Relationship between technostress and labor-related variables in workers of the Tecnomática Enterprise

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Relación del tecnoestrés y variables sociolaborales en trabajadores de la Empresa Tecnomática

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ABSTRACT

Introduction: technostress (TS), an emerging psychosocial risk derived from the use of ICTs, can affect worker well-being and performance. This study aimed to characterize the relationship between TS and its dimensions in workers of Tecnomática Enterprise, an organization in the Cuban ICT sector.
Method: a study was conducted with 97 workers, selected through intentional "snowball" sampling. The RED-Technostress scale adapted and validated for Cuba was applied. Data analysis included descriptive statistics, Mann-Whitney U tests, Spearman correlations, and the application of Salanova's standardized benchmark for intensive ICT users.
Results: the mean global TS score was 47,3 (SD=12,8). No statistically significant differences were found in the total scores or by dimensions based on sex, educational level, work modality, or labor area. After applying the benchmark, high levels of Skepticism (54,6 %), Anxiety (38,0 %), and Addiction (34,0 %) were identified, as well as medium-high levels of Inefficacy (28,9 %). Fatigue showed a more heterogeneous distribution.
Conclusions: some workers manifested TS, and another group was at risk of suffering from it. Although a severe situation was not found, the high scores in several dimensions establish warning signs that justify the implementation of preventive and corrective measures to mitigate its impact on the organization.

Keywords: Technostress; RED-Technostress; ICT; Occupational Well-Being; Psychosocial Risks.

RESUMEN

Introducción: el tecnoestrés (TS), un riesgo psicosocial emergente derivado del uso de las TIC, puede afectar el bienestar y rendimiento laboral. Este estudio se propuso caracterizar la relación del TS y sus dimensiones en trabajadores de la Empresa Tecnomática, una organización del sector TIC en Cuba.
Método: se realizó un estudio con 97 trabajadores, seleccionados mediante muestreo intencional "bola de nieve". Se aplicó la escala RED-Tecnoestrés adaptada y validada en Cuba. El análisis de datos incluyó estadística descriptiva, pruebas U de Mann-Whitney, correlaciones de Spearman y la aplicación del baremo estandarizado de Salanova para usuarios intensivos de TIC.
Resultados: la puntuación global media de TS fue de 47,3 (DE=12,8). No se hallaron diferencias estadísticamente significativas en las puntuaciones totales ni por dimensiones en función del sexo, nivel educativo, modalidad de trabajo o área laboral. Tras aplicar el baremo, se identificaron niveles altos de Escepticismo (54,6 %), Ansiedad (38,0 %) y Adicción (34,0 %), así como niveles medio altos de Ineficacia (28,9 %). La Fatiga mostró una distribución más heterogénea.
Conclusiones: una parte de los trabajadores manifestó TS y otro grupo presentó riesgo de padecerlo. Aunque no se encontró una situación grave, los altos puntajes en varias dimensiones establecen signos de alerta que justifican la implementación de medidas preventivas y correctivas para mitigar su impacto en la organización.

Palabras clave: Tecnoestrés; RED-Tecnoestrés; TIC; Bienestar Laboral; Riesgos Psicosociales.

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INTRODUCTION

Contemporary organizational development is deeply influenced by the dynamics of volatile environments, where innovation and technological change are critical variables that are difficult to predict. This reality imposes on companies the need to adapt quickly, effectively, and efficiently to digital transformations. Technology has brought about substantial changes in work habits and organization, giving rise to new production paradigms, the emergence of [new] professions, and, concomitantly, a series of emerging occupational risks from ergonomic and psychosocial perspectives.

The widespread implementation of information and communication technologies (ICT), such as computers, collaboration tools, videoconferencing, and instant messaging, has accelerated significantly in recent years, driven, among other factors, by labor flexibility and the forced adoption of teleworking during the COVID-19 pandemic. This phenomenon has reconfigured the forms of organizational interaction and communication. While the use of ICT brings tangible benefits, such as reduced operating costs, process optimization, and the creation of new strategic and innovative alternatives, its implementation can also have adverse effects on the cognitive-work environment of the worker

In this context, technostress (TS) emerges as a negative psychosocial phenomenon with global reach. Initially conceptualized as the negative impact on attitudes, thoughts, behaviors, or bodily physiology caused directly or indirectly by technology,[3] Brod redefines it as a modern adaptation disorder,[4] resulting from the inability to cope healthily with new information technologies. TS represents a novel problem arising from the excessive and inappropriate use of ICT, directly affecting the well-being and quality of life of workers in their work environment.

The manifestations of STD are multifaceted and are associated with harmful consequences for individual and organizational health. Among its most common effects are fear, anxiety, resistance, frustration, mental fatigue, and stress. [5] At the organizational level, these consequences translate into impaired performance, increased absenteeism, and decreased job satisfaction. International studies show its prevalence. For example, research by the Beijing Baizhong Medicare Center reported that 46,0 % of Chinese workers experienced technology-related mental dysfunction, 52,3 % suffered from anxiety, and 37,1 % faced difficulties in their interpersonal relationships. [Similarly], a study in India involving 160 employees indicated significant impacts in terms of techno-aversion, techno-invasion, techno-insecurity, and techno-uncertainty.

TS is therefore an emerging psychosocial risk in the workplace, the impact of which is exacerbated by the growing penetration of ICT in society. Individuals are forced to invest continuous time and effort in updating their digital skills to adapt to new software and tools, which can generate sustained negative emotions. Working under these circumstances can be detrimental to the mental health and psychosocial balance of employees.

Rigorous assessment of TS is imperative for preventive occupational risk management. In this regard, the use of valid and reliable instruments is essential. The Resources, Experiences/Emotions, and Demands-Information and Communication Technologies Scale (RED-Technostress), developed and validated in different contexts, represents a robust tool for operationalizing this construct. Its application allows for the identification, assessment, and control of these risk factors, facilitating the planning of preventive and corrective measures.

This study focuses on the characterization of technostress in professionals at Empresa Tecnomática, a leading organization in the ICT sector in Cuba. The research stems from a previous diagnosis of teleworking in that company, which revealed problems associated with digital disconnection and the blurring of boundaries between work and personal life. A significant finding indicated that 7 out of 10 workers surveyed shared the belief that teleworkers should be available 24 hours a day, 7 days a week, suggesting a potential technological invasion of personal space.

The overall objective of this research is to characterize the relationship between technostress and its dimensions in employees of the Tecnomática company. To this end, we propose: 1) To describe the sociodemographic and occupational characteristics of the study sample; 2) To analyze the total and dimension-specific scores of the RED-Technostress questionnaire; 3) Establish correlations between the sample variables and the TS scores using Spearman's coefficient; and 4) Perform a diagnostic assessment using the standardized scale proposed for the instrument. The results of this study seek to provide empirical evidence to support organizational interventions aimed at mitigating the impact of ST, thus promoting more effective human capital management, a better person-task-environment fit, and ultimately, improved performance and well-being at work.

METHOD

Intentional sampling was carried out with employees of the Tecnomática Company, who were accessed using the snowball method, based on an initial list of employees. These employees, in turn, invited other colleagues to participate in the study. People who did not systematically use computers as a fundamental tool in their daily work and people who refused to participate in the study were excluded.

The sample consisted of 97 people, predominantly women (54, 57,7 %), workers in productive areas (63, 64,9 %), working on-site (61, 62,9 %), and higher education graduates (77, 79,4 %). The average age of the participants was 45,2 (*SD* = 13,8), ranging from 18 to 78 years, and the average number of years of experience reported was 13,5 (*SD* = 12,2), with a maximum value of 46 years.

Information was collected *online* using *Google Forms*, where sociodemographic data such as age, gender, type of work, areas of work, and seniority were gathered.

A descriptive analysis was performed of sociodemographic variables and total scores on the RED-Technostress Questionnaire, adapted and validated for Cuba,[14,15] as well as by dimension. To estimate the reliability of the test, Cronbach's α coefficient was calculated overall and by dimension, and the corresponding item elimination analysis was performed.

To compare the behavior of total scores according to sociodemographic variables, the T-test for independent samples (in particular, the nonparametric Mann-Whitney U test) was used, and Spearman's correlation coefficient was used to analyze the relationship between age, years of experience, and total scores for the dimensions and overall. In both cases, a statistical significance cutoff point of 0,05 was used. Correlations were considered strong if the corresponding coefficient value was >

0,6.

In addition, the scale proposed by Salanova *et al.*[10] was applied to the RED-Technostress Questionnaire, and a comparison was made between the research results and this scale.

Ethical aspects were taken into account, based on the principles of autonomy, justice, beneficence, and non-maleficence, as well as informed consent. In the first section of the online questionnaire, participants were informed about the need for and purpose of the research, the importance and voluntary nature of participation, and their consent was requested. It was explained to them that the information would be used collectively, not individually, and that the principle of data confidentiality would always be respected. The data would only be used for research purposes and in summary form, taking the Declaration of Helsinki as a reference.[19]

This research was approved by the Academic Committee of the Master's Degree in Psychological and Social Assessment of the Miguel Enríquez Faculty of Medical Sciences, University of Medical Sciences of Havana.

RESULTS

The total score on the RED-Technostress Questionnaire ranged from 18 to 95 points, with a mean of 47,3 (*SD* = 12,8). The average score on the Skepticism dimension ranged from 5 to 23, with a mean of 11,9 (*SD* = 2,79). For the Fatigue dimension, the average score ranged from 0 to 20, with a mean of 6,77 (*SD* = 4,94). The Anxiety dimension took values between 0 and 18, with a mean of 5,25 (*SD* = 3,99). The average score for the Ineffectiveness dimension ranged from 0 to 20, with a mean of 4,94 (*SD* = 4,14). In the case of the Addiction dimension, the total score ranged from 5 to 36, with a mean of 18,4 (*SD* = 6,80).

The reliability analysis using internal consistency yielded acceptable values with an overall Cronbach's alpha of 0,758, as well as for the dimensions Fatigue (α = 0,888), Anxiety (α = 0,714), Ineffectiveness (α = 0,771), and Addiction (α = 0,777). In the case of the Skepticism dimension, an inadequate value of α = 0,248 was achieved. This suggests that the items that are most difficult to measure are those related to attitudes of indifference.

The item elimination analysis showed that by eliminating items 1, 2, 3, and 18, the reliability of the test increases slightly. The first three items belong to the Skepticism dimension and item 18 to the Addiction dimension.

When performing this analysis by dimension, in Skepticism, it was confirmed that eliminating item 3 increased the alpha to 0,300; in the Ineffectiveness dimension, item 16 increased to 0,811; and in the Addiction dimension, item 17 also increased its α to a value of 0,797. The other dimensions remained below the value given per dimension.

The sample was characterized using the scale proposed by Salanova[20] and the variables were related to the total scores and scores per dimension. This option was chosen because the scale estimated for Spain, created by the researchers of the original test, was developed in early 2000, when there was not yet the same level of internet coverage as there is now, and no data is available for Cuba.

The non-parametric Mann-Whitney U test was used on the total test score and its dimensions to check for statistically significant differences with respect to gender. No statistically significant differences were reported in the total scale score (U = 1111, p = 0,837), where the mean for women (MM) was 46,43 (*SD* = 11,26) and the mean for men (MH) was 48,37 (*SD* = 14,58).

As for the other dimensions, no significant differences were found for Skepticism (*U* = 996, *p* = 0,210), where MM was 11,69 (*SD* = 3,02) and MH was 12,16 (*SD* = 2,47), with a higher average value for women.

The same occurred in the Anxiety dimension (*U* = 1131, *p* = 0,830), where MM was 5,35 (*SD* = 3,99) and MH was 5,12 (*SD* = 4,03), as well as in the Ineffectiveness dimension (U = 1022, p = 0,312), where MM was 5,26 (*SD* = 4,12) and MH was 4,53 (*SD* = 4,19). In the Fatigue dimension, it was the men who achieved higher values, although the difference was not statistically significant (U = 1053, p = 0,433), where MM was 6,30 (*SD* = 4,34) and MH was 7,37 (*SD* = 5,59).

Finally, the Addiction dimension also did not report statistically significant differences by gender (U = 1047, *p* = 0,409), where MM was 17,83 (*SD* = 7,05) and MH was 19,19 (*SD* = 6,47).

With regard to educational level, no significant differences were found in the total scores. This sample contains 77 university students (Univ) and 20 mid-level technicians (TM). In the Skepticism dimension, the average total score for MTs was 11,75 (*SD* = 3,40) and for Univ it was 11,94 (*SD* = 2,63); these differences were not statistically significant (U = 687, p = 0,442), although Univ had a higher total score.

In the Fatigue dimension, no statistically significant differences were reported in these groups (*U* = 745, *p* = 0,823). The average total score for the MTs was 6,45 (*SD* = 4,47) and for the Univ it was 6,86 (*SD* = 5,08), with the MTs having higher values.

No statistically significant difference was reported for the total score of the Anxiety dimension either (*U* = 559, *p* = 0,059). The average total score for the TM group was 6,75 (*SD* = 4,01) and for the Univ group it was 4,86 (*SD* = 3,92), with the TM group having higher scores.

In the analysis of the Addiction dimension, again no statistically significant differences were found (*U* = 570, *p* = 0,823), where the average total score for the TM was 6,45 (*SD* = 4,47) and for the Univ 6,86 (*SD* = 5,08). No statistically significant differences were reported for the Ineffectiveness dimension either (U = 570, p = 0,073), with the average total score for the TM group being 6,55 (*SD* = 4,76) and for the Univ group 4,52 (*SD* = 3,89), with the TM group also having a higher score.

Finally, no statistically significant differences were found in the overall scale score in these groups by educational level (*U* = 742, *p* = 0,806), where the average total score for the TM was 47,40 (*SD* = 10,88) and for the Univ it was 47,26 (*SD* = 13,32).

It was found that 61 workers are in the face-to-face modality (MP), while 36 work remotely (TT). With regard to the work modality, no statistically significant differences were found in the total score, nor by dimension.

In the Skepticism dimension, no statistically significant differences were found between the groups (*U* = 1074, *p* = 0,854). Workers in MP had an average total score of 11,97 (*SD* = 3,04), while those in TT had a score of 11,78 (*SD* = 2,32), showing higher scores in the face-to-face modality.

In the Fatigue dimension, no statistically significant differences were found either (*U* = 1060, *p* = 0,779), where the average total score for MP workers was 6,61 (*SD* = 4,84), while for TT workers it was 7,06 (*SD* = 5,15), showing higher scores

among teleworking colleagues.

For the total score in the Anxiety dimension, the Mann-Whitney test was not significant (U = 1075, p = 0,866), where the average total score for both MP and TT workers was 5,25 with SD = 4,15 and SD = 3,77, respectively.

When analyzing the total score for the Ineffectiveness dimension, no statistically significant differences were reported (U = 1038, p = 0,652). The average total score for MP workers was 5,10 (SD = 4,25) and for TT workers was 4,67 (SD = 3,99), showing a higher score in the face-to-face modality.

Regarding the total score for the Addiction dimension, the Mann-Whitney test was also not significant (U = 1077, p = 0,875). TT workers achieved an average total score of 18,39 (SD = 6,44) and MP workers achieved a score of 18,50 (SD = 7,47).

Finally, with regard to the overall score on the scale, no statistically significant differences were found by work modality (U = 1070, p = 0,837). The average total score for MP was 47,31 (SD = 12,21) and for TT it was 47,25 (SD = 13,94).

To continue the analysis, independent samples t-tests were used to compare the overall score and the score by dimension according to work areas. Workers in the production areas (PA) hold positions that are linked to production, i.e., positions that make intensive use of computing resources in services to other customers, for example, IT specialists, automation specialists, developers, network installers, etc., which is directly related to the company's mission.

On the other hand, in the regulation and control areas (ARC), they hold positions associated with the administrative part of the organization, responsible for controlling, organizing, and supervising these production processes, such as financiers, secretaries, lawyers, administrators, etc.

The APs comprise 63 workers (64,9 %) and the ARC 34 (35,1 %). No statistically significant differences were found in the total scores by work area (U = 966, p = 0,427), where the average total score for AP was 46,60 (SD = 13,13) and for ARC was 48,56 (SD = 12,27).

In the Skepticism dimension, no statistically significant differences were found between work areas (U = 916, p = 0,220), where the average total score for PAs was 12,02 (SD = 2,57) and for ARCs was 11,68 (SD = 3,17).

Similarly, in the Fatigue dimension (U = 920, p = 0,252), where the average total score for PAs was 6,21 (SD = 4,49) and for ARCs was 7,82 (SD = 5,58); as well as in the Anxiety dimension (U = 944, p = 0,336), where the average total score for PAs was 4,87 (SD = 3,69) and for ARCs 5,94 (SD = 4,47). In these two dimensions, ARC workers had higher anxiety scores.

In the Ineffectiveness dimension, the average total score for PAs was 4,73 (SD = 3,91) and for ARCs 5,32 (SD = 4,58), also showing a higher score in ARCs. The Addiction dimension showed no significant differences by area (U = 1014, p = 0,669), where the average total score for PAs was 18,78 (SD = 6,92) and for ARCs 17,79 (SD = 6,61).

To continue the analysis, the relationship between years of experience and the total score on the scales was studied using Spearman's correlation coefficient. This correlation was weak and statistically significant in the Skepticism dimension (Rho = 0,243; p = 0,05).

A similar analysis was performed for years of experience, where a very low and statistically insignificant correlation was found in the Anxiety dimension (Rho = 0,090; p = 0,383). Something similar occurred with the Fatigue (Rho = 0,029; p = 0,774), Ineffectiveness (Rho = -0,038; p = 0,715), and Addiction (Rho = -0,020; p = 0,847) dimensions. Finally, the overall score showed a very low correlation with the variable years of experience (Rho = 0,095; p = 0,353).

Spearman's correlation coefficient was also calculated between age and the overall total score and by dimension. As a result, a weak correlation was reported for the Skepticism dimension (Rho = 0,111; p = 0,280), indicating that the age of the worker does not affect their indifference towards ICT. A weak correlation was found for the Fatigue dimension (Rho = 0,034; p = 0,740). The same occurred for the dimensions Anxiety (Rho = 0,185; p = 0,070), Ineffectiveness (Rho = 0,087; p = 0,396), and Addiction (Rho = -0,006; p = 0,956), where their correlations were low and not statistically significant. Finally, the comparison between the overall score and age showed a weak and non-significant correlation (Rho = 0,154; p = 0,131).

For the final result, the scale in Salanova *et al.* was applied at very low, low, medium-low, medium-high, high, and very high levels. Given that most of the workers in the sample belong to primary care settings where they constantly use ICT, for comparative reasons with respect to the original test, it was decided to use the scale for intensive ICT users from Salanova *et al.*[10] The scores for each scale were added together and divided by the total number of items in each dimension. Descriptive statistics for the nominal variable obtained using the scale were performed using frequency tables with *jamovi*.[21]

The results after applying the scale are described below. In the Skepticism dimension, 54,6 % (53) of participants had a high level, 36,1 % (35) had a medium-high level, and 9,3 % (9) had a very high level.

With regard to the Fatigue dimension, the results show that 20,6 % (20) of respondents have a medium-low level, 19,6 % (19) have very high levels, 12,4 % (12) had a high level, 11,3 % (11) had a low level, and finally, 10,3 % (10) had a very low level.

High levels predominated in the Anxiety dimension (38,0 %, 37 people), followed by 17,5 % (17) with medium-high levels, 14,4 % (14) with medium-low levels, 12,4 % (12) with very low levels, 9,3 % (9) with low levels, and 8,2 % (8) with very high levels of anxiety.

In the Ineffectiveness dimension, 28,9 % (28) reached a medium-high level, followed by 27,8 % (27) with a high level, 18,6 % (18) with a very low level, while 15,5 % (15) reported a medium-low level in this dimension. This may be due to the transition the company is undergoing in terms of digital transformation.

Finally, in the Addiction dimension, the high level predominates (34 %, 33 workers), followed by the medium-high level (28,9 %, 28 people), 20,6 % (20) at the medium-low level, 10,3 % (10) at the low level, and 6,2 % (6) at the very high level.

DISCUSSION

In view of these results, women expressed higher levels of anxiety, inefficiency, and skepticism in the use of ICT, although this difference was not statistically significant. It can therefore be argued that women are vulnerable to techno-anxiety, which may cause them to feel discomfort or have negative attitudes and feelings of low ability to use ICT.[22,23]

The results show that staff in both work styles may experience anxiety related to the use of ICT. Picón *et al.* argue that women reveal high levels of anxiety and fatigue due to the use of ICT,

coinciding with our research, showing negative qualities and feelings of insufficient ability to handle them.

As for men, they exhibit techno-addiction, as their highest scores were in the Addiction and Fatigue dimensions. This may be because men are more likely to interact with technologies, are more confident in using them, and spend their leisure time playing video games and searching for information of interest to them. The differences in total and dimension scores found in this sample may be due to the daily and frequent routine of ICT use.

It was found that TM may be experiencing techno-anxiety and techno-fatigue due to the daily dynamics of their tasks, and although Univ had higher scores in the Addiction dimension, the values for techno-anxiety and techno-fatigue were also similar to those of TM. This result may be due to the fact that university students perform more complex tasks and have a greater workload.

The high scores among TMs may be related to the fact that these workers in the company perform technical tasks and feel pressure to provide answers and solutions to the services they provide to customers.

The results suggest that people in TT tend to experience greater addiction, as they are more focused on the tasks to be delivered and responding to services urgently.

In summary, similar behavior is evident in the total scores for these two types of work, so it can be said that, for this sample, workers in either type of work may or may not experience technostress, although Fajardo's study suggested that, despite the facilities and comforts that teleworking offers staff, there were negative aspects, one of which was risk behaviors such as stress, mental strain, and physical discomfort. It also suggested that after experimenting with teleworking, people may determine that it is more convenient for their performance and health to work in person.

On the other hand, the results show that workers in productive areas have a high relationship with ICT, which is reflected in their high score in this dimension. The regulatory area showed a higher score because, despite performing tasks with documentation, they must also be constantly attentive to the sending of information via email and social networks, which leads to exhaustion. Given that the company is dedicated to technology, there are always new applications and programs to study and apply, which can be more difficult to assimilate for those who are not computer experts, generating doubts about their ability to handle ICT and causing anxiety.

The results show evidence that due to the ongoing digital transformation and the implementation of new programs, ARC workers may feel fear and have negative thoughts about their ability to use ICT. The AP scored higher on the Addiction dimension, which highlights the fact that these individuals work with ICT continuously and for long periods of time, as these tasks are part of their main duties within the company.

Overall, for people in AP, skepticism and addiction scored higher than ARC, which may develop into TS in the future. In ARC, there are some signs of TS, as these people are under pressure from the new changes that are constantly taking place in the company and society. This area also showed higher levels of techno-anxiety and techno-fatigue compared to APs. This data could be the result of the implementation of the digital transformation that is taking place in the entity, as more procedures and strategies are being generated where the use of ICT is greater. This would make work more complex for people with less knowledge in this area.

On the other hand, the correlation between years of experience and the total score for the Skepticism dimension was weak and statistically significant. This may be because most of the company's staff are involved with ICT and deal with it on a daily basis, so they are not necessarily indifferent to its use. It has been reported that regular use of technology tends to increase performance compared to those who use it more or less. This finding is consistent with this approach, as it shows that skepticism decreases with higher levels of education and that years of experience benefit stressful circumstances, which is consistent with the results found in our research.

A very low correlation was reported between the total score on the scales and years of experience, which indicates that years of experience do not necessarily influence whether or not a worker presents symptoms of technostress. Since the more ICTs are used, the more experience workers have in handling them, which reduces their levels of technoanxiety.[24,31]

It was also found that age is not related to high levels of technostress, coinciding with Salanova, who found no significant differences in the dimensions of technostress based on gender or age.[32] One study asserts that young people tend to use ICT constantly, as they are the ones who report being most frequent on social networks, sending chat messages, and playing video games.[25,33] Despite this, Khasawneh states that, because ICT is commonly and regularly used, there are no significant contradictions in terms of age and the degree of acceptance of ICT, coinciding with Salanova.[34]

With regard to the scale used, it should be noted that this scale was used only for the sake of completeness of comparison with the original test, given that this score is normative for the Spanish population, but not for the Cuban population. Furthermore, this scale was estimated prior to the COVID-19 pandemic, which accelerated the presence of ICT in all areas of work and daily life. On the other hand, we note that the determination of ST in individuals requires an analysis of other variables, as proposed by the Salanova *et al.*[10] model on resources, emotions, and work demands. Therefore, the adapted instrument is an important step towards the diagnosis of ST.

For this reason, and given that our sample was not representative, it is difficult to generalize and give a result on whether workers have ST. We can only refer to the total scores per dimension.

After applying the scale and performing the analysis, it was found that a predominance of high levels of skepticism may be due to the fact that most of the respondents are professionals with degrees in technology-related fields, which are intensively related to ICT and may be causing psychological and physical alterations in their work with these technologies. In the Fatigue dimension, most workers had high scores, which may mean that they may be experiencing symptoms of fatigue.

With regard to the Anxiety dimension, the highest score is high, as they may be experiencing anxiety generated by ICT.

In summary, the relevant differences between dimensions by scale are as follows:

1. Ineffectiveness: This dimension reflects feelings of lack of competence and ability to use information and communication technologies (ICT). No significant differences were found based on gender, although women had higher values than men. In terms of educational level, the highest values were found among mid-level

technicians. In terms of work modality, the highest values were found among those who work in person, as well as in the areas of regulation and control. In terms of years of experience and age, the values were low.

2. Skepticism: This dimension refers to attitudes of indifference, skeptical reactions, or doubts about the use of electronic tools and ICT. High values were found for men in terms of gender, university graduates in terms of educational level, workers in face-to-face work, and productive areas, and low values for years of experience and age. No significant differences were found between these variables. However, it is mentioned that the items related to these attitudes presented greater difficulty in measuring the construct.

3. Addiction: This dimension reflects the degree of dependence and addictive behavior toward ICT. Men had slightly higher values, as did university students, teleworkers, and those in productive areas. Values were low for age and years of experience. Again, there were no significant differences.

4. Anxiety: This dimension reflects levels of discomfort, negative attitudes, and feelings of low ability to use ICT. Women were found to have slightly higher values in this dimension, as did mid-level technicians and those in regulation and control areas. For the work modality, values remained equal for both on-site and teleworking, and for age and years of experience, values were low.

5. Fatigue: This dimension reflects mental and cognitive discomfort and exhaustion, feelings of tiredness due to the use of technologies, also integrating skeptical circumstances and beliefs of inefficiency with the use of ICT. Men, university students, those in the teleworking modality, and those in productive areas were found to have higher values, while those in the low values were those in terms of age and years of experience. Slightly higher values in this dimension were found among mid-level technicians and those in regulation and control areas. For the work modality, values remained equal for both on-site and teleworking, and for age and years of experience, values were low.

Analysis of the results concludes that some of the workers at Empresa Tecnomática are experiencing TS, while others are at risk of suffering from it. We must take these results into account in the future when taking action.

The results showed very high levels of fatigue, high skepticism, medium-high inefficiency, high anxiety, and addiction. Given this, it can be concluded that Tecnomática scored high on the indicators. This means that there is no serious situation of technostress, but there are signs that preventive measures should be taken to reduce or eliminate the causes shown and prevent their manifestation in the future.

The main limitations of this study were the lack of participation by institutions in the IT sector, which is why it is proposed to expand the sample in order to obtain results that have an impact on the content of the research.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTION

Conceptualization: Estela Edicta Diéguez Reyes, Damian Valdés Santiago.

Data curation: Estela Edicta Diéguez Reyes.

Formal analysis: Damian Valdés Santiago.

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