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Predictors of managers' mental health during the COVID-19 pandemic

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ABSTRACT

This study reports early evidence of managers' mental health and its predictors during the Coronavirus disease 2019 (COVID-19) pandemic in May 2020. In a sample of 646 managers from 49 countries, 5.3% (32) of managers reached the cut-off levels for disorders in distress (Kessler Psychological Distress Scale-6; K-6), 7.3% (38) experienced anxiety (General Anxiety Disorder-7; GAD-7), and 10.7% (56) had depression (Patient Health Questionnaire-9; PHQ-9). Age, relative income, and work status each predicted at least one of the conditions. Managers' 'illegitimate tasks' caused by COVID-19 predicted all three. Particularly noteworthy is the finding that the degree of downsizing an organization experienced during COVID-19 significantly predicted distress, anxiety, and depression for managers at the highest level (board members) only. This study helps identify managers in need of healthcare services as the COVID-19 pandemic affects organizations and their managers around the world.

Predictores en salud mental de los gerentes durante la pandemia de COVID-19

Este estudio informa sobre evidencia temprana en salud mental de los gerentes y sus predictores durante la pandemia de la enfermedad del coronavirus 2019 (COVID-19) en mayo de 2020. En una muestra de 646 gerentes de 49 países, el 5.3% (32) de los gerentes alcanzaron niveles de punto de corte para trastornos en angustia (escala de angustia Psicológica de Kessler-6; K-6), el 7,3% (38) experimentó ansiedad (Trastorno de ansiedad generalizado-7; GAD-7) y el 10,7% (56) tenía depresión (Cuestionario de salud del paciente-9; PHQ-9). La edad, los ingresos relativos y la situación laboral predijeron por sí solos al menos una de las condiciones. Las 'tareas ilegítimas' de los gerentes causadas por COVID-19 predijeron las tres. Particularmente digno de mención es el hallazgo de que el grado de reducción que experimentó una organización durante el COVID-19 predijo significativamente angustia, ansiedad y depresión solo para los gerentes del más alto nivel (miembros del directorio). Este estudio ayuda a identificar a los gerentes que necesitan servicios de atención médica, ya que la pandemia de COVID-19 afecta a las organizaciones y sus gerentes en todo el mundo.

COVID-19 疫情期间管理者心理健康的预测因素

本研究报告了2020年5月的2019年新型冠状病毒肺炎 (COVID-19) 疫情期间管理者心理健康及其预测因素的早期证据。在来自49个国家的646名管理者中, 5.3% (32) 名管理者达到了心理困扰变为障碍的临界水平 (凯斯勒心理困扰量表6; K-6), 7.3% (38) 经历过焦虑 (广泛性焦虑障碍量表7; GAD-7) 和10.7% (56) 有过抑郁 (患者健康问卷-9; PHQ-9)。年龄, 相对收入和工作状态均至少预测其中一种情况。由COVID-19引起的管理者的'非法任务'预测了这三个方面。特别值得发现的发现是, 在COVID-19期间体验到的组织裁员程度仅显著预测了最高层管理者 (董事会成员) 的心理困扰, 焦虑和沮丧。本研究有助于识别出COVID-19疫情在全球范围内影响到组织及其管理人员时, 需要医疗保健服务的管理者。

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关键词

企业管理者; 高管; 精神病筛查; 风险因素; 疫情; 2019-nCoV; 裁员

HIGHLIGHTS

- First study on managers' mental health during a pandemic.
- Identifies several risk factors, including 'illegitimate tasks'.

Managers, i.e. workers that are tasked with making decisions and leading others (Kraut, Pedigo, McKenna, & Dunnette, 1989), are often considered at particular risk for mental health issues. For instance, a recent survey found that 31% of managers had at some point received a formal mental health-related diagnosis (Palmer, 2019). Further, 'management' is one of the occupational groups with the highest suicide rates (Peterson et al., 2018). One might thus expect managers

to also hurt during the Coronavirus disease 2019 (COVID-19) pandemic, as they cannot manage as usual and may be under pressure to perform demanding tasks like cutting budgets or even employees.

Extant research on mental health during COVID-19, however, focuses largely on how patients, health-care workers, and the general public are adversely affected (Chao, Chen, Liu, Yang, & Hall, 2020; Chen et al., 2020; Torales, O'Higgins, Castaldelli-Maia, &

Ventriglio, 2020), and a literature search reveals no research on managers' mental health during pandemics at all. This is unfortunate not only because managers might be particularly vulnerable but also because managers' mental health issues may have important consequences. First, lost productivity due to mental health issues could be higher for managers (Loeppke et al., 2009). Second, managers are, by definition, tasked with making decisions and leading others, and poor leadership due to mental health issues is likely to adversely affect their subordinates (Kelloway, Sivanathan, Francis, & Barling, 2005).

This study aims to provide evidence on the mental health and its predictors among managers during the COVID-19 pandemic. We explore various predictors of distress, anxiety, and depression. In particular, we examine individuals' perception of having to perform stress-creating 'illegitimate tasks' (Semmer et al., 2015), the degree of downsizing in their organization due to COVID-19, and managers' level of seniority. As the COVID-19 pandemic continues to impact organizations worldwide, we hope this research stimulates more research to identify predictors to help mental health professionals locate the more mentally vulnerable managers to provide timely assistance.

1. Methods

1.1. Setting

Data collection took place through an online survey between 2 May and 8 May, 2020 during the global COVID-19 pandemic. Respondents to our survey are former consultants of a global elite management consulting firm, who largely moved into managerial roles after consulting. Non-managers were screened out and a total of 646 managers participated in this study approved by ESCP Business School (#2020-04-01).

1.2. Measures

The survey asked respondents for their age, gender, education, relative income level, geographic location, and current work situation. As variables of interest, the survey included Kessler-6 (K-6) for distress (Kessler et al., 2002) ($\alpha = 0.80$), Generalized Anxiety Disorder-7 (GAD-7) for anxiety (Kroenke, Spitzer, Williams, & Lowe, 2010) ($\alpha = 0.86$), and Patient Health Questionnaire-9 (PHQ-9) for depression (Kroenke et al., 2010) ($\alpha = 0.83$). The survey included various potential predictors, including managers' level of seniority in the organizational hierarchy and the percentage of staff reductions in their organizations since the start of COVID-19. Managers also reported their amount of 'illegitimate tasks,' which are tasks that a person thinks he or she should not have to perform (Semmer, McGrath, & Beehr, 2005) because (1)

the tasks may be unreasonable, i.e. outside the scope of one's professional role or at odds with one's level of experience, expertise, of authority, or (2) the tasks may be unnecessary, for example because they could have been prevented from arising in the first place, or because their performance serves no apparent purpose. Managers reported their illegitimate tasks *caused by COVID-19* using a correspondingly modified Bern Illegitimate Tasks Scale (Semmer, Tschan, Meier, Facchin, & Jacobshagen, 2010). In line with the factor structure of the measure found in prior literature (Semmer et al., 2015), we combined the four responses for unnecessary tasks and unreasonable tasks, respectively ($\alpha = 0.90$ and $\alpha = 0.82$).

1.3. Statistical analysis

All analyses were conducted in Stata 16.1 at a significance level of 0.05. To identify the predictors of health conditions (K-6, GAD-7, and PHQ-9), we followed prior work (Jahanshahi, Dinani, Madavani, Li, & Zhang, 2020; Zhang, Wang, Rauch, & Wei, 2020) and used ordinary least squares (OLS) multiple regression. OLS accommodates our continuous dependent variables and is the simplest appropriate method given our research objectives. We use robust standard errors and report the coefficient, 95% confidence interval (CI), and *p*-value.

2. Results

2.1. Descriptive findings

The second column of Table 1 presents the descriptive findings. Of the 646 managers from 49 countries in our sample, 72.6% (469) were male, 27.2% (176) were female, and one individual identified as 'other.' Most managers, 82.6% (534), reported being in either the top 1% or top 5% of income earners in their countries. Most managers, 85.6% (553), reported that they had worked primarily from home during the prior week. On the K-6, 5.3% (32) of managers reached a score of at least 13, a level often taken to be indicative of mental illness (Kessler et al., 2010). On the GAD-7, 9.6% (50) of the managers experienced moderate or severe anxiety (Kroenke et al., 2010), and 10.7% (56) had moderate or severe depression based on the PHQ-9 (Kroenke et al., 2010).

2.2. Risk factors for managers' distress, anxiety, and depression

The three columns on the right-hand side of Table 1 present the regression results on the potential risk factors for managers' distress, anxiety, and depression. Older managers exhibited less distress, anxiety,

Table 1. Descriptive findings and predictors of mental health in one ordinary least squares multiple regression model for each dependent variable ($n = 646$).

Variables	Frequency	Parameter estimates (95% confidence interval)		
		Distress (K-6)	Anxiety (GAD-7)	Depression (PHQ-9)
Dependent variable: Mean (Std. dev.)		5.3 (3.6)	3.6 (3.7)	3.7 (11.3)
Gender (categorical)				
Male	469 (72.6%)	Reference category	Reference category	Reference category
Female	176 (27.2%)	0.35 (−0.26 to 0.96)	0.24 (−0.46 to 0.93)	0.82 (0.11 to 1.53)
Other	1 (0.2%)	0.67 (−0.37 to 1.70)	1.45** (0.41 to 2.49)	−0.11 (−1.24 to 1.02)
Age (continuous)				
20–29	5 (0.8%)	−0.09*** (−0.13 to −0.05)	−0.07*** (−0.11 to −0.03)	−0.08*** (−0.12 to −0.04)
30–39	186 (28.8%)			
40–49	276 (42.7%)			
50–59	143 (22.1%)			
> 59	36 (5.6%)			
Educational level (continuous)				
Completed less than secondary school (1)	1 (0.2%)	0.12 (−0.85 to 1.09)	−0.03 (−1.23 to 1.16)	−0.40 (−1.59 to 0.78)
Completed secondary school (2)	0 (0.0%)			
Attended some college but no degree (3)	0 (0.0%)			
Completed college degree (4)	46 (7.1%)			
Completed graduate degree (5)	599 (92.7%)			
Income level relative to others in country (continuous)				
Bottom 50% (1)	2 (0.3%)	−0.30 (−0.66 to 0.07)	−0.36* (−0.72 to −0.01)	−0.71*** (−1.11 to −0.31)
Top 50% (2)	17 (2.6%)			
Top 25% (3)	93 (14.4%)			
Top 5% (4)	311 (48.1%)			
Top 1% (5)	223 (34.5%)			
Country (categorical)				
USA	206 (31.9%)	Dummy variable included for each country	Dummy variable included for each country	Dummy variable included for each country
Germany	111 (17.1%)			
France	33 (5.1%)			
Switzerland	33 (5.1%)			
UK	33 (5.1%)			
Australia	23 (3.6%)			
43 other countries	<20 (<3.1%) each			
Predominant work situation (categorical)				
Working from usual workplace	76 (11.8%)	0.75 (−0.14 to 1.64)	0.39 (−0.57 to 1.35)	0.22 (−0.77 to 1.20)
Working from home	553 (85.6%)	Reference category	Reference category	Reference category
Temporarily not working under Covid-19	17 (2.6%)	1.82* (0.02 to 3.63)	1.58 (−0.02 to 3.17)	0.95 (−1.06 to 2.96)
Illegitimate tasks due to COVID-19: Unnecessary tasks (continuous)				
1–2	167 (25.9%)	0.37* (0.03 to 0.71)	0.28 (−0.08 to 0.65)	0.63** (0.25 to 1.01)
2–3	246 (38.1%)			
3–4	172 (26.6%)			
4–5	61 (9.4%)			
Illegitimate tasks due to COVID-19: Unreasonable tasks (continuous)				
1–2	316 (48.9%)	1.51*** (1.07 to 1.95)	1.70*** (1.25 to 2.14)	1.46*** (0.93 to 1.99)
2–3	238 (36.8%)			
3–4	81 (12.5%)			
4–5	11 (1.7%)			
Seniority (categorical)				
Junior management	15 (2.3%)	−0.55 (−2.72 to 1.61)	−1.21 (2.64 to 0.21)	−1.76 (−3.74 to 0.22)
Middle management	176 (27.2%)	0.18 (−0.51 to 0.86)	−0.06 (−0.79 to 0.68)	−0.04 (−0.79 to 0.70)
Senior management	445 (68.9%)	Reference category	Reference category	Reference category
Board	10 (1.6%)	0.85 (−1.41 to 3.10)	0.36 (−1.36 to 2.09)	0.26 (−1.19 to 1.71)
Downsizing due to COVID-19 (continuous)				
0%–10%	549 (85.0%)	0.04 (−0.00 to 0.09)	0.02 (−0.03 to 0.06)	0.04 (−0.01 to 0.10)
10%–20%	52 (8.1%)			
20%–40%	29 (4.5%)			
> 40%	16 (2.5%)			
Interaction				
Downsizing * Seniority: Junior Management	-	−0.14 (−0.65 to 0.37)	−0.10 (−0.46 to 0.25)	0.04 (−0.42 to 0.51)
Downsizing * Seniority: Middle Management	-	−0.02 (−0.09 to 0.05)	−0.03 (−0.09 to 0.03)	−0.02 (−0.10 to 0.07)
Downsizing * Seniority: Senior Management	-	Reference category	Reference category	Reference category
Downsizing * Seniority: Board	-	0.13** (0.05 to 0.21)	0.08* (0.01 to 0.16)	0.09** (0.02 to 0.16)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

and depression. Relative income was favourably related to anxiety and depression. Temporarily not working due to COVID-19 significantly predicted distress, but not anxiety or depression.

Unnecessary tasks caused by COVID-19 significantly predicted distress and depression, and unreasonable tasks predicted distress, anxiety, and depression.

Neither managers' seniority nor the degree of firm downsizing due to COVID-19 significantly predicted mental health alone. However, the interaction between downsizing and the indicator for board membership significantly predicted distress, anxiety, and depression. An analysis of marginal effects showed that the relationship between downsizing and anxiety was significant only among board members ($\beta = 0.10$, 95% CI: 0.04 to 0.15, $p = 0.001$), suggesting that downsizing was more associated with mental health issues for board members than other managers.

3. Discussion

To our knowledge, this study presents the first attempt to document managers' mental health conditions as well as their predictors during a pandemic. Overall, we found that only a modest proportion of managers in our sample reached the typical cut-off values for mental disorder concerns. Our global sample showed lower prevalence ($p < 0.05$) of anxiety and depression (9.6% and 10.7%) than, for example, adults in the USA (25.5% and 24.3%) (Czeisler et al., 2020) or Germany (44.9% and 14.3%) (Bäuerle et al., 2020). The same holds true for meta-analytic evidence for Asia (32.9% and 35.3%) and Europe (23.8% and 32.4%) (Salari et al., 2020). The results are even more striking for distress, which had a prevalence of 5.3% in our sample, lower ($p < 0.05$) than the 65.2% in Germany and the 27.9% in the USA. It is important to consider, of course, that studies use partially different scales to assess the constructs.

We further gained new insights into predictors of mental health issues among managers. For instance, gender has been a strong predictor of mental health among various populations during the COVID-19 pandemic (Jahanshahi et al., 2020; Lai et al., 2020), but there were no significant differences between male and female managers across any outcome variables in our study. Age, in contrast, was not significant in some other studies (e.g. Jahanshahi et al., 2020), but did predict distress, anxiety, and depression in our sample. Our findings suggest that younger managers are more vulnerable than older managers, potentially because older managers may be more experienced and have developed functional coping strategies. Firms in a pandemic might thus wish to target younger rather than older managers with mental health service offerings. Additionally, relative income had a significant negative relationship with anxiety and depression, suggesting that managers who are relatively poorly compensated might be particularly at risk. Especially in global firms, human resource departments might be able to identify at-risk individuals by comparing managers' compensation with the local income distribution. It is worth noting, though, that our sample was highly skewed

towards high relative incomes and that our results in this regard are thus to be treated with caution.

Beyond these oft-studied variables, our research also uncovered several risk factors particularly relevant for managers. For example, those managers who perceived to have more illegitimate tasks were more distressed, depressed, and anxious. Given that people within the organizations often can identify illegitimate tasks, such as via complaints to superiors, overheard 'water cooler talk,' or informal channels on corporate communication systems like *Slack*, illegitimate tasks can serve as behavioural risk factors to identify managers at risk of mental health issues. Alternatively, if illegitimate tasks can be captured in human resource surveys, there is an opportunity to automatically (and thus confidentially) offer online tools to managers at risk (Harvey, 2018). This finding of course also suggests the need to address illegitimate tasks, e.g. by reviewing them and devising plans to manage them. This could, for instance, be done by justifying such tasks better and thus making them legitimate to managers or by reassigning them to others for whom they may be legitimate (e.g. to assistants or information technology professionals on matters of coordinating details of remote work and corresponding infrastructure during a lockdown).

Moreover, our results show that downsizing was associated with mental health conditions of the managers, conditional on their seniority. The association between downsizing and mental health conditions was significant only for those who were board members. This finding suggests that healthcare services and future research should pay attention specifically to board members, who bear the biggest responsibility for setting the direction of their organizations and may be vulnerable under the COVID-19 pandemic when their companies downsize. Specifically, organizations might anticipate such vulnerability even before downsizing programmes are being discussed so they can actively manage executives' mental health.

4. Limitations and future research

All managers in our sample passed the initial hiring process at one of the most selective consulting firms in the world, and hence other studies might wish to replicate our study findings on different manager populations. Further, our survey was voluntary, and it is possible that severely mentally ill managers might not have responded to it in the first place. Additionally, managers might be active in different industries with different challenges to their mental health. Future studies may thus wish to repeat the survey with a 'captive' population of managers in a homogenous setting, for example by embedding mental health questions in an organization's internal human resource survey (where legally and ethically permissible). Finally, the survey was administered online, yielding potentially different

results than in-person data collection, and had a cross-sectional design, precluding claims of causality.

5. Conclusion

Managers making decisions and leading others may experience great challenges during the COVID-19 pandemic. To our knowledge, this study is the first to assess the overall level of managers' mental health and it identifies several unique risk factors that allow identifying particularly vulnerable managers during a pandemic. Given that many organizations may have to downsize during the COVID-19 pandemic, we encourage future research on the identification of mentally vulnerable managers in downsizing organizations.

Author Statement

L. Graf-Vlachy: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data Curation, Writing - Original Draft, Writing - Review & Editing, Supervision
S. Sun: Methodology, Writing - Original Draft, Writing - Review & Editing
S. X. Zhang: Conceptualization, Methodology, Formal analysis, Investigation, Writing - Original Draft, Writing - Review & Editing, Supervision

Disclosure statement

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References

- Bäuerle, A., Teufel, M., Musche, V., Weismüller, B., Kohler, H., Hetkamp, M., ... Skoda, E. M. (2020). Increased generalized anxiety, depression and distress during the COVID-19 pandemic: A cross-sectional study in Germany. *Journal of Public Health, fdaa106*.
- Chao, M., Chen, X., Liu, T., Yang, H., & Hall, B. (2020). Psychological distress and state boredom during the COVID-19 outbreak in China: The role of meaning in life and media use. *European Journal of Psychotraumatology, 11*(1), 1769379. in press.
- Chen, F., Zheng, D., Liu, J., Gong, Y., Guan, Z., & Lou, D. (2020). Depression and anxiety among adolescents during COVID-19: A cross-sectional study. *Brain, Behavior, and Immunity, 88*, 36–38. in press.
- Czeisler, M. É., Lane, R. I., Petrosky, E., Wiley, J. F., Christensen, A., Njai, R., ... Czeisler, C. A. (2020). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic—USA, June 24–30, 2020. *Morbidity and Mortality Weekly Report, 69*(32), 1049–1057.
- Harvey, B. (2018). What companies can do to help employees address mental health issues. *Harvard Business Review*. Retrieved from <https://hbr.org/2018/12/what-companies-can-do-to-help-employees-address-mental-health-issues>
- Jahanshahi, A. A., Dinani, M. M., Madavani, A. N., Li, J., & Zhang, S. X. (2020). The distress of Iranian adults during the Covid-19 pandemic—More distressed than the Chinese and with different predictors. *Brain, Behavior, and Immunity, 87*, 124–125. in press.
- Kelloway, E. K., Sivanathan, N., Francis, L., & Barling, J. (2005). Poor leadership. In J. Barling, E. K. Kelloway, & M. R. Frone (Eds.), *Handbook of workplace stress* (pp. 89–112). Thousand Oaks, CA: Sage.
- Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L. T., ... Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*(6), 959–976.
- Kessler, R. C., Green, J. G., Gruber, M. J., Sampson, N. A., Bromet, E., Cuitan, M., ... Zaslavsky, A. M. (2010). Screening for serious mental illness in the general population with the K6 screening scale: Results from the WHO World Mental Health (WMH) survey initiative. *International Journal of Methods in Psychiatric Research, 19*(S1), 4–22.
- Kraut, A. I., Pedigo, P. R., McKenna, D. D., & Dunnette, M. D. (1989). The role of the manager: What's really important in different management jobs. *Academy of Management Executive, 3*(4), 286–293.
- Kroenke, K., Spitzer, R. L., Williams, J. B. W., & Lowe, B. (2010). The patient health questionnaire somatic, anxiety, and depressive symptom scales: A systematic review. *General Hospital Psychiatry, 32*(4), 345–359.
- Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., ... Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open, 3*(3), e203976.
- Loeppke, R., Taitel, M., Haufle, V., Parry, T., Kessler, R. C., & Jinnett, K. (2009). Health and productivity as a business strategy: A multiemployer study. *Journal of Occupational and Environmental Medicine, 51*(4), 411–428.
- Palmer, S. (2019, October 8). Managers more likely to be diagnosed with a mental health condition than other employees. *People Management*. Retrieved from <https://www.peoplemanagement.co.uk/news/articles/managers-more-likely-diagnosed-mental-health-condition-other-employees>
- Peterson, C., Stone, D. M., Marsh, S. M., Schumacher, P. K., Tiesman, H. M., McIntosh, W., & Luo, F. (2018). Suicide rates by major occupational group—17 states, 2012 and 2015. *Morbidity and Mortality Weekly Report, 67*(45), 1253–1260.
- Salari, N., Hosseinian-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., ... Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *Globalization and Health, 16*(1), 57.
- Semmer, N. K., Jacobshagen, N., Meier, L. L., Elfering, A., Beehr, T. A., Kälin, W., & Tschan, F. (2015). Illegitimate tasks as a source of work stress. *Work and Stress, 29*(1), 32–56.

- Semmer, N. K., McGrath, J. E., & Beehr, T. A. (2005). Conceptual issues in research on stress and health. In C. L. Cooper (Ed.), *Handbook of stress medicine and health* (2nd ed., pp. 1–43). New York: CRC Press.
- Semmer, N. K., Tschan, F., Meier, L. L., Facchin, S., & Jacobshagen, N. (2010). Illegitimate tasks and counterproductive work behavior. *Applied Psychology: An International Review*, 59(1), 70–96.
- Torales, J., O’Higgins, M., Castaldelli-Maia, J. M., & Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. *International Journal of Social Psychiatry*, 66(4), 317–320. in press.
- Zhang, S. X., Wang, Y., Rauch, A., & Wei, F. (2020). Unprecedented disruption of lives and work: Health, distress and life satisfaction of working adults in China one month into the COVID-19 outbreak. *Psychiatry Research*, 288, 112958.