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Diagnosis of Technostress, its causes and repercussions in the teaching staff of the Instituto Tecnológico Superior de la Sierra Norte de Puebla

Diagnóstico de Tecnoestrés, sus causas y repercusiones en la planta docente del Instituto Tecnológico Superior de la Sierra Norte de Puebla

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Abstract

The objective of this study has been to diagnose the psychosocial damage of Technostress, caused by technodemands and technoresources; as well as the psychological, psychosomatic and physical repercussions on the teaching staff of the ITSSNP (Higher Technological Institute of the Sierra Norte de Puebla). In a sample of 80 teachers (men and women); Through a questionnaire, topics related to the types of Technostress, its dimensions, causes and physical effects have been explored. The methodological aspects used in this research are based on a qualitative and quantitative research approach. I approach a type of Case Study research, the Sequential Exploratory design (DESXPLOS) was applied. The type of research is non-experimental. The design is Transversal (transsectional). The objective or scope in this study is Explanatory - Correlational (Hernández et al, 2010). For the statistical analysis, variance (ANOVA) was applied. Statistically, the results show the existence of Technostress in ITSSNP teachers in 2019 and 2020, with an increase in the period of the COVID-19 pandemic. The predominant types of technostress in the pandemic are technofatigue and technoanxiety; The causes are work overload (techno-demands) and the state and availability of computer equipment and internet service (techno-resources). Women teachers presented higher levels of technostress in a pandemic due to work overload (technodemands) and by the state, as well as availability of computer equipment and internet service.

Technostress, Teachers, Physical effects

Resumen

El objetivo del presente estudio ha sido diagnosticar el daño psicosicial del Tecnoestrés, ocasionado por las tecnodemandas y tecnorecursos; así como las repercusiones psicológicas, psicosomáticas y físicas en la planta docente del ITSSNP (Instituto Tecnológico Superior de la Sierra Norte de Puebla). En una muestra de 80 docentes (hombres y mujeres); mediante un cuestionario se ha explorado temas relacionadas con los tipos de Tecnoestrés, sus dimensiones, las causas y efectos físicos. Los aspectos metodológicos empleados en esta investigación parten de un enfoque de investigación cualitativa y cuantitativa. Abordo un tipo de investigación de Estudio de Casos, se aplicó el diseño Exploratorio Secuencial (DESXPLOS). El tipo de investigación es no experimental. El diseño es Transversal (transeccional). El objetivo o alcance en este estudio es Explicativo - Correlacional (Hernández et al, 2010). Para el análisis estadístico se aplicó varianza (ANOVA). Estadísticamente los resultados muestran la existencia de Tecnoestrés en los docentes del ITSSNP en 2019 y 2020, con incremento en periodo de pandemia COVID-19. Los tipos de tecnoestrés predominantes en pandemia son la tecnofatiga y la tecnoansiedad; las causas son la sobrecarga de trabajo (tecnodemandas) y el estado, así como disponibilidad del equipo de cómputo y del servicio de internet (tecnorecursos). Las mujeres docentes presentaron mayores niveles de tecnoestrés en pandemia por sobrecarga de trabajo (tecnodemandas) y por el estado, así como disponibilidad del equipo de cómputo y del servicio de internet.

Tecnoestrés, Docentes, Efectos físicos

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Introduction

In the current context in organizations, it is increasingly common to find environments of maximum competitiveness in which work groups need to optimize their productivity to obtain maximum benefits and differentiate themselves from the competition, something that depends largely on the adaptability of their collaborators (Sanchez, 2021) and Information and Communication Technologies (ICT) play an important role in meeting the demands. The COVID-19 pandemic has affected human beings, directly disrupting lifestyles and quality of life. ICTs are an ally for the work environment or for situations such as the COVID-19 pandemic, but on the other hand, they can be triggers of tension and stress (Arredondo, 2022). Occupational technostress is a negative psychological state that is linked to the perception of a mismatch between the demands and resources related to the use of ICTs. It is intimately related to the repercussions that the disruptive implementation of ICT has originated; negatively transgressing the physical and mental well-being of people (Government of Spain, State Foundation for Occupational Risks, Foment del Treball Nacional, 2018).

In these times, Technostress punctuates the syndrome of receiving a large amount of information, which produces a cognitive overload due to excessive activation of neuronal connections and this produces a state of stress or alarm (Martin, 2020).

Technostress in the ITSSNP teaching staff is due to technological work demands (González, 2019); such as the generation of reports in different platforms, being integrated to several WhatsApp groups, the constant invitation to participate in various courses for the management of platforms and applications. As well as receiving information by mail and WhatsApp at all hours and on weekends. Another cause detected corresponds to the lack of internet service and having obsolete computer equipment. The lack of labor Technorecursos can generate alterations in stress levels that can even affect health (Ruiz, 2019). Teachers suffer a high level of stress in their work, and with the pandemic, the demands and excess of bureaucratic activities have increased (Robinet and Perez, 2020). Every teacher is susceptible to be affected positively or negatively in their emotional state by family, work or educational issues (Ossa et al, 2015).

Likewise, teachers have presented resistance to using new platforms. This resistance to change is understood as an observable behavior as a consequence of the displeasure or challenge experienced by teachers as a result of the introduction of new ideas, methods or devices, and which is also inevitable in educational organizations (Corica, 2020).

The repercussions are nervousness, anxiety, listlessness, lack of motivation and weariness; with effects on their academic (students and fellow teachers), family and social relationships. They have presented pathologies such as the following: Mild neurosis, several cases of peripheral neuritis, anguish, anxiety and stress.

The hypothesis put forward is that Technostress is a psychosocial damage caused by Technodemands, which involves the use of Technoresources and affects in different ways the health conditions of the teachers of the Tecnológico Nacional campus Zacatlán, presenting consequences such as mental fatigue, sleep disorders, stress, anxiety, psychosomatic and physical complaints.

This work is divided in the methodology chapter which specifies a qualitative and quantitative research approach. I approached a Case Study type of research, the Sequential Exploratory Design (DESXPLOS) was applied to the research. The type of research is non-experimental. The design is Transversal (cross-sectional). In the results chapter it is inferred that the predominant types of technostress in the ITSSNP teaching staff are Technofatigue and Technoanxiety and the causes are Technodemands and Technoresources. The physical effects range from

Methodology to be developed

Participants

A total of 86 ITSSNP teachers participated in the present study, of whom 31 were men (55.9%) and 26 were women (44.07%). The sample was divided into two groups; the first group was made up of male teachers and the second of female teachers.

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The careers in which the teachers collaborate (men and women) are: Division of Information Technologies and Systems, Department of Basic Sciences, Division of Economic Administrative Sciences, Division of Gastronomy, Division of Electromechanical Engineering, Division of Engineering in Food Industries, Division of Engineering in Innovation, Sustainable Agriculture, Division of Forestry Engineering, Division of Industrial Engineering, Department of Extracurricular Activities, Division of Industrial Engineering.

Instruments

To carry out this study, two instruments were used, which are described below:

A scale based indicators such as skepticism, fatigue, anxiety, inefficiency, work overload, digital resources and physical effects. It was structured with grade anchors from 0 to 6, with 0 being "Never or Not at all" and 6 being "Always or all month". This scale has 24 items.

To assess the types of technostress, 16 items from the RED-TIC questionnaire (Resources, Emotions/Experiences and Demands in ICT Users Questionnaire) were used (Llorens et al, 2011). Nine items were added to assess the causes of technoetrés such as technodemands, technoresources and the physical effects of bibliographic material: Foundation for the Prevention of Occupational Risks (2015). This instrument in total consists of 24 items that allows to evaluate in two different years before and during the pandemic (2019 and 2020), where the response scale is Likert type and goes from 0 to 6, being 0 "Never or Nothing" and 6 "Always or all month".

The RED-TIC Questionnaire of Technostress (Llorens et al, 2011) is grouped into 4 indicators: Fatigue, Anxiety, Skepticism and Inefficacy. The items and the likert scale were modified for better understanding. The items formulated from information from Fundación para la prevención de riesgos laborales (2015) are grouped into 3 indicators: Work overload, status and availability of computer resources and physical effects.

Procedure

To carry out this study, a protocol was developed in three blocks. In the first block, the objective of the research project was presented and the voluntary and confidential nature of the collaboration was clarified. The second block was divided into two parts; in the first part, sociodemographic data such as age, gender, and the division in which they work were asked; in the second part, the instructions and the scale were explained. In the third block, the Tecnoestrés questionnaire was presented with the respective adaptations to the RED-TIC questionnaire (Llorens et al, 2011) and information from the source Fundación para la prevención de riesgos laborales (2015).

This protocol was sent through the Microsoft® Teams Forms platform, for voluntary completion to a minimum total of 80 (according to the probabilistic sampling) ITSSNP teachers. The invitation guaranteed anonymous participation and a duration of 10 minutes.

Statistical analysis

Once the data from the volunteer teachers were collected in Excel, they were treated with an analysis of variance (ANOVA) with 95% reliability; for comparison of means in two different years before and during the pandemic (2019 and 2020). For comparison of means, the Tukey test statistic (α=0.05) was used.

The software used was Minitab® 19. Descriptive statistics were performed for the sociodemographic data, as well as for items 22, 23 and 24 related to the technoresources dimension. The scale of question 22 'I acquired new computer or cellular equipment during the pandemic' and question 23 'I have needed to contract internet service' were transformed; indicating as No the negative answer and indicating as YES the positive answer. Item 24 'Indicate which of the following symptoms you have experienced while working with ICT'S (cell phone, tablet, PC, internet, WhatsApp, e-mail, educational platforms), as well as the intensity' had to select a physical symptom from eleven options.

Cronbach's alpha was obtained for all the items of the instrument.

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Results

The internal consistency analysis of the instrument was carried out to find out if the reliability was good. It was found that within the Tecnoestres instrument, the internal consistency was α=0.952. Given these results, the internal consistency of the instrument is considered to be good.

ICT (Information and Communication Technologies) are work tools commonly used by teachers in any educational institution. According to the circumstances of the SARS pandemic COVID-19, the teachers resorted to educational platforms, acquisition of computer and cellular equipment, hiring of Internet service and unforeseen training in the use of these technologies; as a consequence, the work schedule and academic load increased, resulting in Technostress. The academic community of the Tecnológico Nacional de México, Zacatlán campus has a teaching staff of 106 members. The present investigation diagnoses cause, repercussions and the level of Technostress of the teachers of this house of studies.

The table (see Table 1) shows the results of the analysis of variance (ANOVA), comparing two different years; before the pandemic (2019) and during the pandemic (2020) in which it is observed that there is no significant statistical difference (=0.05). Dimension one (D1): attitudinal manifests as the type of technostress called Technoanxiety, and the indicator skepticism (indifference, denial) as well as dimension four (D4): cognitive which verifies the manifestation of Technoanxiety with the indicators Inefficiency (low capacity and low ability) in the management of ICT. The teachers (men and women) of the Tecnológico Nacional de México campus Zacatlán already presented Technoanxiety; this type of Techno-stress is originated by the skepticism provoked by the ideference and denial of the contribution of ICT at work (attitudinal dimension) and by the inefficiency generated by the low capacity and skill in the management of ICT (cognitive dimension). Therefore, it is inferred that the Covid-19 pandemic did not influence the type of Technostress called Technoanxiety, both cognitively and attitudinally; it could be said that levels of skepticism and beliefs of low capacity and skill in the management of ICTs were present in both periods (2019-2020), the Technoanxiety already existed.

In dimensions two (D2) and three (D3) corresponding to the type of technostress: Technofatigue and Technoanxiety; and in dimensions five (D5) and six (D6) concerning the causes of technostress: Technodemands and Technoresources; as well as dimension seven (D7) referring to psychological, psychosomatic and physical consequences, there was a significant statistical difference. Dimension two (D2): affective, corresponding to the manifestation of Technofatigue and the fatigue indicator that is measured by stress and tiredness, did increase during the pandemic period, that is, the teachers (men and women) of the Tecnológico Nacional de México campus Zacatlán, the longer the work time using ICT, the greater the affective fatigue (Cardenas et al, 2020). Dimension three (D3): affective, which is manifested with Technoanxiety and the anxiety indicator that is evaluated through restlessness and insecurity, increased during the pandemic period in male and female teachers of the Tecnológico Nacional de México campus Zacatlán; it can be inferred that they felt tense, anxious and uncomfortable when working with ICT and nervous and insecure because they thought they could destroy the information or make mistakes in the handling of ICT (Arredondo, 2022).

In dimension five (D5): Cognitive, which corresponds to the manifestation Tecnoansiedad por tecnodemandas, it is measured through indicators such as work overload and the large amount of data to process through ICT; the impact was significant due to COVID19 since teachers (men and women) of the Tecnológico Nacional de México campus Zacatlán manage the accounts in educational platforms and whatsapp groups of school-age children; it is inferred that technology led them to do more work than they can handle, to change work habits to adapt to new technologies and to train in an unplanned way to manage ICT (Capanegra et al, 2016). Dimension six (D6): Cognitive concerning the manifestation Technoanxiety due to lack of Technoresources (state of computing resources and the availability of internet service), was evaluated by means of the indicators anxiety (restlessness, insecurity); evidencing an increase in this type of Techno-stress.

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Male and female teachers of the Tecnológico Nacional de México campus Zacatlán required to perform maintenance and updates of hardware and software to their computer equipment, acquired new computer equipment, cell phones and / or hire internet service; all these factors lead to greater Technansieda and a predisposition to physical symptoms (Ruiz et al; 2019). In dimension seven (D7): Physical (psychological, psychosomatic and physical symptoms), it is manifested through the types of Techno-stress: Techno-fatigue and Techno-anxiety and is estimated through indicators of physical effects such as pain, constipation, nausea, respiratory diseases, vertigo and facial paralysis to mention a few. Therefore, according to this research, male and female teachers of the Tecnológico Nacional de México campus Zacatlán did present greater psychological, psychosomatic and physical symptoms during the pandemic (Coppari et al; 2017), such as headaches, sleep disorders, diarrhea, constipation, respiratory diseases, numbness of the face, limbs, facial paralysis, vertigo, increased consumption of coffee, alcoholic beverages and tobacco, among the most common.

Demonstration	2019	2020
D1	1.330 ^{A}	1.593^{A}
D2	1.650^{B}	2.651^{A}
D3	1.147 ^{B}	1.647^{A}
D4	1.051^{A}	1.049 ^{A}
D5	2.163 ^{B}	3.285 ^{A}
D6	2.538 ^{B}	3.538 ^{A}
D7	0.878 ^{B}	1.487 ^{A}
D1 = Technoanxiety/attitudinal/skepticism. D2 = Technofatigue/affective/fatigue. D3 = Technoanxiety/affective/anxiety. D4 = Technoanxiety/Cognitive/inefficacy. D5 = Technodemands/cognitive/work overload (TICS). D6 = Techno-resources/cognitive/Resource availability (computer equipment). D7 = Technofatigue/physical/physical effects. A,B Means with the same letters in rows are statistically equal (α 0.05).		

Table 1 Evaluation of the causes, levels and repercussions of Technostress in teachers (women and men) of the Tecnológico Nacional de México campus Zacatlán
Source: Own elaboration with data obtained from the adapted Tecnoestrés questionnaire (Llorens et al, 2011) (Fundación para la prevención de los riesgos laborales, 2015)

Table 2 shows the results of the analysis of variance (ANOVA), the causes, levels and repercussions of Technostress in teachers (women) of the Tecnológico Nacional de México campus Zacatlán, compared in two different years, before the pandemic (2019) and during the pandemic (2020). It is observed that there is no significant statistical difference (=0. 05) in dimension one (D1): corresponding to the attitudinal dimension that manifests itself as Technoanxiety, and the identifier is skepticism (indifference, denial) as well as dimension four (D4): The cognitive dimension also assesses the manifestation of Technoanxiety with the indicators Inefficiency (low capacity and low ability in the handling of ICT), that is, the academic women of the Tecnológico Nacional de México campus Zacatlán already presented Technoanxiety; this type of Technostress is originated by skepticism caused by the ideference and denial of the contribution of ICTs at work (attitudinal dimension) and by the inefficiency generated by the low capacity and skill in the management of ICTs (cognitive dimension). Therefore, it is inferred that the COVID-19 pandemic did not influence the type of technostress called Technoanxiety, both cognitively and attitudinally; it could be said that there are levels of skepticism and low capacity and skill in the management of ICT in both periods (2019-2020), the technoanxiety already existed.

In dimensions two (D2), three (D3), five (D5), six (D6) and seven (D7), there was a significant statistical difference in the pandemic period (2020). Dimension two (D2): affective, corresponding to the manifestation of Technofatigue and the fatigue indicator that is measured by stress and tiredness, did increase in the pandemic period, that is, the teachers (women) of the Tecnológico Nacional de México campus Zacatlán, the longer they work using ICT. Women are more prone to suffer affective fatigue; it is due to the burden of social responsibility, linked to their status as mothers and wives (Gaytán et al, 2019).

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Dimension three (D3): referring to the affective dimension, through the manifestation Technoanxiety and the anxiety indicator that is evaluated through restlessness and insecurity, was manifested with greater impact in 2020 in the teachers (women) of the Tecnológico Nacional de México campus Zacatlán; it can be inferred that they felt tense, anxious and uncomfortable when working with ICT and nervous and insecure for thinking that they could destroy the information or make mistakes in the handling of the same (López, 2021). In dimension five (D5): which is Cognitive and corresponds to the manifestation Technoanxiety caused by technodemands, which is measured through indicators such as work overload and the large amount of data to process through ICT; the impact was significant due to SARS VOC 2 since the teachers of the Tecnológico Nacional de México campus Zacatlán manage the accounts in educational platforms and whatsapp groups of school-age children. It is inferred that technology led them to do more work than they can handle, to change work habits to adapt to new technologies and to train in an unplanned way to manage ICT (Domínguez et al, 2021).

Dimension six (D6): Cognitive concerning the manifestation of Technoanxiety caused by lack of Technoresources (state of computer resources and availability of internet service) and was evaluated by means of the anxiety indicators (restlessness, insecurity); showing an increase in this type of Techno-stress. The teachers (women) of the Tecnológico Nacional de México campus Zacatlán required to perform maintenance and updates of hardware and software to their computer equipment, acquired new computer equipment, cell phones and/or contracted internet service; all these factors lead to greater Technansieda and a predisposition to physical symptoms (Ruiz et al; 2019). In dimension seven (D7): Physical (physical symptoms), it is manifested through the types of Techno-stress: Techno-fatigue and Techno-anxiety and is estimated through indicators of physical effects such as pain, constipation, nausea, respiratory diseases, vertigo and facial paralysis to mention a few.

Therefore, according to this research, the teachers (women) of the Tecnológico Nacional de México campus Zacatlán did present greater physical symptoms during the pandemic (Montes de Oca et al; 2021), such as headaches, sleep disorders, diarrhea, constipation, respiratory diseases, numbness of the face and extremities, facial paralysis, vertigo, increased consumption of coffee, alcoholic beverages and cigarettes, among the most common.

Manifestación	2019	2020
D1	1.578 ^{A}	1.767^{A}
D2	1.974^{B}	3.259^{A}
D3	1.414 ^{B}	2.147^{A}
D4	1.207^{A}	1.155 ^{A}
D5	2.250 ^{B}	3.655 ^{A}
D6	2.655 ^{B}	4.172 ^{A}
D7	0.958 ^{B}	1.890 ^{A}
D1 = Technoanxiety/attitudinal/skepticism. D2 = Technofatigue/affective/fatigue. D3 = Technoanxiety/affective/anxiety. D4 = Technoanxiety/Cognitive/inefficacy. D5 = Technodemands/cognitive/work overload (TICS). D6 = Techno-resources/cognitive/Resource availability (computer equipment). D7 = Technofatigue/physical/physical effects. A, B Means with the same letters in rows are statistically equal (Tukey=0.05).		

Table 2 Evaluation of the causes, levels and repercussions of Technostress in female teachers at the Tecnológico Nacional de México Zacatlán campus
Source: Own elaboration with data obtained from the adapted Tecnoestrés questionnaire (Llorens et al, 2011) (Fundación para la prevención de riesgos laborales, 2015)

Table 3 shows the results of the analysis of variance (ANOVA), the causes, levels and repercussions of Technostress in teachers (men) of the Tecnológico Nacional de México campus Zacatlán, compared in two different years, before the pandemic (2019) and during the pandemic (2020). And it is observed that there is no significant statistical difference (=0. 05) in dimension one (D1): Attitudinal corresponding to the manifestation of Technoanxiety through the indicators skepticism (indifference, denial), dimension four (D4): Cognitive related to the manifestation of Technoanxiety and indicators ineffectiveness (low capacity and ability) and dimension (D6): Cognitive referring to the manifestation Technoanxiety due to lack of Tecnorecursos (state of computer resources and availability of internet service) which is measured by indicators such as anxiety (restlessness, insecurity).

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The teachers of the Tecnológico Nacional de México campus Zacatlán already presented Technoanxiety due to distrust and thoughts of ignorance in the use of ICT; that is, due to skepticism caused by ideference and denial of the contribution of ICT at work (D1) (Sanchez et al., 2021), inefficiency due to low capacity and ability in the use of ICT at work (D4) and anxiety due to lack of resources such as computer or cellular equipment and internet service to cope with work activities (D6) (Ruiz et al., 2019).

In dimension two (D2) and three (D3) corresponding to the variables types of techno-stress techno-fatigue and techno-anxiety respectively, dimension five (D5) evaluates the rate of techno-stress due to technodemands and dimension seven (D7) referring to physical or psychosomatic affectations; it was evidenced that there was a significant statistical difference in the levels of techno-stress in teachers (men) of the ITSSNP in time of pandemic (2020).

Dimension two (D2): affective, referring to the manifestation of technostress (type of technostress) and the fatigue indicator that is measured by stress and tiredness, did increase during the pandemic period; it could be said that the teachers (men) of the Tecnológico Nacional de México campus Zacatlán, when increasing the work time using ICT, manifested greater fatigue (Rodríguez et al; 2021). In dimension three (D3): affective, through the manifestation Tecnoansiedad and the anxiety indicator that is evaluated through restlessness and insecurity, was externalized with greater intensity during the pandemic period and the teachers (men) of the Tecnológico Nacional de México campus Zacatlán; it can be glimpsed that they felt tense, anxious and uncomfortable when working with ICT and nervous and insecure for thinking that they can destroy the information or make mistakes (Aragüez, 2017). Dimension five (D5): cognitive and corresponds to techno-stress caused by the cause called technodemand; it is manifested by techno-anxiety; it is measured by work overload or the amount of data to work; the impact was significant due to the pandemic in teachers of the Tecnológico Nacional de México campus Zacatlán; it is inferred that technology led them to do more work than they can handle, to change work habits to adapt to new technologies and to train in an unexpected way to handle ICT (Government of Spain. Ministry of Labor, Migration and Social Security, 2018).

In dimension seven (D7): Physical (psychosomatic and physical symptoms), it is manifested through the types of Techno-stress: Techno-fatigue and Techno-anxiety and is estimated through indicators of psychosomatic and physical effects such as pain, constipation, nausea, respiratory diseases, vertigo and facial paralysis among others. Therefore, according to this research, the teachers of the Tecnológico Nacional de México campus Zacatlán did present greater physical and psychosomatic symptoms during the pandemic, such as headaches, sleep disorders, diarrhea, constipation, respiratory diseases, numbness of the face and extremities, facial paralysis, vertigo, increased consumption of coffee, alcoholic beverages and cigarettes (Ávila, 2020).

Demonstration	2019	2020
D1	1.184 ^{A}	1.490^{A}
D2	1.459^{B}	2.291^{A}
D3	0.990 ^{B}	1.352^{A}
D4	0.959^{A}	0.980 ^{A}
D5	2.112 ^{B}	3.066 ^{A}
D6	2.469 ^{A}	3.163 ^{A}
D7	0.830 ^{B}	1.249 ^{A}
D1 = Technoanxiety/attitudinal/skepticism. D2 = Technofatigue/affective/fatigue. D3 = Technoanxiety/affective/anxiety. D4 = Technoanxiety/Cognitive/inefficacy. D5 = Technodemands/cognitive/work overload (TICS). D6 = Techno-resources/cognitive/Resource availability (computer equipment). D7 = Technofatigue/physical/physical effects. A,B Means with the same letters in rows are statistically equal (α 0.05).		

Table 3 Evaluation of the causes, levels and repercussions of Technostress in teachers (men) of the Tecnológico Nacional de México campus Zacatlán
Source: Own elaboration with data obtained from the adapted Tecnoestrés questionnaire (Llorens et al., 2011) (Fundación para la prevención de riesgos laborales, 2015)

Graphic 1 shows that 95% of ITSSNP female teachers acquired computer equipment in 2020.

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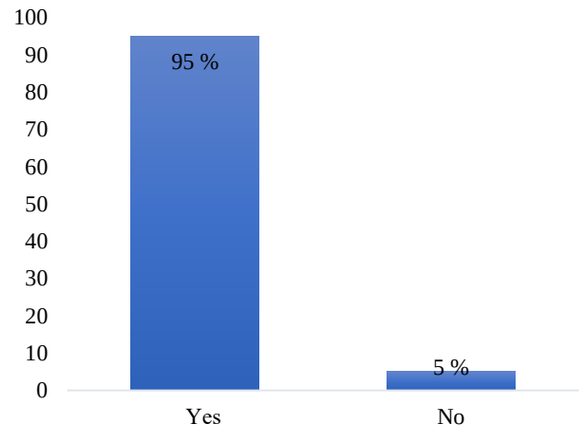
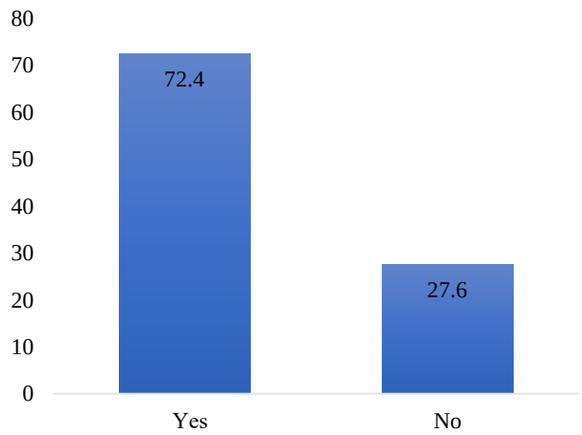


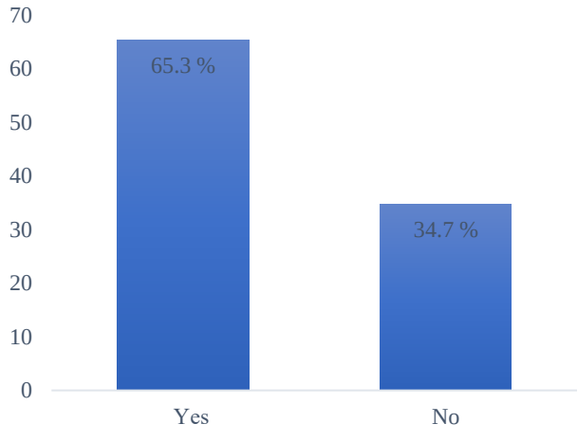
Graphic 1 Women teachers of the Tecnológico Nacional de México campus Zacatlan who acquired new computer equipment in pandemic (2020)
Source: Own elaboration with data obtained from the adapted Tecnoestrés questionnaire (Llorens et al., 2011) (Fundación para prevención de riesgos laborales, 2015)

In Graphic 2 (See Graphic 2) it is evident that 72. 4 % of ITSSNP female teachers contract internet service in 2020.



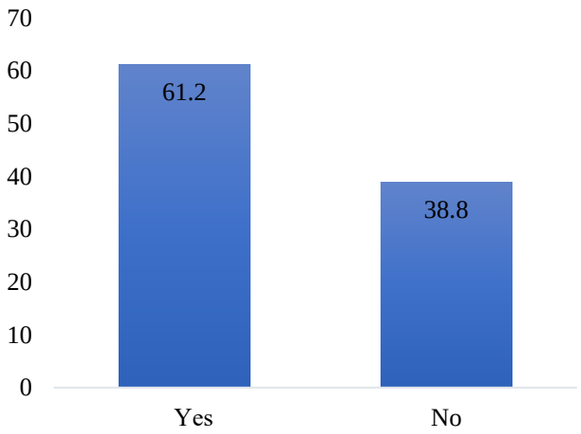
Graphic 2 Women teachers of the Tecnológico Nacional de México campus Zacatlán who contracted internet service in pandemic (2020)
Source: Own elaboration with data obtained from the adapted Tecnoestrés questionnaire (Llorens et al., 2011) (Fundación para prevención de riesgos laborales, 2015)

Graphic 3 shows that 65.3% of male ITSSNP teachers acquired new computer equipment in 2020.



Graphic 3 Male teachers at the Tecnológico Nacional de México campus Zacatlán who contracted Internet service in pandemic (2020)
Source: Own elaboration with data obtained from the adapted Tecnoestrés questionnaire (Llorens et al., 2011) (Fundación para la prevención de riesgos laborales, 2015)

Graphic 4 shows that 65.3% of male ITSSNP teachers contracted internet service in 2020.



Graphic 4 Male teachers of the Tecnológico Nacional de México campus Zacatlán who contracted internet service in pandemic (2020)
Source: Own elaboration with data obtained from the adapted Tecnoestrés questionnaire (Llorens et al., 2011) (Fundación para la prevención de riesgos de riesgos de riesgos laborales, 2015)

The psychological, psychosomatic and physical effects of technostress on male and female teachers increased during the pandemic period.

Table 4 shows psychological, psychosomatic and physical effects experienced by female ITSSNP teachers.

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Number	Female teachers 2019	2020	Physical Symptom
1	87. 2 %	93.1 %	Headache.
2	62 %	82.7 %	Sleep disturbances.
3	31 %	58.6 %	Diarrhea and constipation.
4	24.1 %	44.8 %	Nausea and dizziness.
5	13.7 %	37.9 %	Chest pains.
6	44.8 %	51.7%	Respiratory diseases.
7	24.1 %	51.1%	Numbness of face and extremities.
8	27.5 %	27.5 %	Smoking.
9	79.3%	89.6 %	Coffee.
10	27.5 %	31 %	Alcohol.

Table 4 Psychosomatic symptoms experienced by female teachers (female) in 2019 and 2020.
Source: Own elaboration with data from the Technostress questionnaire

Table 5 shows psychological, psychosomatic and physical effects experienced by male ITSSNP teachers.

Number	Male teachers 2019	2020	Physical Symptom
1	41%	46%	Headache.
2	32%	42.8%	Sleep disturbances.
3	30.6%	49.8%	Diarrhea and constipation.
4	28.5%	38.7%	Nausea and dizziness.
5	24.4%	28.5%	Chest pains.
6	30.6%	32.6%	Respiratory diseases.
7	22.4%	38.7%	Numbness of face and extremities.
8	22.49%	20.4%	Smoking.
9	85.7%	85.7%	Coffee.
10	48.9%	44.8%	Alcohol.

Table 5 Psychosomatic symptoms experienced by female teachers (men) in 2019 and 2020
Source: Own elaboration with data obtained from the adapted Tecnoestrés questionnaire (Llorens et al., 2011) (Fundación para la prevención de riesgos de riesgos de riesgos laborales, 2015)

Conclusions

The results of the present study suggest that Technostress in the ITSSNP teaching staff is caused by Technodemands and by the lack of Technoresources. The physical repercussions that are manifesting themselves in ITSSNP teachers were identified: mental fatigue, sleep disorders, stress, anxiety and psychosomatic complaints. The analyses reveal that the physical repercussions were present in both men and women; but with greater intensity in the COVID-19 pandemic in women teachers. And they range from fatigue or mental tiredness, stress to psychosomatic manifestations such as headache, sleep disorders, diarrhea and constipation, nausea and dizziness, chest pains, respiratory diseases, numbness of the face and extremities, consumption of coffee, alcohol, cigarettes, facial paralysis and vertigo. These findings, despite the need for further research, highlight the need to design and implement actions in favor of male teachers and especially female teachers of the ITSSNP.

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