Tesla Revista Científica, ISSN: 2796-9320
Vol. 4 Núm. 2 (2024) e424
https://doi.org/10.55204/trc.v4i2.e424

Área: Ingenieria
Articulo de investigación Orignal

Mental load in University Teachers: Case study

Carga mental en docentes universitarios: Estudio de caso

[1] Edmundo Cabezas-Heredia [0000-0001-5708-0054], [2] Luis Cabezas-Chávez [0009-0001-3040-2946], [3]Melanie Cabezas-Chávez [0009-0007-4408- 5682], [4] Ana Paula Molina-Recalde [0009-0002-5199-8512], [5] Diana Vallejo-Tixi [0009-0005-9818-1122] , [6] Juan Carlos Santillán-Lima [0000-0001-5812-7766]

[1]Universidad Nacional de Chimborazo. Facultad de Ingeniería, Carrera de Ingeniería Industrial. Ecuador
[2]Universidad Nacional de Chimborazo. Facultad de Ingeniería, Carrera de Ingeniería Industrial. Ecuador
[3]Escuela Superior Politécnica del Chimborazo. Facultad de Recursos Naturales, Carrera Forestal. Ecuador
[4]Investigadora Independiente, Ecuador
[5]Universidad Tecnológica Indoamérica. Carrera de Arquitectura. Ecuador
[6]Escuela Superior Politécnica del Chimborazo. Facultad Informática y Electrónica. Ecuador

[1]ecabezas@unach.edu.ec, [2] felipe.cabezas@unach.edu.ec, [3] cabezas.melani2@espoch.edu.ec, [4]apmolina091015@gmail.com
[5] gabdy87@hotmail.com, [6]carlos.santillan01@espoch.edu.ec

CITA EN APA:
Cabezas-Heredia, E., Cabezas-Chávez, L., Cabezas-Chávez, M., Molina-Recalde, A. P., Vallejo-Tixi, D., & Santillán Lima, J. C. (2024). Carga mental en docentes universitarios: Estudio de caso. *Tesla Revista Científica*, *4*(2), e424. https://doi.org/10.55204/trc.v4i2.e424

Recibido: 2024-07-20
Revisado: 2024-08-02 al 2023-08-21
Corregido: 2024-09-15
Aceptado: 2024-10-07
Publicado: 2024-10-11

TESLA
Revista Científica
ISSN: 2796-9320

Abstract:
Mental load among university teachers has gained importance in recent decades due to its impact on workers' health and well-being. This study focuses on the mental load of teachers from the Faculty of Engineering at the National University of Chimborazo, analyzing factors like the cognitive and emotional demands they face in their daily work. The aim is to determine mental load levels and their relationship with sociodemographic variables, identifying the need for preventive interventions. The Subjective Workload Assessment Technique (SWAT) was applied to a sample of 97 teachers who voluntarily completed the survey. Results showed that 80.4% of teachers exhibit medium mental load levels, while 18.6% report high levels. Significant correlations were identified between mental load and variables like age and gender. Stress and mental effort dimensions were particularly high, indicating a potential risk to teachers' health. It is concluded that implementing preventive measures and intervention programs is necessary to improve working conditions and teacher self-efficacy.

Keywords: Mental Load, Teachers, Preventive Measures

Resumen: La carga mental entre los docentes universitarios ha ganado relevancia en las últimas décadas debido a su impacto en la salud y el bienestar de los trabajadores. Este estudio se centra en la carga mental de los docentes de la Facultad de Ingeniería de la Universidad Nacional de Chimborazo, analizando factores como las demandas cognitivas y emocionales que enfrentan en su trabajo diario. El objetivo es determinar los niveles de carga mental y su relación con variables sociodemográficas, identificando la necesidad de intervenciones preventivas. Se aplicó la Técnica de Evaluación Subjetiva de la Carga de Trabajo (SWAT) a una muestra de 97 docentes, quienes completaron la encuesta de forma voluntaria. Los resultados revelaron que el 80.4% de los docentes presentan niveles medios de carga mental, mientras que el 18.6% reportan niveles altos. Se identificaron correlaciones significativas entre la carga mental y variables como la edad y el género. Las dimensiones de estrés y esfuerzo mental fueron particularmente elevadas, sugiriendo un riesgo potencial para la salud de los docentes. Se concluye que es necesario implementar medidas preventivas y programas de intervención para mejorar las condiciones laborales y la autoeficacia docente.

Palabras clave: Carga Mental, Docentes, Medidas Preventivas.

1. Introduction

In recent decades, there has been an increased interest in research on mental load and psychosocial risk factors associated with work, due to the impact they can have on workers' health, the expressions "work organization" and "organizational factors" are often used as synonyms for "psychosocial factors" to describe working conditions that can cause stress. mental load, anxiety, depression, etc. These psychosocial risk factors affect the work activity, quality of life, health and well-being of workers. In addition, productive restructuring,

labor flexibility, and new forms of work organization have influenced labor relations.

The mental workload is a concept that has become increasingly important in recent decades, especially in the work environment of university teachers. The mental load in university teachers is a topic of growing interest in educational and psychological research due to its impact on the quality of teaching and the well-being of teachers and students. As physical tasks have become less demanding, the mental load has increased considerably, becoming one of the most important psychosocial risk factors associated with the characteristics of the task (Ormaza-Murillo, et.al., 2019).

In the case of teachers, the mental load can be affected by various factors such as the cognitive demands of teaching, the management of the teaching-learning process, research, and teamwork (Vega et.al., 2023). Mental load can be defined as the level of cognitive effort required to perform a specific task within a particular context (Cain, 2021).

In the field of university education, the mental load includes aspects such as class preparation, exam correction, research, and administrative management (González-Gancedo et al., 2020). This concept is crucial because a high mental load can lead to burnout, stress, and a decrease in teacher effectiveness (Wang et al., 2019).

The mental workload is defined as the set of cognitive demands that an individual faces in the performance of a task (Acosta, 2023). These demands can include the amount of information that needs to be processed, the complexity of the task, the time available to perform it, and the associated psychological pressure. When cognitive demands exceed the individual's capabilities, mental overload occurs that can have negative consequences on the worker's performance and well-being (Ormaza-Murillo, et.al., 2019).

The results of the latest National Survey of Working Conditions in Spain support the statement that the organizational work environment, that is to say, the conditions in which work is carried out, is very common and has a major responsibility for numerous health problems. In NTP 534, the mental workload is addressed, describing it as the set of tensions caused by the demands of mental work, which include information processing, recall, reasoning, and finding solutions. The factors that influence this mental load are also mentioned. (Arquer, 1999).

Recent studies indicate the need to improve physical and mental health due to high rates of obesity, blood pressure problems, depression, and vascular disease. These problems affect quality of life, social development, and productivity, requiring government policies. (WHO, 2018; Mujica España and Escobar, 2018; Vicente et al., 2016)

To assess the mental load of university teachers, various instruments have been used, including the Subjective Workload Assessment Technique (SWAT) (Ormaza-Murillo, et.al., 2019). This test allows us to measure mental load through three dimensions: time, mental effort, and psychological stress (Ormaza-Murillo, et.al., 2019). In addition, SWAT has been validated in different contexts and has proven to be a reliable and

valid tool for assessing mental load in various tasks (Ormaza-Murillo, et.al., 2019).

The Mental Load in University Professors who face a complex and varied workload that can result in a significant mental load. According to recent studies, factors contributing to this burden include pressure to publish research, teaching large groups of students, and administrative responsibilities (Karimi et al., 2021). In addition, the COVID-19 pandemic has exacerbated these factors due to the rapid transition to online teaching, increasing the mental load due to technological adaptation and stress management (Bao, 2020), where teleworking, lack of ergonomic furniture, excessive hours in front of a computer have caused problems such as technostress, visual fatigue, physical and mental discomfort in teachers that require intervention.

In the case of university teachers, the mental load can be affected by various factors such as the preparation of classes, the correction of assignments and exams, attention to students, participation in meetings and commissions, and the performance of research and extension activities (Morina & Herruzo, 2019) and other dysergonomics aspects of work. In addition, changes in teaching methodologies and scenarios, as a result of epidemiological situations such as the COVID-19 pandemic, have generated new cognitive demands for teachers (Vega et.al., 2023)

Teacher self-efficacy refers to teachers' beliefs about their ability to effectively play their role in the teaching-learning process (Sernaqué, 2023). These beliefs may vary depending on the different dimensions of the teaching practice, such as the management of the teaching-learning process, student assessment, research management, and teamwork (Sanchez, et.al., 2024)

Teacher self-efficacy is an important construct because it influences the way teachers deal with challenges and obstacles in their professional practice. Teachers with high levels of self-efficacy tend to be more persistent, use more effective teaching strategies, and have a greater commitment to their work. Conversely, teachers with low levels of self-efficacy may experience higher levels of stress and burnout, as well as other psychosocial risk factors (Santiago, 2023).

Stress and burnout are increasingly frequent problems among university teachers. Stress is defined as a physiological and psychological response to external or internal demands that exceed the individual's resources (Santiago, 2023). Burnout, on the other hand, is a syndrome characterized by emotional exhaustion, depersonalization and low personal fulfillment at work, all this is due to various factors that contribute to the appearance of the problem and one of them is the high mental load (Morina & Herruzo, 2019).

Various factors can contribute to stress and burnout in teachers, such as work overload, lack of social support, role ambiguity, interpersonal conflicts, and educational policies. In addition, personality characteristics can also influence the vulnerability of teachers to stress and burnout, for this reason the present study aims to determine the levels of mental load in teachers (Cuevas, 2024). In order to prevent and address stress and burnout in teachers, as well as the mental load on teachers, various strategies have been proposed, such as the implementation of intervention programs, the improvement of working conditions, the promotion

of teamwork and social support. In addition, early detection of initial states of stress and burnout can help reduce absenteeism and psychiatric sick leave (Morina & Herruzo, 2019;Paredes,2024).

Assessment of mental load is essential to identify stress levels and support needs among teachers. Various methodologies have been developed for this purpose, including subjective questionnaires, physiological measurements, and observational techniques (Hart and Staveland, 1988). The SWAT test stands out among these methods because of its focus on the subjective perception of mental load.

The SWAT test, developed by Reid and Nygren in 1988, is a subjective assessment technique that measures mental load in three dimensions: time, effort, and stress. This tool has been validated and widely used in different work contexts, including educational settings (Reid & Nygren, 1988). The test consists of a series of paired comparisons in which subjects evaluate the combination of these three factors in relation to their workload.

Recent literature has used the SWAT test to assess mental load in university teachers, highlighting its applicability and effectiveness. For example, a study by Martínez et al. (2022) used the SWAT test to measure the mental load in teachers during the transition to face-to-face to online teaching, finding that the increase in effort and stress was significant during this period. Another study by Johnson and Smith (2021) applied SWAT in a hybrid teaching context, concluding that the burden of time and effort were critical factors that negatively affected the perception of the teaching work.

The research has identified several factors that influence the mental load of university teachers, as detailed below:

Administrative Burden: Administrative responsibilities, such as managing student records and participating in committees, can significantly increase the mental load (González-Gancedo et al., 2020).

Innovation and Technology: The need to keep up with new technologies and teaching methodologies also contributes to the mental load. The COVID-19 pandemic and the need for rapid adaptation to online teaching platforms are clear examples of this (Bao, 2020).

Research Expectations: The pressure to publish and obtain research funding adds another layer of stress and mental burden for university professors (Karimi et al., 2021).

Work-Life Balance: Balancing work demands and personal life is a constant challenge, and the inability to manage this balance can lead to an increase in mental load (Wang et al., 2019). Given the complexity of the mental load on university teachers, several strategies have been proposed to mitigate its negative effects:

Training and Professional Development: Providing ongoing training and support in the use of new technologies can reduce the mental load associated with online teaching (Johnson & Smith, 2021).

Psychological and Social Support: Fostering a culture of social support and access to mental health services can help teachers better manage stress and mental load (Karimi et al., 2021).

Institutional Policy Review: Educational institutions can review and modify policies to reduce the administrative burden and publication pressure, allowing teachers to focus more on teaching and learning (González-Gancedo et al., 2020).

This research is the product of a project entitled: "Creation of a web and mobile application to determine psychosocial risk factors in university teachers" and one of the aspects analyzed is the Mental Load, so the following research problem is posed to be solved: To determine the levels of mental load of the teachers of the National University of Chimborazo as a psychosocial factor?, to later in a second phase develop the web and mobile application that allows a quick evaluation of the investigated topic and inform about the possible preventive measures to be implemented to the surveyed teachers and university students in general.

2. Method

Design and Type of Research

The research was non-experimental, there is no manipulation of the variables, due to the cross-sectional time, the test was analyzed and applied in a single instant, descriptive since it allowed to inquire about the mental load of the teachers of the National University of Chimborazo, correlational since the relationship between the sociodemographic variables and the Mental Load test was determined by means of Cramer's V, field since it used observation in surveyed teachers.

Sample and Study Population

The study population was the professors of the National University of Chimborazo of the Faculty of Engineering, in total 97 professors randomly surveyed with non-probabilistic sampling by snowball, the same who freely and voluntarily filled out the survey through the link of the institutional platform SICOA or disseminated by mobile WhatsApp. so, the entire population was used and no sampling was carried out.

Methodology and/or instruments used

The methodology used was through the elaboration of the Mental Load survey in the google forms, the link was attached to the corresponding official letter for the authorization of the Vice-Rectorate for Research and Graduate Studies so that it can be published on the institutional platform SICOA and the teachers can answer it.

The applied survey is downloaded its data from the google drive in an electronic Excel sheet, for the respective programming and exported to the SPSS V26 program to be programmed again, then the corresponding results of the levels of Teacher Mental Load are obtained.

To assess the mental load of university teachers, the Mental Workload (SWAT) test will be used (Ormaza-Murillo, et.al., 2019). This test consists of three dimensions: time, mental effort and psychological stress (Ormaza-Murillo, et.al., 2019). Each dimension is evaluated on a scale of 1 to 7, with 1 representing a low mental load and 7 a high mental load (Ormaza-Murillo, et.al., 2019).

Table No. 1. SWAT Mental Load Test Dimensions

Dimensions	Test questions
Time	P1, P2, P3
Mental Effort	P4, P5, P6
Stress	P7, P8, P9

Source: SWAT Test (Ormaza-Murillo, et.al., 2019).

To assess the Mental Load, this research proposes the following evaluation table:

Table No. 2. SWAT Mental Load Test Assessment

SWAT Mental Load Test	Assessment
Low	Of 0 to 15 points
Half	Of 16 to 30 points
High	Of 31 to 45 points

The reliability of the SWAT Mental Load test is determined in the following table by means of Cronbach's alpha.

Table No. 3. Reliability through Cronbach's alpha

Cronbach's alpha	Internal Consistency
$\alpha \geq 0,9$	Excellent
$0,8 \leq \alpha < 0,9$	Well
$0,7 \leq \alpha < 0,8$	Acceptable
$0,6 \leq \alpha < 0,7$	Questionable
$0,5 \leq \alpha < 0,6$	Poor
$\alpha < 0,5$	Unacceptable

Source: Virla, M. Q. (2010)

The reliability of the SWAT Mental Load test is determined in the following table by means of the KMO.

Table No. 4 Reliability through KMO

KMO Values	Value Quality
1.00 ≥ KMO > 0.90	Excellent
0.90 ≥ KMO > 0.80	Good
0.80 ≥ KMO > 0.70	Acceptable
0.70 ≥ KMO > 0.60	Regular
0.60 ≥ KMO > 0.50	Bad
KMO < 0.50	Unacceptable

Source:Virla, M. Q. (2010)

To determine the correlation of the sociodemographic variables and the dimensions of the SWAT Mental Load test, it is determined in the following table by means of Cramer's V.

Table No. 5 Correlation of sociodemographic variables and dimensions of the Mental Load test

Cramer's Phi V	Interpretation
> 0.25	Very Strong
from 0.25 - 0.15	Strong
from 0.10 to 0.15	Moderate

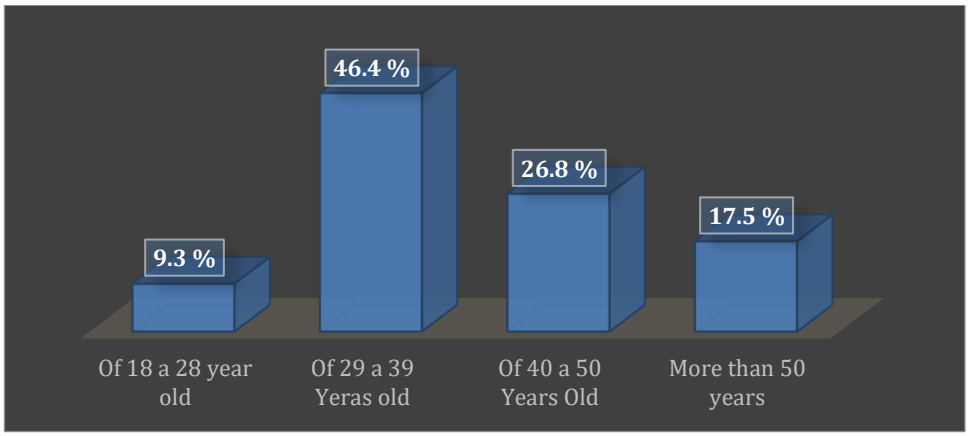
from 0.05 to 0.10	Low
from 0 to 0.05	There is no relationship / Very Low

Source: Virla, M. Q. (2010)

3. Results and discussion

In the present research, it is expected to find moderate to high levels of mental load in university teachers, especially in the SWAT test dimensions. (Ormaza-Murillo, et.al., 2019). It is also expected to find differences between the sociodemographic variables and mental load by crossed tables, depending on variables such as: gender, age, educational level, etc., The present research begins with the study of the sociodemographic variables of the teachers of the Faculty of Engineering of the National University of Chimborazo.

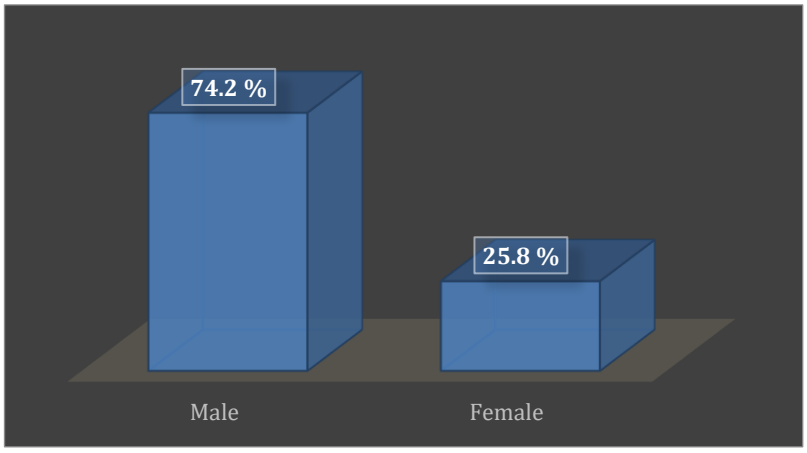
Figure No. 1. Age of the teachers surveyed



Regarding the age of the teachers surveyed, we have: 9.3% from 18 to 28 years old, 46.4% from 29 to 39 years old, 26.8% from 40 to 50 years old and 17.5% over 50 years old, it can be concluded that there is youth and experience in university teachers, according to (Rodríguez et al, 2022), states in their research that the data show that the highest percentage of age in the respondents corresponds to the age between 45 and 54 years, almost similar to the present research.

The gender of the teachers analyzed is presented below:

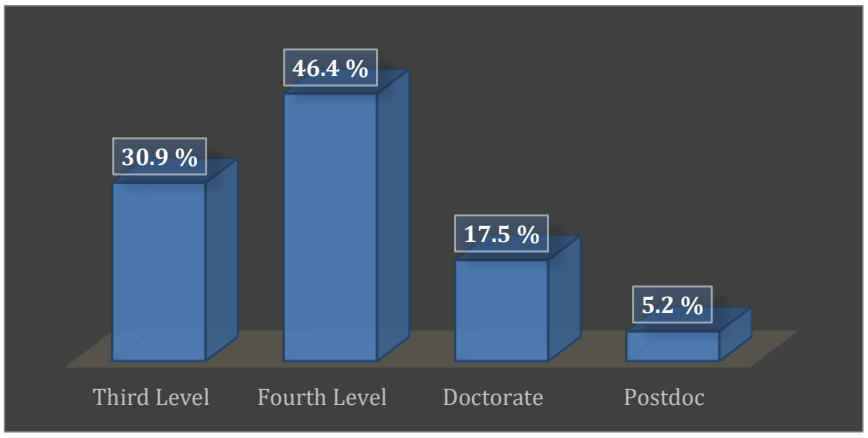
Figure No. 2. Gender of the surveyed professors of the Faculty of Engineering



Regarding the gender of the teachers surveyed, we have: 74.2% are men and 25.8% women, it can be concluded that there is no gender equity in the staff, according to (Rodríguez et al, 2022), states in their research that the data show that the highest percentage of respondents are men, similar to this research, the national regulations establish in its pertinent part to comply with the Right to Work and Gender Equity.

Regarding the Educational Level of the teachers, we have the following:

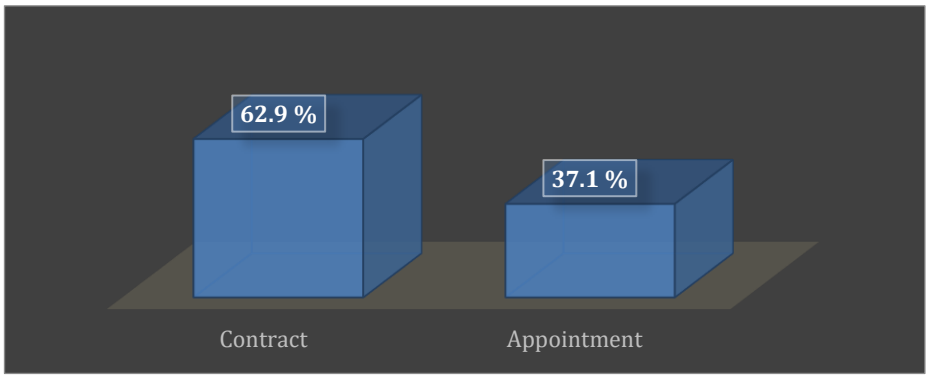
Figure No. 3. Educational level of the teachers surveyed



Regarding the educational level of the teachers surveyed, we have: 30.9% are third level, 46.4% fourth level, 17.5% doctorate and 5.2% post doctorate, it can be concluded that there are specialized personnel in the teaching of the subjects that work at the University.

The type of personnel action of the professors of the Faculty of Engineering, we have the following:

Figure No. 4. Staff Action of the Teachers Surveyed



Regarding the personnel action of the surveyed teachers, we have: 62.9% are contract and 37.1% are appointment, it can be concluded that the majority of the surveyed personnel were contracted.

Regarding the reliability and reliability of the SWAT test performed by means of Cronbach's Alpha and KO, it is presented below:

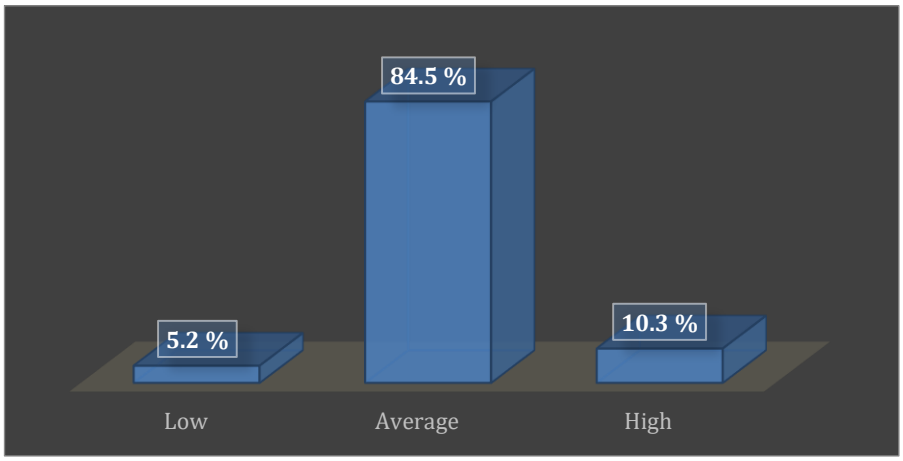
Table No. 6 Reliability and Reliability found in the SWAT test

Denomination	**p value**
Cronbach's alpha	0.735
KMO	0.710

Regarding the analysis of reliability and reliability of the SWAT test, the values found statistically are acceptable, these results can be improved in the case of Cronbach's alpha, with the elimination of questions that reflect a new construct and regarding reliability increase the sample to be surveyed, however, it is concluded that the test and reliability are reliable for this work environment.

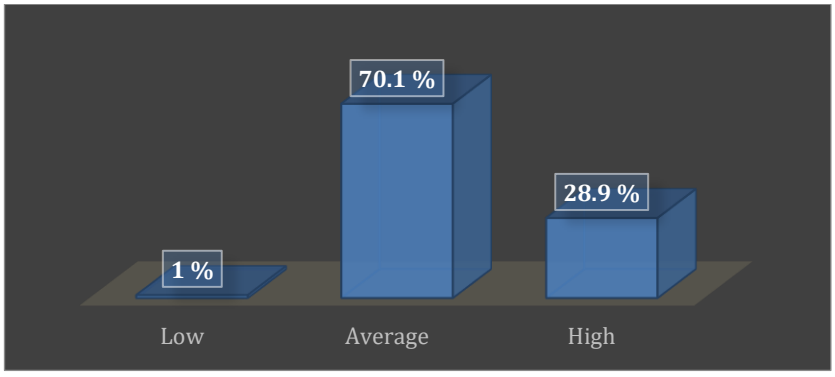
The SWAT test has 3 dimensions that have been analyzed in this research:

Figure No. 5. SWAT Test Time Dimension of the Surveyed Teachers



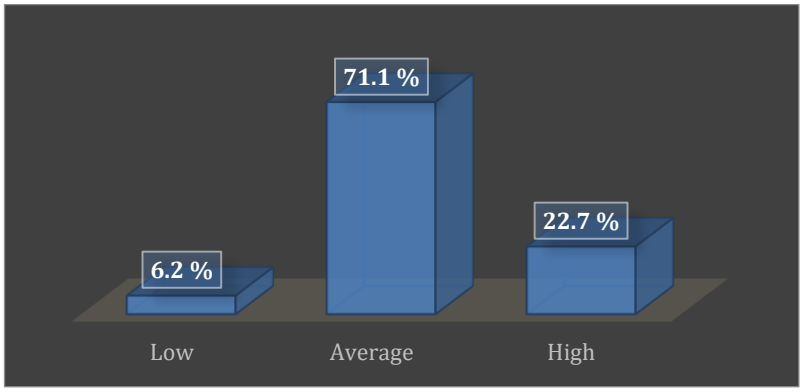
Regarding the time dimension of the teachers surveyed, we have: 5.2% time is low, 84.5% medium and 10.3% high, it is concluded that the aspect of this dimension is medium high, according to (Valdehita, 2007), states in his research that the time in a job gives us indications of the extent to which more training should be provided in the performance of a task in isolation or if the objective of the training should be Producing an increase in the time-sharing efficiency of several simultaneous tasks, the increase in the time to perform a task or multitasking increases the mental load, so it is necessary to plan and execute it.

Figure No. 6. Mental Effort Dimension of the SWAT Test of the Teachers Surveyed



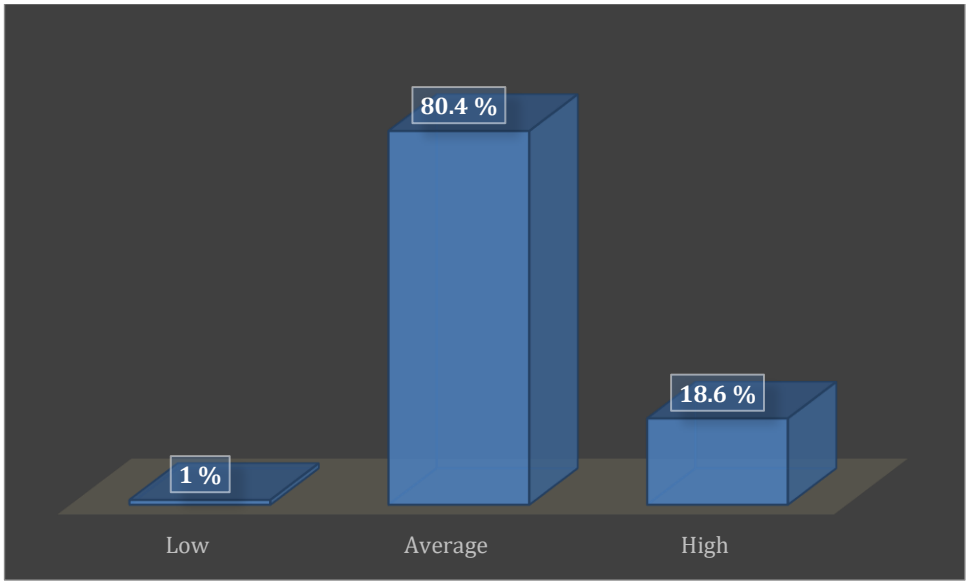
Regarding the mental effort dimension of the teachers surveyed, we have: 1% low mental effort, 70.1% medium and 28.9% high, it is concluded that the aspect of this dimension is medium high, according to (Cruz & Osorio, 2020), it states that the mental demand of occupational groups increases due to the demands required by the tasks affecting different parts of the human locomotor system and these depend a lot on how the organization is conceived in its structure.

Figure No. 7. Stress dimension of the SWAT test of the surveyed teachers



Regarding the stress dimension of the teachers surveyed, we have: 6.2 % with low stress, 71.1 % medium and 22.7 % high, it is concluded that the stress is medium high; according to (Martínez et al, 2020), states that stress at its high levels is a consequence of the level of mental load they have at work due to the dysergonomic conditions of the environment, presenting situations such as exhaustion, insomnia, low ability to understand and muscle pain and headaches, which affect teachers physically and mentally in this case.

Figure No. 8. SWAT test mental load of the surveyed teachers



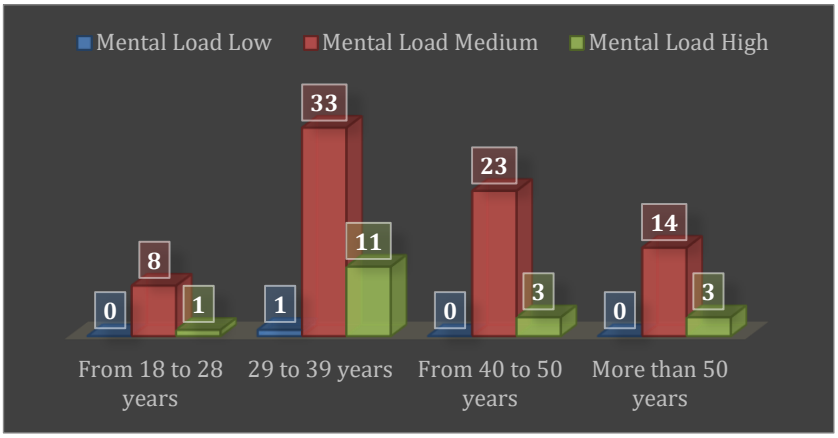
Regarding the Mental Load of the teachers surveyed we have: 1 % with low mental load, 80.4 % medium and 18.67 % high, it is concluded that the Mental Load is medium high; according to (Pons & Puig, 2004), states that the activity that people carry out in their work situation constitutes a unitary, dialectical and recursive phenomenon that brings together in the same process needs, motives, thinking and behavior that affect the worker and need to be improved.

The results of this study could have practical implications for the management of human resources in universities, such as the implementation of strategies to reduce the mental load of teachers and promote their self-efficacy (Ormaza-Murillo, et.al., 2019) and (Scielo, 2023), through postural hygiene manuals to improve

dysergonomic conditions, active breaks to generate rest of the body system, Positive psychology: coaching, neurolinguistics, teamwork, leadership and other conditions that generate a safe and healthy environment for teachers in this case.

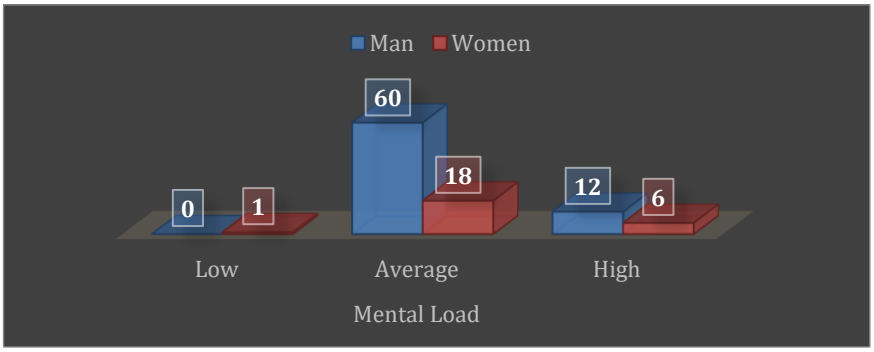
In the research, it is proposed to correlate the sociodemographic variables of teachers with the Mental Load analyzed by means of the SWAT test, which is as follows:

Figure No. 9. Correlation between age and mental load of the teachers surveyed



Regarding the correlation between age and Mental Load of the Faculty of Engineering surveyed, there is a p value through Cramer's V is 0135, this means that it is moderate, there are other factors that influence the presence of Mental Load, in the graph it can be observed that, from the age of 29 onwards, there are cases with a greater frequency of medium and high load.

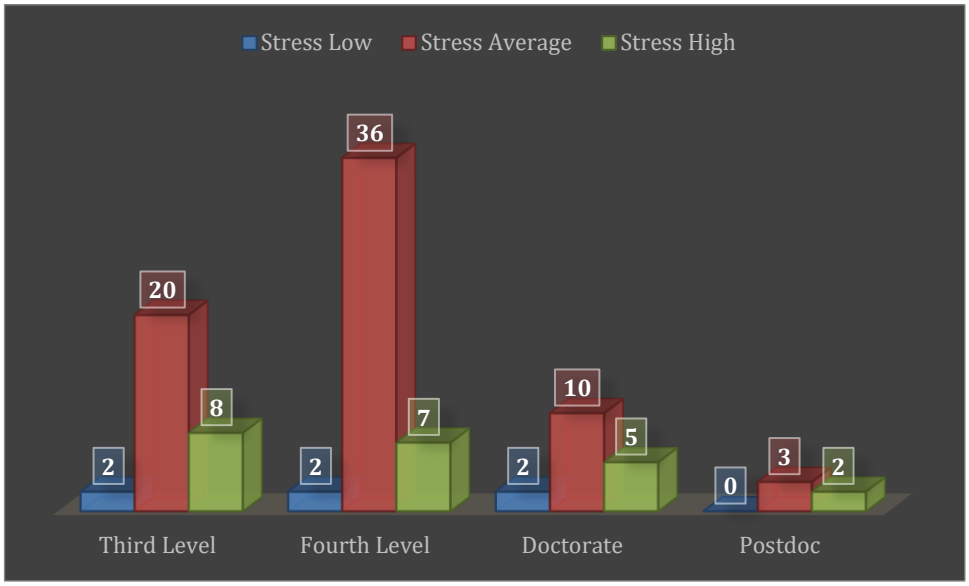
Figure No. 10. Correlation between Gender and Mental Load of the surveyed teachers



Regarding the correlation between Gender and Mental Load of the Faculty of Engineering teachers surveyed, there is a p value through Cramer's V is 0.196, this means that it is strong, that is, if it affects the presence of Mental Load, in the graph it can be seen that there are a greater number of cases in men than in women with medium and high mental load.

Regarding the correlation between Educational Level and Mental Load of the Faculty of Engineering teachers surveyed, there is a p value through Cramer's V is 0.221, this means that it is strong, that is, if it affects the presence of the Mental Load, in the graph it can be seen that there are a greater number of cases in all educational levels of medium and high mental load.

Figure No. 11. Correlation between Educational Level and Mental Load of the surveyed teachers



In addition, the findings found could contribute to the development of intervention programs to prevent and address stress, burnout and other psychosocial factors in university teachers (Morina & Herruzo, 2019), which are necessary for occupational health issues, these results on the mental load in university teachers have important practical implications for higher education institutions.

To mitigate the mental load experienced by teachers, universities could implement several intervention programs and specific policies:

Mental Health Support Programs: Establishing dedicated mental health resources, such as counseling services and stress management workshops, can provide teachers with the tools needed to cope with high levels of mental load. Regular mental health check-ups and support groups can foster a sense of community and shared experience among teachers.

Workload Management Policies: Colleges and universities should review and adjust workload expectations to ensure they are reasonable and manageable. This could involve limiting the number of courses taught per semester, reducing administrative responsibilities, and providing adequate time for research and professional development.

Professional Development Training: Offering training sessions focused on time management, effective teaching strategies, and the use of educational technology can help teachers feel more competent and confident in their roles. This can reduce the cognitive demands associated with adapting to new teaching methods.

Flexible Work Arrangements: Implementing flexible scheduling options and hybrid work models can help teachers more effectively balance their professional and personal lives. Allowing teachers to choose when and where they work can alleviate some of the pressures associated with traditional teaching environments.

Peer Support Networks: Encouraging the formation of peer support groups can help teachers share experiences, strategies, and resources. These networks can provide emotional support and practical advice, helping to reduce feelings of isolation and overwhelm.

Reduction of Forced Postures due to the excessive use of a computer: it is proposed to improve ergonomic furniture based on anthropometric measurements and implement the following strategies that are detailed below:

By adopting these strategies, universities can create a more supportive environment that addresses the mental burden of their educators, ultimately improving their well-being and the quality of education provided to students.

Figure No. 12. Strategies to Reduce Computer Overuse for Teachers Surveyed

Figure No. 13. Strategies to Reduce Computer Overuse for Teachers Surveyed

4. Conclusions

Mental load in university teachers is a complex and multifaceted problem that affects both the well-

being of the teacher and the quality of the education provided. The SWAT test has been shown to be an effective tool to assess this load, providing valuable data that can guide interventions to reduce stress and improve the working conditions of teachers, the objective of applying the test is to determine the levels of mental load in order to mitigate or minimize them, so the following are concluded:

The high mental load observed may be related to the cognitive and emotional demands inherent to teaching, as well as to external factors such as the pressure for research and adaptation to new technologies, especially in the context of the COVID-19 pandemic.

It is concluded that it is essential to implement preventive measures and intervention programs that address the mental load in university teachers. This includes promoting a healthy work environment, improving working conditions and encouraging teacher self-efficacy, which could contribute to reducing stress and the risk of burnout.

The Work Mental Load Test (SWAT) is a valid and reliable instrument as demonstrated by the Cronbach alpha and KMO of the test whose p value is as follows: 0.735 and 0.710 respectively to evaluate these variables in the university context (Chauca, 2024).

The present research underscores the importance of addressing psychosocial factors such as mental load, determining their present levels and then implementing effective strategies for their mitigation or reduction, with respect to the correlations established between sociodemographic variables and Mental Load by means of Cramer's V, it is established that: referring to the type of personnel action, a p value of 0.08 was obtained, which means that its correlation is weak, that is, it does not influence the presence of mental load, this means that there are other factors of the work environment that affect the presence of the investigated phenomenon, with respect to the educational level found there is a p value of 0.222, its correlation is strong this influences the appearance of mental load symptomatology and presents a level of health risk.

With respect to the Gender variable, the p value is 0.196 is also strong, which means that both men and women present levels of mental load due to the tasks they perform, in relation to age their correlation has a p value of 0.135 is average, which means that in some way it influences the presence of mental load in teachers, however, there are other factors with their work environment that contribute to the appearance of this psychosocial factor. The results suggest that mental load is influenced by various sociodemographic variables, which highlights the need to consider these factors when designing support and prevention programs. The correlation between mental load and variables such as age, gender, and educational level should be further explored to develop personalized strategies.

Mental workload is an important psychosocial risk factor in the workplace of university teachers (Academia.edu, 2020), when assessing mental load by the SWAT test, it allows a better understanding of the cognitive demands faced by teachers and the design of strategies to improve their well-being and work

performance (Vega et.al., 2023) Research has determined that the mental load in university professors of the Faculty of Engineering of the National University of Chimborazo is predominantly of medium level (80.4%), with 18.6% of teachers experiencing high levels of mental load. This finding indicates that a significant proportion of teachers are at risk of experiencing negative effects on their physical and mental health if appropriate interventions are not implemented.

AGRADECIMIENTOS

Agradecemos a todos los autores de la presente investigación quienes gracias a su participación fue posible la elaboración del presente manuscrito para su publicación.

FINANCIACIÓN

Los autores no recibieron financiación para el desarrollo de la presente investigación.

CONFLICTO DE INTERESES

Los autores declaran que no existe ningún conflicto de intereses.

CONTRIBUCIÓN DE AUTORÍA

Participar activamente en:	*Autor 1*	*Autor 2*	*Autor 3, 6*	*Autor 4*	*Autor 5*
Conceptualización	X	X			X
Análisis formal	X		X		
Adquisición de fondos	X			X	
Investigación	X	X			X
Metodología	X		X		X
Administración del proyecto	X	X	X		
Recursos	X	X	X	X	X
Redacción –borrador original	X	X	X	X	X
Redacción –revisión y edición	X	X		X	X
La discusión de los resultados	X	X	X	X	X
Revisión y aprobación de la versión final del trabajo.	X	X	X	X	X

References

Academia.edu. (2020). Cómo difundir ciencia desde los gabinetes de Relaciones Públicas a través de los periodistas.

Acosta Prieto, J. L. (2023). Tecnología para la gestión de carga mental en puestos de trabajo con demandas cognitivas. Aplicación en entidades cubanas (Doctoral dissertation, Universidad de Matanzas. Facultad de Ciencias Técnicas). https://rein.umcc.cu/handle/123456789/2188

Arquer, M. (1999.). NTP 534: Carga mental de trabajo: Disponible en http://www.insht.es/InshtWeb/Contenidos/Documentacion/FichasTecnicas/NTP/Ficheros/501a600/ntp_534.pdf

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. Human Behavior and Emerging Technologies, 2(2), 113-115. https://doi.org/10.1002/hbe2.191

Cain, B. (2021). A Review of the Mental Workload Literature. Ergonomics, 64(5), 601-614. https://doi.org/10.1080/00140139.2021.1875269

Cuevas Caravaca, E. (2024). Burnout académico personalidad, salud mental y hábitos saludables en estudiantes de enfermería y educación. https://repositorio.ucam.edu/handle/10952/7685

Cruz, L. D. V., Ibarra, R. C., & Osorio, R. V. B. (2020). Carga mental en personal de enfermería: Una revisión integradora. Revista Ciencia y Cuidado, 17(3), 108-121.

Chauca Izurieta, N. S., & López - Rubio, E. (2024). Evaluación de la Fatiga Visual de los trabajadores administrativos

de la empresa Provip's, mediante el método CVSS17. Technology Rain Journal, 3(2). https://doi.org/10.55204/trj.v3i2.e38

González-Gancedo, J., Montañés-Muñoz, P., & Pérez-López, J. (2020). Administrative burden and burnout syndrome in university professors. Journal of Educational Administration, 58(5), 510-527. https://doi.org/10.1108/JEA-10-2019-0174

Hart, S. G., & Staveland, L. E. (1988). Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research. In Human Mental Workload (pp. 139-183). Elsevier.

Johnson, D. M., & Smith, R. L. (2021). The impact of hybrid teaching on university faculty's workload and mental health. Journal of Educational Technology Systems, 49(2), 145-162. https://doi.org/10.1177/0047239520982063

Karimi, Z., Mohammadi, E., & Shakibaei, F. (2021). The impact of academic workload on job burnout among university professors: A case study. Journal of Educational Psychology, 113(4), 789-804. https://doi.org/10.1037/edu0000528

Martínez, F. J., Gómez, J. R., & López, M. P. (2022). Evaluación de la carga mental en la transición a la enseñanza en línea: Un estudio con el Test SWAT. Revista de Psicología Educativa, 28(1), 21-35. https://doi.org/10.1016/j.riped.2021.06.004

Martínez Suárez, S. M., Manjarrés Moyano, E., Pulido Casallas, M. T., Rivera Tolosa, E. M., & Trujillo Hernández, M. (2020). Estrés laboral y carga mental desencadenado por el trabajo remoto.

Moriana Elvira, J. A., & Herruzo Cabrera, J. (2004). Estrés y burnout en profesores. Rodríguez, S. N. R., Puga, A. M. R., Serpa, A. V., & Vásconez, A. I. R. (2022). Evaluación de carga mental en docentes a tiempo completo en el ámbito del COVID-19. Revista Conecta Libertad ISSN 2661-6904, 6(1), 1-14. https://helvia.uco.es/handle/10396/20924

Mujica España, S. A., & Escobar, M. B. (2018). Previniendo consecuencias laborales: Programas de prevención de consumo y hábitos saludables. Boletín Informativo CEI, 5(2), 24-30

Organización Mundial de la Salud (2018). Actividad física para la salud. Más personas activas para un mundo más sano: Proyecto de plan de acción mundial sobre actividad física 2018-2030(No. A71/18). In 71.ª Asamblea Mundial de la Salud.

Ormaza-Murillo, M. P., Zambrano-Rivera, A. D., Zamora-Napa, S. C., Parra-Ferié, C., & Félix-López, M. (2019). Carga mental de profesores de la Escuela Superior Politécnica Agropecuaria de Manabí. Ingeniería Industrial, 40(1), 3-13. Reid, G. B., & Nygren, T. E. (1988). The subjective workload assessment technique: A scaling procedure for measuring mental workload. In Human Mental Workload (pp. 185-218). Elsevier. http://scielo.sld.cu/scielo.php?pid=S1815-59362019000100003&script=sci_arttext

Pons, I. D., & Puig, R. F. (2004). Revisión del concepto de carga mental: evaluación, consecuencias y proceso de normalización. Anuario de Psicología /The UB Journal of psychology, 521-546.

Paredes Moyano, E. P., & Jaramillo Galarza, K. A. (2024). Evaluación de los niveles de consumo de alcohol mediante el test Audit a los trabajadores del departamento de operación y mantenimiento de la aerovía de Guayaquil. Caso práctico . Technology Rain Journal, 3(2). https://doi.org/10.55204/trj.v3i2.e35

Santiago, A. R., & Pérez, J. P. (2023). Afrontamiento al estrés laboral. Estrés laboral. Fundamentos teóricos, medición, investigación e intervención. https://books.google.com/books?hl=es&lr=&id=d7nSEAAAQBAJ&oi=fnd&pg=PT315&dq=El+estr%C3%A9s+se+define+como+una+respuesta+fisiol%C3%B3gica+y+psicol%C3%B3gica+a+demandas+externas+o+internas+que+exceden+los+recursos+del+individuo&ots=Gpl-1ubgGP&sig=0hp80nGD-POse-KJz793iVoFdTQ

Sánchez, G. I., Jara, X. E., & Verdugo, F. A. (2024). Los estándares para docentes en formación: nudos críticos.

Formación universitaria, 17(2), 173-184.

Sernaqué Delgado, M. V. (2023). Autoeficacia y estrés académico en estudiantes de psicología de una universidad privada de Trujillo.

Valdehita, S. R., Moreno, L. L., García, J. M., & Díaz, J. J. (2007). Modelos y procedimientos de evaluación de la carga mental de trabajo. EduPsykhé: Revista de Psicología y Educación, 6(1), 85-108.

Vega Rodríguez, Y., & Vizcaíno Escobar, A. E. (2023). Evaluación de la autoeficacia del docente universitario: una revisión sistemática de la literatura. Mendive. Revista de Educación, 21(3). http://scielo.sld.cu/scielo.php?pid=S1815-76962023000300003&script=sci_arttext

Vicente, B., Saldivia, S., & Pihán, R. (2016). Prevalencias y brechas hoy: salud mental mañana. Acta Bioethica, 22(1), 51-61

Virla, M. Q. (2010). Confiabilidad y coeficiente Alpha de Cronbach. Telos, 12(2), 248-252.

Wang, Y., Ramos, A., & Wu, X. (2019). Work-life balance and job satisfaction: How coping strategies and mental health mediate this relationship among university teachers. Journal of Happiness Studies, 20(1), 337-354. https://doi.org/10.1007/s10902-018-9941-3