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Creative Work During A COVID-19 Lockdown

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ABSTRACT

In Csikszentmihalyi's 1990 theory of "flow", individuals can become immersed in creative activities as well as other positive activities including exercise and meditation. Research has suggested that individuals engaged in "flow" could persevere regardless of feeling boredom or fatigue. However, the flow state is more difficult to achieve in the face of stress. In the current study, an archival database on a COVID-19 lockdown was analyzed for the relations between flow-like activities (creative work, meditation, and inside exercise) and psychological well-being (boredom, fatigue, anxiety, and depression). Hierarchical regressions suggested that creative work was positively associated with meditating, indicating that participants who reported more frequent creative work also reported meditating more often. Further, creative work, inside exercise, and meditation were associated with feeling boredom and fatigue. And, inside exercise was associated with decreased anxiety and depression symptoms. These findings should inform interventions to improve psychological well-being during lockdowns like COVID-19.

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Introduction

Individuals across different cultures have experienced psychological problems including anxiety and depression (Field et al., 2021). For example, in a lockdown sample from China, 20% experienced depression and 35% reported anxiety (Huang, 2020). In a sample from Italy, 33% experienced anxiety and 24% reported depression (Wang et al., 2020). In Austria 19% experienced anxiety and 21% reported depression (Pieh et al., 2020). In addition, boredom has been reported by as many as 71% and fatigue by as many as 72% in a lockdown sample (Field et al, 2020).

Although COVID-19 lockdowns have negatively impacted both psychological and physical wellbeing of individuals, very few lockdown studies have addressed positive activities that may have been occurring. Exercise is an exception. Exercise has alleviated psychological problems during COVID-19 including anxiety and depression (Field et al, 2020; Huang Y & Zhao N, 2020; Li et al., 2020; Wang et al., 2020). Other lockdown activities such as creative work may also alleviate these stressors, although creative work has not been the focus of COVID-19 publications. In research on "flow", creative work was the first to be explored followed by other activities that appeared to alleviate boredom and fatigue including sports and meditation (Csikszentmihalyi, 1997).

The Theory of Flow

The theory of flow was introduced in the 1960's by Hungarian-American psychologist, Mihaly Csikszentmihalyi, who first studied creative processes by interviewing dancers, poets, chess players, and artists. In later years, he interviewed athletes and hikers. He found that when they engaged in these activities, they would persevere regardless of feeling bored or fatigued. In Csikszentmihalyi's concept of flow (1997), an individual is actively engaged in a cognitive state, entirely immersed in an activity such as exercise, painting, drawing, writing, etc. During the flow experience, individuals are intensely focused, engaged and lose awareness of themselves and their surroundings (Csikszentmihalyi, 1997; Drake & Winner,).

Creative work

Pre-COVID research has suggested that engaging in creative work can be an adaptive response to a changing environment (Kapoor & Kaufman, 2020). However, limited research has studied the impact of creative work during the COVID-19 pandemic. In a study that was conducted before and during a French lockdown (N=1266), everyday creativity significantly increased during the COVID-19 lockdown (Faranda & Alberti, 2020). Additionally, those who experienced more creativity during the lockdown were also less bored.

Other "Flow" Activities

Csikszentmihalyi's theory of "Flow" included other positive activities (Csikszentmihalyi, 1990). According to this theory, activities such as sports, sex, dance, yoga, the martial arts, and music can all help produce enjoyment. Csikszentmihalyi and Jackson investigated the process of flow in sports using a mixed-methods approach (Jackson & Csikszentmihalyi, 1999). In this research, positive associations were noted between flow and several constructs of sports psychology including perceptions of ability, hypnotic susceptibility, use of psychological skills, and focused motivation (Jackson & Csikszentmihalyi, 1999). Although they studied several different sports, exercise and its effects were common to all of them.

Exercise

Exercise has typically reduced psychological problems associated with COVID-19 lockdowns. In one study, indoor and outdoor exercise were associated with reduced levels of anxiety (Field et al., 2020a). In that study, indoor, outdoor, and outdoor exercise with someone else were associated with lower fatigue and depression. Indoor exercise and outdoor exercise with others were also related to healthy indoor activities including feeling more spiritual, connecting with

others, and working on projects, which may have been confounding variables (Field et al., 2020a).

Meditation

Meditation was also referred to as a "flow" activity by Csikszentmihalyi and his colleagues (Csikszentmihalyi, 1990). Meditation is another healthful activity that has been associated with less anxiety and depression during a COVID-19 lockdown (Field et al., 2021). Meditation practices are also associated with reduced blood pressure, cortisol levels, and other physiologic markers of stress (Pascoe et al., 2017).

Gaps in Existing Knowledge

In Csikszentmihalyi's 1990 theory of "Flow", individuals can become immersed in creative activities such as painting, drawing, writing, etc. as well as other positive activities including exercise and meditation. Csikszentmihalyi (1975) found that individuals who engaged in Flow would persevere through those activities regardless of feeling boredom or fatigue. However, the flow state is more difficult to achieve in the face of stress and anxiety. In Csikszentmihalyi's research, artists, athletes and meditators were noted to have "flow", but relationships between engaging in creative work and other "flow" activities were not reported. Flow activities such as exercise and meditation have been negatively related to adverse effects experienced during the COVID-19 pandemic. However, one of the most traditional flow activities, namely engaging in creativity, has not appeared in the COVID-19 pandemic literature. Pre-COVID research has suggested that engaging in creative work can be an adaptive response to a changing environment and has been associated with positive emotional wellbeing (Kapoor & Kaufman, 2020). The lack of empirical research regarding the impact of creativity during the COVID-19 lockdown highlights the importance of the current study.

In the current study, participants who reported engaging in more creative work and other related activities may have been more immersed in the creative process, similar to what is experienced during "flow". In that context, those who reported engaging in more creative work during the COVID-19 lockdown may have also been more engaged in other positive activities including exercise and meditation and experienced less boredom and fatigue. In this study, an archival database was used, which was collected during a COVID-19 lockdown. Correlation and regression analyses were conducted to determine the relative variance in boredom and fatigue that can be explained or alleviated by "flow" activities including creative work, exercise and meditation. Additionally, the relationship between flow activities and levels of anxiety and depression symptoms were explored. Following the theory of flow, creative work was expected to alleviate boredom and fatigue during the lockdown and to be associated with other flow-like activities including exercise and meditation that, in turn, would alleviate anxiety and depression.

Method

Participants

The participants included 260 individuals who ranged in age from 18 to 82 (M=47 years). Gender was distributed 79% female, 18% male and 3% other (non-specified). Ethnicity was distributed 68% Non-Hispanic White, 21% Hispanic, 3% Black and 8% other (non-specified). Professions were distributed 35% office worker, 30% academic, 15% managerial, 12% medical and 8% labor. The average income was $72,572, 28% were unemployed and 69% worked at home. Twenty-three percent lived alone.

Procedure

A flyer was posted on Facebook giving a brief description of the study including some sample items and the age criterion being greater than 18 years old. The Facebook flyer included a link to the survey on Survey Monkey which included 11 scales for a total of 87 items. The survey was four weeks duration during the U.S. COVID-19 lockdown (April 1-30, 2020), and the data were directly transported to SPSS for data analyses.

Measures

The survey included several demographic items including those already mentioned (age, gender, ethnicity, profession, income, type of employment, working at home, and living alone). The core measures for the study include the Creative Work Rating, Exercise Rating, Meditation Rating, Boredom Rating, PROMIS Fatigue Subscale, PROMIS Anxiety Subscale, and the PROMIS Depression Subscale as follows:

Creative Work

To measure creative work, participants rated the extent to which they engaged in creative work during the prior seven days, from 0 (not at all) to 1(a little), 2 (a moderate amount) and to 3 (a lot).

Exercise

To measure exercise, participants rated on a single item on the survey asking participants to rate their engagement in indoor exercise; Participants rated their level of exercise on a scale from 0 (not at all) to 1(a little), 2 (a moderate amount) and to 3 (a lot).

Meditation

To measure meditation, participants rated on a single item on the survey that asked participants to rate their engagement in meditation on a scale from 0 (not at all) to 1(a little), 2 (a moderate amount) and to 3 (a lot).

Boredom

To measure boredom, participants responded on a single item on the survey that asked participants to rate their boredom on a scale from 0 (not at all) to 1(a little), 2 (a moderate amount) and to 3 (a lot).

The PROMIS Fatigue Subscale (3 items) (Cronbach's alpha=.92). The scale includes ratings on statements "I felt fatigued", "I had trouble starting things because I'm tired", and "I felt run-down". On this standardized subscale on the PROMIS (Dewitt et al., 2018), each item was rated on a 5-point scale as 1= never, 2= rarely, 3= sometimes, 4= often, and 5=always.

The PROMIS Anxiety Subscale (4 items) (Cronbach's alpha=.88). The subscale includes ratings on the statements "I felt fearful", "I found it hard to focus on anything other than my anxiety", "My worries overwhelmed me", and "I felt uneasy". On this standardized subscale on the PROMIS (Dewitt et al., 2018), each item was rated on a 5-point scale as 1= never, 2= rarely, 3= sometimes, 4= often, and 5=always.

The PROMIS Depression Subscale (4 items) (Cronbach's alpha=.91). The depression subscale includes ratings on the statements "I felt worthless", "I felt helpless", "I felt depressed", and "I felt hopeless". On this standardized subscale on of the PROMIS (Dewitt et al., 2018), each item was rated on a 5-point scale as 1= never, 2= rarely, 3= sometimes, 4= often, and 5=always.

Results

Flow-like Activities for the Overall Sample

Flow-like activities for the overall sample are presented in Table 1. In the sample, 51.9% of participants reported that they do not meditate at all, 24% reported they meditated a little, 12.4% a moderate amount, and 12% reported that they meditated a lot. For indoor exercise, 28.5% of participants reported engaging in no indoor exercise, 32.7% reported a little, 20% reported moderate exercise, and 18.8% reported a lot of exercise. Finally, 28.8% of participants reported engaging in no creative work, 35.4% reported a little, 21.2% reported moderate, and 14.2% reported a lot of creative work.

Table 1 *Flow-like Activities Among the Sample (N = 260)(Percentages in parentheses)*

Flow-Like activities	*Not at all*	*A little*	*Moderate*	*A lot*
Meditating	134 (51.9)	62 (24.0)	32 (12.4)	30 (11.6)
Exercise (Indoor)	74 (28.5)	85 (32.7)	52 (20.0)	49 (18.8)
Creative Work	75 (28.8)	92 (35.4)	55 (21.2)	37 (14.2)

Demographic Covariates

To identify demographic covariates that should be taken into account in subsequent analyses, correlations between each of five demographic characteristics (gender, age, years of schooling, ethnicity, living alone) and the outcome measures were examined. Years of schooling were negatively associated with feeling bored (r = -.198, p = .002). Age was negatively associated with both Anxiety (r = -.143, p = .025) and Fatigue (r = -.139, p =.028). A small positive correlation was noted between years of schooling and meditating (r = .128, p = .045). Age was not associated with flow-like activities and there were no significant gender differences in flow activities among those who did versus did not live alone. Non-white participants reported exercising inside somewhat more frequently (M = 2.52, SD = 1.16) than white participants (M = 2.19, SD = 1.02), t (258) = 2.34, p = .021.

Tests of Hypotheses

A series of (bivariate) correlation coefficients were generated to examine the hypothesized associations between flow-like activities (meditating, indoor exercise, creative work) and psychological outcomes (boredom, anxiety, depression, fatigue). Results can be found in Table 2. The first hypothesis concerned the extent to which creative work was associated with exercise and meditating. Creative work was somewhat positively associated with exercise (r = .119, p = .055) although the effect was not significant. Further, creative work was positively associated with meditating (r = .243, p = .000). Thus, these results partially confirm the hypothesized association between creative work and other flow-like activities (meditation and inside exercise).

The second hypothesis concerned the association between the three flow-like activities and psychological well-being. Of the three flow-like activities, only inside exercise was significantly (negatively) associated with all four of the outcome measures. Meditating was significantly (negatively) associated with feeling bored, but not with the other outcomes, while creative work was significantly (negatively) associated with both feeling bored and fatigue. This pattern of results thus partially confirmed the hypothesized association between flow activities and well-being.

Table 2 *Bivariate (unadjusted) Association between Flow Activities and Psychological Outcomes*

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. Inside Exercise	1						
2. Meditating	.272**	1					
3. Creative Work	.119	.243**	1				
4. Feeling Bored	-.131*	-.169**	-.227**	1			
5. Anxiety Subscale	-.140*	-.052	-.027	.374**	1		
6. Depression Subscale	-.162**	-.084	.007	.448**	.771**	1	
7. Fatigue Subscale	-.246**	-.085	-.132*	.332**	.624**	.643**	1

Further Tests of Hypotheses with Hierarchical Models

Feeling Bored

The hypotheses were further examined with multiple (linear) regression models where a block of demographic covariates (gender, age, years of schooling, and living alone) was entered in a first step and the three flow-like activities were entered as a block in a second step. These analyses, therefore, provided further tests of the hypothesis with adjusted models. The first

hierarchical model treated feeling bored as the outcome. Results indicated that the 3 flow-like activities contributed significantly to the model beyond the demographic covariates F(3, 220) = 4.02, p = .008, R^2 *Change = .048*. This further supports the hypothesis that flow-like activities including creative work, exercise, and meditation would be associated with psychological health and well-being (boredom, fatigue, depression, anxiety). Table 3 included both demographic covariates and the flow measures and indicated that, of the flow activities, only creative work remained significantly associated with feeling bored (β = -.182, p = .007). Of the demographic covariates, only years of schooling was significantly negatively associated with feeling bored (β = -.189, p = .004.

Table 3 *Coefficients of the Significant Demographic Covariates and Flow Measures for Feeling Bored*

Variable	*Beta*	*t*	*Sig*	*95% CI*	
				LL	*UL*
(Constant)		9.229	.000	3.505	5.409
How many years of schooling do you have?	-.189	-2.887	.004	-.107	-.020
Creative work	-.182	-2.719	.007	-.339	-.054
Meditating	-.051	-.744	.458	-.201	.091
Inside exercise	-.071	-1.055	.293	-.210	.064

Anxiety

The second hierarchical model treated feeling anxious as the outcome. Results indicated that the 3 flow-like activities did not contribute significantly to the model beyond the demographic covariates F (3, 219) = 1.02, p = .383, R^2 *Change = .013*. This did not support the hypothesis that flow-like activities including creative work, exercise, and meditation would be associated with psychological health and well-being (boredom, fatigue, depression, anxiety).

Table 4 included both demographic covariates and the flow measures. The table indicated that, none of the flow activities (creative work, meditation, exercise) remained significantly associated with feeling anxious (β = -.182, p = .007). Of the demographic covariates, age remained significantly negatively associated with feeling anxious (β = -.151, p = .034).

Table 4 *Coefficients of the Significant Demographic Covariates and Flow Measures for Feeling Anxious*

Variable	*Beta*	*t*	*Sig*	*95% CI*	
				UL	*LL*
Age	-.151	-2.136	.034	-.083	-.003
Creative work	-.033	-.474	.636	-.599	.367
Meditating	.017	.233	.816	-.431	.547
Inside exercise	-.116	-1.639	.103	-.846	.078

Depression

The third hierarchical model treated feeling depressed as the outcome. The model indicated that the demographic variables were associated with feeling depressed F(5, 224)= 3.44, p= .005. However, the 3 flow-like activities did not

contribute significantly to the model beyond the demographic covariates F(3, 220) = 1.48, p = .220, R^2 *Change* = *.018*. This did not support the hypothesis that flow-like activities including creative work, exercise, and meditation would be associated with psychological health and well-being (boredom, fatigue, depression, anxiety).

Table 5 includes both demographic covariates and the flow measures. The table indicates that, of the flow activities (creative work, meditation, exercise), inside exercise remained significantly negatively associated with feeling depressed (β = -.140, p = .043). Of the demographic covariates, living alone (β = .217, p = .001) and age (β = -.143, p = .039) remained significantly associated with feeling depressed.

Table 5 *Coefficients of the Significant Demographic Covariates and Flow Measures for Depression*

				95 % CI	
Variable	*Beta*	*t*	*Sig*	*LL*	*UL*
(Constant)		6.887	.000	8.307	14.966
Living alone	.217	3.250	.001	.752	3.070
Age	-.143	-2.079	.039	-.085	-.002
Creative work	.001	.011	.991	-.498	.504
Meditating	.003	.040	.968	-.499	.520
Inside exercise	-.140	-2.033	.043	-.976	-.015

Dependent Variable: Depression Subscale

Fatigue

The fourth hierarchical model treated feeling fatigued as the outcome. Results indicated that the 3 flow-like activities contributed significantly to the model beyond the demographic covariates F(3, 222), p=.005, R^2 *Change* = *.051*. This further supports the hypothesis that flow-like activities including creative work, exercise, and meditation would be associated with psychological health and well-being (boredom, fatigue, depression, anxiety). Table 6 includes both demographic covariates and the flow measures. The table indicates that, of the flow activities, inside exercise (β = -.199, p = .003) and creative work (β = -.125, p = .060) remained significantly negatively associated with feeling fatigued. Of the demographic covariates, gender (β = .136, p = .033), ethnicity (β = .140, p = .041), and age (β = -.181, p = .008), remained significantly associated with feeling fatigued.

Table 6 *Coefficients of the Significant Demographic Covariates and Flow Measures for Fatigue*

Variable	*Beta*	*t*	*Sig*	*95% CI*	
				LL	*UL*
(Constant)		8.141	.000	8.319	13.632
Dichotomous Gender	.136	2.151	.033	.091	2.074
Dichotomous Ethnicity	.140	2.054	.041	.038	1.834
Age	-.181	-2.691	.008	-.078	-.012
Creative work	-.125	-1.889	.060	-.783	.016
Meditating	.046	.666	.506	-.268	.543
Inside exercise	-.199	-2.988	.003	-.963	-.197

Further Examination of Correlates of Creative Work

Creative work during COVID-19 was of particular interest. To better understand the impact of creative work among respondents, correlations with a range of additional activities and psychological outcomes were examined (see Table 7). Here, the strongest associations with creative work were found for the working on projects/hobbies (r = .652) and working subscale (r = .626). Additionally, small to moderate sized correlations (r >.20) were noted for getting support, sudden emotional/physical reactions, and the Health and Connecting subscales.

Table 7 Additional Correlates of Creative Work

Exercise outside w/someone else	.142	.023
Self-touching, like brushing in the shower, yoga, and stretching	.149	.018
Engaging in Zoom, Skype, or Facetime activities like yoga or meditation	.199	.001
Watching movies	.126	.043
Connecting with friends	.140	.025
Trying to connect with old friends	.160	.010
Getting support from others	.257	.000
Cooking	.154	.013
Housekeeping	.137	.027
Working on projects and hobbies	.652	.000
I had trouble starting things because I am tired	-.165	.008
I was reminded of other traumatic experiences	.163	.009
Sudden emotional or physical reactions when reminded of the event	.202	.006
Health Subscale	.216	.001
Connecting Subscale	.265	.000
Working Subscale	.626	.000
PTSD Subscale	.147	.048

Additional Correlates of Creative Work during COVID-19

Summary of Results

The data were analyzed to explore two main hypotheses. First, the hypothesized associations between flow-like activities (meditating, indoor exercise, creative work) and well-being outcomes (boredom, anxiety, depression, fatigue) were explored. The first hypothesis concerned the extent to which creative work was associated with exercise and meditating. Here, creative work was somewhat positively associated with exercise, but the effect was not significant. Further, creative work was positively associated with meditating, indicating that participants reporting more frequent creative work reported meditating more often. Therefore, the results partially confirm the hypothesized association between creative work and other flow-like activities (meditation and inside exercise).

Next, the hypothesized associations between the three flow-like activities and psychological well-being were explored. Of the three flow-like activities, only inside exercise was significantly (negatively) associated with all four of the outcome measures. Meditating was significantly associated with feeling bored, but not with the

other outcomes, while creative work was significantly (negatively) associated with both feeling bored and fatigue. This pattern of results thus partially confirmed the hypothesized association between flow activities and well-being.

The second hypothesis was further examined using adjusted models to determine the extent to which demographic characteristics (gender, age, years of schooling, and living alone) and the flow-like activities (creative work, exercise, and meditation), contributed significantly to well-being outcomes (feeling bored, fatigue, anxiety, and depression). Each of these outcomes were explored individually and results are summarized below.

Feeling Bored

Of the flow activities, only creative work was significantly negatively associated with feeling bored. Of the demographic characteristics, years of schooling was also negatively associated with feeling bored.

Anxiety

None of the flow activities (creative work, meditation, exercise) were associated with feeling anxious. Age was negatively associated with feeling anxious. The older participants tended to be less anxious than the younger participants.

Depression

Of the flow activities (creative work, meditation, exercise), only inside exercise was negatively associated with feeling depressed. Of the demographic characteristics, living alone and age were associated with feeling depressed.

Feeling Fatigue

Of the flow activities, inside exercise and creative work remained significantly negatively associated with feeling fatigued. Additionally, gender, ethnicity, and age remained significantly associated with feeling fatigued.

Further Examination of Creative Work

Creative work was strongly associated with *working on projects/hobbies* and the *working sub-scale.* The working sub-scale collectively included questions associated with caregiving, cooking, housekeeping, paperwork, and working on projects/ hobbies. Additionally, there were small to moderate sized correlations on getting support, sudden emotional/physical reactions, and the Health and Connecting subscales. The health subscale included questions regarding exercise, touching (hugging, self-touch, stretching/yoga), washing hands, social distancing, meditating, liking being at home, self-care, feeling spiritual, and spending time with others. The connecting subscale included items regarding connecting with friends/ old friends, helping children with homework, and support from others.

Discussion

The current research utilized an archival database collected during a COVID-19 lockdown to examine the impact of flow-like activities (creative work, meditation, and inside exercise) on psychological well-being (boredom, fatigue, anxiety, and depression). In a Survey Monkey study during a COVID-19 lockdown, data suggested that 71% of the COVID lockdown participants reported boredom and 72% experienced fatigue (Field et al., 2020b). Preliminary correlation analyses suggested that creative work was negatively related to boredom and fatigue ratings and positively related to exercise and meditation ratings. These archival data were interpreted as “flow” in which more creative work and other flow-like activities (exercise and meditation) may be related to less boredom and fatigue. Specifically, the study aimed to understand if creative work would be associated with other flow-like activities (exercise and meditation); and if creative work and other flow-like activities were negatively associated with psychological outcomes including feeling bored, fatigue, anxiety and depression symptoms.

The study explored the extent to which creative work was associated with exercise and meditating. Here, creative work was somewhat positively associated with exercise, but the effect

was not significant. Further, creative work was positively associated with meditating, indicating that participants reporting more frequent creative work also reported meditating more often. Therefore, the results partially confirm the hypothesized association between creative work and other flow-like activities (meditation and inside exercise).

Next the hypothesized association between the three flow-like activities (creative work, exercise, and meditation) and psychological well-being (fatigue, feeling bored, anxiety, and depression) was explored. Of the three flow-like activities, only inside exercise was significantly (negatively) associated with all four of the outcome measures. This outcome aligns with the previous research (Field et al, 2020; Huang Y & Zhao N, 2020; Li et al., 2020; Wang et al., 2020), suggesting that engaging in exercise improves psychological outcomes for individuals, and continues to do so during difficult times such as the COVID-19 lockdown.

Additionally, of the flow activities, both inside exercise and creative work remained significantly negatively associated with feeling fatigued. Participants who engaged in more inside exercise and creative work, experienced less fatigue during the COVID-19 lockdown. Engaging in inside exercise and creative work decreased feelings of fatigue, suggesting that these activities be included in fatigue interventions.

Meditating was significantly associated with creative work and feeling bored, but it was not associated with the other outcomes. In contrast, creative work was significantly (negatively) associated with both feeling bored and fatigue. This pattern of results thus partially confirmed the hypothesized association between flow activities and well-being. The finding suggests that engaging in these flow-like activities can improve well-being by decreasing boredom and fatigue.

The association between flow-like activities and depression and anxiety outcomes was also explored. None of the flow activities (creative work, meditation, exercise) were associated with feeling anxious, and only inside exercise was negatively associated with feeling depressed. Given that the survey occurred during April of 2020, that lockdown period may have been associated with increased psychological symptoms (anxiety and depression) and less engagement in flow-like activities (creative work, exercise, and meditation).

The study also explored the association between demographic characteristics and psychological outcomes in the sample. Here, age was negatively associated with feeling anxious. Therefore, the older participants in the COVID-19 lockdown sample tended to be less anxious than the younger participants. Years of schooling was negatively associated with feeling bored, indicating that the more educated the participant was, the less bored they tended to be during the COVID-19 lockdown. Additionally, living alone and age were associated with feeling depressed, and gender, ethnicity, and age were significantly associated with feeling fatigued.

Further analyses explored the association of creative work with a wide range of additional activities and psychological outcomes represented within the COVID-19 lockdown survey. Creative work was strongly associated with working on projects/hobbies and the working subscale. This finding suggested that those who engaged in creative work also engaged in activities such as working on projects/hobbies, cooking, caregiving, housekeeping, and paperwork. Additionally, the study found correlations on getting support, sudden emotional/physical reactions, and the Health and Connecting subscales. These findings suggested that those who engaged in creative work also engaged in other health-related activities such as exercise, touching (hugging, self-touch, stretching/yoga), washing hands, social distancing, liking being at home, self-care, feeling spiritual, and spending time with others. Additionally, creative work was associated with connecting with friends/old friends, helping children with homework, and

getting support from others. However, the study did not explore the methods used to connect, and it would be interesting to study the impact that technology and social media may have had on connection and health (Clark, 2021), as well as creative processes during the COVID-19 lockdown. These exploratory findings suggest that creative work is associated with a wide range of activities associated with well-being and should be explored in future research.

Limitations of the Study

There is a relatively limited amount of research regarding the impact of creativity and other flow-like measures on individuals during the COVID-19 lockdown. Unfortunately, the measures used in this study are limited to self-report ratings. Participants could have misinterpreted a question, been untruthful in their responses, and over/under reported their symptoms and experiences. Additionally, the creative work, meditation, and inside exercise variables were all single item measures. Criticisms of single item scales include low content validity, lack of sensitivity, and lack internal-consistency reliability. Finally, there was a lack of diversity represented in the sample. The sample was disproportionately female (79.2%) and non-Hispanic White/Caucasian (68.3%). Therefore, the sample did not proportionally represent the population in the United States and may not be representative of the total population. Due to these limitations, the results should be interpreted with caution.

Future Recommendations

The weaknesses in the study should be used to inform and improve future research regarding flow-like activities and psychological well-being during the COVID-19 pandemic. The results suggest the need to discover differential effects of flow activities (creative work, meditation, and exercise) on psychological problems such as boredom, fatigue, anxiety, and depression. The study could be repeated with more comprehensive measures for creative work, exercise, and meditation. Future research should recruit a more representative sample and also explore the impact that creative processes have on connection, health and psychological outcomes during the COVID-19 lockdown. Due to the ongoing nature of the COVID-19 pandemic, longitudinal research should explore the long-term impact that COVID-19 has had on individuals in both the United States and worldwide. Finally, researchers and clinicians are encouraged to work together to explore intervention efforts designed to reduce psychological outcomes (depression, anxiety, boredom, and fatigue) during difficult times such as the COVID-19 lockdown.

Unique contributions of this study include; 1) focusing on creative work ratings in the COVID-19 lockdown activities database with implications for whether creative work might alleviate boredom and fatigue during lockdowns; 2) assessing whether creative work is related to other flow-like activities including exercise and meditation, and 3) investigating Csikszentmihalyi's hypothesis that flow activities might alleviate boredom and fatigue. Although the measures used in this study were limited to self-report ratings, the results may suggest future research and help inform intervention efforts to reduce negative effects during lockdowns such as COVID-19.

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