1)
 - ☐ Female (2)
 - ☐ Non-binary / third gender (3)
 - ☐ Prefer not to say (4)
-

Q3 What is your age?

Q4 What is your nationality?

- ☐ German (1)
 - ☐ Dutch (2)
 - ☐ Other (3) _____
-

Q5 What is your living situation?

- ☐ Living alone (1)
 - ☐ Living with others (roommates, partner, family member etc.) (2)
-

Q6 With whom do you live together?

- ☐ with a partner (1)
- ☐ with my parent(s) (2)
- ☐ with my parent(s) and brother(s) and sister(s) (3)
- ☐ With other student(s) in a student home (4)

End of Block: Background information

Start of Block: Block 8

Q7 The next questions refer to university students. If you are not currently enrolled as a student you are directed to the first questionnaire.

- ☐ I am a student (1)
 - ☐ I am not a student (2)
-

Q25 Can you indicate whether your financial situation has changed due to the COVID-19 social distancing measures ?

- ☐ Better (1)
- ☐ Situation stayed the same (2)
- ☐ Worse (3)
- ☐ Not applicable (4)

Dutch Government applied the social distancing rules (before March 2020) **and** how your situation was **during** the last 6 weeks.

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	All time (5)
Visited or received visit from family/family visit before social distancing (1)	☐	☐	☐	☐	☐
Visited or received visit from family/family visit during social distancing (19)	☐	☐	☐	☐	☐
Visited or received visit from friends and neighbors before social distancing (2)	☐	☐	☐	☐	☐
Visited or received visit from friends and neighbors during social distancing (20)	☐	☐	☐	☐	☐
Attended religious activity/group before social distancing (3)	☐	☐	☐	☐	☐
Attended religious activity/group during social distancing (4)	☐	☐	☐	☐	☐

Used the internet/social media for social interactions **before** social distancing (5)

☐☐☐☐☐

Used the internet/social media for social interactions during social distancing (6)

☐☐☐☐☐

Phone call for social communication **before** social distancing (7)

☐☐☐☐☐

Phone call for social communication during social distancing (8)

☐☐☐☐☐

Gone to cafe/restaurant, bar or party **before** social distancing (9)

☐☐☐☐☐

Gone to cafe/restaurant, bar or party during social distancing (10)

☐☐☐☐☐

Gone to cinema or theatre or sport events **before** social distancing (11)

☐☐☐☐☐

Gone to cinema or theatre or sport events during social distancing (12)	☐	☐	☐	☐	☐
Gone to gym or exercise class before social distancing (13)	☐	☐	☐	☐	☐
Gone to gym or exercise class during social distancing (14)	☐	☐	☐	☐	☐
Gone to class before social distancing (15)	☐	☐	☐	☐	☐
Gone to class during social distancing (16)	☐	☐	☐	☐	☐
Had social contact through other activities before social distancing (17)	☐	☐	☐	☐	☐
Had social contact through other activities during social distancing (18)	☐	☐	☐	☐	☐

Q33 This part of the survey focuses on the changes in social participation due to the social distancing measure during the current pandemic. Please answer how your social life was before the German or

Dutch Government applied the social distancing rules (before March 2020) and how your situation was during the last 6 weeks.

	No (1)	Yes (2)
University-related group before social distancing (1)	☐	☐
University-related group during social distancing (2)	☐	☐
Volunteer organization or group before social distancing (3)	☐	☐
Volunteer organization or group during social distancing (4)	☐	☐
Ethnic group before social distancing (5)	☐	☐
Ethnic group during social distancing (6)	☐	☐
Other group (e.g. sport, service, etc.) before social distancing (7)	☐	☐
Other group (e.g. sport, service, etc.) during social distancing (8)	☐	☐

End of Block: Social participation Questionnaire (SPQ)

Start of Block: adherence to containment measures

Q12 Think about your mental wellbeing **BEFORE** the Covid-19 social distancing measures (March 2020), how would you assess the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I like most parts of my personality. (1)	☐	☐	☐	☐	☐	☐	☐
When I look at the story of my life, I am pleased with how things have turned out so far. (2)	☐	☐	☐	☐	☐	☐	☐
Some people wander aimlessly through life, but I am not one of them. (3)	☐	☐	☐	☐	☐	☐	☐
The demands of everyday life often get me down. (4)	☐	☐	☐	☐	☐	☐	☐
In many ways I feel disappointed about my achievements in life. (5)	☐	☐	☐	☐	☐	☐	☐
Maintaining close relationships has been difficult and frustrating for me. (6)	☐	☐	☐	☐	☐	☐	☐

I live life one day at a time and don't really think about the future. (7)

☐☐☐☐☐☐☐☐

In general, I feel I am in charge of the situation in which I live. (8)

☐☐☐☐☐☐☐☐

I am good at managing the responsibilities of daily life. (9)

☐☐☐☐☐☐☐☐

I sometimes feel as if I've done all there is to do in life. (10)

☐☐☐☐☐☐☐☐

For me, life has been a continuous process of learning, changing, and growth. (11)

☐☐☐☐☐☐☐☐

I think it is important to have new experiences that challenge how I think about myself and the world. (12)

☐☐☐☐☐☐☐☐

People would describe me as a giving person, willing to share my time with others. (13)

☐☐☐☐☐☐☐☐

I gave up trying to make big improvements or changes in my life a long time ago. (14)

☐☐☐☐☐☐☐☐

I tend to be influenced by people with strong opinions. (15)

☐☐☐☐☐☐☐☐

I have not experienced many warm and trusting relationships with others. (16)

☐☐☐☐☐☐☐☐

I have confidence in my own opinions, even if they are different from the way most other people think. (17)

☐☐☐☐☐☐☐☐

I judge
myself by
what I think
is important,
not by the
values of
what others
think is
important.
(18)



Page Break

Q28 Think about the situation of the last 6 weeks **DURING** the Covid-19 social distancing measures, how would you assess the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I like most parts of my personality. (1)	☐	☐	☐	☐	☐	☐	☐
When I look at the story of my life, I am pleased with how things have turned out so far. (2)	☐	☐	☐	☐	☐	☐	☐
Some people wander aimlessly through life, but I am not one of them. (3)	☐	☐	☐	☐	☐	☐	☐
The demands of everyday life often get me down. (4)	☐	☐	☐	☐	☐	☐	☐
In many ways I feel disappointed about my achievements in life. (5)	☐	☐	☐	☐	☐	☐	☐
Maintaining close relationships has been difficult and frustrating for me. (6)	☐	☐	☐	☐	☐	☐	☐

I live life one day at a time and don't really think about the future. (7)

☐☐☐☐☐☐☐☐

In general, I feel I am in charge of the situation in which I live. (8)

☐☐☐☐☐☐☐☐

I am good at managing the responsibilities of daily life. (9)

☐☐☐☐☐☐☐☐

I sometimes feel as if I've done all there is to do in life. (10)

☐☐☐☐☐☐☐☐

For me, life has been a continuous process of learning, changing, and growth. (11)

☐☐☐☐☐☐☐☐

I think it is important to have new experiences that challenge how I think about myself and the world. (12)

☐☐☐☐☐☐☐☐

People would describe me as a giving person, willing to share my time with others. (13)

☐☐☐☐☐☐☐☐

I gave up trying to make big improvements or changes in my life a long time ago. (14)

☐☐☐☐☐☐☐☐

I tend to be influenced by people with strong opinions. (15)

☐☐☐☐☐☐☐☐

I have not experienced many warm and trusting relationships with others. (16)

☐☐☐☐☐☐☐☐

I have confidence in my own opinions, even if they are different from the way most other people think. (17)

☐☐☐☐☐☐☐☐

I judge
myself by
what I think
is important,
not by the
values of
what others
think is
important.
(18)

☐☐☐☐☐☐☐

End of Block: Mental Wellbeing Questionnaire

Start of Block: Block 11

Q31 Think about the time **BEFORE** the Covid-19 social distancing measures (March 2020), how do you evaluate the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
There is always someone I can talk to about my day-to-day problems. (1)	☐	☐	☐	☐	☐	☐	☐
I miss having a really close friend. (2)	☐	☐	☐	☐	☐	☐	☐
I experience a general sense of emptiness. (3)	☐	☐	☐	☐	☐	☐	☐
There are plenty of people I can lean on when I have problems. (4)	☐	☐	☐	☐	☐	☐	☐
I miss the pleasure of the company of others. (5)	☐	☐	☐	☐	☐	☐	☐
I find my circle of friends and acquaintances too limited. (6)	☐	☐	☐	☐	☐	☐	☐
There are many people I can trust completely. (7)	☐	☐	☐	☐	☐	☐	☐

There are
enough
people I feel
close to. (8)

☐	☐	☐	☐	☐	☐	☐	☐
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I miss having
people
around me.
(9)

☐	☐	☐	☐	☐	☐	☐	☐
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I often feel
rejected.
(10)

☐	☐	☐	☐	☐	☐	☐	☐
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I can call on
my friends
whenever I
need them.
(11)

☐	☐	☐	☐	☐	☐	☐	☐
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Page Break

Q32 Think about the situation of the last 6 weeks **DURING** the Covid-19 social distancing measures, how do you evaluate the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
There is always someone I can talk to about my day-to-day problems. (1)	☐	☐	☐	☐	☐	☐	☐
I miss having a really close friend. (2)	☐	☐	☐	☐	☐	☐	☐
I experience a general sense of emptiness. (3)	☐	☐	☐	☐	☐	☐	☐
There are plenty of people I can lean on when I have problems. (4)	☐	☐	☐	☐	☐	☐	☐
I miss the pleasure of the company of others. (5)	☐	☐	☐	☐	☐	☐	☐
I find my circle of friends and acquaintances too limited. (6)	☐	☐	☐	☐	☐	☐	☐
There are many people I can trust completely. (7)	☐	☐	☐	☐	☐	☐	☐

There are
enough
people I feel
close to. (8)

☐☐☐☐☐☐☐☐

I miss having
people
around me.
(9)

☐☐☐☐☐☐☐☐

I often feel
rejected.
(10)

☐☐☐☐☐☐☐☐

I can call on
my friends
whenever I
need them.
(11)

☐☐☐☐☐☐☐☐

End of Block: Loneliness Questionnaire

Start of Block: Life Satisfaction

Q38 Compare the time **BEFORE** the Covid-19 confinement measures (March 2020). How would you assess the following statements?

	Disagree (1)	Neither agree nor disagree (2)	Agree (3)
I felt miserable or unhappy. (1)	☐	☐	☐
I did not enjoy anything at all. (2)	☐	☐	☐
I felt so tired I just sat around and did nothing. (3)	☐	☐	☐
I was very restless. (4)	☐	☐	☐
I felt I was no good anymore. (5)	☐	☐	☐
I cried a lot. (6)	☐	☐	☐
I found it hard to think properly or concentrate. (7)	☐	☐	☐
I hated myself. (8)	☐	☐	☐
I was a bad person. (9)	☐	☐	☐
I felt lonely. (10)	☐	☐	☐
I thought nobody really loved me. (11)	☐	☐	☐
I thought I could never be as good as other people. (12)	☐	☐	☐
I did everything wrong. (13)	☐	☐	☐

Q40 Think about the situation of the last 6 weeks DURING the Covid-19 social distancing measures, how do you assess the following statements?

	Disagree (1)	Neither agree nor disagree (2)	Agree (3)
I felt miserable or unhappy. (1)	☐	☐	☐
I did not enjoy anything at all. (2)	☐	☐	☐
I felt so tired I just sat around and did nothing. (3)	☐	☐	☐
I was very restless. (4)	☐	☐	☐
I felt I was no good anymore. (5)	☐	☐	☐
I cried a lot. (6)	☐	☐	☐
I found it hard to think properly or concentrate. (7)	☐	☐	☐
I hated myself. (8)	☐	☐	☐
I was a bad person. (9)	☐	☐	☐
I felt lonely. (10)	☐	☐	☐
I thought nobody really loved me. (11)	☐	☐	☐
I thought I could never be as good as other people. (12)	☐	☐	☐
I did everything wrong. (13)	☐	☐	☐

