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Occupational Balance and Depressive Symptoms During the COVID-19 Pandemic

A Four-Wave Panel Study on the Role of Daily Activities in Austria

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Objective: The aim of this study was to investigate the relationship among daily activities (paid work, childcare, caregiving, voluntary work, sports, and social contact), occupational balance, and depressive symptoms during the COVID-19 pandemic. **Methods:** We analyzed data from the Austrian Corona Panel Project (four time points, 6-month period) using regression models with logarithmically transformed data and nonparametric repeated-measures tests (N = 871). **Results:** Results showed higher depressive symptoms among women. Family caregivers (either parents or those caring for other relatives) were at the highest risk for occupational imbalance and depressive symptoms. Sports and social contact were initially associated with better outcomes, but the effects waned. There was a main effect for time point driven by the last wave (amidst the second lockdown), but no significant interaction effects between predictors and time point were found. **Conclusion:** The results provide a nuanced depiction of the relationship between different daily activities and health-related outcomes during the pandemic, highlighting groups at risk.

Keywords: SARS-CoV-2, COVID-19, occupational balance, depressive symptoms, mental health

Since the early days of the pandemic, experts have been warning about the mental health implications of the COVID-19 crisis and the ensuing crisis response. Restrictions in personal freedom, although needed to contain the spread of the virus, are major stressors that undoubtedly contribute to widespread emotional distress and are likely to result in increased risk for psychiatric illness.[1–3] The World Health Organization has raised concerns about the psychosocial consequences triggered by self-isolation, feelings of uncertainty, and the disruption of daily routines, which can lead to an increase in anxiety, depression, substance abuse, and suicidal behavior.[4] In fact, studies have reported that changes in work and life patterns are increasingly associated with depressive symptoms, burnout, and anxiety during the pandemic.[5–7] As the grip of COVID-19 continues, it is key to understand how the disruption of daily activities may affect health-related outcomes during the current pandemic and during other potential crisis scenarios.

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At a day-to-day level, different daily activities and occupations have been severely affected by the crisis. People in Austria, as around the globe, have faced an arduous balancing act of unprecedented nature. Occupations are defined as the goal-directed, meaningful, and purposeful everyday activities that people do as individuals in social contexts. These can be subsumed in different areas such as work, leisure activities, and childcare, among others.[8] The need for balance between everyday activities largely guides the clinical practice and research of occupational therapists and scientists.[9,10] Occupational balance can thus be defined as the perceived satisfaction and self-efficacy in balancing everyday activities. The belief in one's capabilities to cope with different life demands is a key indicator of well-being in times of hardship.[11] Some of the activities we perform on a daily basis might be particularly taxing on our mental health during these extraordinary circumstances. For instance, many people have moved into home office in the last year. A recent study has shown that several social, behavioral, and physical factors have affected well-being while working from home during lockdown.[12] Others have seen their working hours reduced: a public-funded "short-work" scheme has been enacted in Austria to alleviate the burden on the private sector, with reduced working hours and salaries for employees. This could have compounding effects on feelings of job insecurity and financial concern, which have been associated with poor mental health during the COVID-19 crisis.[13] Childcare and homeschooling have also become major challenges for many parents during the pandemic.[14] In addition, 10% of the population in Austria are primary caregivers for at least one relative (eg, adult children of aging parents),[15] and when compared with other occupational areas, the situation of caregivers has remained largely overlooked within the context of COVID-19.[16] On the other hand, some activities (eg, sports, meeting with friends, volunteering) might act as psychosocial resources, giving us a sense of connection, control, and purpose. This goes in line with salutogenesis, an approach that calls for a more balanced perspective on (mental) health, focusing not only on what makes people ill (pathogenesis) but also on what makes them thrive.[17,18] Activities such as regular social contact and sports are known predictors of mental health and have been drastically affected by the measures. Furthermore, volunteering has been linked to connectedness and a higher sense of purpose and mastery,[19] all three pillars of the salutogenic approach to (mental) health and well-being.[17] Although some forms of volunteering were brought to a halt because of restrictions, new forms have emerged and many people have rushed to help others under the strenuous circumstances. In summary, understanding how different occupational areas might affect mental health outcomes can help inform measures to palliate mental illness during and in the aftermath of the crisis.

AIM OF THE STUDY

The aim of this study is to investigate the relationship between different daily activities and mental-health–related outcomes at different time points of the COVID-19 pandemic. We take a dual approach, focusing on activities that represent both demands (eg, childcare) and resources (eg, sports), as well as tapping into both positive (ie,

occupational balance) and negative (ie, depressive symptoms) outcomes. We delve into six activities/occupational areas (childcare, paid work, volunteering, home nursing/caregiving, sports, and social contact) and investigate how participation in these activities correlates with occupational balance and depressive symptoms at four time points during the COVID-19 pandemic.

METHODS

The Austrian Corona Panel Project

In this study, we analyzed data from the Austrian Corona Panel Project (ACPP),[20] a publicly available data set, coordinated by the University of Vienna and financed by the Austrian Science Fund as part of the Urgent SARS-CoV-2 funding scheme. The panel survey began on a weekly basis by the end of March 2020 and has been conducted on a monthly basis since July 2020. It comprises approximately 1500 respondents per wave representing the sociodemographic structure of the Austrian population. The questionnaire contains a core set of items that are repeated in each wave and alternating modules that delve into specific areas of concern pertaining to social, health, political, and economic aspects of the COVID-19 crisis. We contributed the "Occupational Balance" module, which was first included in wave 9 of the panel survey (end of May 2020; ie, right after the first easing of restrictions) and again in wave 17 (end of November 2020; ie, the third week of the second lockdown). We have also included waves 13 and 15 (although occupational balance was not assessed) to better capture patterns in depressive symptoms, which were measured in all waves. In summary, our analysis includes four time points (W1, W2, W3, and W4) in 6- to 8-week intervals. Participants of the ACPP resided in Austria and were 14 years and older.[20] Individuals who participated in all four of the abovementioned waves were included for the analyses in the current study.

Predictor Variables

Employment Status, Home Office, and Short-Work Contract

We looked at whether participants were currently working (yes/no). Changes in work situation were assessed in W2 and W4, asking participants whether they were currently in home office and/or on a short-time work contract (yes/no).

Childcare

In W1, participants reported whether they had children younger than 14 years living with them at home (yes/no).

Family Caregiving

In W4, participants were asked whether they were primary caregivers of a relative (yes/no). This entry was cross-checked with data from a wave a week before W1 (wave 8 in the panel), to make sure that it was a stable occupational area through the entire assessment period.

Sports

Sports was assessed in all four waves by asking participants how often they did sports during the last week. This was an ordinal scale ranging from 1 = never to 5 = daily.

Voluntary Work

In W1 and W4, participants reported whether they had volunteered in either an organization or an informal context (eg, mutual aid in the neighborhood) during the last month. Answer choices ranged from "never" to "several times a week" on a 5-point Likert scale including the following response options: never, rarely, once a month, and a few times a week. We then proceeded to combine these two questions across the two waves and dichotomized answers into two groups: "never/rarely/once" was recoded into "no," and "a few times a month/a few times a week" was recoded into "yes." Through this form of operationalization, we attempted to capture volunteering as a recurring activity rather than as a one-shot activity.[17]

Social Contact

Participants responded "How often have you had contact or an exchange with people that are close to you?" on an ordinal scale ranging from "never" to "several times a day." Unfortunately, this item was not included in W1 of the panel; hence, we were able to analyze relationships for W2, W3, and W4 only.

Dependent Variables

Occupational Balance

Occupational balance was assessed in W1 and W4. Two items were developed based on existing occupational balance measures.[9] Participants rated the extent to which they agreed with the following statements on a 5-point Likert scale: "I am satisfied with my daily activities in the current situation" and "I can manage my daily activities well in the current situation." An arithmetical mean was calculated to operationalize occupational balance. High scores indicated high occupational balance.

Depressive Symptoms

Depressive symptoms were assessed in all four waves with nine items in which participants rated how often in the last week they had felt full of energy, happy, at peace, lonely, angry, exhausted, very nervous, afraid, and sad. The 5-point Likert scale ranged from "never" to "daily." This nine-item battery has shown to be a valid screening instrument for depressive symptoms.[21] After reversing positively connoted items, an arithmetical mean was calculated. High scores indicated higher depressive symptoms.

Statistical Analysis

A first exploratory analysis of the data yielded a nonnormal distribution of the outcome variables and nonhomogenous variance in group comparisons. For this reason, we have used logarithmic transformations and nonparametric procedures for the data analysis. Hierarchical regression models controlling for sex were conducted with logarithmically transformed data with all predictors in each wave. The nonparametric Friedman test was used to assess trends in the outcome variables, as well as repeated-measures generalized linear models with logarithmically transformed data to analyze the interaction between predictors and time point. Post hoc tests were conducted when required.

RESULTS

A total of 871 individuals were considered for analyses (participants in all four waves), of which 438 (50.3%) were female, 430 (49.4%) were male, and 3 (0.3%) were gender diverse. The mean age of participants was 52 years (SD, 16), that is, somewhat higher than the average found in the population and in the full ACPP data set, which is 42 years.[20] This led to an overrepresentation of participants in retirement (30%) and an underrepresentation of students (5%). However, the proportion and distribution of (self-)employed (54.7%) and unemployed (5%)[1] participants were representative of the Austrian population.[22,23] Table 1 shows the breakdown of age and employment status by sex. In subsequent analyses, we used weights to counteract the age difference between data panel and our sample.

[1] Calculated as percentage of the population that is registered as unemployed.

TABLE 1. Sociodemographic Data

	Female	Male	Gender-Diverse	Total
Sex, n (%)	438 (50.3)	430 (49.4)	3 (0.3)	871 (100)
Mean (±SD) age, yr	52.09 (±15.65)	52.16 (±16.26)	25 (±5.29)	52.03 (±16)
Employment status, n (%)				
Employed	180 (41.1)	242 (56.3)	1 (33.3)	423 (48.6)
Self-employed	20 (4.6)	30 (7)	1 (33.3)	51 (5.9)
Student	21 (4.8)	18 (4.2)	1 (33.3)	40 (4.6)
Retired	153 (34.9)	113 (26.3)	-	266 (30.5)
Unemployed	21 (4.8)	20 (4.7)	-	41 (4.7)
Other*/not specified	39 (9)	7 (1.6)	-	46 (5.3)

*Parental leave, permanent disability, or household chores only.

Hierarchical Regression Models Controlling for Sex

Table 2 shows the hierarchical regression models in all four waves for depressive symptoms. In all waves, sex was a statistically significant predictor, with female participants reporting higher levels of depressive symptoms. Model 1, with the control variable sex, explained between 1.1% and 2.1% of the variance, as shown by the r^2 values. In model 2, which included all predictors and sex, four variables explained a total of 3.8% to 5.5% of the variance. Caregivers showed higher depressive symptoms throughout all waves, peaking in wave 4 ($\beta = 0.188$). Having children younger than 14 years was also correlated with the outcome variable in all waves, although to a lesser extent. Doing sports regularly correlated negatively with depressive symptoms in waves 1 and 2, but the effect vanished in waves 3 and 4. Finally, social contact with friends and family was negatively correlated with depressive symptoms in all assessed waves (no data were available for wave 1), but the effect waned as shown by the decreasing β coefficients ($\beta = -0.132$ in wave 2, $\beta = -0.120$ in wave 3, and $\beta = -0.076$ in wave 4). None of the other predictors provided significant improvement of the model.

Table 3 shows the hierarchical regression models for occupational balance in waves 1 and 4. Unlike depressive symptoms, sex was not associated with occupational balance in neither one of the waves. Once again, caregivers and parents of children younger than 14 years were reporting higher imbalance in both waves. In addition, whereas employment status was not associated with occupational balance in wave 1, people in the workforce reported higher imbalance in wave 4, amidst the second lockdown. All in all, these predictors explained 2.5% and 3.5% of the variance in occupational balance in wave 1 and wave 4, respectively.

Time Trends

Friedman tests yielded significant differences for both outcome variables. Occupational balance dropped significantly from W1 to W4, $\chi^2_1 = 44.50$, $P < 0.001$. When it comes to depressive symptoms, $\chi^2_3 = 50.02$, $P < 0.001$, we conducted a post hoc test to elucidate which differences among the waves were driving the effect. Pairwise comparisons showed no significant differences among the first three waves after Bonferroni correction. However, all three time points differed significantly from wave 4 ($z = -6.39$ for comparison W1-W4, $z = -4.469$ for comparison W2-W4, $z = -4.403$ for comparison W3-W4; $P < 0.001$) where higher levels of depressive symptoms were reported. Time point explained up to 1.6% of the variance in outcomes.

Table 4 shows the repeated-measures, within-subjects effects of the interaction between statistically significant predictors in the

TABLE 2. Regression Model for Depressive Symptoms

	Wave 1	Wave 2	Wave 3	Wave 4
Sex	0.138***	0.132***	0.113**	0.135***
	(0.034)	(0.027)	(0.031)	(0.033)
R^2 model 1 (control)	*0.021*	*0.018*	*0.011*	*0.018*
Caregivers	0.144***	0.188***	0.112**	0.167***
	(0.032)	(0.025)	(0.031)	(0.039)
Children (<14 years old)	0.065	0.085*	0.086*	0.116**
	(0.028)	(0.033)	(0.027)	(0.029)
Sports	−0.093**	−0.075*	−0.019	−0.004
	(0.020)	(0.018)	(0.015)	(0.022)
Social contact	n.a.	−0.132***	−0.120***	−0.076*
		(0.031)	(0.022)	(0.028)
Voluntary work	0.001	0.010	0.021	0.016
	(0.028)	(0.015)	(0.021)	(0.031)
Employment status	0.028	0.070	0.025	0.066
	(0.021)	(0.019)	(0.023)	(0.029)
Home office	0.019	0.051	0.023	0.033
	(0.026)	(0.025)	(0.022)	(0.023)
Short-time work	0.021	0.037	0.042	0.041
	(0.022)	(0.019)	(0.022)	(0.025)
R^2 model 2 (predictors)	*0.041*	*0.050*	*0.038*	*0.055*

Effect size, R-squared, in italics, representing the percentage of variance explained through the model.

n.a., not available.

*$P < 0.05$, **$P < 0.01$, ***$P < 0.001$; standard errors in parentheses.

TABLE 3. Regression Model for Occupational Balance

	Wave 1	Wave 4
Sex	−0.034	−0.031
	(0.029)	(0.027)
R^2 model 1 (control)	*0.003*	*0.002*
Caregivers	−0.125**	−0.176***
	(0.027)	(0.035)
Children (<14 years old)	−0.170***	−0.181***
	(0.031)	*(0.035)*
Sports	0.065	−0.016
	(0.022)	*(0.023)*
Social contact	n.a.	−0.055
		(0.028)
Voluntary work	0.040	0.029
	(0.030)	*(0.029)*
Employment status	−0.029	−0.145**
	(0.023)	*(0.028)*
Home office	0.021	0.037
	(0.023)	*(0.026)*
Short-time work	0.025	0.035
	(0.019)	*(0.024)*
R^2 model 2 (predictors)	*0.025*	*0.035*

Effect size, R-squared, in italics, representing the percentage of variance explained through the model.

n.a., not available.

*$P < 0.05$, **$P < 0.01$, ***$P < 0.001$; standard errors in parentheses.

TABLE 4. Within-Subjects Effects of Interaction Terms Between Predictors and Time Point

	Occupational Balance				Depressive Symptoms			
Predictor × Time Point	**MS (Error)**	***F***	**η^2**	***P***	**MS (Error)**	***F***	**η^2**	***P***
Sex × Time Point	0.015 (0.046)	0.221	0.000	0.638	0.149 (0.071)	1.749	0.002	0.186
Caregivers × Time Point	0.190 (0.048)	3.131	0.004	0.077	0.373 (0.069)	4.891*	0.006	0.027
Children × Time Point	0.116 (0.050)	0.426	0.001	0.516	0.105 (0.070)	1.129	0.001	0.288
Sports × Time Point	0.019 (0.047)	0.549	0.003	0.700	0.078 (0.070)	1.192	0.006	0.313
Social Contact × Time Point	0.118 (0.045)	2.081	0.010	0.081	0.054 (0.069)	1.063	0.005	0.374

MS indicates mean squares (error terms) in logarithmically transformed values.
*$P < 0.05$.

hierarchical models (ie, sex, caregivers, children, sports, and social contact) and time point. Because of lack of within-subjects variability in the frequency of sports and social contact, we used average scores to run the repeated-measures general linear model on these two variables. The analyses yielded no significant interactions, except for caregivers and time point on depressive symptoms, $F = 1.749$, $\eta^2 = 0.006$, $P = 0.027$. Figure 1 illustrates this interaction, showing that the trajectories of depressive symptoms between W1-W2 and W2-W3 run in opposite directions for caregivers and noncaregivers, with error bars overlapping at W3. Finally, although there was a significant increase in depressive symptoms for both groups between W3 and W4, it was particularly strong for caregivers as shown by the slope.

DISCUSSION

Understanding how different occupational areas might exacerbate or buffer the effects of the measures taken to mitigate the spread of COVID-19 is critical not only for the current situation but also as an important lesson in the event of future public health crises. Our analysis of the data from the ACPP[20] yielded some relevant results for short-term and long-term consideration.

In our analysis on sex, we found that women ranked higher in depressive symptoms than men in all waves. This pattern also was found in the area of caregiving (be it childcare or home nursing for a relative), where participants scored higher in depressive symptoms and lower in occupational balance. The results contribute to the discussion regarding the mental health implications for child-rearing parents[24] and primary caregivers.[1,16] This is particularly the case for women who still perform most of the caregiving duties, as an Austrian study shows.[25]

We also found that activities known to promote mental health (sports, social contact) were in fact negatively correlated with depressive symptoms in the first waves; the more sports and social contact people had in the last week, the lower they scored in depressive symptoms. However, the effect waned or disappeared by wave 4. This could be explained by the overriding effects the latest lockdown has had on mental health, rendering many resilience-building activities, such as sports and social contact, less effective. This seems a plausible hypothesis, particularly after months of restrictions that have led to weariness in the population.

When it comes to work, people who were in the workforce in November 2020 (wave 4) reported less occupational balance than those who were not working at the time. Home office and short-work employment had no impact on the outcomes. There was also no support for the hypothesis of volunteering as a psychosocial resource.[19] Finally, time trend analyses showed a significant difference in occupational balance and depressive symptoms in wave 4, when compared with the previous waves. The link between caregivers and depressive symptoms was the only to vary significantly across waves, but the effect was very small ($\eta^2 = 0.006$), showing a relative stability of the predictor-outcome effects throughout time.

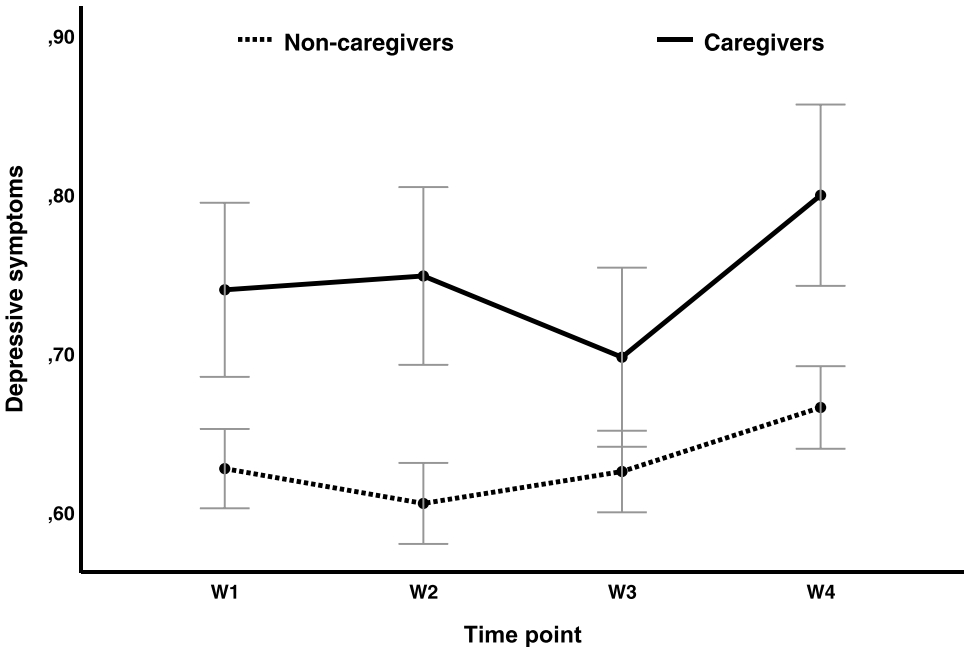

FIGURE 1. Interaction between caregiver status and time point.

There are certain limitations to this study. Given the nature of our data (nonparametric, occupational balance assessed only in the first and fourth wave, mixture of time-varying and invariant predictors), we were only able to gain limited longitudinal insights. Future assessments during crises should systematically look at the development of predefined occupational areas with clear prospective pathways as they relate to health outcomes. Such pathways could also unveil synergies between different occupational areas, tapping into complementary and compensatory effects and providing a more detailed picture.[26] Another limitation is the lack of comparability to data before the pandemic. It could well be argued, for example, that the differences in occupational balance between parents and nonparents are also found under normal circumstances, as it has been shown to be the case.[27] This is in fact a methodological problem that many publications are currently facing and that has been discussed by scholars within the context of COVID-19 and mental health.[28] However, our analysis of four waves of data over 6 months, covering some of the key turning points in public measures (eg, easing of restrictions, return to lockdown), could show to some extent that different time points led to different outcomes. Particularly, in W4, we found that the difference in occupational balance and depressive symptoms was greater than those in previous waves. In addition, our repeated-measures analyses bring a more nuanced depiction than what could be captured through single–time-point, cross-sectional data. A third limitation is a potential risk of selection bias due to missing data. As mentioned, the sample in our study (participants in all four waves) was older than the average in the data panel. We tried to remedy this by applying age weights to the analyses. Finally, the effect sizes were rather small, not exceeding a total value of 0.055 for models with all predictors. This is not uncommon in research using self-reported psychological measures and does not discount the findings.[29] In fact, the effects were able to highlight some of the pressing issues in the current situation in a consistent and coherent fashion, which can help to guide policies in the allocation of resources to alleviate the burden of certain segments of the population, particularly women with caregiving duties.

CONCLUSION

The results of our study provide a nuanced depiction of the relationship among different occupational areas, perceptions of occupational balance, and depressive symptoms at different time points of the pandemic, with women, parents, and caregivers being at a higher risk. Policies and interventions that strengthen the occupational balance and mental health of these vulnerable groups should be considered in the short and long term.

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