Perceived stress among employees of software companies in Romania, toward the COVID-19 Pandemic

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Abstract
The COVID-19 pandemic situation affected all the businesses and all the humans around the world. After the impact of the first pandemic months, the companies developed a set of knowledge and strategies for preventing the loss. At the same time, the population had to protect themselves and find a solution to the other emerging problems. One of the most common effects of the pandemic is the stress. The present study, aims to analyse the perceived stress level among employees of software companies acting in Romania using Pandemic-Related Perceived Stress Scale. The score registered in researched population was 14.140; that means that the perceived stress level is lower moderate. The female registered a higher score, 14.261, while the male registered 14.005, with a standard deviation of .204 and .075. Although there are differences between scores recorded by females and males, they are not significant.

1. Introduction

The current pandemic situation has major implications for all businesses around the globe. Even if we are referring to continents such as Europe, Asia, or America, or business sectors such as commerce, production, hospitality, or IT, the COVID-19 crisis-affected billions of people.

The lockdowns affected most of the companies but it was a saving life measure willing to stop the spreading of the virus (Tang J. et al., 2021). This action has a different impact on businesses, depending on their sizes: in the small companies, given the relationship between the owner and the company, the effects were felt worse (Stephens J. et al., 2021) while the bigger companies were trying to transform their business models so that they prevent the loss (Li X. et al., 2022). Nevertheless, according to Mindes and Lewin, the most affected sector was represented by the people working as self-employed (Mindes S., 2021)

According to many papers, the most affected sector was hospitality (Yan J. et al., 2021) (Huang A. et al., 2021) (Aigbedo H, 2021) but the other ones also feel the pandemic effects. Many companies from education or commercial areas were forced to adapt their operations and lean-to online (Choi JJ et al., 2021) (Erjavec J., 2022). The effect was increased pressure on the IT&C companies who tried to maximize their profits. This was translated into an extended amount of work, tight deadlines and a lot of pressure on employees who worked remotely (Smite D et al., 2022).

The COVID-19 pandemic situation has different effects on people's lives and brings unpredictable changes in human behaviour (Ceccato I et al., 2021). Some people manifest increased loneliness (Holm M E et al., 2021), other was affected by not being able to access their family and friends (Koon L M et al., 2022) but all of them felt their lives has changed. Suddenly everyone was hit by information, whether it was real or fake. A lot of papers analyse the spreading of fake news and talk about an information crisis besides the medical one. (Bermes A., 2021) (Gupta A et al., 2022) The effect of this practice is analysed by many authors and it consists on increased anxiety and a lower level of work engagement (Khan A N., 2021)

Given the fact that many business sectors were affected, including a lot of companies, millions of employees felt the effects of the pandemic situation as well. If the businesses had taken a set of measures to stop or

decrease the losses, employees haven't so many options but to try to keep their jobs and keep good mental health (Ortiz-Calvo E et al., 2021). That was easy for the employees of the companies investing in human resources management and teams' behaviour (Marinho M et al., 2021) and harder for the rest of it. Most of the workers had fears regarding keeping their job (Chen C C et al., 2022) or emotional exhaustion (Chen H Eyoun K., 2021). Authors are analysing the effects of the pandemic situation on employees and most of them were focusing on anxiety (Tengilimoğlu D., 2021), different fears (Naghizadeh S., 2021), and stress (Corten D E et al., 2021). The combination of keywords "COVID-19" and "stress" appear on more than 25k papers on scientific databases (sciencedirect.com, 2022)

2. Methods

a. Design and sample

The study conducted between December 2021 and January 2022, aims to analyse the perceived stress level among employees of software companies acting in Romania. The criteria used for selecting the companies were:

- Software company
- Acting in Romania.
- Medium to large company: over 100 employees

Data were collected using an internet-based survey. The perceived stress was measured using Pandemic-Related Perceived Stress Scale (Campo-Arias A et al., 2020). It is an adapted version of the classic PSS instrument (Cohen S et al., 1983) widely used for over 20 years for measuring perceived stress (Ruisoto P et al., 2020). Besides the scale's questions, we collected demographic data related to the respondent's genre and age. We aimed to check if there are any differences between men and women regarding perceived stress or between different age classes.

Participants were 300 employees of medium to large software companies acting in Romania (N=300), including 177 females and 123 males.

b. Hypotheses

Our hypotheses were:

1) Software companies' employees perceived a medium stress range.
2) Women registered a higher perceives stress score than men
3) Older people registered a high perceived stress

c. Ethical principles:

The research was carried out in accordance with the Declaration of Helsinki. There was no potential harm to participants, informed consent forms were collected and anonymity was guaranteed. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

3. Results

a. Descriptive statistics

Of the total participants (N=300), 177 were females and 123 males. Table 1 presents the age distribution of participants.

Table 1. Descriptive statistics

	F	M	Sum
<25	54	37	91
25-35	93	65	158
>35	30	21	51
Sum	177	123	300

b. Distribution of the scores

Individual scores in PSS can range between 0 to 40, with the higher score showing a higher amount of perceived stress. Scores ranging from 0 to 13 are considered a low-stress level, from 13 to 26 a moderate stress level, and from 27 to 40 a high perceived stress level (Cohen S et al., 1983)

The score registered in researched population was 14.140. That means that the perceived stress level is lower moderate. The female registered a higher score, 14.261, while the males registered 14.005, with a standard deviation of .204 and .075. Although there are differences between scores recorded by females and males, they are not significant. Both of the scores place the participants on the lower moderate stress scale. In the female class, the higher score was measured in under 25 years (14.462) and the lowest in the range between 25 and 35 (14.053). In the male class, the higher score was registered in the range of 25 to 35 (14.092) and the lowest, above 35 years (13.952). We also note that two categories of males, under 25 and above 35, registered a perceived stress level, closer to the low-stress level (13.972 and 13.952). The calculated variance was 0.041 on females and 0.005 on males, so there is not a statistically significant difference between the two sets of data. The Pearson coefficient is -.83 which means that we have a negative correlation between the two sets of data.

Table 2. Distribution of the scores

	F			M		
	<25	25-35	>35	<25	25-35	>35
PSS Score	14.462	14.053	14.266	13.972	14.092	13.952
PSS Score Mean		14.261			14.005	
SD		.204			.075	
Variance		.041			.005	
Pearson coefficient			-0.803			

4. Conclusion

The COVID-19 pandemic situation affected all the businesses and all the humans in all countries. After the impact of the first pandemic months, the companies developed a set of knowledge and strategies for preventing the loss. At the same time, the population had to protect themselves and find a solution to the other emerging problems. Studies had shown that stress is one of the most important issues people faced. This paper analysed the perceived stress level of software company's employees and the results show they perceived a low moderate stress level. This phenomenon can be attributed to the fear of being infected, to a large amount of work that has to be completed in a shorter time, or to other internal reasons.

The first hypothesis is confirmed, the software company's employees perceived medium stress. The second hypothesis is also confirmed, but there is no statistical significance, women registering a higher perceived stress score than the men. The third hypothesis is declined, older people did not register a high level of perceived stress. We have to mention here that age ranges analysed were under 25, between 25 and 35, and over 35, and "the older people" formulation found in the third hypothesis, regards the class over 35. However, the precise age of participants wasn't analysed, but the highest one was 47.

Declaration of competing interest:
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References
1. Aigbedo H. (2021). Impact of COVID-19 on the hospitality industry: A supply chain resilience perspective. *International Journal of Hospitality Management*.
2. Bermes A. (2021). Information overload and fake news sharing: A transactional stress perspective exploring the mitigating role of consumers' resilience during COVID-19. *Journal of Retailing and Consumer Services*.

3. Campo-Arias A et al. (2020). Escala de estrés percibido relacionado con la pandemia de COVID-19: una exploración del desempeño psicométrico en líneaPandemic-Related Perceived Stress Scale of COVID-19: An exploration of online psychometric performance. *Revista Colombiana de Psiquiatría*.

4. Ceccato I et al. (2021). Data on the effects of COVID-19 pandemic on people's expectations about their future. *Data in Brief*.

5. Chen C C et al. (2022). The fear of being infected and fired: Examining the dual job stressors of hospitality employees during COVID-19. *International Journal of Hospitality Management*.

6. Chen H Eyoun K. (2021). Do mindfulness and perceived organizational support work? Fear of COVID-19 on restaurant frontline employees' job insecurity and emotional exhaustion. *International Journal of Hospitality Management*.

7. Choi JJ et al. (2021). University students' perception to online class delivery methods during the COVID-19 pandemic: A focus on hospitality education in Korea and Malaysia. *Journal of Hospitality, Leisure, Sport & Tourism Education*.

8. Cohen S et al. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 385-396.

9. Corten D E et al. (2021). Stress Among Asian Youth During COVID-19: Moderation by Educational, Spiritual, and Cultural Sources of Belonging. *Journal of Adolescent Health*.

10. Erjavec J., M. A. (2022). Online shopping adoption during COVID-19 and social isolation: Extending the UTAUT model with herd behavior. *Journal of Retailing and Consumer Services*.

11. Gupta A et al. (2022). Understanding patterns of COVID infodemic: A systematic and pragmatic approach to curb fake news. *Journal of Business Research*.

12. Holm M E et al. (2021). The effects of the COVID-19 pandemic on the psychosocial well-being of people with disabilities. *Disability and Health Journal*.

13. Huang A. et al. (2021). COVID-19 and the future of work in the hospitality industry. *International Journal of Hospitality Management*.

14. Khan A N. (2021). A diary study of psychological effects of misinformation and COVID-19 Threat on work engagement of working from home employees. *Technological Forecasting & Social Change*.

15. Koon L M et al. (2022). Examining the effects of the COVID-19 pandemic on community engagement for people with mobility disabilities. *Disability and Health Journal*.

16. Li X. et al. (2022). Business transformation in an age of turbulence – Lessons learned from COVID-19. *Technological Forecasting and Social Change*.

17. Marinho M et al. (2021). Happier and further by going together: The importance of software team behaviour during the COVID-19 pandemic. *Technology in Society*.

18. Mindes S., L. P. (2021). Self-employment through the COVID-19 pandemic: An analysis of linked monthly CPS data. *Journal of Business Venturing Insights*.

19. Naghizadeh S. (2021). Relationship of fear of COVID-19 and pregnancy-related quality of life during the COVID-19 pandemic. *Archives of Psychiatric Nursing*.

20. Ortiz-Calvo E et al. (2021). The role of social support and resilience in the mental health impact of the COVID-19 pandemic among healthcare workers in Spain. *Journal of Psychiatric Research*.

21. Ruisoto P et al. (2020). Psychometric properties of the three versions of the Perceived Stress Scale in Ecuador. *Physiology & Behavior*.

22. *sciencedirect.com*. (2022, 01 20). Retrieved from sciencedirect.com: https://www.sciencedirect.com/search?qs=covid%20stress

23. Smite D et al. (2022). Changes in perceived productivity of software engineers during COVID-19 pandemic: The voice of evidence. *Journal of Systems and Software*.

24. Stephens J. et al. (2021). Small business in a time of crisis: A five stage model of business grief. *Small business in a time of crisis: A five stage model of business grief*.

25. Tang J. et al. (2021). To reopen or not to reopen? How entrepreneurial alertness influences small business reopening after the COVID-19 lockdown. *Journal of Business Venturing Insights*.

26. Tengilimoğlu D. (2021). Impacts of COVID-19 pandemic period on depression, anxiety and stress levels of the healthcare employees in Turkey. *Legal Medicine*.

27. Yan J. et al. (2021). Hospitality workers' COVID-19 risk perception and depression: A contingent model based on transactional theory of stress model. *International Journal of Hospitality Management*.