Physical activity in long covid sufferers: the effect of physical self-efficacy and the moderating role of gender

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Abstract

Background. Long covid is a new phenomenon that results from an infection with the SARS-CoV-2 virus. Recent research found that physical activity works as a recovery strategy for long covid sufferers. The current study further explores the association between physical self-efficacy and physical activity in long covid suffering individuals and the moderating role of gender.

Methods. A descriptive cross-sectional study design was applied using the International Physical Activity Questionnaire Short Form (IPAQ-SF) to measure physical activity in long covid sufferers and the Self Efficacy for Physical Activity Scale (SEPAS) measuring physical self-efficacy. 64 participants aged on average 34.9 (*SD* = 13.0) years with (68.8%, *n* = 44) females and (29.8%, *n* = 19) males were recruited through snowball and convenience sampling and were asked to complete an online survey.

Results. Simple linear regression and moderation with bootstrapping using PROCESS were applied, and a small but significant relationship of self-efficacy predicting physical activity in long covid sufferers was found (*B* = 94.41, *t* (62) = 3.63, 95*% CI* [47.82, 153.39], *p* = .004). Gender was not found to moderate this relationship (*p* = .638).

Discussion. The first finding aligns with previous research, but the effect was unexpectedly small. The second finding was not in line with previous research. This study helps gain deeper insights into recovery strategies by investigating whether physical self-efficacy enhances physical activity in long covid sufferers. Further, it can be used as starting point for further research and for designing more fitting interventions, helping those suffering from long covid.

Keywords: long covid, physical activity, physical self-efficacy, gender, recovery, simple linear regression, PROCESS moderation, SPSS, descriptive cross-sectional study design

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Introduction

The outbreak of COVID-19 in 2019 has significantly impacted the world's population. As of June 5th, 2022, there have been over 530.000.000 confirmed cases worldwide and over 6 million deaths (*WHO Coronavirus (COVID-19) Dashboard*, 2022).

Being infected with SARS-CoV-2 can result in severe long-term outcomes, amongst others long covid (Crook et al., 2021). Along with long covid come negative consequences concerning mental health, physical health, and problems in daily living (Crook et al., 2021; Humphreys et al., 2021; Vanichkachorn et al., 2021).

According to previous research conducted by Aiyegbusi et al. (2021), Humphreys et al. (2021), and Crook et al. (2021), it appears that physical activity can function as a recovery and coping strategy to enhance the lives of those affected by long covid. Now, it is interesting to investigate further psychological constructs that facilitate physical activity and thus increase the quality of life.

This research aims to inspect the relationship between physical self-efficacy and physical activity in long covid sufferers and the moderating role of gender. Determining whether self-efficacy for physical activity might enhance physical activity in long covid sufferers could be an essential point to focus on while developing appropriate interventions and guiding future research.

Long covid

Long covid can be defined as a post-COVID-19 state in which, three months from being infected with SARS-CoV-2, symptoms occur for at least 12 weeks, which cannot be explained by other diagnoses (Soriano et al., 2022; Shah et al., 2021). Further, previously conducted studies found that it is a multisystem disease that tackles neurological, cardiovascular, musculoskeletal, dermatological, respiratory, and immunological effects, differing in frequency, severity, and duration (Houben-Wilke et al., 2022). Overall, 1 in 10

individuals infected with SARS-CoV-2 struggle with experiencing symptoms continuing for 12 weeks (Aiyegbusi et al., 2021). To emphasize, Carfì et al. (2020) found that after 12 weeks, symptoms still impacted 87% of individuals, of whom 55% struggled with three or more symptoms (Carfì et al., 2020).

Common symptoms are shortness of breath, cough, headaches, altered taste, chest pain, fatigue, cognitive dysfunction, and insomnia. Notably, fatigue is the most commonly experienced symptom and is defined as a state of sustained exhaustion, drained energy, and dysfunction which cannot be alleviated by rest (Alwan, 2021; Vanichkachorn et al., 2021). Other impairing symptoms are brain fog, hair loss, hearing problems, and palpitations leading to negative thoughts and ideas of self-harm and even suicide in extreme cases (Aiyegbusi et al., 2021). Thus, dealing with these symptoms for an extended time comes along with struggles to perform daily routines, leading to anxiety, depression, and symptoms of post-traumatic stress disorder (PTSD) (Soriano et al., 2022; Raveendran et al., 2021, Aiyegbusi et al., 2021).

Long covid symptoms might not always be persistent but can relapse and fluctuate over time. Moreover, Humphreys et al. (2021) describe how individuals are often exhausted after the slightest movement, such as changing the bedding or washing clothes, also referred to as activities in daily life (ADL). Especially living with the steady symptom of fatigue influences normal activities and impedes daily life (Amdal et al., 2021). This circle of inability to execute ADLs and being sick repeatedly results in frustration, less motivation, lower self-belief, and guilt (Humphreys et al., 2021). Hence, many refer to it as life-altering and a state of losing the own identity due to the experienced limitations affecting daily life activities and mental health (Humphreys et al., 2021). The importance of recovery is evident, and recent research found that a possible recovery strategy could be the implementing physical activities, including ADLs, into daily life (Humphreys et al., 2021).

Impact of physical activity on long covid

Serious health consequences resulting from long covid can be tackled by different self-management approaches, for instance, physical activity (Humphreys et al., 2021). More precisely, *physical activity* can be defined as "any bodily movement produced by skeletal muscles that result in energy expenditure" (Amekran & el Hangouche, 2020). To gain a deeper understanding, one can divide physical activity into three categories: light, moderate and vigorous (Bull et al., 2020). More in detail, light physical activity comprises mainly *walking* and activities of daily living, for instance, *dishwashing* and *changing bedding* which do not affect the heart rate. The metabolic equivalent of the task (MET) is performed at 1.5 to 3 MET. *Walking intensely* and *riding the bike* can be categorized as moderate physical activity, and the METs lie between 3 and <6. Lastly, the most demanding physical activity category is performed at 6 METs and more and is composed of vigorous sports and demanding activities (Bull et al., 2020).

In a healthy population, physical activity helps to improve cognitive performance, physical health, concentration, mood, quality of life, and attention (Fennell et al., 2022); however, the situation is different for those struggling with long covid. Experiencing long-term symptoms influences physical activity as every movement requires energy, and many experience cardiopulmonary problems (Davis et al., 2021; Humphreys et al., 2021; Aiyegbusi et al., 2021). Therefore, vigorous and moderate physical activities can be problematic, impossible, and draining. Witnessing inconveniences while executing even light physical activities or ADLs due to symptoms negatively affects mental and physical health leading to disappointment, low self-esteem, and frustration (Humphreys et al., 2021). Experiencing such disruptions daily limits the overall quality of life. Another reason that potentially influences the amount of physical activity in afflicted individuals is inconsistent advice and help. Often aimless responses, wrong advice, lacking social support, and discrimination are the reason for

less physical activity and watching others struggle, and relapse can have a negative and discouraging effect (Humphreys et al., 2021; Aiyegbusi et al., 2021).

Physical activity and the execution of ADLs positively affect the recovery process and quality of life (Vij, 2021). It gives back a sense of freedom to distressed individuals. Even though relapses are often the consequence, some individuals state that these are worth it given the positive effect of normality and life control which underlines the importance (Davis et al., 2021; Humphreys et al., 2021). As fatigue is the most experienced symptom of long covid (Crook et al., 2021), one could compare it with chronic fatigue syndrome (CFS) and its recovery strategies as drawing long-term conclusions from long covid is not yet possible. A researched strategy to cope with CFS is physical activity (Humphreys et al., 2021; Fulcher & White, 1997). Depression scores, perceived effort, attentional function, better sleep patterns, and mental fatigue improved after an intervention for CFS that included physical activity (Crook et al., 2021).

Self-efficacy and physical activity

Self-efficacy shapes an individual's thoughts, feelings, behaviour, and motivation. It can be an essential psychological construct to keep in mind while exploring factors that reinforce physical activity in long covid sufferers. Albert Bandura introduced *self-efficacy* in 1966, defining it as "the belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura et al., 1999). Further, a strong sense of self-efficacy is associated with more and higher levels of achievement and a tendency to tackle more complex tasks (Bandura et al., 1999). Bouncing back after failures is more common in those who score high in self-efficacy. Thus, oppositely, individuals doubting their capabilities and focusing on their deficiencies manifest low commitment, anxiety for challenging tasks, less goal-directed behaviour, and fewer comebacks after failure, as research

conducted by Bandura et al. (1999) states. Low efficacious individuals often lose faith in themselves and tend to depressive episodes (Bandura, 1994).

A relationship between physical activity and self-efficacy is supported by various research (Kaleth et al., 2020; Sharma et al., 2005; Williams & French, 2011; Kaewthummanukul & Brown, 2006; Rovniak et al., 2002). Here, it was found that physical self-efficacy promotes physical activity better than social support or self-regulation (Rovniak et al., 2002). It appears that self-efficacy for physical activity positively supports knowing how to overcome barriers, sticking to demanding tasks, and gaining feelings of success, which are desired behaviours for supporting the recovery of those suffering (Rovniak et al., 2002). The barrier to beginning executing physical activity is way more prominent, which raises the question of whether physical self-efficacy can help predict physical activity in long covid sufferers.

The role of gender

Gender differences play a vital role in both self-efficacy beliefs and physical activity. It is known that self-efficacy is a high predictor of physical activity, especially in women (Spence et al., 2010). However, men generally tend to have more self-efficacy, leading to physical activity, which is a significant gender difference (Spence et al., 2010). Research inspecting self-efficacy concerning unknown tasks discovered that females more often believe in their capabilities and use different strategies to achieve their goals but struggle with being modest and down-to-earth (Pajares, 2002). Men, on the other hand, often exaggerate and have overconfidence regarding unknown tasks, which leads to better performance. Further research found that women perceive more barriers and struggle more with overcoming obstacles than men (Ragins & Cotton, 1991; van Esch et al., 2021; Alsharawy et al., 2021). Hence, the female gender is more likely to seek support and help, which is not often provided for long covid sufferers.

Up to this point, there is research exploring gender differences regarding general self-efficacy in the academic domain, different sports, and cultures available (Lo, 2021; Rogowska et al., 2022; Hanham et al., 2021), as well as on gender differences in CFS patients, which gives a reason to believe that gender impacts the relationship between self-efficacy and physical activity in sufferers. Therefore, gender will be tested as a moderating variable between self-efficacy and physical activity in long covid sufferers.

Current study

Mental and physical health are often restricted and impaired, and since long covid is a new and ongoing phenomenon; thus, supporting those affected is an essential task. People suffering from long covid should be able to receive a proper recovery strategy considering the various adverse health outcomes. Exploring ways to enhance or aid the recovery of those suffering is essential, and as mentioned before, physical activity seems like a suitable recovery strategy to enhance well-being and improve the quality of life. Factors that facilitate physical activity participation should be explored to develop appropriate psychological interventions. Recent research underlines that physical self-efficacy predicts physical activity, which leads to the assumption that it might also predict physical activity in long covid affected individuals. Moreover, it is interesting to investigate whether gender moderates this relationship since scientific data examined that gender differences appear in self-efficacy and physical activity. This could help to understand whether gender must be considered while designing the right intervention strategies.

Overall, the research questions are:

RQ1: *Does physical self-efficacy predict physical activity in long covid sufferers?*

RQ2: Does gender moderate the relationship between physical self-efficacy and physical activity in long covid sufferers?

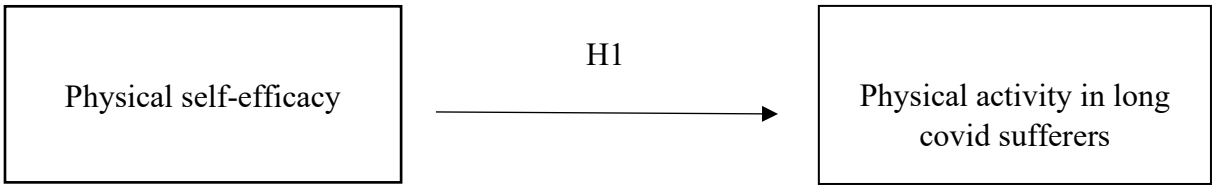
Based on previous findings, the following hypotheses were drafted (see Figure 1):

H1: *Physical self-efficacy predicts physical activity in long covid sufferers*

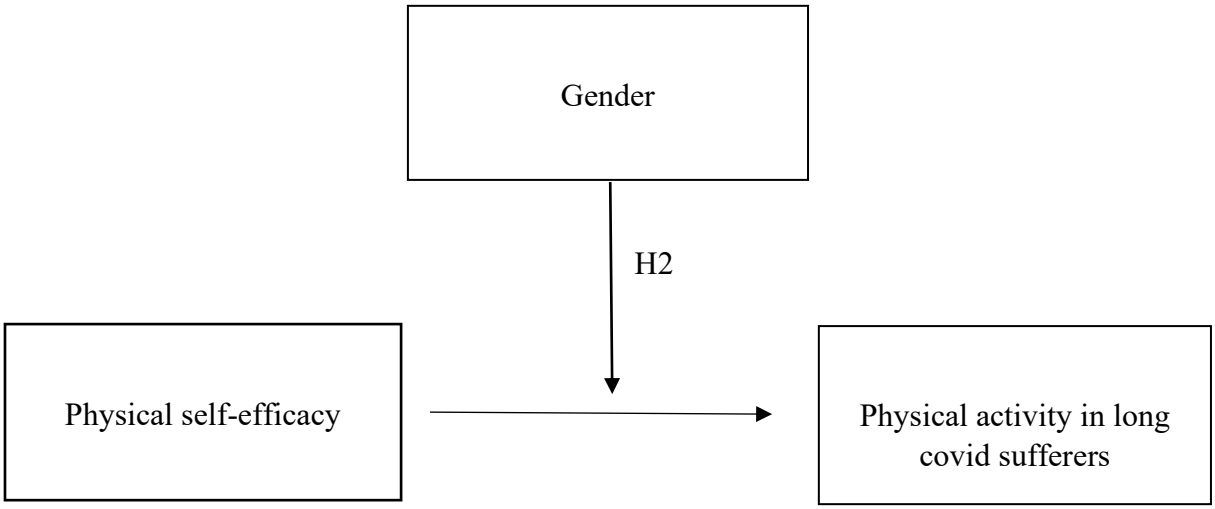
H2: *Gender moderates the relationship between physical self-efficacy and physical activity in long covid sufferers.*

Figure 1

Theoretical model of hypothesis 1.



Theoretical model of hypothesis 2.



Methods

Design

The current study used a descriptive cross-sectional study design, meaning that data was collected at a specific time. The study was part of a joint project conducted by six researchers. For this study, the questionnaires International Physical Activity Questionnaire Short Form (IPAQ-SF) and Self-efficacy Scale for Physical Activity (SEPAS), as well as demographics, were relevant to explore the relationship between the dependent variable

physical activity in long covid affected individuals, the independent variable self-efficacy, and the moderator gender. Data was collected from 08.04.2022 until 21.05.2022. The University of Twente's BMS ethics board confirmed that the study complies with ethical guidelines (request number: 220405).

Participants

Inclusion criteria were a confirmed infection with COVID-19 at least 12 weeks ago with a positive PCR test, a positive Antigen test, or a probable infection. Other inclusion criteria were experiencing at least one symptom up to the point of conducting the survey, not being younger than 18 years, and being fluent in either German or English language.

Participants were recruited using convenience and snowball sampling. Individuals that complied with the inclusion criteria and were in the social environment of the researchers were actively asked to participate. In addition, potential participants were approached via Reddit, Instagram, WhatsApp, and E-mail. Here, the link was shared via WhatsApp and Facebook multiple times, and the Instagram story function was used by each researcher at least twice. Further, on Reddit, the recruitment text with the German and English link was shared about three times within the sampling period in different subreddits that thematize long covid.

The desired sample size was calculated based on a g*power analysis which resulted in a sample size of 74 respondents. The effect size was determined to be medium with three predictors, a significance criterion of $\alpha = .05$, and a power statistic of = 0.95.

Materials

IPAQ – short form

Physical activity was measured using the International Physical Activity Short Form (IPAQ-SF), a 7-item self-report questionnaire that asks for information about light (*walking, working at home,* and *daily life activities*), moderate (*regular bicycling* and *carrying light*

loads), and vigorous physical activities (*digging, heavy lifting*, and *aerobics)* within the last seven days. More in detail, the IPAQ-SF asks for days per week spent doing these activities and follows up with a question asking about the hours and minutes spent doing physical activities. See more details in Appendix A and Appendix B.

The questionnaire was scored according to the IPAQ-SF scoring sheet resulting in MET minutes (Appendix C). To compute scores for each type of physical activity, the walking minutes were multiplied with an additional factor (for instance, 4.0 for moderate activity) and the days per week executing either light, moderate, or vigorous activities. The separate activity scores were then summed to receive the total MET minutes of the sample.

Moreover, the questionnaire is available in English and was translated into German by Hagströmer (2016). The IPAQ-SF displays a good value for test-retest reliability with .8 for the Spearman's *r* (Meh et al., 2021; Craig et al., 2003) and a good validity with a value of .76 (Lee et al., 2011).

SEPAS

Self-efficacy was measured with an adapted form of the Self-efficacy Scale for Physical Activity (SEPAS). Initially, the scale was created to test self-efficacy for physical activity regarding walking exercise in women with fibromyalgia (López-Roig et al., 2021) and consisted of 35 items measured on a 10-point Likert scale fragmented in seven conditions. It requested the self-assessment of how confident one is to perform a particular physical activity task, for instance, *how confident you can walk quickly at least 30 minutes twice a week doing physical exercise.* The original SEPAS scale has a criterion validity of .59 (López-Roig et al., 2021).

To suit the SEPAS scale for long covid affected individuals, certain items required to be adapted to match the current study (Appendix D). Firstly, the SEPAS scale was shortened from 35 to six items to provide a study as concise as possible. Therefore, only the most

relevant items for this study were included in the adjusted version, naming fatigue, pain, and the later added symptoms of depressive feelings and shortness of breath which can be considered applicable for testing long covid affected individuals. Further, the clarity of the phrasing was corrected and revised so that respondents could better comprehend the items. Answers still were provided on a 10- point Likert scale ranging from 1 = n*ot at all confident* to 10 = *very confident*. Multiple researchers checked the changed survey and approved the modifications and advancements. Moreover, the adapted survey was translated into German by a native German speaker, ensuring as much conciseness as possible (Appendix E). Cronbach's alpha showed then an excellent value of α= .94, demonstrating reliability and translational validity was checked using the Mann-Whitney U test.

Demographics

The demographics asked for the respondents' age, gender (female, male, other), and nationality (German, Dutch, other). Further relevant for this current study was asking how the participant found out about the infection with the answer possibilities of either having a positive PCR test, positive Antigen test, or an assumed infection. Moreover, it was inquired what symptoms were experienced in the last week, e.g., *fatigue/tiredness, cough, fever, and chills*. Apart from this, the demographic section asked whether the participant was hospitalized, was experiencing any physical impairments, and the precise date of being infected.

Procedure

Before the study started, respondents were given a recruitment text containing general information about the research and its aim.

After clicking on the link, they would get forwarded to the platform *Qualtrics* and the beginning of the survey. Here, the respondent would get informed regarding the duration, structure, voluntariness, and the right to end the study anytime. Further, the next page

contained the informed consent where the contact address of the researcher and supervisor were provided, as well as the inclusion criteria, the detailed purpose of the study, information on how data will be stored and retrieved, and data privacy (Appendix F). Next, the participant was informed about the procedure and the confidentiality of the study. If they agreed with the consent, the survey would start with the first question, declaring when an individual was infected with COVID-19. Suppose the participant's infection dates back less than 12 weeks; the survey would forward to the end since the inclusion criterion was not fulfilled. Those participants that met the criterion were transmitted to the first questionnaire. Overall, six questionnaires were included in the survey. The last part of the survey asked for demographics. Demographic questions do not require as many complex mental processes as the survey questions asked before. At the end of the survey, respondents were thanked for their time and participation, and the researcher's contact information in the event of follow-up questions or remarks was provided. Overall, respondents answered the survey on average in about 44 minutes after excluding extreme outliers.

Data analysis

The retrieved data were analysed using SPSS (version 28). Excluded from the dataset were incomplete answers, unfulfilled inclusion criteria, participants with a too early infection of COVID-19, and extreme outliers, which were identified by looking at boxplots and the IPAQ-SF scoring sheet. Total physical activity time was calculated according to the IPAQ-SF guidance (Forde, 2018) (Appendix C), and the SEPAS variable was computed by calculating the sum score.

To ensure reliability, Cronbach's alpha was calculated for the SEPAS. The Mann-Whitney U test was used to assure translational validity by assessing significant differences between the questionnaires. Before the analysis, the assumptions of normality, linearity, equal variance of residuals, and independence were checked. More in detail, the Shapiro-Wilk test

was applied to investigate the assumption of normality. The other assumptions were tested by examining the residuals plots. Descriptive statistics were utilized to explore the demographics, illness-related variables, and the constructs of interest by calculating the mean and Standard Deviation or percentage and frequency.

To investigate the first Hypothesis, a simple linear regression analysis was utilized to explore the relationship between self-efficacy, which was treated as the independent variable, and physical activity as the dependent variable. In addition, the bootstrapping method was used with a sample size of 2000 to account for the sample size and the non-normally distributed data. Further, with bootstrapping, the PROCESS macro for SPSS (Hayes, 2022) was applied to test the second Hypothesis. Here, a bootstrapping sample size of 5000 was chosen to increase the sample size using simulated sampling. In the end, the p-value and the 95% Confidence Interval of the interaction effect were interesting to test for the moderation of gender as well as the interval of the bootstrapping outcomes, which should not indicate a value of zero. Lastly, a post-hoc analysis was conducted to check for general gender differences regarding both constructs utilizing the Mann-Whitney U test.

Overall, 336 individuals participated in the study, with 156 participants coming from the German version and 180 from the English version. After extracting those who did not fulfil the inclusion criteria, did not finish the survey or did not agree to the informed consent, 66 participants were left. Further, two participants were considered outliers because of extreme and unrealistic values according to the IPAQ scoring sheet (Forde, 2018). Since this specific study focuses on gender differences between men and women, one participant was excluded that identified as non-binary. The final dataset consisted of 63 participants, which does not conform to the required sample size.

Results

Participant Flow

Overall, 336 individuals participated in the study, with 156 participants coming from the German version and 180 from the English version. After extracting those who did not fulfil the inclusion criteria, did not finish the survey, or did not agree to the informed consent, 66 participants were left. Further, two participants were considered outliers because of extreme and unrealistic values according to the IPAQ scoring sheet (Forde, 2018). Since this specific study focuses on gender differences between men and women, one participant was excluded that identified as non-binary. The final dataset consisted of 63 participants, which does not conform to the required sample size.

Descriptive statistics

The average age of the sample was 35 (*SD* = 13.1), with the youngest participant being 18 years old and the oldest participant 62 years old. Two-thirds of the sample consisted of females (69.8%, *n* = 44), and most participants found out about their COVID-19 infection by receiving a positive PCR test (63.5%, *n* = 40). Moreover, most participants were not hospitalized (93.8%, *n* = 60). More details about the descriptive statistics can be found in Table 1.

Table 1

Frequencies of demographics

Characteristics	n	%
Gender		
Male	19	30.2
Female	44	69.8
Hospitalization		
Yes	4	6.3
No	59	93.7
Nationality		
German	25	39.7
United States	16	25.5
Other [a]	22	34.8
Diagnosis		
PCR test	40	63.5
Antigen test	11	17.2
Assumed infection	12	19

Note. $N = 63$.

[a] other included Canada, United Kingdom, India, Italy, Netherlands, Serbia, Finland, France, Pakistan.

The recruited participants experienced fatigue as the most frequently reported symptom of long covid (88.9%, $n = 56$). Moreover, difficulties concentrating, memory problems, and/or confusion were experienced by 79.4% of the sample ($n = 50$). Overall, the average participant experienced five symptoms, and the maximum of experienced symptoms was nine at the time ($M = 5.2$, $SD = 2.6$). Further, 57 respondents experienced three or more

symptoms (90.1%, *n* = 57). A detailed description of the experienced symptoms is displayed in Table 2.

Table 2

Frequencies of reported symptoms within the sample

Symptoms	*n*	%
Fatigue	56	88.9
Cough	16	25.4
Fever and chills	10	15.9
Shortness of breath	41	65.1
Difficulties moving or talking	32	50.8
Loss of taste or smell	17	27
Difficulties concentrating, memory problems and/or confusion	50	79.4
Pain/ aches	40	63.5
Changes in mood and/or anxiety	40	63.5
Other [a]	28	44.4

Note. $N = 63$.

[a] other reported symptoms include, for example, Neuropathy, tinnitus, PTSD.

The descriptive statistics of the IPAQ-SF and SEPAS after calculating their sum scores are displayed in Table 3. According to the IPAQ-SF scoring sheet, the sample scored moderately with mean MET minutes of $M = 2727.8$ ($SD = 3812.7$). The minimum score of 0 and the maximum score of 19404 MET minutes per week indicate significant differences within the data. Further, the sum score of the SEPAS indicated that, on average, respondents scored moderately according to the IPAQ scoring sheet (Appendix C) in believing in their own ability to perform a specific physical activity-related task with a minimum observed score of 6 and a maximum score of 60 ($M = 34.2$, $SD = 16.6$).

Table 3

Descriptive statistics of relevant constructs

Constructs	*M*	*SD*	*Min*	*Max*	*Skewness*	*Kurtosis*
Physically active time	2727.88	3812.73	0	19404	2.553	7.440
Self-Efficacy	34.22	16.64	6	60	-.308	-1.113

Note. N = 63.

Reliability and Validity

In order to assess the internal consistency of the adapted SEPAS, Cronbach's alpha was calculated, which resulted in an excellent score of $\alpha = .94$ (Bland & Altman, 1997). Further, to assess the validity of the translated SEPAS scale, both languages were compared using the Mann-Whitney U test. It indicated that there are significant differences between the languages; however, after calculating the effect size according to Cohen (2013), it gets clear that there is a small effect; thus, the difference is not significant ($U = .00$, $p = .001$, $r = .99$).

Assumptions

The assumptions of normality, equal variance of residuals, linearity, and independence were checked before conducting the analyses. Skewness and kurtosis were inspected to scrutinize whether the variables were distributed in a normal matter. For the IPAQ-SF and SEPAS, the estimates suggested that both variables are not normally distributed since the values did not scatter around zero. To explore further, the Shapiro-Wilk-Test was applied, which indicated a significant value for the IPAQ-SF ($W(63) = .93$, $p = .002$), as well as for the SEPAS ($W(63) = .69$, $p < .001$). Both scales were not ordinarily distributed; thus, the normality assumption is violated. Additionally, the assumption of equal variance of residuals was tested and appeared to be violated, which indicates heteroscedasticity. The assumptions of linearity and independence were both met.

Hypothesis testing

Hypothesis 1

A simple linear regression with bootstrapping to account for the non-normally distributed data was calculated in order to test the first hypothesis of whether self-efficacy predicts physical activity in long covid sufferers. The predictor variable self-efficacy was discovered to have a statistically significant impact on the outcome variable physical active time in sufferers ($B = 94.41$, $t\ (62) = 3.63$, *95% CI* [47.82, 153.39], $p = .004$). Further, the simple linear regression model explained approximately 17% of the variability ($R^2 = .17$). Overall, the first hypothesis can be confirmed.

Hypothesis 2

The second hypothesis tests whether gender is a moderator in the significant relationship between self-efficacy and physical activity time in long covid affected individuals. In order to test this, the moderation analysis PROCESS by Hayes in SPSS, with a bootstrapping sample size of 5000, was utilized. The overall model was found to be significant ($R = .43$, $F\ (3, 59) = 4.5$, $p = .006$). The interaction effect between self-efficacy and gender with regard to physical active time was statistically not significant ($b = 28.87$, 95% *CI* [-90.59,151.34], $p = .638$). It appears that gender does not moderate the relationship between self-efficacy and physical activity time. Therefore, the second hypothesis must be refuted.

Post-hoc analysis

To test for general differences by gender in the physical self-efficacy and the physical activity construct a post-hoc analysis was conducted using the Whitney-Mann U test. Here, there were no significant differences by gender detected regarding physical self-efficacy ($U = 344.5$, $p = .271$), however men generally scored a bit higher in self-efficacy ($Md = 39.00$, $SD = 15.88$, $n = 19$) than women ($Md = 35$, $SD = 16.91$, $n = 44$). For the physical activity

construct there were no significant gender differences found ($U = 319$, $p = .137$) but men tend to score higher in physical activity ($Md = 1476$, $SD = 4949.14$, $n = 19$) than women ($Md = 1233$, $SD = 3171.05$, $n = 44$).

Discussion

The current study aimed to investigate whether self-efficacy predicts physical activity in long covid affected individuals and tested if gender moderates this relationship to some extent. Regarding self-efficacy and physical active time, a significant relationship was found; hence, hypothesis 1 could be confirmed. No significant associations were found concerning gender acting as a moderator in the relationship mentioned above. Therefore, hypothesis 2 is refuted.

Evaluating Hypothesis 1

The central hypothesis of the current study explored whether physical self-efficacy predicts physical activity in long covid affected individuals. This assumption was based on quantitative and qualitative research, which was repeatedly examined and investigated over the years in a healthy population (Hammer et al., 2015; Hartman et al., 2013; Kaewthummanukul & Brown, 2006; Kaleth et al., 2020; L. L. Lee et al., 2007; Rovniak et al., 2002; Williams & French, 2011). Now, the results of this study indicate that physical self-efficacy also predicts physical activity in long covid sufferers; hence the central hypothesis could be confirmed.

An interesting point to discuss is the relatively low value of R^2, which indicates that only 17% of the model could be explained by physical self-efficacy. This could lead to the assumption that other variables might also explain physical activity in long covid sufferers, such as autonomous motivation, social support, and self-regulation (Kekäläinen et al., 2022; Petersen et al., 2021). Research also found that the attitude toward the exercise, the intention, and physical competence can be determinants of physical activity (Cortis et al., 2017), which

could account for R^2. Hence, physical self-efficacy might only be treated as a partial influence, and it must be noted that more variables play a significant part in predicting physical activity in sufferers.

Moreover, the moderate physical activity scores of the IPAQ-SF should be discussed. Previous research indicated that people suffering from long covid often experience difficulties executing physical activity and even ADLs in their daily life and are restricted by their symptoms (Humphreys et al.,2021). Therefore, less physical activity in the sample was expected; however, the results of the current study show a significant relationship between already moderate physical activity in long covid sufferers and physical self-efficacy. The positive point is that long covid sufferers in this sample know how to be active and consider themselves active individuals, thus, indicating that sufferers might cope better than expected. Additionally, this could indicate that physical self-efficacy predicts physical activity in those who already score moderately and might already execute ADLs and other activities in their daily life.

In order to explain this finding, one could take into account the cycle of physical self-efficacy, where the belief in oneself grows through positive experiences and achievements, leading to more exercise and more self-efficacy (Bandura et al., 1999). An efficacious individual is able to bounce back after failures and acquires more goal-directed behaviour explaining the higher levels of physical behaviour (Bandura et al., 1999). However, since the study aims to help long covid sufferers who still struggle with executing ADLs daily, one cannot conclude from this study alone.

Further, another reason that justifies the higher-than-expected physical activity scores of the sample might be the IPAQ-SF itself. Research conducted by Dyrstad et al. (2014) found that the IPAQ-SF overestimates physical activity and indicates high levels even though a participant is not exercising to that amount. Moreover, the questionnaire might have

overlooked ADLs which are essential to consider in this study. Participants could have also underestimated their sitting time and ADLs, accounting for the low scores of little physical activities in the sample. Assuming overestimation might be a reason for the unexpected results, it is interesting to see that suffering individuals are optimistic and consider and report themselves better, even though they are experiencing symptoms.

Considering all these factors, it gets clear that the significant finding of physical self-efficacy predicting physical activity in long covid sufferers is a valuable guiding principle. Nevertheless, different reasons explain these findings, and other factors that influence the relationship need further investigation to gain more profound and accurate insights.

Evaluating Hypotheses 2

Secondly, it was hypothesized that the relationship between the predictor variable physical self-efficacy and the response variable physical activity gets moderated by gender. Previous research found that gender differences concerning self-efficacy and physical activity in a healthy population exist as well as in individuals suffering from CFS (Faro et al., 2016); thus, leading to the assumption that gender might moderate the relationship between physical self-efficacy and physical activity in sufferers (Pajares, 2002; Alsharawy et al., 2021; van Esch et al., 2021). Even though the overall model showed significance, the interaction effect and the relationship between self-efficacy and physical activity were insignificant; hence, the second hypothesis was refuted.

The post-hoc analysis demonstrated no significant gender differences regarding the relevant constructs; however, men generally tend to score higher in both physical self-efficacy and physical activity. This is an interesting finding because even though the sample was distributed unequally with 19 men and 44 women, there is still a tendency for men to score higher, which is in line with previous research. Still, the nonsignificant results of the

moderation analysis were unexpected. They can be justified by the unequal distribution of the sample and the inadequate sample size that did not match the calculated g*power analysis.

An explanation for the unequal distribution might be that women more often suffer from long covid (RKI – Coronavirus SARS-CoV-2, 2022; Aiyegbusi et al., 2021; Vanichkachorn et al., 2021); therefore, it could be that women are more likely to participate in studies and search for recovery strategies.

Since the overall model showed significance, however, not in relation to the relevant variables of this study, underlying variables may play a part. Other interesting and relevant moderators that might have impacted the results were, for instance, 'action planning,' defined as detailed planning of how a specific behaviour will be performed and executed as well as when and where, or 'facilitated social comparison,' which comprises drawing attention to an individual's performance leading to more comparison. Both moderators were found to positively impact the relationship between physical self-efficacy and physical activity in a healthy population (Williams & French, 2011).

Strengths and limitations

The current study displayed some strengths and limitations. To begin with, a strength would be the novelty and relevance of the research. Up to this point, ongoing research can be found regarding the new phenomenon of long covid; however, this specific study quantitatively researched it in relation to other relevant constructs, namely physical self-efficacy and gender, resulting in insightful and valuable findings for the future. This could be supported by a high number of responses and an interest in the results. Notably, the significance between physical self-efficacy and physical activity adds to a greater understanding and serves as starting point for further research. Tackling the enhancement of self-efficacy and overcoming barriers helps to be physically more active and hence aids to

recover, which is the ultimate goal. Future interventions can consider this psychological construct while creating new fitting strategies.

On the other hand, while conducting the research, limitations became apparent. The first major limitation concerns the length of the survey leading to a small sample size. Working in a group of researchers comes with advantages as well as disadvantages. Many constructs were covered and investigated within this research, resulting in an extensive and time-consuming formation of the survey. There were sudden response endings, and received feedback indicated that the survey was too long. A concomitant limitation would be the survey structure, arranging demanding questions at the beginning and descriptive questions at the end. Participants expressed feeling overwhelmed by the number of complex questions, and many stopped as demographics were asked as they did not seem necessary. For the researchers, however, only complete answers were desired since inclusion criteria were based on them. As this is the reason for extracting more than half of the relevant answers, the sample size was reduced. Preferably the study should have included 74 participants; however, it only contained 63 participants. To account for the small sample size bootstrapping was utilized, but still, statistical strength and the ability to generalize the findings was limited.

Another limitation comprises the materials that were used to measure the constructs. First, as mentioned before, the IPAQ-SF did not measure ADLs in detail, which is an essential factor of the current study. Moreover, it often overestimates physical activity in those suffering. This might have led to inaccurate values and insights. The SEPAS was adapted and translated, and later validity of the translations was checked. Due to the small sample size, the validity checks were not convincing, questioning whether they measured the relevant construct correctly and making it difficult to generalize findings. An alternative measure was not available up to the point of using the survey.

Future research

The study revealed important points for further research. Firstly, the significance of physical self-efficacy predicting physical activity is an initial point for more investigation in order to gain deeper insights. Future research should also examine other possible psychological constructs and factors that could forecast physical activity, as self-efficacy does not fully explain physical exercise. In addition, self-efficacy often is a part of a larger psychological construct or theory, and tackling only self-efficacy to predict physical activity in those suffering from long covid can be difficult. Gaining more evidence into the complexity of physical self-efficacy could lead to more in-depth explanations and may facilitate narrowing down what psychological constructs are essential for designing fitting interventions.

Moreover, a longitudinal study design that also focuses on an equal distribution of gender could be used to ensure reliability and notice little changes or developments that would be lost otherwise, facilitating future inference. Another point to consider would be using experience sampling by extracting information at different points of time through self-reports.

Lastly, the physical activity scale should differentiate more between the different physical activity levels and test precisely. Overestimation and unclear instructions for the participants shall be avoided. More in detail, the measure should mainly focus on ADLs since the current study is interested in finding an appropriate intervention that helps people yet struggling with executing ADLs. An alternative questionnaire might be the Activities of daily living questionnaire (ADLQ) which focuses on a clinical population and measures ADLs in daily life („Validation of the German Version of the Amsterdam Instrumental Activities of Daily Living Questionnaire®“, 2019).

Conclusion

The current study can be evaluated as an insightful step toward designing the right recovery strategies for people struggling with long covid symptoms. The aim was to investigate whether self-efficacy predicts physical activity in long covid sufferers and whether gender acts as a moderator in that relationship. A significant relationship between physical self-efficacy and physical activity in those suffering from long covid was found; however, it can be proposed that other underlying variables are relevant to scrutinize. The gender aspect did not yield any significant results in this study; however, previous research still provided guiding principles of gender differences being a relevant aspect. As this study includes several limitations that may have influenced the results, further research should take them into account and explore those findings in depth. Still, one can say that essential starting points for future interventions were detected.

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Appendices

Appendix A

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

   _____ **days per week**

   ☐ No vigorous physical activities → ***Skip to question 3***

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

   _____ **hours per day**

   _____ **minutes per day**

   ☐ Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ **days per week**

☐ No moderate physical activities → ***Skip to question 5***

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

☐ No walking → ***Skip to question 7***

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

This is the end of the questionnaire, thank you for participating.

Appendix B

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE - German Version

Wir sind daran interessiert herauszufinden, welche Arten von körperlichen Aktivitäten Menschen in ihrem alltäglichen Leben vollziehen. Die Befragung bezieht sich auf die Zeit die Sie während der **letzten 7 Tage** in körperlicher Aktivität verbracht haben. Bitte beantworten Sie alle Fragen (auch wenn Sie sich selbst nicht als aktive Person ansehen). Bitte berücksichtigen Sie die Aktivitäten im Rahmen Ihrer Arbeit, in Haus und Garten, um von einem Ort zum anderen zu kommen und in Ihrer Freizeit für Erholung, Leibesübungen und Sport.

Denken Sie an all Ihre **anstrengenden** und **moderaten** Aktivitäten in den **vergangenen 7 Tagen**. **Anstrengende** Aktivitäten bezeichnen Aktivitäten, die starke körperliche Anstrengungen erfordern und bei denen Sie deutlich stärker atmen als normal. **Moderate** Aktivitäten bezeichnen Aktivitäten mit moderater körperlicher Anstrengung bei denen Sie ein wenig stärker atmen als normal.

1. Denken sie nur an die körperlichen Aktivitäten die Sie für *mindestens 10 Minuten* ohne Unterbrechung verrichtet haben. An wie vielen der **vergangenen 7 Tage** haben Sie **anstrengende** körperliche Aktivitäten wie Aerobic, Laufen, schnelles Fahrradfahren oder schnelles Schwimmen verrichtet? ➲

   _____ Tage pro Woche ❑ **Keine anstrengende Aktivität (Frage 3)**

2. Wie viel Zeit haben Sie für gewöhnlich an *einem* dieser Tage mit **anstrengender** körperlicher Aktivität verbracht?

   _____ Stunden pro Tag **_____ Minuten pro Tag**

   ❑ **Ich weiß nicht/ bin nicht sicher**

3. Denken Sie erneut nur an die körperlichen Aktivitäten die Sie für *mindestens 10 Minuten* ohne Unterbrechung verrichtet haben. An wie vielen der **vergangenen 7 Tage** haben sie **moderate** körperliche Aktivitäten, wie das Tragen leichter Lasten, Fahrradfahren bei gewöhnlicher Geschwindigkeit oder Schwimmen bei gewöhnlicher Geschwindigkeit verrichtet? Hierzu zählt nicht zu Fuß gehen.

   _____ Tage pro Woche ❑ **Keine moderate Aktivität (➲ Frage 5)**

4. Wie viel Zeit haben Sie für gewöhnlich an *einem* dieser Tage mit **moderater** körperlicher Aktivität verbracht?

   _____ Stunden pro Tag **_____ Minuten pro Tag**

   ❑ **Ich weiß nicht/ bin nicht sicher**

5. An wie vielen der **vergangenen 7 Tage** sind Sie *mindestens 10 Minuten* ohne Unterbrechung **zu Fuß** gegangen? Dieses beinhaltet Gehstrecken daheim oder in der Arbeit, gehen um von einem Ort zu einem anderen zu gelangen, sowie alles andere ➲ Gehen zur Erholung, Bewegung oder Freizeit.

   _____ Tage pro Woche ❑ **Keine entsprechenden Wege zu Fuß (Frage 7)**

6. Wie viel Zeit haben Sie für gewöhnlich an *einem* dieser Tage mit **Gehen** verbracht?

   _____ Stunden pro Tag **_____ Minuten pro Tag**

   ❑ **Ich weiß nicht/ bin nicht sicher**

7. Wie viel Zeit haben Sie in den **vergangenen 7 Tagen** an **einem Wochentag** mit **Sitzen** verbracht? Dies kann Zeit beinhalten wie Sitzen am Schreibtisch, Besuchen von Freunden, vor dem Fernseher sitzen oder liegen und auch sitzen in einem öffentlichen Verkehrsmittel.

   _____ Stunden pro Tag **_____ Minuten pro Tag**

- ❑ **Ich weiß nicht/ bin nicht sicher**

Das ist das Ende der Befragung, danke für Ihre Teilnahme.

Appendix C

IPAQ Scoring Protocol (Short Forms)

Continuous Score

Expressed as MET-min per week: MET level x minutes of activity/day x days per week

Sample Calculation:

Walking MET-minutes/week = 3.3 * walking minutes * walking days

Moderate MET-minutes/week = 4.0 * moderate-intensity activity minutes * moderate days

Vigorous MET-minutes/week = 8.0 * vigorous-intensity activity minutes * vigorous-intensity days

A combined total physical activity MET-min/week can be computed as the sum of Walking + Moderate + Vigorous MET-min/week scores.

Categorical Score – three levels of physical activity are proposed

1. **Low**
   - No activity is reported **OR**
   - Some activity is reported but not enough to meet Categories 2 or 3.
2. **Moderate**

   Either of the following 3 criteria
   - 3 or more days of vigorous activity of at least 20 minutes per day **OR**
   - 5 or more days of moderate-intensity activity and/or walking of at least 30 minutesper day **OR**
   - 5 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes/week.
3. **High**

Any one of the following 2 criteria

- Vigorous-intensity activity on at least 3 days and accumulating at least 1500MET-minutes/week **OR**
- 7 or more days of any combination of walking, moderate- or vigorous-intensityactivities accumulating at least 3000 MET-minutes/week

Appendix D

Adapted self-efficacy for physical activity scale (SEPAS) – english version

The following 6 questions will test a psychological construct that is called Self-efficacy. It describes someones belief in their own ability to perform a certain action. In this case, all questions aim to assess your belief in your ability to perform certain physical activities. It is important to note here, that the questions do not ask whether you are actually doing those things but whether you think you ***could*** do those things. Please indicate to what extend you feel confident regarding the scenarios described below.

	Not at all confident								Very confident
How confident are you that you can walk at least 30 minutes taking advantage of daily situations like for example, going to work, shopping or taking the dog out despite feeling fatigue?	○	○	○	○	○	○	○	○	○
How confident are you that you can walk at least 30 minutes taking advantage of daily situations like for example going to work, shopping or taking the dog out despite experiencing other symptoms (for example: pain,	○	○	○	○	○	○	○	○	○

shortness of breath, depressed mood)?									
How confident are you that you can spend at least 30 minutes doing a light physical activity (that does not increase your breathing) like walking stairs, cooking or doing the dishes despite feeling fatigue?	○	○	○	○	○	○	○	○	○
How confident are you that you can spend at least 30 minutes doing a light physical activity (that does not increase your breathing) like walking stairs, cooking or doing the dishes despite experiencing other symptoms (for example: pain, shortness of breath, depressed mood)?	○	○	○	○	○	○	○	○	○
How confident are you that you can spend at least 30 minutes doing a moderate physical activity (that somewhat increases your breathing and perspiration) like	○	○	○	○	○	○	○	○	○

dancing or cycling at a regular pace, despite feeling fatigue?	
How confident are you that you can spend at least 30 minutes doing a moderate physical activity (that somewhat increases your breathing and perspiration) like dancing or cycling at a regular pace, despite experiencing other symptoms (for example: pain, shortness of breath, depressed mood)?	○ ○ ○ ○ ○ ○ ○ ○ ○

Appendix E

Adapted self-efficacy for physical activity (SEPAS) German version

Mit den folgenden 6 Fragen wird eine psychologische Eigenschaft getestet, die Selbstwirksamkeitserwartung genannt wird. Sie beschreibt wie sehr eine Person von ihrer Fähigkeit überzeugt ist, eine bestimmte Handlung ausführen zu können. In diesem Fall, zielen alle Fragen darauf ab, Ihre Selbstwirksamkeitserwartung bezüglich bestimmter körperlicher Aktivitäten, zu testen. Dabei ist es wichtig zu beachten, dass die Fragen nicht danach fragen, ob Sie diese Dinge tatsächlich tun, sondern ob Sie glauben, dass Sie diese Dinge tun könnten.

	Überhaupt nicht sicher								Sehr sicher
Wie sicher sind Sie, dass Sie trotz Müdigkeit oder Erschöpfung mindestens 30 Minuten zu Fuß; gehen können, wenn Sie Alltagssituationen wie z. B. den Weg zur Arbeit, zum Einkaufen oder den Spaziergang mit dem Hund nutzen?	○	○	○	○	○	○	○	○	○
Wie sicher sind Sie, dass Sie trotz anderer Symptome (z. B. Schmerzen, Kurzatmigkeit, gedrückte Stimmung) in der Lage sind, mindestens 30	○	○	○	○	○	○	○	○	○

Minuten zu Fuß zu gehen wenn sie Alltagssituationen wie z. B. den Weg zur Arbeit, zum Einkaufen oder den Spaziergang mit dem Hund nutzen?									
Wie sicher sind Sie, dass Sie trotz Müdigkeit oder Erschöpfung mindestens 30 Minuten lang eine leichte körperliche Tätigkeit (die Ihre Atmung nicht erhöht), z. B. Treppensteigen, Kochen oder Abwaschen ausüben können?	○	○	○	○	○	○	○	○	○
Wie sicher sind Sie, dass Sie trotz anderer Symptome (z. B. Schmerzen, Kurzatmigkeit, gedrückte Stimmung) mindestens 30 Minuten lang eine leichte körperliche Tätigkeit ausüben können (die Ihre Atmung nicht erhöht), z. B.	○	○	○	○	○	○	○	○	○

Treppensteigen, Kochen oder Abwaschen?									
Wie sicher sind Sie, dass Sie trotz Müdigkeit oder Erschöpfung mindestens 30 Minuten lang eine gemäßigte körperliche Aktivität (die Ihre Atmung und Ihr Schwitzen etwas erhöht) wie Tanzen oder Radfahren in einem gleichmäßigen Tempo ausüben können?	○	○	○	○	○	○	○	○	○
Wie sicher sind Sie, dass Sie trotz anderer Symptome (z. B. Schmerzen, Kurzatmigkeit, gedrückte Stimmung) mindestens 30 Minuten lang eine gemäßigte körperliche Aktivität (die Ihre Atmung und Ihr Schwitzen etwas erhöht) wie Tanzen oder Radfahren in einem gleichmäßigen	○	○	○	○	○	○	○	○	○

Tempo ausüben können?	

Appendix F

Informed consent form - English Version

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Researcher (Supervisor):

Gerko Schaap (g.schaap@utwente.nl)

Inclusion Criteria

Only participants with probable or confirmed SARS-Cov-2 infection, usually 12 weeks from the onset of COVID-19 with symptoms that last for at least 8 weeks and cannot be explained by an alternative diagnosis, are eligible for this study.

Purpose of the Study

This study is carried out as part of a bachelor's research project on the physical activity of post-COVID patients. Before you decide to participate in this study, it is essential to know why the research is done and what it will involve. Please read the following information carefully.

Managing physical activity can be difficult for individuals with post-COVID not only because of physical symptoms such as fatigue but also because of physiological symptoms that often accompany the syndrome. Therefore, investigating this relationship is important to enabling more informed decision-making in developing interventions or other efforts to facilitate the recovery process of individuals suffering from post-COVID.

If there are any questions, do not hesitate to approach one of the researchers for more

information or, if you feel more comfortable talking to a more experienced professional, the supervisor.

Study Procedures

The study consists of seven short questionnaires that need to be filled in. Participation is entirely voluntary, and the procedure can be stopped at any time without giving any reason for it. The questionnaires will take around 20 minutes to complete, and if you feel the need to take a break, you can do so.

Confidentiality

Your response to this survey will be anonymous; the researchers will only know you by a number. Participants' data will be kept confidential except in cases where the researchers are legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk. Data will be stored safely and no longer than two years before being deleted.

Voluntary Participation

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you choose to participate, you will be asked to accept the statements below. After doing so, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not negatively affect you.

○ I understand that my participation is voluntary. I am free to withdraw at any time, without giving a reason and I voluntary agree to participate in this study.

Informed consent form – German version

Informationen zur Studienteilnahme und Einverständniserklärung – Physische Aktivität von Corona Langzeit-leidenden

SELF-EFFICACY, GENDER AND PHYSICAL ACTIVITY IN LONG COVID SUFFERERS

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Supervision:

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Teilnahmebedingungen

Nur Personen, mit einer vermuteten oder bestätigten SARS-CoV-2 Infektion, die drei Monate nach Beginn der COVID-19 Erkrankung für mindestens zwei Monate Symptome gezeigt haben, die nicht anders erklärt werden können sind zu dieser Studie zugelassen.

Hintergrund und Ziele der Studie

Diese Studie ist Teil eines Bachelor-Projekts in Bezug auf die physische Aktivität von Menschen die unter Langzeitfolgen von COVID-19 leiden. Bevor Sie an dieser Studie teilnehmen, ist es wichtig, dass Sie wissen und verstehen, warum diese Nachforschungen betrieben werden und was Sie zu erwarten haben. Bitte lesen Sie den folgenden Absatz besonders sorgsam.

Sich physisch zu betätigen kann grade für Menschen die unter Langzeitfolgen des Corona Virus‘ leiden schwierig sein. Physische Symptome wie Müdigkeit aber auch physiologische Symptome sind oft Teil der Langzeitfolgen. Dementsprechend wichtig ist es die Beziehung der Krankheit zu physischer Aktivitäten zu untersuchen und die Informationsgrundlage für potenzielle Interventionen oder andere Versuche der Heilung und Unterstützung für Langzeit-leidende zu erleichtern.

Sollten Sie noch irgendwelche Fragen haben, zögern Sie nicht uns zu kontaktieren. Im Fall, dass Sie lieber mit jemandem sprechen wollen, der mehr Erfahrung hat, kontaktieren Sie gerne den Supervisor.

Ablauf der Studie

Die Studie besteht aus sieben kurzen Fragebögen. Die Teilnahme an dieser Studie ist freiwillig and kann jeder Zeit gestoppt werden, ohne dies begründen zu müssen. Das Ausfüllen der Fragebögen dauert ca. 20 Minuten. Sie können jeder Zeit eine Pause machen und zu einem späteren Zeitpunkt weitermachen.

Diskretion

Ihre Antwort zu den Fragebögen ist anonym und wird nur in Zusammenhang mit einer Nummer einsehbar sein. Die Daten eines jeden Teilnehmers werden vertraulich und diskret behandelt, außer in Fällen, in denen wir dazu legal dazu verpflichtet sind sie zu melden. Das beinhaltet beispielsweise Vorfälle von Missbrauch oder Suizidrisiko und ist nicht darauf beschränkt. Ihre Daten werden sicher aufbewahrt und nicht länger als zwei Jahre gespeichert und anschließend gelöscht.

Freiwillige Teilnahme

Die Teilnahme an dieser Studie ist freiwillig und Sie können entscheiden, ob Sie teilnehmen wollen, oder nicht. Falls Sie sich dazu entscheiden teilzunehmen, bitten wir Sie die unten folgenden Aussagen zu bestätigen. Wenn Sie dies getan haben, sind Sie dennoch frei jederzeit aus dieser Studie auszutreten ohne einen Grund dafür angeben zu müssen. Rücktritt von dieser Studie hat keine negativen Konsequenzen für Sie.

◯ Ich verstehe, dass meine Teilnahme freiwillig ist. Ich verstehe, dass ich frei darin bin diese Studie jederzeit verlassen ohne einen Grund angeben zu müssen und ich stimme freiwillig zu an dieser Studie teilzunehmen.