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The Perceived Stress Levels During COVID-19 Quarantine Periods and Physical Activity and Exercise

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Abstract

Social life disruption diminished the physical activity and isolation at home caused psychological stress on people during the coronavirus outbreak. This study applied the Perceived Stress Scale (PSS). Five hundred forty-three participants voluntarily completed the online questionnaire. The additional questions were asked to participants such as age, gender, educational status, spent time for physical activity or exercise, and isolation status. The perceived stress level and Insufficient Self-Efficacy perception (ISE) as a sub-factor of PSS were found statistically significant among the activity level groups. When compared to isolation status, the not isolated group showed a higher perception of stress (PSS total score, ISE, and SDP values) than partial and isolated groups except for SDP in partial isolated groups value. The findings of this study revealed that during isolation days which limiting energy expenditure and increasing mentally stress exercise and physical activity could be effective in decreasing perceived stress.

Introduction:

Unexpectedly started the new coronavirus pandemic negatively affected all areas of daily life such as education, health, tourism, and travel (Haleem *et al.*, 2020). The social distance and stay at home were the first preventive maneuvers to stop the spread of viruses. Additionally, during increased periods of a pandemic, the governments executed quarantine and lockdown locally or nationwide. Social distancing stay-at-home advice and strict quarantine periods lead to diminishing energy expenditure (Haleem *et al.*, 2020). Also, the impact of coronavirus on slowing down business or canceling of gyms limited physical activity and exercise and forced to sedentary behavior.

Besides negative physical effects, during this quarantine social isolation affected public psychology, unfavorable causes of prime source stressors lead to negative emotional results (Brooks *et al.*, 2020; Lima *et al.*, 2020). Recently Barkur & Vibha, (2020) analyzed the social media reflections of lockdown days and found that these social media posts included dominantly sadness and fear. In another study showed that stops in daily routine caused an increase in anger sentiment and posttraumatic stress syndrome. Moreover, social distance related diminish of communication generates isolation feeling in people and

caused boredom and disappointment (Hull *et al.*, 2020).

It is well studied that stress negatively affects human health (Schneiderman *et al.*, 2005), and exposure to stress and perception of stress increase the substance addiction risk (Pilowsky *et al.*, 2008). However, physical activity and regular exercise caused positive effects on the biological and psychological manner (Anderson & Shivakumar, 2013; Brosse *et al.*, 2002).

Recent a study highlighted the importance of being physically active during the quarantine periods and advised to decrease sedentary lifestyle and regular exercise may have beneficial effects on mental health (Hiremath *et al.*, 2020). Although the exercise has a decreasing effect on anxiety, there is no current study on subjective measurement of perceived stress and methods of overcoming stress during the COVID-19 pandemic related to strict quarantine.

Therefore, this study aims to determine the COVID-19 pandemic related to perceived stress level and investigate the relationship between self-reported exercise or physical activity and mental health.

Materials and Methods:

In this study, we executed the Perceived Stress Scale (PSS) designed in 5-scale Likert type that contains which included 14 items by Cohen *et al.*, (1983). The Perceived Stress Scale

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adapted to the Turkish for long and short versions. The inter-reliability test results founded Cronbach alpha value 0.84 and test-retest score coefficient of variation level 0.87 (Eskin *et al.*, 2013). The scale occurred by Insufficient Self-Efficacy perception and discomfort perception sub-factors. The total grade of PSS varies between 0-56 points and higher point results considered that individuals' elevated stress.

Before the filling scale is online for participants are requested to inform their occupations and isolation status (in isolation, partial, and not in isolation). Additionally, questions were asked that measured some demographic characteristics such as age, gender, educational status, and so on. Furthermore, participants were requested to inform how much physical activity/exercise they practiced at home during isolation, in hours/weeks.

The PSS questionnaire built-in Google forms delivered with social communication tools and invited the participants to fill this form online. To examine the perception of stress in the pandemic process and the healing effect of exercise, the online form was used for a week and all the data was collected. A total of 543 people, 206 males and 333 females with full scale, participated in the study. The age groups of the participants were determined as >20, 21-30, 31-40, 41-50, 51-64, and 65-70 years/year. Activity level was determined by the duration of exercise and physical activities that the participants practiced during the quarantine period. According to this, groups were divided into inactive, less active (1-2 hours/week), moderately active (3-6 hours/week), active (7-10 hours/week), and very active (<10 hours/week).

Statistical analysis was performed using SPSS 25 software (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY). In this study, the perception of Insufficient Self-Efficacy perception (ISE) which was determined by the perceived stress scale among the activity level groups of the participants, Stress & Discomfort Perception (SDP), and PSS total score were compared with variance analysis (ANOVA). In case of a significant difference between the groups, the source of the difference was determined by Bonferroni posthoc test. Comparison of PSS outputs between male and female participants was carried out by test in independent groups. The significance level was set up as $p < 0.05$.

Results and Discussion:

Table-1: Comparisons of the Perceived Stress Scale sub-factors and total scores regarding to physical activity level

PA level	Both sexes				Males				Females			
	N	ISE	SDP	PSS total scores	N	ISE	SDP	PSS total scores	N	ISE	SDP	PSS total scores
Inactive group	208	18.81 ± 4.06 *	21.08 ± 5.01	39.89 ± 7.16 £	136	18.69 ± 4.29	21.13 ± 5.23	39.83 ± 7.38	71	19.05 ± 3.63	17.33 ± 4.18	39.92 ± 6.80
Low active group	180	17.67 ± 4.25 #	20.77 ± 4.31	38.45 ± 6.94 €	125	17.92 ± 4.18	21.11 ± 4.10	39.03 ± 6.62	54	17.14 ± 4.43	20.87 ± 4.51	37.40 ± 7.34
Medium active group	105	16.08 ± 3.48	19.84 ± 4.34	35.93 ± 6.73	49	16.08 ± 3.52	19.77 ± 4.37	35.85 ± 6.90	54	16.12 ± 3.53	20.25 ± 4.40	36.07 ± 6.74
Active group	38	15.97 ± 4.21	19.68 ± 4.36	35.65 ± 7.77	20	16.80 ± 2.76	21.40 ± 3.21	38.20 ± 4.73	18	15.05 ± 5.32	19.94 ± 4.44	32.83 ± 9.51
Very active group	12	17.83 ± 4.01	19.41 ± 4.39	37.25 ± 6.34	3	21.33 ± 4.04	16.33 ± 5.50	37.66 ± 6.65	9	16.66 ± 3.46	17.77 ± 4.75	37.11 ± 6.64

* significantly higher than medium active and active groups ($p = 0.001$) # significantly higher than medium active group ($p = 0.014$) £ significantly higher than medium active and active groups (respectively $p = 0.001$ and $p = 0.007$) € significantly higher than medium active group ($p = 0.037$)

The average age of the participants in the study was 37.74 ± 12.75 and the age group distribution is > 20 years / year ($n = 58$), 21-30 years / year ($n = 73$), 31-40 years / year ($n = 192$), 41-50 years / year ($n = 142$), 51-64 years / year ($n = 52$) and 65-70 years / year ($n = 18$).

When the perceived stress outputs by gender were compared, the ISE, SDP, and PSS total scores were found to be similar between men and women. Similarly, there was no significant difference between education level and perception of stress during the pandemic related quarantine days.

Table-2: Status of isolation during quarantine periods effects on perception of stress; Insufficient Self-Efficacy perception and Stress & Discomfort Perception

Isolation status			N	Mean	Std. Dev.	Pvalue
ISE	Isolated	Partial	423	17.6028	4.16521	1.000
		Not isolated	98	17.5714	3.97155	0.016*
	Partial	Isolated	19	20.3158	4.44788	1.000
		Not isolated	540	17.6926	4.16340	0.025*
SDP	Not - isolated	Isolated	423	20.4421	4.74275	0.016*
		Partial	98	20.9082	4.07681	0.025*
	Isolated	Partial	19	22.9474	4.26189	1.000
		Not isolated	540	20.6148	4.63028	0.063*
PSS total score	Partial	Isolated	423	38.0449	7.25535	1.000
		Not isolated	98	38.4796	6.87927	0.235
	Not - isolated	Isolated	19	43.2632	6.42774	0.063*
		Partial	540	38.3074	7.21354	0.235
	Isolated	Partial	423	17.6028	4.16521	1.000
		Not isolated	98	17.5714	3.97155	0.006*
	Partial	Isolated	19	20.3158	4.44788	1.000
		Not isolated	540	17.6926	4.16340	0.024*
	Not - isolated	Isolated	423	20.4421	4.74275	0.006*
		Partial	98	20.9082	4.07681	0.024*

ISE and PSS total score parameters determined by the perceived stress scale were found to be statistically significant among the activity level groups, respectively [$F(4, 538) = 9.90, p = 0.001$] [$F(4, 538) = 7.07, p = 0.001$]. It was observed that the SDP results were not diverse according to the activity level [$F(4, 538) = 1.92, p = 0.106$]. It was observed that the inactive group ISE score was higher than the less active, active group ($p = 0.001$). The low active group ISE score was found to be statistically higher than the medium active group score (Table 1) ($p = 0.014$).

When compared to isolation status, there was a significant difference between groups. As shown at Table-2, the not isolated group showed the higher perception of

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stress (PSS total score, ISE and SDP values) than partial and isolated groups except for SDP in partial isolated groups value (respectively, ISE; $p=0.016$, $p=0.025$ and SDP; $p=0.063$ and PSS total score; $p=0.006$ and $p=0.024$).

The findings of this study showed that perceived stress and perception of insufficient self-efficacy differs according to physical activity level, whereas no significant difference in stress & discomfort level. Firstly, the self-reported perception of stress did not differ according to gender and education level. These similar stress level results suggest that pandemic and quarantine periods affect the same way general of population because it could be assumed that worldwide and also event-specific stressful incident. It might be explained with people who live in restricted places such as these quarantine days exposed to a psychosocial stressor risk factor in both physical and psychological health.

The main finding of this study was significantly different PSS results between physical activity levels for males, females, and participants from both genders. These results may be explained that exercise and a physically active lifestyle beneficial effects on psychological health. In the same vein, a recently published study mentioned the importance of being physically active during the quarantine periods and advised to decrease sedentary lifestyle and regular exercise may have beneficial effects on mental health (Hiremath *et al.*, 2020). Moreover, in a study, Brooks *et al.* (2020) found quarantine times are considered being a stressor factor that has a negative effect on psychology cause of mandatory stops in daily lifestyle. Further, the negative emotional consequences of the latest COVID-19 pandemic and lockdown were demonstrated by Lima *et al.* (2020). Neves *et al.* (2014) investigated the effects of an 8-week physical exercise on perceived stress and founded that significant differences in exercise groups (aerobic, somatic, and combined exercises) when compared to the controls. In a study, exercise habits and levels of adults in Belgium were investigated during the COVID-19 quarantine period (Constandt *et al.*, 2020) where people who previously exercised at a low level (except 55+ years old) reported that they exercised more during this period, highly active people over the age of 55 reported that they exercised less during this period. However, Starkweather (2007) showed that priorly non-exercised older adults (+60 years) who underwent a 10-week exercise improved their quality of life with decreasing stress perception.

Another finding of the current study was a negative relationship between the status of isolation and PSS results. Surprisingly, not isolated and partial isolated groups showed higher stress perception than the isolated group. This might be a result of isolated peoples' belief on the stay at home is safer for prevention from coronavirus, whereas partial and not isolated people who must maintain working

faced to risk factors and increased stress. In another perspective, social isolation still could be considered a negative influence on both physical and psychological health. A previous study demonstrated that lower physical activity and higher sitting time have a strong relationship with social isolation (Werneck *et al.*, 2019). Moreover, the sedentary behaviours and the physical inactivity incidents were higher in the above middle-age population who spend more time at home in general (Robins *et al.*, 2018). In a recent review, it is argued that isolation led to posttraumatic stress syndrome and increased significantly anger (Hull *et al.*, 2020). When social life disrupted and decreased energy expenditure, it is clearly a negative effect on health and increased the risk factors associated with psychosocial issues. Therefore, we can assume that our results contradictory to literature findings. However, our point of view for isolation is safe to prevent pandemic and illness, which perceived as a great stressor factor.

In conclusion, our results suggest that exercising or being physically active during this rare quarantine days could be effective in decreasing perceived stress. We recommend avoiding an inactive lifestyle in isolation times to decrease perceived stress levels. The different modalities of exercising should be performed at home for both mental and physical wellbeing.

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