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MOBILE APPLICATION FOR STRESS MANAGEMENT IN BASIC EDUCATION TEACHERS: PSYCHOSOCIAL RISKS THAT CAUSE IT

APLICACIÓN MÓVIL PARA MANEJO DE ESTRÉS EN DOCENTES DE EDUCACIÓN BÁSICA: RIESGOS PSICOSOCIALES QUE LO ORIGINAN

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ABSTRACT

The COVID-19 pandemic strongly impacted basic education teachers, who did not have the necessary technological skills, exacerbating stress and other psychosocial risks. This study seeks to create a prototype of a mobile application for stress management in teachers, using teachers from Quevedo, Ecuador as a test. Previous diagnoses were carried out that identified the correlation between psychosocial risks and work stress. The methodological approach is quantitative, non-experimental and explanatory, measuring psychosocial risks and proposing the application as a prevention tool. The conclusions highlight the need for immediate intervention in the teaching environment, and although there are technological and economic limitations, the prototype shows potential to reduce stress and improve psychological health and teaching productivity.

Keywords:

Teaching stress, mobile application, psychosocial risks, COVID-19 pandemic, basic education.

RESUMEN

La pandemia del COVID-19 impactó fuertemente a los docentes de educación básica, quienes no contaban con las competencias tecnológicas necesarias, exacerbando el estrés y otros riesgos psicosociales. Este estudio busca crear un prototipo de aplicación móvil para el manejo del estrés en docentes, utilizando como prueba a docentes de Quevedo, Ecuador. Se realizaron diagnósticos previos que identificaron la correlación entre riesgos psicosociales y estrés laboral. El enfoque metodológico es cuantitativo, no experimental y explicativo, midiendo los riesgos psicosociales y proponiendo la aplicación como herramienta de prevención. Las conclusiones destacan la necesidad de intervención inmediata en el entorno docente, y aunque existen limitaciones tecnológicas y económicas, el prototipo muestra potencial para reducir el estrés y mejorar la salud psicológica y la productividad docente.

Palabras clave:

Estrés docente, aplicación móvil, riesgos psicosociales, pandemia COVID-19, educación básica.

INTRODUCTION

The changes brought about by the COVID-19 pandemic, starting in 2020, significantly impacted basic education teachers who lacked the necessary skills to properly manage stress. This became evident with the challenge of using technology, for which not all felt adequately prepared, combined with health-related pressures and the adoption of new methodologies (Aguilar Pinto, 2018; Alvarado-Dotë et al., 2020).

Therefore, this research aims to address this problem by creating a «Prototype of a mobile application for stress management in basic education teachers. Foundation of the psychosocial risks that cause it.» The research uses teachers in the city of Quevedo, in the Province of Los Ríos - Ecuador, as a testing ground to try out the mobile application device that allows teachers to take real-time actions to immediately reduce the stress caused by various psychosocial risks in their teaching activity (Bandura, 1977, 1986; Ballard y Bates, 2008).

However, such a device can be used in other work environments worldwide where immediate action against stress is required. Bobadilla & Coral (2021), diagnosed the extent to which psychosocial risks can affect teachers in schools and universities during the COVID-19 pandemic, such as stress, burnout syndrome, physical factors, workload, anxiety, uncertainty, emotional exhaustion, dissatisfaction, depression, trauma exposure, distress, and double presence (virtual and in-person).

They identified the need to analyze both intra-work and extra-work factors (Bailey, 2000), noting that various organizational aspects have weakened methods of coping and adapting to new technologies among teachers, limiting their work competence and leading to poorer psychological health (Ballet et al., 2006).

Additionally, other studies like that of Vásquez (2021), show the relationship between psychosocial risk factors and work stress in teachers at an educational center in the city of Cusco who were dedicated to virtual education (Beehr et al., 1976; Bergman et al., 1977; Borg, 1990; Boyle et al., 1995; Benmansour, 1998; Brosschot et al., 1998; Bowers, 2004; Bauer et al., 2007).

The results determined, with a sample of 86 teachers, a positive correlation between the presence of psychosocial risk factors (classified into organizational factors and work factors) and work stress scores. On one hand, there was a 0.855 correlation between the dimension of workplace conditions and work stress. On the other hand, workload and work stress showed a 0.798 correlation, while the correlation between demands and work stress was 0.815.

These investigations establish the importance of having a treatment like the one this research provides, allowing immediate intervention in the teacher's and individual's environment. The study has some limitations, including technological ones.

This is because the current study creates a mobile application prototype; however, the creation of the application is not feasible because it requires more specialized studies and specific competencies not covered by the current doctorate, such as mobile application programming and graphic design. On the other hand, it has economic limitations because the financial resources needed to complete a study that allows validating and introducing an application to the market are very high. Therefore, the research result focuses on the design and application to test the usefulness of the mobile application prototype.

The depth of this study is broad because it aims to measure the psychosocial risks of the sample and create a prototype application that reduces the prevalence of these factors. The depth of this study will allow new research into the implementation of an application that will help reduce stress in basic education teachers, being a pioneering study within the Ecuadorian context in which this study takes place.

MATERIALS AND METHODS

The type of study is quantitative, non-experimental, and explanatory, as it seeks to identify the factors associated with psychosocial risks and work stress in basic education teachers, as well as identify protective factors through a mobile application prototype for their prevention.

The study will be descriptive, aiming to identify and describe the dimensions of psychosocial risks among basic education teachers. The data collection methods used in this study are based on the Risk Assessment Method Questionnaire from the Ministry of Labor of Ecuador (MTD), adapted and transferred to a digital format using a Google Forms questionnaire. This strategy was implemented to expand the reach and accessibility of the survey, leveraging the advantages of digital technology for efficient data collection.

The selected tool for data collection in this study is the Psychosocial Risk Assessment Method, developed by the Ministry of Labor of Ecuador. This method is meticulously designed to assess and analyze various dimensions that encompass psychosocial risks present in the work environment.

This instrument is based on a multidimensional approach, addressing critical aspects such as workload, task control, social support, role clarity, workplace violence, and other factors relevant to workers' psychosocial health. Through a careful selection of items and measurement

scales, the Psychosocial Risk Assessment Method provides a comprehensive and detailed view of the risks present in the workplace context.

The implementation of this method involves a structured and systematic process, beginning with identifying the dimensions to be assessed and adapting the items to the specific characteristics of the workgroup under study. Subsequently, the instrument is administered through questionnaires or interviews, depending on the nature and needs of the study.

Once the data is collected, a thorough analysis is conducted using specialized statistical techniques and software tools. This analysis helps identify significant patterns, trends, and relationships between the evaluated variables, thus providing a solid basis for decision-making and implementing interventions aimed at mitigating psychosocial risks and promoting a healthy and productive work environment.

RESULTS AND DISCUSSION

The Psychosocial Risk Assessment Method of Ecuador was applied to a representative sample of elementary education teachers to obtain a statistical analysis of the most prevalent dimensions of psychosocial risks in this group (Table 1).

Table 1. Result by dimension of the psychosocial risk evaluation.

DIMENSIONS OF THE QUESTIONNAIRE	LOW RISK	MEDIUM RISK	HIGH RISK
Dimension 1. Load and work rate	15%	60%	26%
Dimension 2. Skills development	17%	58%	25%
Dimension 3. Leadership	29%	44%	27%
Dimension 4. Margin of action and control	16%	59%	25%
Dimension 5. Work organization	30%	45%	24%
Dimension 6. Recovery	17%	60%	23%
Dimension 7. Support and support	14%	63%	23%
Dimension 8. Other important points	18%	45%	38%
Dimension 8.1. Other important points: discriminatory harassment	17%	60%	23%
Dimension 8.2. Other important points: workplace harassment	15%	34%	51%
Dimension 8.3. Other important points: sexual harassment	18%	29%	53%
Dimension 8.4. Other important points: work addiction	16%	58%	26%
Dimension 8.5. Other important points: work conditions	15%	37%	48%
Dimension 8.6. Other important points: dual presence (work – family)	14%	34%	53%
Dimension 8.7. Other important points: work and emotional stability	18%	60%	22%
Dimension 8.8. Other important points: self-perceived health	16%	32%	52%

Source: Preparation of authors

These results reveal the perception of elementary education teachers regarding the various dimensions of psychosocial risks present in their work environment. The percentages indicate the prevalence level of each dimension within the studied sample. This data provides valuable information to understand the areas of highest risk and to focus efforts on preventing and mitigating psychosocial risks related to stress in teachers.

It is important to highlight that these results are preliminary and require more detailed analysis. However, they provide an initial insight into the situation and will help guide future actions and strategies to promote a healthier work environment and reduce psychosocial risks among elementary education teachers.

Below are the results obtained from the study on psychosocial risks in the work environment of elementary education teachers. These results reflect the teachers' perceptions of different dimensions that influence their well-being and stress levels at work.

In the dimension of workload and work pace, it was observed that 60% of teachers perceive a moderate workload, while 26% report a high workload. This indicates that a significant proportion of teachers face an intense workload, which can generate stress and affect their emotional balance and overall health.

Regarding competency development, 58% of teachers consider their level of development to be moderate, suggesting the need to implement training and continuous education programs to strengthen teachers' skills and knowledge. This will contribute to improving their professional performance and potentially reduce the psychosocial risks associated with feelings of inadequacy or lack of competencies.

The dimension of leadership was also relevant, with 27% of teachers perceiving a high level of leadership in their work environment. This aspect can be a determining factor for motivation and job satisfaction, as well as for the effective management of psychosocial risks. Conversely, 29% consider leadership to be low, indicating the need to improve leadership skills and promote a more participatory and collaborative work environment.

In terms of action and control margin, 59% of teachers report a moderate level of autonomy and control over their work. However, 16% report a low perception in this aspect. This underscores the importance of promoting active participation of teachers in decision-making and providing them with greater autonomy, which can help reduce stress levels and improve their work well-being.

Work organization is another dimension that impacts teachers' well-being. 45% of participants consider the organization of work to be moderate, while 30% perceive it as low. This suggests the need to implement strategies and practices for time and workload management to improve efficiency and reduce stress levels at work.

The recovery dimension also reveals relevant information, with 60% of teachers considering their level of recovery to be moderate. This indicates room for improvement in teachers' ability to adequately recover from work stress, which can have a direct impact on their physical and emotional well-being.

The availability of support and assistance in the work environment is fundamental to the health and well-being of teachers. In this regard, 63% of participants perceive a moderate level of support and assistance in their work environment. However, it is important to pay attention to the quality and effectiveness of these resources, as 14% consider support and assistance to be low. This highlights the need to strengthen communication channels, promote collaboration among team members, and provide adequate resources for the emotional and professional support of teachers.

In addition to these dimensions, other important factors affecting teachers' well-being were identified. These include discriminatory, workplace, and sexual harassment, work addiction, working conditions, dual work-family presence, job and emotional stability, and self-perceived health. These aspects must be addressed comprehensively, implementing specific policies and actions to prevent and manage these psychosocial risks.

The questionnaire structure has been carefully designed, considering the most relevant dimensions related to psychosocial risks in the workplace. These dimensions are closely linked to the preventive actions to be carried out through the mobile application, aiming to provide elementary education teachers with an effective tool to mitigate and prevent stress-related risks.

The questionnaire consists of specific questions related to each dimension, which will allow for a more precise understanding of the teachers' situation concerning psychosocial factors that may affect their well-being and occupational health. Based on the responses obtained, areas of greatest concern can be identified, and efforts can be focused on implementing appropriate preventive actions.

The mobile application, based on the questionnaire results, will offer personalized resources and tools for each teacher, providing them with practical recommendations and suggestions to address the identified psychosocial risks. This will include stress management strategies, self-care techniques, guidelines for good work organization, and support and professional guidance resources.

In summary, the new structure of the proposed questionnaire for the mobile application has been carefully designed, considering the relevant dimensions related to psychosocial risks in the work environment of elementary education teachers. Through the responses obtained, specific and personalized preventive actions can be implemented, providing teachers with a practical and effective tool for stress management and promoting a healthy work environment.

To demonstrate the prevalent psychosocial risks, a descriptive analysis of the instrument is carried out based on the expected theoretical dimensions, generating the following scores (Table 2).

Table 2. Descriptive Analysis of the instrument.

	TF1	TF2	TF3	TF5	TF6	TF7	TF8_A	TF8_B	TF8_C	TF8_D	TF8_E	TF8_F	TF8_G	TF8_H
Half	2,2960	2,3290	2,3398	2,3456	2,3853	2,3732	2,3858	2,3528	2,3539	2,3498	2,3918	2,3203	2,3970	2,3571
N	462	462	462	462	462	462	462	462	462	462	462	462	462	462
Standard deviation	,74768	,81787	,84818	,84491	,79824	,76935	,82634	,87629	,95266	,78693	,85257	,85827	,84478	,88684

Source: Preparation of authors

Subsequently, the Friedman Test is applied to discern if there is any dominant factor in the instrument. The result reveals a significance value of $p < 0.001$, suggesting significant differences among the different factors. However, through the Wilcoxon Test, it is verified that such difference is not universal across all factors, nor is there one factor that predominates over the others. Factor 1 is primarily distinguished from the rest, but only in pairs TF6 - TF1, TF8_A - TF1, and TF8_G - TF1. Therefore, these findings underscore the need to consider all factors as relevant dimensions in the design of the mobile application prototype.

The questionnaire reveals high scores of psychosocial risk in all theoretical dimensions proposed by the Ministry of Labor, without necessarily having one dimension that is statistically significant compared to the others. For this reason, it is decided to incorporate all theoretically expected dimensions in the final version of the Psychosocial Risks Questionnaire for Teachers, which must be integrated into the mobile application prototype. The selection and inclusion of items are based on those showing a higher factorial load in relation to each theoretically defined dimension. Therefore, the two items with the highest factorial scores are chosen.

CONCLUSIONS

There is a clear need to implement specific measures to address these risk areas, ranging from training and continuous education programs to strategies for strengthening leadership, promoting participation and autonomy at work, improving work organization, and ensuring effective support and assistance.

Additionally, it is important to highlight those other significant aspects such as discriminatory and workplace harassment, work addiction, working conditions, work-family double presence, emotional stability, and perceived health also require comprehensive attention and specific measures for prevention and management.

The design of the STRESS CONTROL mobile application begins with generating a new React Native project using the npx utility, enabling efficient project creation from various command-line environments. Once the project is initiated, Metro Bundler is run in a separate terminal to manage project dependencies and resources.

During the initial project setup, specific adjustments are made for the Android platform, including navigation library configurations. For React Native 0.60 or higher, automatic linking can simplify some installation steps, though certain libraries like react-native-navigation may require manual changes to native files. The project structure is organized following a file type-based approach, grouping each file type into folders based on its function. This enhances project navigation and management, promoting modularity and code reusability.

The libraries required for the project are essential for its functionality, providing necessary features for the application. It is crucial to ensure these libraries are correctly installed and updated to avoid development obstacles. Navigation screens, located in the root/screens directory, constitute the core of user interaction with the application. Grouping these screens into a specific directory facilitates their management and maintenance, promoting project scalability.

Configuring navigation routes in the App.tsx file defines the application flow and how it responds to user actions. This ensures consistent and smooth navigation throughout the interface, adapting to project requirements. Survey screens are essential components facilitating interaction between the operator and the system. By integrating functional logic and design, these screens present surveys clearly and accessibly, ensuring a seamless user experience.

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