

THE EFFECT OF REGULAR AEROBIC EXERCISE ACTIVITY IN CURFEW AND LOCKDOWN CIRCUMSTANCES FOR SELF-REPORTED DISTRESS, DEPRESSION, ANXIETY AND SOMATIZATION LEVELS IN ADOLESCENTS AND YOUNG ADULTS

PRACTICAL RESEARCH

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ABSTRACT

Background: The severity of the Coronavirus pandemic resulted in lockdown and curfew implementations in different countries, including the Netherlands, in order to reduce the spread of the virus. After implementation of “hard lockdown” in the Netherlands, many young adults, among other social groups, had to face limitations of indoor and outdoor activities as well as reduction of social contacts. Lockdown and curfew policies are likely to have an effect on people’s mental health and general well-being. Since physical activity is believed to have a favorable effect on an individual’s mental state and general well-being. The choice of non-restricted activities during lockdown circumstances is reduced significantly, people resort to giving up their usual training routines and generally spend their free time in a more passive manner. Thus, a comparison was planned to be made between local couriers, who perform certain physical activity regardless of epidemiological situation and implemented regulations, and ordinary Netherlands residents. Therefore, the aim of the study is to discover the effect of physical activity on self-reported mental health status in adolescents and young adults.

Objective: To investigate associations between physical activity and mental well-being in young adults and adolescents living in the Netherlands during COVID-19 lockdown restrictions.

Methods: A cross-sectional study was performed between the 3rd and 9th of May 2021, the week after the national curfew was lifted. Local bike couriers who were allowed to stay outside during the curfew hours and were actively engaged in physical activity throughout the previous months because of the nature of their job were included in the experimental group. Ordinary Netherlands residents were recruited in a control group. Depression, somatization, anxiety and distress scores were collected by the means of an online questionnaire-based cross-sectional survey and eventually calculated using the Four-Dimensional Symptom Questionnaire (4DSQ).

Results: The study included 82 participants (53 males, 28 females and 1 genderqueer) aged from 17 to 28 years ($M = 23.05$, $SD = 2.55$). Statistical analysis revealed significant, positive and moderate correlations between Gender and Anxiety [$r_s(79) = .36$, $p = .001$], Distress [$r_s(79) = .34$, $p = .002$], Somatization [$r_s(79) = .35$, $p = .001$]. For Depression scale there was weak, positive correlation which was statistically significant as well ($r_s(79) = .27$, $p = .015$). Also, backward multiple linear regression analysis demonstrated that even though the total distance covered by couriers in a two months period was a negative predictor, individual’s gender was a positive and stronger prognosticator of psychological burden experienced in every 4DSQ domain.

Conclusions: The findings indicate that delivery personnel’s covered distance as physical activity equivalent turned out to be a negative predictor of better mental health and general well-being during the implemented curfew and other COVID-19 related restrictions. Therefore, the right choice of physical activity is vitally important for the individual in order to reduce psychological burden experienced.

Key words: Four-Dimensional Symptom Questionnaire, COVID-19, Physical Activity

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INTRODUCTION

The COVID-19 pandemic is an ongoing global pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). To date, there is no effective treatment or cure for the disease caused by the SARS-CoV-2 virus ([World Health Organization, 2021](#)). Following World Health Organization (WHO) recommendations, most countries implemented lockdown policies for all citizens except for essential services. The Netherlands put in place an “intelligent” lockdown starting from mid-March 2020. People were urged to leave their homes as little as possible and work from home. Furthermore bars, restaurants, schools, gyms and ‘contact professions’ were closed and visiting people in nursing homes was not allowed ([De Haas et al., 2020](#); [Dutch government, 2020](#)). In October 2020 partial lockdown was implemented restricting indoor sport activities, e.g., fitness centres, yoga studios and other indoor sports accommodations were closed. Nonetheless, taking part in individual sports or in team sports with no more than 4 people in total was allowed if social distance was kept ([Dutch government, 2020](#)). Starting from 23rd of January 2021, a nationwide curfew over the hours of 9 PM to 4:30 AM was implemented, which eventually was lifted on 28th of April 2021 ([Dutch government, 2021](#)). At the same time, several exemption groups had a right to stay outside during the designed time limitations. In particular, as front line workers, couriers were excluded from these regulations. The Rijksoverheid (central government) has created a self-declaration form that had to be completed and carried by the individual in case of inspection from police or special investigating officer (BOA).

While these measures were designed and enforced to limit the spread of the virus, such restrictions would likely have a negative impact on a person's mental health ([Tsamakis et al., 2021](#)). Precaution measures like full or partial lockdowns, quarantine in case of getting in contact with people with symptoms or self-isolation in case of displaying disease symptoms lead to separation from friends and family members, fear over personal and loved one's health and urge to deal with new threats. Moreover, recent articles indicate that implemented restrictions lead to expanded levels of stress, anxiety, depression, loneliness and moral exhaustion both for adults and adolescents ([Luo et al., 2020](#); [Schmidt et al., 2021](#)). Even though occupational or general stresses and anxieties could be an integral part of everyday life for many people regardless of epidemiological situation, it has unfavorable effect on all systems of the body including the musculoskeletal, respiratory, cardiovascular, endocrine, gastrointestinal, nervous, and reproductive systems ([American Psychological Association, 2018](#)). Furthermore, individuals with relatively high stress level often experience depression and anxiety symptoms in the bundle ([Wiegner et al., 2015](#)).

One of the well-known ways to decrease psychological burden is maintaining a certain activity level. More active individuals report better mental health and general well-being both in young adults and adolescents ([Wright et al., 2021](#); [Gordon et al., 2020](#)). Discrete national ([Health Council of the Netherlands, 2017](#)) and international ([World Health Organization, 2020](#)) physical activity guidelines recommend that adults engage in at least 150 min of moderate-to-vigorous physical activity per week to achieve health benefits. At the same time, unforeseen exercise withdrawal that is likely to happen in lockdown circumstances also has consequences on psychological well-being ([Weinstein et al., 2017](#)). Therefore, the main goal of the present study is to discover, via an online survey, associations between physical activity and mental well-being in adults and adolescents living in the Netherlands. The secondary aim

is to report gaps and differences in gender and other demographic variables (e.g., age, educational background etc.) within the study groups.

MATERIALS AND METHODS

Participants and Design

A cross-sectional study was conducted via online survey of 60 questions that were compiled by the means of Google Forms to measure mental health and activity level during the COVID-19 restrictions in the Netherlands. For measuring participants' mental status, the Four-Dimensional Symptom Questionnaire (4DSQ) developed in practice by Dr. Berend Terluin was included with all its contents, as it determines a person's Distress, Depression, Anxiety and Somatization levels.

Local delivery companies (e.g., *Thuisbezorgd* and *Uber Eats*) and social networks (e.g., *Discord* and *Facebook Messenger*) were used as the primary platforms of recruitment to reach the targeted audience. Netherlands residents aged from 16 to 45 years both with and without courier work experience were recruited as research participants. Participants were informed that obtained data would be kept anonymous and that they had the right to withdraw from the study at any time due to the voluntary nature of their participation. Respondents were also informed that there were no correct or incorrect answers and were asked to express genuine and truthful replies. Informed consent was obtained from all participants prior to proceeding with the survey. All questionnaire responses were collected during the first week after the curfew lift from the 3rd to the 9th of May 2021. In order to reduce responders' daunt, the survey was designed to be completed between 5 and 10 minutes.

In order to be included in the study, participants had to meet certain inclusion criteria. The eligibility criteria were as follows, see Table 1.

Table 1. Inclusion criteria

Experimental Group	Control Group
Provided their participation consent prior to the start of the survey filling out	Provided their participation consent prior to the start of the survey filling out
Aged from 16 to 45 years	Aged from 16 to 45 years
Netherlands residents	Netherlands residents
Fully conversant in the English language	Fully conversant in the English language
Were hired as a couriers at least since the 1 st of April 2021	
Use either a Regular or an E-Bike during their work	

An exclusion criteria had to be used in order to filter out responders that are not relevant for answering the research question, see Table 2.

Table 2. Exclusion criteria

Experimental Group	Control Group
Participants are pregnant women, people with physical disabilities	Participants are pregnant women, people with physical disabilities
The combined distance covered in March and April <100 km	
Use the vehicle different from the Regular or E-Bike during their work (e.g., motor scooter)	

Four-Dimensional Symptom Questionnaire

The Four-Dimensional Symptom Questionnaire (4DSQ) is a self-report questionnaire that has been developed in Primary Care to distinguish non-specific general distress from depression, anxiety and somatization. Answers were collected on a Likert-type scale, where options ranged from (1) “No” to (5) “Very often or constantly”; the average being (3) “Regularly”. According to [Terluin et al. 2006](#), the 4DSQ is a valid self-report questionnaire to measure distress, depression, anxiety and somatization in Primary Care patients.

The 4DSQ Distress scale measures the most general, most common, expression of psychological problems. Internal consistency reliability (Cronbach’s alpha) of the distress scale is > 0.90 across a range of populations, the Depression scale was associated with major depression (Cronbach’s alpha is > 0.90), the Anxiety scale was associated with anxiety disorder (Cronbach’s alpha is > 0.85), and the Somatization scale was associated with the GPs' suspicion of somatization (Cronbach’s alpha is > 0.85). Another study conducted by [Langerak et al., 2012](#) reported that 4DSQ showed good internal consistency, acceptable to good diagnostic values of the 4DSQ scales and good diagnostic accuracy in detecting depressive and anxiety disorders.

Each 4DSQ scale has three cut-off points, that divide the scores into “Low”, “Moderately High” and “Very High”. Table below (see Table 3) presents an overview of the cut-off points and their meaning for each of the scales.

Table 3. Interpretation of the 4DSQ scores

Scale	Low	Moderately High	Very High
Distress	0-10: normal distress; in principle no action necessary	11-20: increased distress with the threat of dysfunctioning; stress reduction is desirable	21-32: severe distress with high risk of dysfunctioning (sick leave); stress reduction is indicated
Depression	0-2: probably no depressive disorder	3-5: possible depressive disorder; wait-and-see and re-evaluation after a few weeks; if indicated clinical depression diagnosis	6-12: relatively high risk of a depressive disorder; clinical depression diagnosis is indicated
Anxiety	0-7: probably no anxiety disorder	8-12: possible anxiety disorder; wait-and-see and re-evaluation after a few weeks; if indicated clinical anxiety diagnosis	13-24: relatively high risk of one or more anxiety disorders; clinical anxiety diagnosis is indicated

Somatization	0-10: relatively normal bodily reaction to stress	11-20: possible somatization with the threat of dysfunctioning; discuss with patient	21-32: high risk of somatization; discuss with patient, consider cognitive behavioural therapy or referral
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The Concept of Adolescence and Young Adults

The WHO defines adolescence as the phase of life between childhood and adulthood and adolescents as individuals between 10 and 19 years of age ([WHO, 2021](#)). The definitions and opinions of the Young Adults concept may vary. Namely, according to [Levinson, 1986](#), early adulthood lasts from about age 17 to 45 and begins with the Early Adult Transition. Also, it is considered as the era of greatest energy and abundance and of greatest contradiction and stress levels. In terms of practical application of the concept, delivery companies hire drivers who reached at least 16 years of age ([Thuisbezorgd FAQ, 2021](#)). Therefore, indicated age was chosen as the lowest threshold for survey participants.

The Covered Distance as Physical Activity Equivalent

The questionnaire invites participants to report the distance cycled monthly (in kilometres) during their work as a courier in March and April. The numbers were obtained from the Scoober mobile application used by couriers. Integrated Google Maps platform allows accurate calculation by the means of Global Positioning System of covered distance within a certain period. In the Netherlands, Google Maps platform offers complete features coverage with good data quality and availability, including biking and walking directions ([Google Developers, 2021](#)), while mobile Global Positioning System data can be considered as an accessible alternative to provide high-quality contextualised information to enable ubiquitous monitoring of physical activity levels within the general population ([Benson et al., 2015](#)).

Other demographic measures included in the analyses were age; gender; educational background; and performed sport activity. In addition, type of vehicle (*Regular* or *E-Bike*) used during the work and the distance covered monthly were recorded in experimental group.

Statistical Analysis

The software “SPSS Statistics” version 25.0 created by IBM Cooperation was used as the data bank to run statistical testing and analyses. In particular, descriptive analysis such as means, standard deviations and frequencies were computed. The Shapiro-Wilk normality test was used to determine the normality of variables in order to select the most appropriate statistical test. In case of normally distributed data – Pearson correlation analysis is the most appropriate test for bivariate correlations and ANOVA can be used to test differences between group means. If the normality is violated, Spearman rank correlation is appropriate for bivariate correlations and Kruskal-Wallis test can be used to test differences between mean ranks of three or more groups. Multiple linear regressions using an backward elimination method was applied to determine the best predictors of the model. In backward elimination all variables are entered in the model and sequentially removed using the smallest partial correlation with the dependent variable as a criteria. Mann-Whitney U test and t-test

were used to compare the baseline characteristics between genders. The exact Four-Dimensional Symptom Questionnaire scores for each domain were calculated using the scoring instructions provided by the tool's author. The significance level was set at $p < 0.05$.

RESULTS

Participant Characteristics

The sample comprised 82 young adults and adolescents (53 males, 28 females and 1 genderqueer) whose ages ranged from 17 to 28. Participants' descriptive statistics can be found in Table 4 giving a comprehensive outlook on the sample type.

Table 4. Sample Demographic Characteristics

Characteristic	No. (%)	
	Experimental Group	Control Group
Total, N	58	24
Gender		
Male	38 (65.5)	15 (62.5)
Female	19 (32.8)	9 (37.5)
Other	1 (1.7)	0 (0.0)
Age, mean (SD)	22.93 (2.361)	23.33 (2.988)
Type of vehicle used during the work		
E-Bike	50 (86.2)	
Regular Bike	8 (13.8)	
University/college enrolment		
Enrolled	48 (82.8)	17 (70.8)
Not enrolled	7 (12.1)	5 (20.8)
Already obtained a degree	3 (5.2)	2 (8.3)
Regular sport participation		
Regular sport participants	19 (32.8)	7 (29.2)
No sport participation	39 (67.2)	17 (70.8)
Distance covered in March, mean (SD)		
E-Bike in km	396.23 (241.04)	
Regular bike in km	433.25 (217.02)	
Total in km	401.52 (236.25)	
Distance covered in April, mean (SD)		
E-Bike in km	449.33 (249.81)	
Regular in km	423.13 (203.55)	
Total in km	445.65 (242.40)	
Four-Dimensional Symptom Questionnaire		
Distress, range 0–32, mean (SD)		
E-Bike,	12.18 (7.34)	
Regular bike	9.38 (4.96)	
Total	11.79 (7.09)	13.29 (6.42)
Anxiety, range 0–24, mean (SD)		

E-Bike	4.14 (3.89)	
Regular bike	3.63 (2,62)	
Total	4.07 (3.73)	4.75 (3.81)
Depression, range 0–12, mean (SD)		
E-Bike	2.86 (3.36)	
Regular bike	2.13 (1.55)	
Total	2.76 (3.17)	3.58 (2.80)
Somatization, range 0–32, mean (SD)		
E-Bike	9.22 (7.30)	
Regular bike	9.25 (6.36)	
Total	9.22 (7.13)	9.92 (6.07)

General psychosocial symptom scores were moderately elevated for domains Distress ($M=12.18$, $SD=7.34$; $M=13.29$, $SD=6.42$) and Depression ($M=2.86$, $SD=3.36$; $M=3.58$, $SD=2.80$) in Experimental Group for E-Bike drivers and in Control Group respectively. At the same time, the remaining Somatization ($M=9.22$, $SD=7.30$; $M=9.92$, $SD=6.07$) and Anxiety ($M=4.14$, $SD=3.89$; $M=4.75$, $SD=3.81$) scales are considered to have Low scores. For Regular Bike users only Depression domain ($M=2.13$, $SD=1.55$) was slightly above the Low score.

Shapiro-Wilk test of normality showed normal distribution for Control Group and Regular Bike users in all four measures ($p > .05$), however there was no normal distribution for E-bike group in all four measures ($p < .05$). Detailed results of Shapiro-Wilk test for different research groups can be observed in the Table 5. Itemized results are listed in Appendix.

Table 5. Characteristics Tests of Normality

	Group	Shapiro-Wilk		
		W	df	<i>p</i>
Distress	E-Bike	.945	50	.021
	<i>Control</i>	.968	24	.607
	<i>Regular bike</i>	.885	8	.209
Anxiety	E-Bike	.894	50	.000
	<i>Control</i>	.915	24	.046
	<i>Regular bike</i>	.901	8	.298
Depression	E-Bike	.796	50	.000
	<i>Control</i>	.932	24	.108
	<i>Regular bike</i>	.952	8	.731
Somatization	E-Bike	.870	50	.000
	<i>Control</i>	.924	24	.071
	<i>Regular bike</i>	.906	8	.330

Group Differences

The results of the independent Kruskal-Wallis test indicated no significant differences ($p > .05$) in Four-Dimensional Symptom Questionnaire scores between the groups. Namely, the test showed that there was no statistically significant difference in Distress score between the different groups of participants, $\chi^2(2) = 1.98$, $p = .37$, with a mean rank score of 40.76 for E-Bike users, 45.96 for Control Group and 32.75 for Regular bike users.

In the Table 6, the summarized results of the independent Kruskal-Wallis test are displayed, along with the values for group differences in the outcomes assessed.

Table 6. Independent Kruskal-Wallis.

	Group	Mean Rank	χ^2	df	p
Distress	E-Bike	40.76	1.98	2	.37
	Control	45.96			
	Regular bike	32.75			
Anxiety	E-Bike	40.17	.62	2	.73
	Control	44.69			
	Regular bike	40.25			
Depression	E-Bike	38.83	2.49	2	.29
	Control	47.85			
	Regular bike	39.13			
Somatization	E-Bike	39.45	1.08	2	.58
	Control	45.56			
	Regular bike	42.13			

Correlations between physical activity on 4SDQ scores

A Spearman's rank-order correlation was run to determine the relationship between the total distance covered in months of March and April and 4DSQ domains. The results indicated no significant correlations between physical activity and 4SDQ scores, however, it can be observed that all correlations are negative (see Table 7).

Table 7. Correlations between the total distance covered and 4DSQ scales

	Distress	Anxiety	Depression	Somatization	
Total Distance in Kilometers	r_s	-.217	-.226	-.097	-.250
	p (2-tailed)	.101	.088	.469	.058
	N	58	58	58	58

Correlation between demographic factors on 4SDQ scores

A Spearman's rank-order correlation was run to determine the relationship between gender and 4DSQ scales. An individual who has been identified as genderqueer was excluded from analysis, since a single person cannot be qualified as group representative.

There were a significant positive and moderate correlation (Akoglu, 2018) between Anxiety [$r_s(79) = .36, p = .001$], Distress [$r_s(79) = .34, p = .002$], Somatization [$r_s(79) = .35, p = .001$] and gender. For Depression scale there was weak, positive correlation which was statistically significant as well ($r_s(79) = .27, p = .015$).

In terms of all the rest demographic factors, no statistically significant correlations between them and the 4DSQ scales were found for the vast majority. Although a few exceptions (e.g., Sport Activity and Anxiety & Depression) can be observed from detailed results depicted in Table 8.

Table 8. Correlations between demographic factors and 4DSQ domains

		Distress	Anxiety	Depression	Somatization
Age	r_s	.082	-.014	-.22	-.16
	p (2-tailed)	.466	.903	.048	.162
	N	82	82	82	82
Educational Background	r_s	.133	.088	.139	.073
	p (2-tailed)	.233	.433	.214	.516
	N	82	82	82	82
Type of Vehicle	r_s	-.096	-.008	.034	.040
	p (2-tailed)	.475	.955	.803	.763
	N	58	58	58	58
Sport Activity	r_s	.182	.218	.223	.077
	p (2-tailed)	.102	.049	.044	.491
	N	82	82	82	82

The effects of demographic factors and physical activity on 4SDQ scores

Four multiple linear regression models using backward elimination method were run with demographic factors that significantly correlated with Four-Dimensional Symptom Questionnaire scorings and Total Distance as predictor variable and Four-Dimensional Symptom Questionnaire scorings as an outcome variable. Indicated predictor variables were chosen due to statistically significant correlation, whereas the effect of physical activity is the main point of interest of the study.

In model *No1* gender and total distance were initially entered as the predictors and distress was an outcome variable. Only gender remained in the final model and total distance was excluded from it. The model was significant, $F(1, 55) = 7.43, p = .01, R^2 = .12$, and accounted for 12 % variation in distress. Females had higher levels of distress compared to males (beta = .35).

In model *No2*, gender, physical activity, and total were entered as predictors and anxiety was an outcome. The final model included gender and physical activity as the strongest

predictors of anxiety, $F(2, 54) = 7.59, p = .001, R^2 = .22$, and total distance was removed. The model accounted for 22 % of variation in anxiety. Only gender independently contributed to prediction of anxiety ($\beta = .37, p = .004$) whilst controlling for physical activity. Again, females had higher levels of anxiety.

In model *No3*, gender, age, total distance, and physical activity were used in order to predict depression. The final model consisted of gender only that was found to be a significant predictor of depression, $F(1, 55) = 5.28, p = .03, R^2 = .09$, and accounted for 9 % of variation. Females showed a higher level of depression than males ($\beta = .30$).

Lastly, model *No4* was created with gender and total distance as predictors and somatization as an outcome. Both variables together significantly predicted somatization, $F(2, 54) = 6.56, p = .003, R^2 = .20$, and accounted for 20 % of variation, however, only gender showed a significant independent contribution to the model ($\beta = .36, p = .005$). Females had higher somatization than males.

Table 9. Multiple linear regression final models with 4DSQ domains (N=56)

Dependent variable	R ²	F	P	Independent predictor	b	t	p
Distress	.12	7.43	.01	Gender	.345	2.73	.009
Anxiety	.22	7.59	0.01	Gender	.372	3.04	.004
				Sport Activity	.224	1.83	.073
Depression	.09	5.28	.03	Gender	.296	2.30	.025
Somatization	.20	6.56	.003	Gender	.362	2.94	.005
				Total Distance Covered	-.211	-1.71	.092

b: standardized coefficients, $p < 0.05$ was considered significant.

Gender Differences in Four-Dimensional Symptom Questionnaire scores

An independent samples t-test results showed a statistically significant difference in Distress between males and females, $t(79) = -3.17, p = .002$. Females had a significantly higher distress scores ($M = 15.14, SD = 6.53$) compared to males ($M = 10.41, SD = 6.31$).

A Mann-Whitney U test (see Table 10) showed that there was a significant difference ($U = 422.5, p = 0.001$) in Anxiety scale between Males with Mean Rank = 35 and Females with Mean Rank = 52.4.

Table 10. Summary of Gender on Mann-Whitney U Test

	Mean Ranks	
	Male (n = 53)	Female (n = 28)
Anxiety		
Mann-Whitney U	422.5	
p	.001	
	34.97	52.41
Depression		
Mann-Whitney U	503.5	

<i>p</i>	.016	36.50	49.52
Somatization			
Mann-Whitney U	425.0	35.02	52.32
<i>p</i>	.002		

DISCUSSION

The primary aim of this study was to investigate the impact of physical activity measured by the means of monthly covered distance by bike couriers on self-reported levels of anxiety, depression, somatization and distress. Several statistically significant correlations between demographic factors and mental health were found. Firstly, a negative relationship existed between the distance covered in a two months period as physical activity equivalent and Four-Dimensional Symptom Questionnaire domains in multiple linear regression analysis, while female gender was a positive and stronger prognosticator of psychological burden experienced. Therefore, delivery personnel's covered distance as physical activity equivalent was a negative predictor of better mental health and general well-being.

The secondary objective of the research was to report differences in gender and other demographic variables within the study groups. The results of independent Kruskal-Wallis test demonstrated no statistically significant differences between the experimental and the control groups. Whereas in contrast, statistically significant gender dissimilarity in Four-Dimensional Symptom Questionnaire scores were found. In particular, in every 4DSQ domain women reported higher figures in comparison with men.

Some obtained results correspond with different sources, while some, in contrast, demonstrate the opposite figures. In particular, the results of the study align with several others, where the gender differences in experienced stress and anxiety levels were examined. Generally, females tend to experience higher self-reported levels of stress and anxiety before ([Calvarese, 2015](#); [Gao et al., 2020](#)) and during ongoing pandemic ([García-Fernández et al., 2020](#), [Mazza et al., 2020](#)). Simultaneously, physical activity is likely to reduce psychological burden and to have a favorable effect on individual's mental health ([Herbert et al., 2020](#); [Ristau 2020](#)), accordingly the findings of conducted research run counter to the commonly-held view about the positive effects of exercise or physical activities.

It is worth mentioning that couriers' work cannot be considered as a fully voluntary type of activity. Some participants may also pursue a certain number of working hours to be obtained monthly in order to be eligible for study grant or allowance, which could potentially cause additional psychological burden. It can be especially stressful for individuals who combine the work with their studies. Even before the COVID-19 outbreak couriers experienced relatively high levels of stress ([R.Rangarajan, 2018](#); [Magdalene et al., 2019](#)), but in the context of global pandemic, when delivery personnel play a vital role in maintaining the ongoing and optimal functioning of healthcare workers and of the general public, additional stress factors are likely to contribute. Due to the nature of their work, they are also exposed to COVID-19 and its' consequences because of the number of people they interact with during their work duties.

All these factors could potentially lead to accumulation of psychological burden instead of contributing to better mental health and general well-being regardless of their activity level.

The figures of depression prevalence align with the study conducted before the SARS-CoV-2 outbreak with Dutch university students as participant group, where 17% of participants experienced a moderately severe or severe major depression ([König, 2019](#)). Generally, among all the participants, N = 12 (14.6%) scored over 20 in terms of Distress, indicating “Very High” distress levels. Moreover, N = 17 (20.7%) had strongly elevated Depression record, and N = 3 (3.7%) reported “Very High” results in Anxiety domain. Additionally, N = 8 (9.8%) had strongly elevated Somatisation scores. Within the group of E-Bike drivers, the highest combined 4DSQ score was 83 points, whereas 1 point was the lowest result recorded (M = 28.3, SD = 20.7). Regular bike users indicated the following numbers: the maximum value is 49, the minimum value is 0 (M = 23.0, SD = 13.9). Lastly, the total figures of control group stand as follows: 66 points as the maximal score obtained, 5 points as the minimal record (M = 31.0, SD = 16.8).

Strengths and Limitations

Limitations of a study are inevitable, and with this study there were a few difficulties faced. To begin with, an important drawback of the study was limited size and diversity of certain study samples due this been an undergraduate research project. Namely, only 8 participants who cycled on the regular bike were recruited, all of them were men. Even though initially the age thresholds were set from 16 to 45 years, certain age groups and decades turned out to be underrepresented. In particular, no participants older or younger than 28 and 17 years of age respectively were recruited. Additionally, only Netherlands residents from the city of Groningen were recruited, therefore the results are not meant to be generalised to all couriers or citizens of The Netherlands or beyond. Lastly, the cross-sectional design of the study cannot infer cause-effect relationships.

In terms of strengths, the findings of this study may be valuable for the province of Groningen since the research demonstrates a regional-specific state of affairs. Additional strengths include the date of survey conduction – it was conducted between the 3rd and 9th of May 2021, the week after the national curfew was lifted, giving an opportunity to evaluate full term consequences of implemented limitations. Finally, groups were quite homogenous in terms of demographic characteristics and their background.

CONCLUSION

The findings indicate that having constant physical activity while working as bike courier during the implemented curfew and other SARS-CoV-2 related restrictions not have a significant effect on psychological state. Therefore, the right choice of physical activity is vitally important for the individual in order to reduce psychological burden experienced.

Recommendations

Future researchers could consider an expansion of the study population, in particular to recruit a bigger group of regular bike drivers to discover the group differences and the impact

of physical activity on them more in-depth. Also, in order to exclude additional stress factors, further research can be conducted during the summer break and after the drop of most COVID-19 related restrictions. Finally, the further investigation could be less region-specific with the aim to determine distinct associations on a national scale.

The results of the study might be valuable for healthcare and public health professionals as they illustrate that while individual could adhere to national or international physical activity guidelines, the right selection of physical activity type and its context have to be taken into consideration in order to have a favorable effect. Additionally, conducted research highlights gender differences, and this potentially contributes to increasing awareness about elevated stress, anxiety, depression and somatization symptoms experienced by females in comparison with men.

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APPENDICES:

Survey instructions

You are invited to participate in a web-based online survey on your current activity level and self-reported well-being for my Graduation Assignment. It's completely anonymous since no identifying information such as your name, email address, or IP address is collected. It requires approximately 10 minutes to complete. Your participation in this survey is voluntary. You may refuse to take part in the research or exit the survey at any time. Some of the survey questions may be distressing to you as you think about your experiences.

Each well-being question refers to the complaints and symptoms that you had in the past week (the past 7 days, including today). Please indicate for each complaint how often you noticed that you had it in the past week by putting an "X" in the box under the answer that is most appropriate for you.

If you have any questions about this study, feel free to contact me via e-mail:

m.dolgitski@st.hanze.nl

Content of the survey and informed consent

1. I hereby consent to voluntary participate in the survey and processing of the data *

*

Mark only one oval.

I agree to participate

2. What gender do you identify as? *

Mark only one oval.

Male

Female

Prefer not to say

Other: _____

3. What is your current age? *

4. Do you regularly participate in any sport activities at the moment? *

Mark only one oval.

Yes

No

5. Are you currently enrolled in a college or university? *

Mark only one oval.

Yes

No

No, since I have obtained a degree already

Other: _____

6. What type of vehicle do you use during the work? *

Mark only one oval.

E-Bike

Regular bike

Other: _____

7. How many kilometres have you covered in March 2021 working as a courier? *

Scoober App → Profile → Job History

T NOV DEC JAN FEB **MAR** APR MAY

jobs

636.9
km

8. How many kilometres have you covered in April 2021 working as a courier? *

Scoober App → Profile → Job History

V DEC JAN FEB MAR APR MAY JUN



9. How many hours have you been working in March 2021?

Scoober App → Shift Planning



10. How many hours have you been working in April 2021?

Scoober App → Shift Planning



During the past week, did you suffer from:

Mark only one oval per row.

	No	Sometimes	Regularly	Often	Very often or constantly
1. Dizziness or feeling light-headed?	<input type="radio"/>				
2. Painful muscles?	<input type="radio"/>				
3. Fainting?	<input type="radio"/>				
4. Neck pain?	<input type="radio"/>				
5. Back pain?	<input type="radio"/>				

6. Excessive sweating?	<input type="radio"/>				
7. Palpitations?	<input type="radio"/>				
8. Headache?	<input type="radio"/>				
9. A bloated feeling in the abdomen?	<input type="radio"/>				
10. Blurred vision or spots in front of your eyes?	<input type="radio"/>				
11. Shortness of breath?	<input type="radio"/>				
12. Nausea or an upset stomach?	<input type="radio"/>				

Mark only one oval per row.

	No	Sometimes	Regularly	Often	Very often or constantly
13. Pain in the abdomen or stomach area?	<input type="radio"/>				
14. Tingling in the fingers?	<input type="radio"/>				
15. Pressure or a tight feeling in the chest?	<input type="radio"/>				
16. Pain in the chest?	<input type="radio"/>				
17. Feeling down or depressed?	<input type="radio"/>				
18. Sudden fright for no reason?	<input type="radio"/>				
19. Worry?	<input type="radio"/>				
20. Disturbed sleep?	<input type="radio"/>				
21. A vague feeling of fear?	<input type="radio"/>				
22. Lack of energy?	<input type="radio"/>				
23. Trembling when with other people?	<input type="radio"/>				

24. Anxiety or panic attacks?

During the past week, did you feel: *

Mark only one oval per row.

	No	Sometimes	Regularly	Often	Very often or constantly
25. Tense?	<input type="radio"/>				
26. Easily irritated?	<input type="radio"/>				
27. Frightened?	<input type="radio"/>				
28. That everything is meaningless?	<input type="radio"/>				
29. That you just can't do anything anymore?	<input type="radio"/>				
30. That life is not worth while?	<input type="radio"/>				
31. That you can no longer take any interest in the people and things around you?	<input type="radio"/>				
32. That you can't cope anymore?	<input type="radio"/>				
33. That you would be better off if you were dead?	<input type="radio"/>				
34. That you can't enjoy anything anymore?	<input type="radio"/>				
35. That there is no escape from your situation?	<input type="radio"/>				
36. That you can't face it anymore?	<input type="radio"/>				

During the past week, did you: *

Mark only one oval per row.

	No	Sometimes	Regularly	Often	Very often or constantly
37. No longer feel like doing anything?	<input type="radio"/>				
38. Have difficulty in thinking clearly?	<input type="radio"/>				
39. Have difficulty in getting to sleep?	<input type="radio"/>				
40. Have any fear of going out of the house alone?	<input type="radio"/>				

During the past week, did you: *

Mark only one oval per row.

	No	Sometimes	Regularly	Often	Very often or constantly
41. did you easily become emotional?	<input type="radio"/>				
42. were you afraid of anything when there was really no need for you to be afraid? (for instance animals, heights, small rooms)	<input type="radio"/>				
43. were you afraid to travel on buses, streetcars/ trams, subways or trains?	<input type="radio"/>				
44. were you afraid of becoming embarrassed when with other people?	<input type="radio"/>				
45. did you ever feel as if you were being threatened by unknown danger?	<input type="radio"/>				

46. did you ever think "I wish I was dead"?

47. did you ever have fleeting images of any upsetting event(s) that you have experienced?

48. did you ever have to do your best to put aside thoughts about any upsetting event(s)?

49. did you have to avoid certain places because they frightened you?

50. did you have to repeat some actions a number of times before you could do something else?

RAW SPSS OUTPUT

Tests of Normality

	Gender	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Distress	Male	.121	53	.052	.959	53	.066
	Female	.105	28	.200*	.964	28	.426
Anxiety	Male	.159	53	.002	.865	53	.000
	Female	.145	28	.139	.929	28	.059
Depression	Male	.201	53	.000	.813	53	.000
	Female	.131	28	.200*	.917	28	.030
Somatization	Male	.229	53	.000	.871	53	.000
	Female	.176	28	.027	.914	28	.025

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Age	.138	58	.008	.954	58	.026

Distress	.119	58	.041	.954	58	.029
Anxiety	.137	58	.008	.900	58	.000
Depression	.233	58	.000	.803	58	.000
Somatization	.189	58	.000	.890	58	.000
Total_KM	.134	58	.012	.922	58	.001

a. Lilliefors Significance Correction

Backward Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Total_KM, Gender ^b		Enter
2		Total_KM	Backward (criterion: Probability of F- to-remove >= ,100).

a. Dependent Variable: Distress

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.361 ^a	.130	.098	6.51107
2	.345 ^b	.119	.103	6.49317

a. Predictors: (Constant), Total_KM, Gender

b. Predictors: (Constant), Gender

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	342.930	2	171.465	4.045	.023 ^b
	Residual	2289.281	54	42.394		
	Total	2632.211	56			
2	Regression	313.342	1	313.342	7.432	.009 ^c
	Residual	2318.868	55	42.161		
	Total	2632.211	56			

a. Dependent Variable: Distress

b. Predictors: (Constant), Total_KM, Gender

c. Predictors: (Constant), Gender

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.452	3.189		2.023	.048
	Gender	4.769	1.846	.331	2.583	.013
	Total_KM	-.002	.002	-.107	-.835	.407
2	(Constant)	4.895	2.580		1.897	.063
	Gender	4.974	1.824	.345	2.726	.009

a. Dependent Variable: Distress

Excluded Variables^a

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	Total_KM	-.107 ^b	-.835	.407	-.113	.982

a. Dependent Variable: Distress

b. Predictors in the Model: (Constant), Gender

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Sport, Total_KM, Gender ^b		Enter
2		Total_KM	Backward (criterion: Probability of F-to-remove >= .100).

a. Dependent Variable: Anxiety

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.489 ^a	.239	.196	3.33752
2	.468 ^b	.219	.191	3.34913

a. Predictors: (Constant), Sport, Total_KM, Gender

b. Predictors: (Constant), Sport, Gender

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	185.629	3	61.876	5.555	.002 ^b
	Residual	590.371	53	11.139		
	Total	776.000	56			
2	Regression	170.301	2	85.151	7.591	.001 ^c
	Residual	605.699	54	11.217		
	Total	776.000	56			

a. Dependent Variable: Anxiety

b. Predictors: (Constant), Sport, Total_KM, Gender

c. Predictors: (Constant), Sport, Gender

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.717	2.112		-0.813	.420
	Gender	2.762	.963	.353	2.869	.006
	Total_KM	-.001	.001	-.142	-1.173	.246
	Sport	1.775	.954	.227	1.860	.068
2	(Constant)	-2.806	1.903		-1.475	.146
	Gender	2.914	.957	.372	3.044	.004
	Sport	1.753	.957	.224	1.831	.073

a. Dependent Variable: Anxiety

Excluded Variables^a

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics	
					Tolerance	
2	Total_KM	-.142 ^b	-1.173	.246	-.159	.982

a. Dependent Variable: Anxiety

b. Predictors in the Model: (Constant), Sport, Gender

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Age, Sport, Gender, Total_KM ^b	.	Enter
2	.	Total_KM	Backward (criterion: Probability of F-to-remove >= ,100).
3	.	Age	Backward (criterion: Probability of F-to-remove >= ,100).
4	.	Sport	Backward (criterion: Probability of F-to-remove >= ,100).

a. Dependent Variable: Depression

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.380 ^a	.145	.079	2.92246
2	.380 ^b	.145	.096	2.89478
3	.362 ^c	.131	.099	2.89101
4	.296 ^d	.088	.071	2.93502

a. Predictors: (Constant), Age, Sport, Gender, Total_KM

b. Predictors: (Constant), Age, Sport, Gender

c. Predictors: (Constant), Sport, Gender

d. Predictors: (Constant), Gender

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	75.142	4	18.785	2.200	.082 ^b
	Residual	444.121	52	8.541		
	Total	519.263	56			
2	Regression	75.136	3	25.045	2.989	.039 ^c
	Residual	444.127	53	8.380		

	Total	519.263	56			
3	Regression	67.935	2	33.968	4.064	.023 ^d
	Residual	451.328	54	8.358		
	Total	519.263	56			
4	Regression	45.474	1	45.474	5.279	.025 ^e
	Residual	473.789	55	8.614		
	Total	519.263	56			

a. Dependent Variable: Depression

b. Predictors: (Constant), Age, Sport, Gender, Total_KM

c. Predictors: (Constant), Age, Sport, Gender

d. Predictors: (Constant), Sport, Gender

e. Predictors: (Constant), Gender

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.539	4.482		-1.236	.222
	Gender	1.742	.846	.272	2.060	.044
	Total_KM	2.361E-5	.001	.004	.026	.979
	Sport	1.374	.836	.215	1.643	.106
	Age	.154	.184	.117	.835	.408
2	(Constant)	-5.562	4.359		-1.276	.208
	Gender	1.740	.834	.272	2.087	.042
	Sport	1.374	.828	.215	1.660	.103
	Age	.156	.168	.119	.927	.358
3	(Constant)	-1.820	1.643		-1.108	.273
	Gender	1.645	.826	.257	1.991	.052
	Sport	1.355	.826	.212	1.639	.107
4	(Constant)	.105	1.166		.090	.928
	Gender	1.895	.825	.296	2.298	.025

a. Dependent Variable: Depression

Excluded Variables^a

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	Total_KM	.004 ^b	.026	.979	.004	.831
3	Total_KM	.050 ^c	.385	.702	.053	.982
	Age	.119 ^c	.927	.358	.126	.983
4	Total_KM	.054 ^d	.411	.683	.056	.982

Age	.113 ^d	.871	.388	.118	.983
Sport	.212 ^d	1.639	.107	.218	.966

- a. Dependent Variable: Depression
- b. Predictors in the Model: (Constant), Age, Sport, Gender
- c. Predictors in the Model: (Constant), Sport, Gender
- d. Predictors in the Model: (Constant), Gender

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Total_KM, Gender ^b	.	Enter

- a. Dependent Variable: Somatization
- b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.442 ^a	.195	.166	6.30936

- a. Predictors: (Constant), Total_KM, Gender

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	522.298	2	261.149	6.560	.003 ^b
	Residual	2149.632	54	39.808		
	Total	2671.930	56			

- a. Dependent Variable: Somatization
- b. Predictors: (Constant), Total_KM, Gender

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.515	3.090		1.461	.150
	Gender	5.251	1.789	.362	2.935	.005
	Total_KM	-.003	.002	-.211	-1.713	.092

- a. Dependent Variable: Somatization

Correlations

Spearman's rho		Distress	Anxiety	Depression	Somatization	Gender	Age	Educational background	Vehicle	Sport	Total_KM
Distress	Correlation Coefficient	1.000	.870**	.748**	.792**	.335**	.082	.133	-.096	.182	-.217
	Sig. (2-tailed)	.	.000	.000	.000	.002	.466	.233	.475	.102	.101
	N	82	82	82	82	81	82	82	58	82	58
Anxiety	Correlation Coefficient	.870**	1.000	.688**	.809**	.358**	-.014	.088	-.008	.218*	-.226
	Sig. (2-tailed)	.000	.	.000	.000	.001	.903	.433	.955	.049	.088
	N	82	82	82	82	81	82	82	58	82	58
Depression	Correlation Coefficient	.748**	.688**	1.000	.626**	.269*	.219*	.139	.034	.223*	-.097
	Sig. (2-tailed)	.000	.000	.	.000	.015	.048	.214	.803	.044	.469
	N	82	82	82	82	81	82	82	58	82	58
Somatization	Correlation Coefficient	.792**	.809**	.626**	1.000	.353**	-.156	.073	.040	.077	-.250
	Sig. (2-tailed)	.000	.000	.000	.	.001	.162	.516	.763	.491	.058
	N	82	82	82	82	81	82	82	58	82	58
Gender	Correlation Coefficient	.335**	.358**	.269*	.353**	1.000	.027	.008	-.286*	.166	-.179
	Sig. (2-tailed)	.002	.001	.015	.001	.	.808	.944	.031	.138	.183
	N	81	81	81	81	81	81	81	57	81	57
Age	Correlation Coefficient	.082	-.014	.219*	-.156	.027	1.000	.117	.020	-.036	.375**
	Sig. (2-tailed)	.466	.903	.048	.162	.808	.	.294	.884	.746	.004
	N	82	82	82	82	81	82	82	58	82	58
Educational background	Correlation Coefficient	.133	.088	.139	.073	.008	.117	1.000	.082	.025	.363**
	Sig. (2-tailed)	.233	.433	.214	.516	.944	.294	.	.540	.822	.005
	N	82	82	82	82	81	82	82	58	82	58
Vehicle	Correlation Coefficient	-.096	-.008	.034	.040	-.286*	.020	.082	1.000	-.147	.075
	Sig. (2-tailed)	.475	.955	.803	.763	.031	.884	.540	.	.271	.577
	N	58	58	58	58	57	58	58	58	58	58

Sport	Correlation Coefficient	.182	.218*	.223*	.077	.166	-.036	.025	-.147	1.000	-.029
	Sig. (2-tailed)	.102	.049	.044	.491	.138	.746	.822	.271	.	.832
	N	82	82	82	82	81	82	82	58	82	58
	Total_KM	Correlation Coefficient	-.217	-.226	-.097	-.250	-.179	.375*	.363**	.075	-.029
	Sig. (2-tailed)	.101	.088	.469	.058	.183	.004	.005	.577	.832	.
	N	58	58	58	58	57	58	58	58	58	58

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

* . Correlation is significant at the 0.05 level (2-tailed).

Enter Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Total_KM, Gender ^b	.	Enter

a. Dependent Variable: Distress

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.361 ^a	.130	.098	6.51107

a. Predictors: (Constant), Total_KM, Gender

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	342.930	2	171.465	4.045	.023 ^b
	Residual	2289.281	54	42.394		
	Total	2632.211	56			

a. Dependent Variable: Distress

b. Predictors: (Constant), Total_KM, Gender

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	6.452	3.189		2.023	.048
	Gender	4.769	1.846	.331	2.583	.013
	Total_KM	-.002	.002	-.107	-.835	.407

a. Dependent Variable: Distress

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Total_KM, Sport, Gender ^b		Enter

a. Dependent Variable: Anxiety

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.489 ^a	.239	.196	3.33752

a. Predictors: (Constant), Total_KM, Sport, Gender

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	185.629	3	61.876	5.555	.002 ^b
	Residual	590.371	53	11.139		
	Total	776.000	56			

a. Dependent Variable: Anxiety

b. Predictors: (Constant), Total_KM, Sport, Gender

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.717	2.112		-.813	.420
	Gender	2.762	.963	.353	2.869	.006
	Sport	1.775	.954	.227	1.860	.068
	Total_KM	-.001	.001	-.142	-1.173	.246

a. Dependent Variable: Anxiety

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
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1	Total_KM, Sport, Gender, Age ^b	.	Enter
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- a. Dependent Variable: Depression
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.380 ^a	.145	.079	2.92246

- a. Predictors: (Constant), Total_KM, Sport, Gender, Age

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	75.142	4	18.785	2.200	.082 ^b
	Residual	444.121	52	8.541		
	Total	519.263	56			

- a. Dependent Variable: Depression
b. Predictors: (Constant), Total_KM, Sport, Gender, Age

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.539	4.482		-1.236	.222
	Gender	1.742	.846	.272	2.060	.044
	Age	.154	.184	.117	.835	.408
	Sport	1.374	.836	.215	1.643	.106
	Total_KM	2.361E-5	.001	.004	.026	.979

- a. Dependent Variable: Depression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Total_KM, Gender ^b	.	Enter

- a. Dependent Variable: Somatization
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.442 ^a	.195	.166	6.30936

a. Predictors: (Constant), Total_KM, Gender

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	522.298	2	261.149	6.560	.003 ^b
	Residual	2149.632	54	39.808		
	Total	2671.930	56			

a. Dependent Variable: Somatization

b. Predictors: (Constant), Total_KM, Gender

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.515	3.090		1.461	.150
	Gender	5.251	1.789	.362	2.935	.005
	Total_KM	-.003	.002	-.211	-1.713	.092

a. Dependent Variable: Somatization

Kruskal-Wallis Test

Ranks

	Group	N	Mean Rank
Distress	e-bike	50	40.76
	Control	24	45.96
	regular bike	8	32.75
	Total	82	
Anxiety	e-bike	50	40.17
	Control	24	44.69
	regular bike	8	40.25
	Total	82	
Depression	e-bike	50	38.83
	Control	24	47.85
	regular bike	8	39.13
	Total	82	
Somatization	e-bike	50	39.45

Distress	Equal variances assumed	.226	.636	-3.168	79	.002	-4.72776	1.49255	-7.69861	-1.75691
	Equal variances not assumed			-3.134	53.479	.003	-4.72776	1.50837	-7.75254	-1.70299

Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Total_KM, Gender ^b		Enter

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Regression

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Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
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1	Total_KM, Sport, Gender, Age ^b	.	Enter
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- a. Dependent Variable: Depression
b. All requested variables entered.

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Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
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