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The impact of physical activity and meditation to reduce stress and anxiety during covid-19 pandemic: Knowledge and awareness assessment

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ABSTRACT

Background: COVID-19 is a disease that is caused by the coronavirus and until today, there has been no-effective treatment for this virus. In this study, our aim is to estimate the mediating effect of health behavior engagement on the associations between mental health and COVID-19–related worry, stress. Moreover, how Physical activity affect psychological health through the COVID19 pandemic in Saudi adult population. *Methodology:* This study was a cross-sectional survey conducted in Saudi Arabia from October 2021 to April 2022. The least possible sample size to achieve an accuracy of 5% marginal error with 95% confidence level is 384. The sample was made up of adults (male & female) who are residents of Saudi Arabia. SPSS 26 used for data entry and data analysis. *Results:* The study included 1698 participants, Seventy percent of them were females and 30% were males. 51.1% of participants aged between 20- 30 years old. 6.5% always and 17% usually feel nervous or anxious. 5% always and 12.9% usually feel inability to control anxiety. 65.1% of participants practiced meditation before the pandemic but only 38.3% practice it currently after the pandemic. Of the participants who used to meditate before the pandemic. *Conclusion:* The study concluded that increased exercise and meditation were linked with better-quality mental health and decreased the level of anxiety through the pandemic. The findings emphasize the importance of maintaining self-management health behaviors like physical activity and meditation to maintain one's mental health throughout pandemic of COVID-19.

Keywords: Physical Activity, Meditation, COVID-19 pandemic.

1. INTRODUCTION

The corona-virus-disease (COVID-19) is a pathology caused by the severe acute-respiratory illness coronavirus-2 (Cari et al., 2020). There is no-effective

treatment for this infection until now (Tobaiqy et al., 2020). Researchers have looked at the effects of the disruptive routine adjustments that most people have encountered as a result of the CO-VI-D-19 pandemic on a number of occasions (Scarmozzino & Visioli, 2020). People have been facing enormous psychological distress as the incidence and mortality rates of COVID-19 have quickly increased over the world (Gómez et al., 2020; Smith et al., 2020). An increases in anxiety, stress, sadness, and sleep disturbances, somatization, and OCD disorders was seen during the COVID-19 (Liu et al., 2020; Lu et al., 2020; Zhang et al., 2020). Anxiety disorders are extremely common, with global prevalence rates varying from 3.8 to 25% across nations, and prevalence rates as high as 70% in patients with chronic illnesses (Rikkers et al., 2016). As reveled by a study conducted in China, anxiety is reported to be on the rise as a result of the COVID-19 outbreak's strict measures, which included school closures, home quarantines, cancellation of sporting events, and distance (Kandola et al., 2018). There is a strong link between anxiety and stress.

Anxiety is a reaction to stress, whereas stress is a response to a stimulus (e.g., a threat) in a specific (Telles et al., 2018). The increased incidence of anxiety and stress-related disorders may be entirely pandemic-related, such as anxieties of contracting the virus or of losing a loved one, as well as generalized worry about the future (Troyer et al., 2020). Therefore, Physical activity (PA) has been widely adopted as a helpful strategy to self-manage mental health, and it may help to mitigate COVID-19-related mental health decline (Beaulac et al., 2011; Green et al., 2021). Individuals who engage in frequent physical activity got lesser anxiety levels and was less stressed, and higher well-being, according to population-based studies (Deboer et al., 2012). Furthermore, increased physical activity is linked to improved social functioning and vitality in those with anxiety disorders (Schmitz et al., 2004). Another self-management approach is meditation, which is described as the deliberate and self-controlled concentration of attention with the goal of relaxing and soothing the mind and body (Edenfield & Saeed, 2012).

Meditation has been proven effective in reducing psychological distress, assisting disease treatment and recovery, and improving the quality of life in various populations over the last 40 years or so. It has its origins in ancient eastern culture and is gaining popularity in western psychological study and practice (Yanyu et al., 2019). A study of college students found that regular physical activity helps to reduce Covid-19-induced stress and anxiety (Khawam et al., 2020). Similarly, relaxation techniques and exercises were recommended as one of the interventions for Covid-19 patients to relieve acute anxiety, although more evidence is needed (Zhang et al., 2020). When taken as a whole, the COVID-19 pandemic has an impact not just physically but also mentally and psychologically (Fiorillo & Gorwood, 2020).

Regular physical activities are beneficial for mental health, and able to alleviate the levels of anxiety during COVID-19 pandemic. Staying physically active would contribute to the attenuation of the COVID-19 side effects on mental health (Hu et al., 2020). To the best of our knowledge, no national studies addressed the relation of physical activity and meditation in term of relieving stress and anxiety that resulted from Covid-19 pandemic in Saudi Arabia. Therefore, we aim to assess knowledge and awareness about impact of physical activity and meditation to reduce stress and anxiety during COVID-19 pandemic.

In this study, our objectives are to assess knowledge and awareness about impact of physical activity and meditation to reduce stress and anxiety during COVID-19 pandemic, to explore the associations between COVID-19–related stress, anxiety and health behavior engagement (ie. physical activity, and mindfulness meditation) and to estimate the role of health behavior engagement on the associations between mental health and COVID-19–related stress, and anxiety in Saudi adult population

2. PARTICIPANTS AND METHODS

Study design

A cross-sectional study was conducted in Saudi Arabia from October 2021 to April 2022. The sample size was 1698 participants' male and female adults who are residents of Saudi Arabia. Online Google survey questionnaires were based on a structured questionnaire developed by authors. SPSS 26 will be used for data entry and data analysis.

Subject, Participants, recruitment and sampling procedure

The study's population consisted of Saudi Adults. The sample size was estimated using the Raosoft calculator with a confidence level of 95%, and 5% margin of error; the minimum sample size is 384 participants.

Inclusion criteria

All Saudi population either male or female from 18 years and older who willingness to participate in the study.

Exclusion criteria

People who have been previously diagnosed with any psychological issue that resulted in being anxious and frustrated prior the pandemic.

Method for data collection and instrument

Data collection was in the form of the participants' responses to the questions. The survey instrument was a self-administered anonymous questionnaire in Arabic. The questionnaire included demographic features such as age, gender, and the residential area of the participants. The participants were asked about their fear of COVID-19 pandemic, causes of anxiety and fear of COVID-19 consequences, and to what extent has the quarantine affect their daily physical activity and meditation practice. Also, the questionnaire asked about the knowledge and awareness about the effect of meditation and physical activity in reducing COVID-19 pandemic related stress and anxiety.

Data entry and analysis

Data was entered on the computer using the "Microsoft Office Excel Software" program (2016) for windows. Data was then transferred to the Statistical Package of Social Science Software (SPSS) program, version 26 (IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp) to be statistically analyzed.

3. RESULTS

According to table (1), the study included 1698 participants, 70% of them were females and 30% were males. 51.1% of participants aged between 20- 30 years old while 25.7% between 31- 40 years old. Most participants 42.3% were from western region of the kingdom.

Table 1 Socio-demographic characteristics of participants (n=1698)

Parameter		No.	%
Gender	Male	510	30.0
	Female	1188	70.0
Age	Less than 20	135	8.0
	20 - 30	868	51.1
	31 -40	436	25.7
	41 - 50	191	11.2
	51 -60	62	3.7
	More than 60	6	.4
Residence area	Southern area	259	15.3
	Eastern Region	140	8.2
	Northern area	363	21.4
	Western Region	719	42.3
	Central Region	217	12.8

As shown in table (2), 66.6% of participants feel nervous if someone close to coughs or sneezes. 30.4% avoid reading news related to the epidemic through the COVID19 pandemic. 29.6% frequently check the temperature of body and blood oxygen content, use screening tests, and check if other family members have signs of illness. 44.2% shared and published news and reports related to the epidemic. 61.8% been afraid that this epidemic would cause economic pressure, corporate bankruptcy or unemployment.

Table 2 nervousness level of participants during COVID-19 pandemic

		Yes	No
Been nervous if someone close to coughs or sneezes	No.	1131	567
	%	66.6%	33.4%
Avoid reading news related to the epidemic through the COVID19 pandemic	No.	516	1182
	%	30.4%	69.6%
Frequently check the temperature of body and blood oxygen content, use screening tests, and check if other family members have signs of illness	No.	503	1195
	%	29.6%	70.4%
Shared and published news and reports related to the epidemic (including articles from various media channels) and excited to participate in relevant discussions	No.	750	948
	%	44.2%	55.8%
Been afraid that this epidemic would cause economic pressure, corporate bankruptcy or unemployment	No.	1050	648
	%	61.8%	38.2%

Table (3) illustrate that 6.5% always and 17% usually feel nervous or anxious. 5% always and 12.9% usually feel inability to control anxiety. 6.2% always and 11% usually find difficulty in relaxing. 4.2% always and 8.2% are so anxious that it's hard to sit still. In table (4), 65.1% of participants practiced meditation before the pandemic but only 38.3% practice it currently after the pandemic. Of the participants who used to meditate before the pandemic, 3.8% reported that they a lot less after the pandemic, 12% a little less and 16.3% reported that meditation practice has increased a lot after the pandemic (figure 1).

Table 3 Anxiety and nervousness among participants during COVID-19 pandemic

		Always	Usually	Sometimes	Never
Feeling nervous, or anxious	No.	111	288	862	437
	%	6.5	17.0	50.8	25.7
Inability to stop or control anxiety	No.	85	219	500	894
	%	5.0	12.9	29.4	52.7
Thinking and worrying about different things	No.	181	296	667	554
	%	10.7	17.4	39.3	32.6
Difficulty relaxing	No.	105	187	575	831
	%	6.2	11.0	33.9	48.9
Being so anxious that it's hard to sit still	No.	72	140	409	1077
	%	4.2	8.2	24.1	63.4
Easily agitated or upset	No.	121	215	575	787
	%	7.1	12.7	33.9	46.3
Feeling scared as if something terrible might happen	No.	114	158	489	937
	%	6.7	9.3	28.8	55.2

Table 4 Meditation behavior among participants before and after COVID-19 pandemic

Parameter		**No.**	**%**
Practice meditation before the Corona pandemic	Yes	1105	65.1
	No	593	34.9
Currently meditate	Yes	650	38.3
	No	1048	61.7
If practice of meditation before the pandemic, how has the Corona pandemic changed meditation	Meditate the same	377	30.4
	Meditate a little less	133	12
	Meditate a lot less	43	3.8
	Meditation practice has increased a bit after	191	17.2

	the pandemic		
	Meditation practice has increased a lot after the pandemic	181	16.3
	No longer meditate	167	15.1

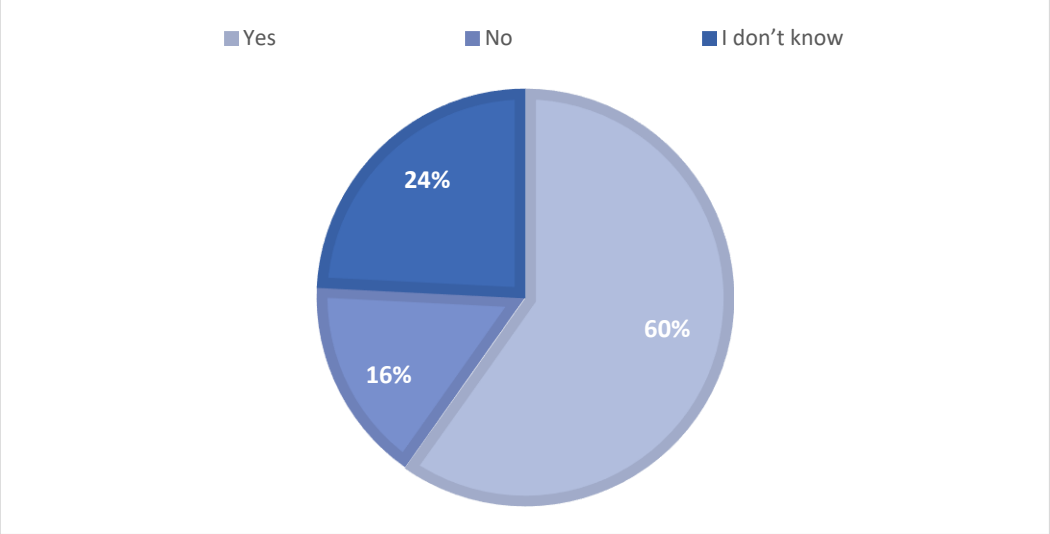

Figure 1 Meditation effect on mood among participants

43.3% of participants always feel well on exercise days during quarantine and 48.2% reported that mood improves when exercise during quarantine. 50.2% feel that day is getting better when exercise during quarantine. 39.4% feel less anxious when exercise during quarantine. 39.5% feel more motivated to exercise during quarantine. 39.4% feel less anxious when exercise during quarantine. 54.7% think it is important to exercise during quarantine as shown in table (5).

Table 5 Exercise behavior among participants before and after COVID-19 pandemic

Parameter		**No.**	**%**
Feeling well on exercise days during quarantine	Never	163	9.6
	Sometimes	616	36.3
	Always	735	43.3
	Rarely	184	10.8
Mood improves when exercise during quarantine	Never	142	8.4
	Sometimes	552	32.5
	Always	819	48.2
	Rarely	185	10.9
Feel that day is getting better when exercise during quarantine	Never	163	9.6
	Sometimes	481	28.3
	Always	853	50.2
	Rarely	201	11.8
Feel less anxious when exercise during quarantine	Never	228	13.4
	Sometimes	553	32.6
	Always	669	39.4
	Rarely	248	14.6
Feel more inclined to exercise during quarantine	Never	276	16.3
	Sometimes	521	30.7
	Always	573	33.7
	Rarely	328	19.3

Feel happy when exercise during quarantine	Never	180	10.6
	Sometimes	542	31.9
	Always	770	45.3
	Rarely	206	12.1
Feel more motivated to exercise during quarantine	Never	254	15.0
	Sometimes	486	28.6
	Always	670	39.5
	Rarely	288	17.0
Think it is important to exercise during quarantine	Never	158	9.3
	Sometimes	426	25.1
	Always	929	54.7
	Rarely	185	10.9
Feel bad when not exercising during quarantine	Never	437	25.7
	Sometimes	510	30.0
	Always	341	20.1
	Rarely	410	24.1

According to table (6), there was non-significant association among participants before and after COVID-19 pandemic this for all questions except being so anxious that it's hard to sit still in this question there was significant association among participants.

Table 6 Meditation behavior among participants before and after COVID-19 pandemic

		Currently meditate		**Total (N=377)**	**P value**
		Yes	No		
Feeling nervous, or anxious	sometimes	338	524	862	0.005
		52.0%	50.0%	50.8%	
	always	41	70	111	
		6.3%	6.7%	6.5%	
	usually	130	158	288	
		20.0%	15.1%	17.0%	
	do not apply	141	296	437	
		21.7%	28.2%	25.7%	
Inability to stop or control anxiety	sometimes	200	300	500	0.001
		30.8%	28.6%	29.4%	
	always	36	49	85	
		5.5%	4.7%	5.0%	
	usually	107	112	219	
		16.5%	10.7%	12.9%	
	do not apply	307	587	894	
		47.2%	56.0%	52.7%	
Thinking and worrying about different things	sometimes	261	406	667	0.001
		40.2%	38.7%	39.3%	
	always	57	124	181	
		8.8%	11.8%	10.7%	

	usually	146	150	296	
		22.5%	14.3%	17.4%	
	do not apply	186	368	554	
		28.6%	35.1%	32.6%	
Difficulty relaxing	sometimes	234	341	575	0.462
		36.0%	32.5%	33.9%	
	always	41	64	105	
		6.3%	6.1%	6.2%	
	usually	66	121	187	
		10.2%	11.5%	11.0%	
	do not apply	309	522	831	
		47.5%	49.8%	48.9%	
Being so anxious that it's hard to sit still	sometimes	150	259	409	0.592
		23.1%	24.7%	24.1%	
	always	24	48	72	
		3.7%	4.6%	4.2%	
	usually	58	82	140	
		8.9%	7.8%	8.2%	
	do not apply	418	659	1077	
		64.3%	62.9%	63.4%	
Easily agitated or upset	sometimes	219	356	575	0.008
		33.7%	34.0%	33.9%	
	always	29	92	121	
		4.5%	8.8%	7.1%	
	usually	86	129	215	
		13.2%	12.3%	12.7%	
	do not apply	316	471	787	
		48.6%	44.9%	46.3%	
Feeling scared as if something terrible might happen	sometimes	177	312	489	0.036
		27.2%	29.8%	28.8%	
	always	38	76	114	
		5.8%	7.3%	6.7%	
	usually	76	82	158	
		11.7%	7.8%	9.3%	
	do not apply	359	578	937	
		55.2%	55.2%	55.2%	

4. DISCUSSION

The Covid-19 disease has had a significant impact on people's mental health. Students, persons who live alone, and those with pre-existing mental health disorders are disproportionately affected. Fear, concern, and stress are typical reactions to perceived or real threats, according to the World Health Organization, and when faced with uncertainty or the unknown, it is natural and acceptable for individuals to be scared in the context of the Covid-19 outbreak (Nelson et al., 2020). Current studies show that having superior apprehension about CO-VI-D-19 was linked to higher levels of anxiety and depression, and that reduced physical exercise and increased physically inactive time during COVID-19 was associated with poor psychological health (ie, higher-stress, anxiety, and depression-symptoms). Furthermore, both regular exercise and meditation have been suggested as healthy coping mechanisms with stress during the COVID-19 pandemic, emphasizing the significance of sustaining these practices during a stressful period (Cheval et al., 2021; Nelson et al., 2020).

Another self-management strategy, mind-fulness meditation has been verified to promote mental health, and continued practice of this activity, especially during the COVID-19 epidemic, may help to prevent mental health deterioration over time. Mindfulness meditation appears to reduce stress, enhance mood (e.g., anxiety and depression symptoms), and promote well-being, according to research (Behan, 2020). Meditation can be used as an alternative therapy and may become useful in the treatment and management of SARS-CoV-2-infected mental health patients. Meditation's effects are based on the regulation of the endocrine system, which includes the renin-angiotensin-aldosterone system (RAAS), the hypothalamic-pituitary-adrenal axis, and the thyroid axis with energy homeostasis. Furthermore, mindfulness meditation has been shown to increase anti-inflammatory glucocorticoid receptor activity and to induce type I interferon signaling, which is associated with SARS-CoV-2 care. Meditative practices can help to support the immune system, which can help to reduce stress. Meditation activates psychological problems such as anxieties are modulated by neurotransmitters. Meditation, for example, raises Gamma aminobutyric acid (GABA) and serotonin levels while decreasing norepinephrine (NE) levels aids in anxiety reduction (Behan, 2020; Goyal et al., 2014; Jiménez et al., 2020).

In our study, only 38.3% practice meditation currently after the pandemic. Of the participants who used to meditate before the pandemic, 3.8% reported that they a lot less after the pandemic, 12% a little less and 16.3% reported that meditation practice has increased a lot after the pandemic. 59.8% of participants reported that meditation have effect on mood. Behan (2020) observed that introducing mindfulness and meditation practice during the COVID-19 pandemic could supplement treatment and help with anxiety suppression for everyone. Jiménez et al., (2020) conducted a cross-sectional study with 412 participants and discovered that self-compassion was associated with better cohabitation during confinement, improved mental health, and the COVID-19 epidemic. According to a Mindfulness meditation programs showed modest evidence of decreased anxiety in 47 studies with 3515 individuals., depression, and pain (Goyal et al., 2014).

According to recent physical activity research, physical activity is recommended for both indoor and outdoor people during the COVID-19 outbreak because it is beneficial for boosting the immune system and relieving anxiety and depression. Maintaining mental and physical activity during the COVID-19 outbreak will aid in reducing the negative impact on mental health following the COVID- plague (Gómez-Salgado et al., 2020). Previous research has linked higher levels of concern about COVID-19 to lower physical activity levels and meditation practice strength; yet, the proportion of persons said they would increase or continue their physical exercise or meditating. Higher levels of concern about COVID-19 may have contributed to people's inability to maintain physical activity participation and engage in habitual meditation practice (Green et al., 2021). This is consistent with other studies that show that anxiety and stress can make it difficult to engage in health-promoting habits on a regular basis (Banerjee et al., 2018) and in the context of COVID-19 (Schuch et al., 2020; Stanton et al., 2020).

During the COVID-19 lockdown, Increases in physical activity were detected in one cross-sectional study done in Belgium, but only among individuals who were previously less active; declines in physical activity were recorded in another among previously highly active adults (Constandt et al., 2020). During COVID-19 pandemic, several cross-sectional researchers suggest substantial declines in physical exercise and elevated sitting time (Almandoz et al., 2020; Ammar et al., 2020). There have been no research on meditating practice patterns; nevertheless, during the COVID-19 pandemic, single cross-sectional analysis that looked at stress-coping strategies among New York City-based health care workers found that meditation (23 percent) was a commonly endorsed behavior, along with physical-activity/exercise (59 percent) (Shechter et al., 2020).

Studies also looked at the relationship in terms of intensity; there is a link between physical exercise and mental health. Moderate-intensity physical exercise (e.g., running or sprinting on a treadmill, using an elliptical trainer, cleaning the home) is linked to improved mental health outcomes (Conti et al., 2021), and light-intensity physical activity (Nie et al., 2021). However, intense physical activity anticipated depressive symptoms better than moderate-intensity physical activity; additionally, the effect size was larger for the association between vigorous-intensity physical activity and level of resilience when compared to moderate-

intensity physical activity (Carriedo et al., 2020). According to one study, high levels of physical activity have no positive effect on depressive symptoms (Méndez-Giménez et al., 2021). Another study looked at the type of physical activity and discovered that stretching and resistance training were related to lower anxiety, and three types of physical activity (household chores, stretching, and resistance training) were related to lower depression symptoms (Xiang et al., 2020).

Significant increase in physical activity were seen in a minority of the study samples, but the majority of those who showed a positive change did not meet recommended physical activity guidelines erstwhile to the CO-VI-D-19 pandemic (Conti et al., 2021; Maugeri et al., 2020). Another reason could be a greater awareness of health issues and more time to engage in physical activity during the stay-at-home period (Conti et al., 2021). These behavioral changes can assist in maintaining a more active lifestyle through the COVID19 pandemic.

Another study found a 40% increase in physical activity in a sample that was already active erstwhile to the COVID-19 pandemic. Physical activity could be used as a coping mechanism to deal with the pandemic's consequences. The location where people prefer to engage in physical activity appears to be important, as active participants reported higher levels of connectedness to and relatedness to nature than the inactive population (Nienhuis & Lesser, 2020). Since the COVID-19 pandemic has had a significant effect on general routines (e.g., social isolation, quarantine, business closures) and may have a negative. It's vital to keep fostering identity of health activities like physical exercise and meditation, which can reduce worsening of psychological health during the COVID-19 pandemic.

5. CONCLUSION

The study concluded that increased exercise and meditation are associated with improved mental health and decreased anxiety through the COVID19 pandemic. The findings highlight the importance of maintaining self-management health behaviors like physical activity and meditation to maintain one's mental health during the COVID-19 pandemic. More research on health behavior patterns Even during CO-VI-D-19 pandemic, more research is needed to fully under-stand whether CO-VI-D-19 could affect long-term health, negative health behavior changes.

Ethical approval

The research proposal was approved by the Ethical Committee of Human Research at the Armed Forces Hospitals, in Taif city, Saudi Arabia with Ethical approval number (2022-596).

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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