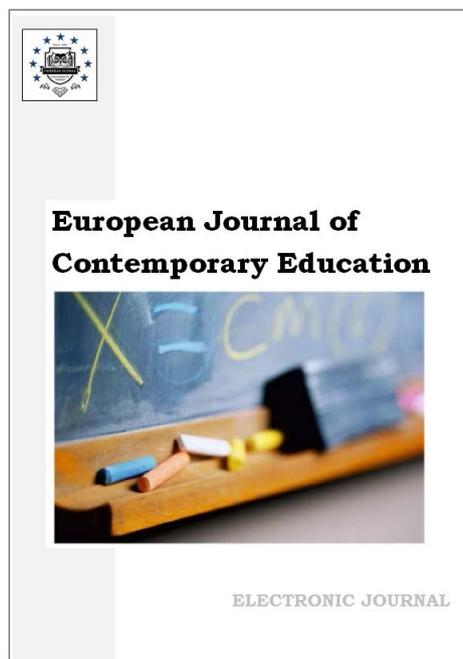




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Analysis of the Psychosocial Factors of University Professors

María Teresa de la Garza Carranza ^{a,*}, José Porfirio González Farías ^a, Salustia Teresa Cano Ibarra ^a, Laura Georgina Vázquez Lara de la Cruz ^a

^a Departamento de ciencias económico administrativas, Tecnológico Nacional de México en Celaya, Mexico

Abstract

The present study is a proposal of a questionnaire of psychosocial factors for university professors based in a standard proposed in the Mexican law that considers the International Labor Organization recommendation. The study is based on five dimensions: Work environment, factors for the activity, organization of working time, leadership and relationships and work and organizational environment. The information was collected among 300 teachers with a wide range of tenure and conditions at work in Mexico. Also, the questionnaire was developed during the pandemic of COVID-19 which affected the job this kind of professionals. We performed an exploratory factor analysis to evaluate each one of the five dimensions using questionnaires previously validated by different authors. We obtained one dimension for the work environment factor, two dimensions for the factor for the activity, one dimension for the organization of working time, three dimensions for the factor leadership and relations at work and two dimensions for the organizational environment factor. The results showed that the questionnaire is valid and can be used as a tool to improve the conditions of work at universities. We found that the dimension insecurity and leadership were the worst evaluated by university teachers. This questionnaire could be used to promote safety conditions after the sanitary emergency and to promote a healthy environment among workers.

Keywords: university professors, psychosocial factors, exploratory factor analysis, Mexico.

1. Introduction

Universities have a primary role in our society. On one hand, they have the function of transmitting knowledge to create professionals from the various disciplines that are required in the labor field and, on the other hand, they generate knowledge through their researchers (Pace et al.,

* Corresponding author

E-mail addresses: teresa.garza@itcelaya.edu.mx (M.T. de la Garza Carranza)

2021). In recent years, the demands of universities have changed the work requirements of professors due to work overload, administrative requirements, and the achievement of research results (Tacca, Tacca, 2019). Depending on the country, the contractual and salary differences of the universities have caused the levels of job satisfaction to be different according to the type of work that a professor accomplishes (Szromek, Wolniak, 2020).

Mexican universities have a great diversity, and we can classify them as universities exclusively for teaching purposes where full-time professors are very scarce and universities dedicated to teaching and research that are recognized for their quality and scientific impact as the National Autonomous University of Mexico (UNAM) the National Polytechnic Institute (IPN), etc. The types of work contracts that professors have define the type of activity they carry out within the institution and can be part-time or full-time. In both cases there may be definitive contracts or for specific periods of time. Universities can generally be classified as private or public depending on the source from which they obtain their primary resources. Among the most recognized private universities in Mexico is the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), the Universidad Iberoamericana, etc.

The levels of well-being of university professors depend on various factors such as social, personal, demographic, economic, institutional, and environmental (Cerci, Dumludag, 2019). An especially important one, is the salary level, this may depend on the type of contract and seniority that the professor has and, on some occasions, if there is a bonus for some type of prize due to activities such as research, work with students, etc. In addition to this, one of the sectors most affected by the COVID-19 pandemic was education, as there was a general stoppage of activities for approximately two years. This recess undoubtedly disrupted all school settings from the study plans to the way of living in the community and the way of carrying out the teaching-learning process. Although there are studies that indicate how the COVID-19 pandemic affected students (Browning et al., 2021), there are few studies that have shown how this situation affected teachers. The most relevant concerns on the part of the teaching and administrative staff in the school environment include the physical, mental, social and administrative areas as described by Pattison et al. (2021) as shown in Table 1. However, it is important to mention that, in the Mexican environment, especially in some states such as Guanajuato, Zacatecas, State of Mexico, etc., gender violence increased, as well as violence by criminal groups, which represents a risk for both teachers as for students. Some universities have had to modify their work schedules to safeguard the safety of the community (INEGI, 2022).

Table 1. Risks generated for teachers from the COVID-19 pandemic

Physical environment	Physical distancing in hallways, cafeteria, cubicles, classrooms, etc. Safety in public transport (bus, subway, etc.). Properly clean spaces and use of sanitary products (water, soap, disinfectants, etc.)
Health	Resurgence of new outbreaks of COVID-19. Sufficient vaccination for all students and teachers. Sufficient availability in hospitals for medical care. Obesity problems due to confinement
Mental health	Student concern due to the pandemic (depression, self-esteem, etc.) Sufficient resources for student support (counseling, psychological support, etc.) Support for students who lost a family member in the pandemic

Source: Browning et al., 2021

The International Labor Organization (ILO, 2011) defined psychosocial risk factors as those characteristics of working conditions that affect people's health through psychological and physiological mechanisms called stress. These interactions can have consequences on the health of workers as they may present anxiety, abuse of toxic substances, cardiovascular diseases, etc. The main risk factors are: 1) Environmental factors and jobs. They include workloads, shifts, ergonomic problems, work pace, etc. 2) Organizational Factors. It involves supervision,

organizational structure, organizational climate and culture, salary level, and discrimination issues. 3) Relationships at work. They are generated through coexistence through the work community and can generate workplace, sexual and violence harassment. 4) Job security and career development. In general, it refers to the perspective that the worker has regarding her future. 5) Workload. The relationship that the worker has in relation to his free time and his family.

As a result of this problem, the Ministry of Labor and Social Welfare of Mexico (STPS) published in the Official Gazette of the Federation the Mexican standard 035, which aims to establish the elements to identify, analyze and prevent psychosocial risk factors, as well as to promote a favorable organizational environment in the workplace (NOM-035-STPS-2018). Although the standard allows flexibility with reference to the parameters established to evaluate psychosocial risks, it provides specific guidelines that help organizations to establish their own criteria on the evaluation of the parameters. Some standards such as COPSOQ (2021) do not allow changes to the questionnaire, since they are the effort of international research groups that are making changes to the parameters of the standard and require that they be made in a uniform manner in order to establish comparisons between countries. The objective of this research is to propose an instrument for the evaluation of psychosocial factors at work based on NOM-035.

Educational reforms in different countries have affected teachers of any educational level, causing them to be more affected by stress levels every day (Dicke et al., 2017). The introduction of new educational models, the diversity of students, the size and number of students attended, budget restrictions, digitization of content, etc., cause teachers to find themselves in an environment of change every day (Salmela-Aro et al., 2019). This affects their levels of psychosocial well-being and has an impact on the quality of life of both the teacher and their quality of teaching (Laurie, Larson, 2020). It is therefore urgent to have an instrument that allows evaluating psychosocial factors in the work of university professors.

According to Mexican regulations, NOM-035, which was published in the Official Gazette of the Federation in October 2018, the standard is mandatory, so the instrument proposed in Mexican legislation for the evaluation of psychosocial aspects is a broad questionnaire that it comprises 5 categories and 10 dimensions in 72 items (Table 2). Next, we will describe each of the categories included in the standard, taking into consideration the studies developed for university professors and from the perspective of organizational psychology studies, but with a focus on university professors.

Table 2. Categories, and domains proposed by the standard

Categories	Domains
Work environment	Conditions in the work environment
Factors of the activity	Workload Lack of control over work
Organization of working time	Working day Interference in the work-family relationship
Leadership and relationships at work	Leadership Relationships at work Violence
Organizational environment	Performance recognition Insufficient sense of belonging and instability

Source: STPS (2018)

Next, we will describe each of the categories included in the standard, taking into consideration the studies developed for university professors and from the perspective of organizational psychology studies.

Work environment

According to Gil-Monte (2012), psychosocial risks originating in work activity have their origin in: a) The characteristics of the task: amount of work, development of skills, complexity of the task, monotony or repetitiveness, automation, work rate etc. b) The characteristics of the job: the workplace, remuneration, job stability and physical conditions of work (temperature, noise,

lighting, etc.), c) The organization of working time: shifts, breaks, breaks to eat etc. The amount of work that teachers have negatively affects their productivity measured through teaching, fulfillment of research goals and increases the levels of conflict with their co-workers (Gillespie et al., 2001). In a study conducted by Otero-López et al. (2008) in Spanish university professors, showed that workload and seniority, as well as routine inconveniences such as paperwork, filling out reports, etc. correlates with the levels of stress of this type of professional.

Factors of the activity

According to the standard, the factors of the activity are divided into workload and lack of control over the work. Aspects such as work rhythms, mental loads, autonomy, possibility of development, training, etc. are considered. These processes in most universities were affected taking into consideration that most daily activities were carried out remotely (Orellana et al., 2021). Further, we must consider that the COVID-19 pandemic considerably affected university professors since a transformation was experienced at work during the pandemic crisis that lasted in Mexico from 2020 to 2021, although the World Health Organization has not declared the end. As of 2022, the vast majority of professors were forced to return to work face-to-face from January, resulting in a transition period that affected academic life in every way. Especially the elder university professor was put at risk who, although he already had some type of protection due to vaccination, many of the professors belonging to this age group have comorbidities (high blood pressure, diabetes, etc.). In most universities these risks were not taken into account for the return to face-to-face instruction. According to Garcia et al. (2016), the psychosocial risks of teachers due to job demands are higher in those academics who have higher degrees (doctorate) and who must comply with the required academic productivity (articles, books, etc.). According to their study, they are those who are over 55 years old.

Organization of working time

The third dimension proposed by the standard includes the duration of the working day and the analysis of the work-family conflict. These two factors are highly interrelated because the time that the worker spends in activities at work (outside or inside the workplace) includes his personal goals and the time he spends with his family. As explained above, especially during the pandemic the boundaries between work and family were severely affected as work was done at home. The conflict has increased due to globalization, the economic situation or to the personal aspirations of mothers, and also, the number of couples where both work is increasing (Bennett et al., 2017). The work-family conflict in general is the interference between the aspirations or needs of the individual who works and his family role and his personal aspirations. Like any person, teachers, doctors or any other professional, they need a time where they can carry out other types of activities, whether sports, cultural, recreational, etc. A very special case occurs, for example, when the worker has children or family members to take care of and who require special attention from the worker. Various authors have shown a relationship between work-family conflict and the intentions to look for another job (Carr et al., 2008; Nohe, Sonntag, 2014). There is also a strong relationship between work-family conflict and organizational commitment (Casper et al., 2002; Talukder, 2019). According to Soomro et al. (2018), in a study carried out on professors in Pakistan at public universities, found that the balance between work and family has a significant positive effect on performance and those individuals who can achieve this balance are committed to the organization.

Leadership and relationships at work

The fourth category is made up of leadership and relationships at work. This category includes some aspects of leadership, relationships with co-workers and supervisors, and workplace violence. This category is important due to the possible aggressions that could occur at work, especially by students towards teachers. Although the attacks can be of different types (physical, cyber, etc.), one of the most reported is sexual assault, which can occur at any level within the university. In a study conducted at Canadian universities, Bergeron et al. (2019) reported that a third of the surveyed population of employees, teachers and students suffered some form of sexual violence, with minorities being more prone to this phenomenon.

Leadership is a concept that has received wide attention due to its importance in the world of work. One of the authors who has studied this phenomenon in detail is Northouse (2015), who defines it as "A process by which a person influences a group of individuals to achieve a common goal." (p. 5). The leader can have different positions in the university from the rector to the head of the area, but as in general in the academies, the process is participatory and implies that the

professors can express their opinions freely. According to Mefi, Asoba (2021), the relationship between leadership and the satisfaction of university professors is not a linear relationship and has many variables that must be taken into account in the process (such as workload, the relationship with colleagues, work-family conflict, etc.). Other factors such as recognition, autonomy, job security are also associated with leadership. In general, we can say that the leader has the function of managing the teacher's needs and can improve some of the variables that intervene in the satisfaction process (Khan et al., 2020).

Regarding relationships between colleagues, relationships of respect between peers and the behavior of how the person's actions can affect other colleagues is important when a group of people works together in small spaces. This can be grouped in the concept of "organizational citizenship behavior" since it implies a voluntary behavior that goes beyond what is expected by the worker in relation to the behavior that he has with his co-workers for the benefit of the organization. In this sense, it is important to say that in small spaces such as teachers' cubicles, the use of cell phones, student counseling and other types of behavior can affect or interfere with the work of other teachers. There are studies that propose that human resource practices and organizational citizenship behavior facilitate organizational performance (Taamneh et al., 2018). According to Rita et al., (2018), leadership can have an effect on good relations between workers through organizational citizen behavior and its application can increase the motivation of workers.

Organizational environment.

This category includes the domains of performance recognition, belonging to the organization and job instability (intentions to change jobs). Employees put forth effort in return for pay, recognition, and other important work outcomes, but job insecurity introduces a sense of violation of these expectations and leads to worsening attitudes (Mahmoud et al., 2021). In the academic field in Mexico there are multiple types of contracts for university professors that can generally be divided into two full-time and part-time. Full-time professors at public universities can access certain economic incentives according to their academic level and performance, and those who are hired part-time generally do not have any type of economic incentive (Rodríguez-Lagunas et al., 2021). In this last group there are many teachers who have serious salary and social benefit deficiencies.

In a study conducted in Spain by Ozamiz-Etxebarria et al. (2021) in teachers of different educational levels found that there was a high degree of stress among them and those who had job instability had a higher percentage. Therefore, these authors suggest that in order to safeguard the well-being of the students, it is first necessary to safeguard the well-being of the teachers, since the quality of learning depends on them. In relation to organizational commitment, Mwesigwa et al. (2020), found that leadership styles and job satisfaction are related to organizational commitment in African universities; the high demands that universities impose, imply that university authorities must develop the necessary skills to meet the needs of teachers and meet their expectations.

Supporting this notion, the five categories presented above are very broad and each of them could consider various elements to be evaluated different from those proposed in the standard, depending the circumstances and points of view. However, in this study we will proceed to propose essential elements of the domains proposed to advance their validation in the field, and subsequently establishing lines of research that can support the enrichment of this work.

2. Method

To perform an evaluation of the reliability of the questionnaire, an exploratory analysis was carried out with questionnaires previously validated by various authors (not necessarily belonging to the educational sector). A Likert scale from 1 to 5 was used, where 1 indicated totally disagree and 5 totally agree. The exploratory factor analysis technique was chosen because there are practically no previous studies reported on the questionnaire in the literature, as in the case of the COSPSOQ mentioned above. According to Lloret-Segura et al. (2014) both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are used to evaluate a factorial structure underlying a correlation matrix, but while EFA seeks to build a theory, CFA seeks to confirm a theory. In this case, it is intended to build a theory since, from different authors, a generic guideline that complies with the STPS standard will be proposed.

To determine the adequacy of the EFA test using the principal components method, the KMO (Kaiser, Meyer, Olkin) sample adequacy measure was calculated, which tests whether the partial correlations between the variables are small enough. This test allows to compare the magnitude of

the observed correlation coefficients with the magnitude of the partial correlation coefficients. The KMO statistic varies between 0 and 1. Small values indicate that the factorial analysis is not adequate (de la Fuente-Fernández, 2011). Additionally, Bartlett's sphericity test was calculated to test the null hypothesis that the correlation matrix is an identity matrix, in which case there would be no significant correlations between the variables and the factorial model would not be relevant. The significance value of the test must be close to zero, which means that the variables are highly correlated to provide a basis for factor analysis (Leech et al., 2013). The communalities were also calculated, which is the proportion of the variance that can be explained by the factorial model obtained. To complement the EFA, the eigenvalues, the load of the items and the percentage of explained variance were calculated. To carry out the EFA, SPSS v24 was used.

Data Analysis

A sample of 300 university professors from the State of Guanajuato and Querétaro was obtained. 52 % were women and 47 % were men. Ages ranged from 25 years to over 66 years. 16 % are between 25 and 35 years old, 27 % are between 36 and 45 years old, 30 % between 46 and 55 years old, 20 % between 56 and 65 years old and the remaining (approximately 6%) are over 66 years old. Most of the teachers are married (63 %) and the remaining 36 % are single. 5 % of those surveyed belong to private universities and the remaining 95 % to public universities. The studies that the professors have are: 19 % bachelor's degree, 48 % master's degree, 28 % doctorate and 4 % post doctorate. The form of hiring of professors is: full-time professors 53 %, ¾-time professors 3 %, part-time professor 2 %, professors by subject 11 % and fee professors 31 %. The experience teachers have varied from less than one year to more than 30 years, distributed as follows: less than one year 3 %, from 1 to 9 years 30 %, from 10 to 19 years, 29 %, from 20 to 29 years old 21 % and more than 30 years old 17 %. It is important to mention that the questionnaires were completed in the first half of 2022, where there was still a high risk of infection by COVID-19 and the highly contagious omicron variant generated the fourth wave in Mexico.

To test each of the categories proposed by the standard, AFEs were carried out and the results were as follows:

a. Work environment. For the category of work environment, the Unda et al. (2016). The same items presented by these authors were taken as they were in Spanish, but only those that were considered best adapted to the study were included. Tables 3, 4 and 5 show the result of the analysis, where only one factor was found, which indicates agreement with the norm. The AFE meets accepted statistical criteria.

Table 3. Items evaluated for the work environment category

Items: Work environment conditions (resources).	Communalities
R1 The materials I need for the job are purchased with my own salary.	0.729
R2 It bothers me that I lack resources for research.	0.732
R3 The institution forces me to manage my own resources.	0.798
R4 It annoys me to have to use my own financial resources when I attend a conference.	0.813

Source: SPSS

Table 4. AFE of work environment

KMO	Significance of the Bartlett test	Explained variance	Number of factors found
0.70	P < 0.00	59 %	1

KMO = Kaiser, Meyer, Olkin index

Source: SPSS

Table 5. Factor loads of the items and Cronbach's alpha

Item	Load	Chronbach's Alpha
R1	0.73	
R2	0.73	
R3	0.80	
R4	0.81	
		0.77

Source: SPSS

b. Factors specific to the activity. According to [Table 2](#) presented above, the aforementioned category has two domains: workload and lack of control over work. The items analyzed were taken from Unda et al. (2016). Next, the analysis carried out is shown where the obtaining of two factors is shown. [Tables 6, 7](#) and [8](#) show the analysis.

Table 6. Items evaluated for the category factors of the activity

Items: Workload	Communalities
S1 I have a heavy workload	0.649
S2 Preparing papers for conferences takes a lot of time	0.606
S3 Conducting research takes a lot of time	0.561
S4 I spend a lot of time grading my students' work	0.396
S5 I have little time to attend to the diversity of tasks	0.397
Items: Lack of control over work	
FC1 The laziness of my students bothers me	0.743
FC2 My students are irresponsible	0.454
FC3 The ignorance of my students bothers me	0.647
FC4 I am angry about the students' lack of interest in learning	0.743
FC5 Students do not complete their homework	0.363
FC6 The lack of punctuality of my students exasperates me	0.592

Source: SPSS

Table 7. AFE of the category factors of the activity

KMO	Significance of the Bartlett test	Explained variance	Number of factors found
0.84	P < 0.00	56 %	2

KMO = Kaiser, Meyer, Olkin index

Source: SPSS

Table 8. Factor loads of the items and Cronbach's alpha

Item	Load	Chronbach's Alpha
Items: Factors of the activity		
S1	0.79	
S2	0.77	

S3	0.75	
S4	0.60	
S5	0.60	0.76
FC1	0.86	
FC2	0.67	
FC3	0.78	
FC4	0.86	
FC5	0.59	
FC6	0.74	0.86

Source: SPSS, using the varimax rotation method

c. Organization of working time. According to the norm, the category has two dimensions: working hours and interference in the work-family relationship. The items related to the working day were taken directly from the NOM-035 and the work-family relationship from the article by Chen et al. (2020). Next, the analysis of the items is shown, the result indicates the obtaining of a single factor. Tables 9, 10 and 11 show the analysis.

Table 9. Items evaluated for the category factors of the activity

Items: Organization of working time	Communalities
J1 I work overtime more than three times a week	0.49
J2 My job requires me to work on days off, holidays or weekends	0.38
TF1The workload affects my family life.	0.75
TF2The amount of time my work takes makes it difficult for me to fulfill family responsibilities.	0.76
TF3The workload makes it difficult for me to carry out my personal tasks and/or pursue hobbies.	0.73

Source: SPSS

Table 10. AFE of the category factors of the activity

KMO	Significance of the Bartlett test	Explained variance	Number of factors found
0.89	P < 0.00	62 %	1

KMO = Kaiser, Meyer, Olkin index

Source: SPSS

Table 11. Factor loads of the items and Cronbach's alpha

Item	Charge	Chronbach's Alpha
Items: Organization of working time		
J1	0.70	
J2	0.62	
TF1	0.70	
TF2	0.62	
TF3	0.86	

TF4	0.88	
TF5	0.66	0.89

Source: SPSS

d. Leadership and relationships at work. Two domains, leadership and violence, were tested in this category. The items analyzed were taken from Unda et al. (2016). The result of the analysis shows that three factors were obtained. In this case, there are five items that, according to the analysis carried out, are perceived by teachers as relationships at work and not as leadership and were taken from the questionnaire proposed by Unda et al. (2016). Tables 12, 13 and 14 show the analysis.

Table 12. Items evaluated for the category leadership and relationships at work

Items: Leadership	Communalities
L1 My supervisor is authoritarian	0.71
L2 My supervisor hinders my work	0.74
L3 My supervisor has arrogant attitudes	0.68
L4 I receive little support from my supervisor	0.50
L6 I receive conflicting orders	0.61
Items: relationships at work	
L5 In my institution I am treated unfairly	0.53
L7 My supervisor do not recognize my effort	0.38
L8 I perceive a lack of recognition from my classmates	0.65
L9 My colleagues accept corruption	0.45
L10 Resources are given only to a few	0.55
Items: Violence	
V1 I am afraid of insecurity inside my institution	0.75
V2 An atmosphere of insecurity is perceived in the institution	0.69
V3 I am worried about being assaulted at work	0.60
V4 Security measures are inadequate	0.43
V5 There is excessive noise in the buildings where I teach	0.34

Source: SPSS

Table 13. AFE of the category factors of the activity

KMO	Significance of the Bartlett test	Explained variance	Number of factors found
0.90	P < 0.00	57 %	3

KMO = Kaiser, Meyer, Olkin index. Source: SPSS

Table 14. Factor loads of the items and Cronbach's alpha

Item	Charge	Chronbach's Alpha
Items: Leadership		
L1	0.74	
L2	0.80	
L3	0.80	
L4	0.52	

L6	0.60	0.88
Items: relationships at work		
L5	0.66	
L7	0.60	
L8	0.75	
L9	0.58	
L10	0.65	0.77
Items: Violence		
V1	0.80	
V2	0.80	
V3	0.65	
V4	0.57	
V5	0.50	0.76

Source: SPSS Note: using the varimax rotation method

e. Organizational environment. The category of organizational environment is made up of the dimensions of recognition of performance and the sense of belonging in the organization. The items were taken from Patlán-Pérez (2021). The corresponding analysis is shown below. The Tables 15, 16 and 17 show the analysis.

Table 15. Items evaluated for the category organizational environment

Items: Recognition of performance	Communalities
R1 I feel motivated because my supervisor gives me feedback at work	0.66
R2 My supervisor tells me how to improve my work	0.67
R4 I feel satisfied when receiving information about my work performance	0.75
R5 My supervisor informs me about my performance at work	0.52
R1 I feel motivated because my supervisor gives me feedback at work	0.66
Items: Sense of belonging	
PI1 I participate in the decision-making of my work	0.44
PI2 I feel responsible and make decisions at work	0.60
PI3 I feel important because I participate in the decisions that are made at work	0.67
PI4 I have the freedom to make decisions	0.54
PI1 I participate in the decision-making of my work	0.44

Source: SPSS

Table 16. AFE of the category factors of the activity

KMO	Significance of the Bartlett test	Explained variance	Number of factors found
0.87	P < 0.00	62 %	2

KMO = Kaiser, Meyer, Olkin index.

Source: SPSS

In relation to the statistical analysis performed, we can conclude that there are categories and domains relevant to the psychosocial risk of teachers according to NOM-035. The result of the AFE shows satisfactory values according to the generally accepted statistical criteria. These results show

that domains were found to evaluate the categories proposed by NOM-035 proposed by the Mexican legislation but it could be used as basis of a general evaluation of psychosocial factors for the academia.

Table 17. Factor loads of the items and Cronbach's alpha

Item	Charge	Chronbach's Alpha
Items: Recognition of performance		
R1	0.85	
R2	0.84	
R3	0.80	
R5	0.571	0.86
R1	0.85	
Items: Sense of belonging		
PI3	0.81	
PI4	0.68	
R4	0.65	
PI1	0.62	
PI2	0.49	0.76

Source: SPSS Note: using the varimax rotation method

3. Results

Once the criteria for each of the variables had been calculated, the descriptive calculations of each of the domains were carried out to identify the problems associated with the psychosocial factors of the teachers. According to the results, the domain best evaluated by the teachers was the sense of belonging ($\mu = 3.7$, $\sigma = 0.75$), highlighting that the teacher feels identified with her institution. It was followed by performance recognition ($\mu = 3.2$, $\sigma = 1.05$), workload ($\mu = 3.1$, $\sigma = 0.8$), resources ($\mu = 2.9$, $\sigma = 0.96$), lack of control over work ($\mu = 2.8$, $\sigma = 0.96$), organization of work time ($\mu = 2.6$, $\sigma = 0.9$), relationships at work ($\mu = 2.2$, $\sigma = 0.81$) and violence at work ($\mu = 2.1$, $\sigma = 0.74$) and leadership ($\mu = 1.9$, $\sigma = 0.85$). According to the results, we must analyze point by point what is happening with each domain and identify the domains that are being poorly qualified, since there are some that are in a negative sense and look for strategies to improve the work of professors within the universities.

4. Discussion

The circumstances detonated by the sanitary contingency showed that the work done by all kind of workers must be reevaluated taking in account the risk. Our results show that psychosocial factors must be included in the university context to identify the risk levels that professors have at work.

We performed a series of exploratory factor analyses (EFA) to test the factor structure of the categories proposed in the Mexican law. We found that the questionnaires selected to measure the five categories proposed by STPS are adequate for evaluating the psychosocial factors. These categories and items could be used to evaluate the risk that professors have at universities during critical times as the one we have in recent years but also, in a post pandemic situation.

According to our results the worst evaluated domains were leadership and violence. Leadership should be improved to manage the complex conditions that the post pandemic situation has detonated. Thus academic leaders have to adapt to the environment and provide guidance to their personnel and to students to meet academic goals. The violence problem in university in Mexico is a challenge that needs to be attended by federal and local authorities. Students, academic and in general all the personnel need safe conditions to ensure that the environment fosters the conditions to achieve academic performance.

The conditions of the post pandemic crisis are still emerging. The economic situation is becoming critical as the inflation rate is not under control in many countries (Ciravegna, Michailova, 2022). Also, political factors as the war in Europe and the confrontation between China and USA are promoting an extremely complex world with repercussions for the more vulnerable. In these sense, universities are not excluded. Many students won't find the way to finance their studies and professors must afford a continuous decrease in resources for the academia. This will propitiate an increase in stress and work conditions for academic personnel.

5. Conclusion and Recommendations

NOM-035-STPS-2018 is a recently created standard in Mexico that must evolve over time to be perfected and find the parameters that meet the statistical criteria recommended by experts. The norm, as its text mentions, allows adaptations and in this case one proposed for this purpose is presented. In this sense, we must take into account that the questionnaire proposed in Denmark (COPSOQ), which already has a solid evolution, is not only an information collection instrument, but also an organizational intervention instrument for continuous improvement.

This article presents a valid instrument for the evaluation of psychosocial risk factors for university teachers and can be used anywhere in the world. In reality, there are few questionnaires that have been tested for these characteristics after the pandemic and in the most critical period when most of the universities began to work with active cases. University professors, like any worker, have the right to be treated according to the ILO guidelines proposed in international treaties. The proposed instrument can contribute to the literature in proposing new questionnaires and dimensions to assess working conditions for university professors. Also, as mentioned before, in countries with high risk of violence, the university authorities need to know how the professors feel.

University authorities should provide to the university community a learning environment that meets the highest requirements that young people deserve. Also, the professors or researchers should be supported in their efforts to contribute to science and technology. In developing countries, the need of competent professionals and the increase of the development of science and technology should be a priority for education as for politicians. These goals can't be achieved without the adequate academic personnel.

The present proposal for an instrument to assess the risks of psychosocial factors at work for university professors could serve as a basis for later work where other types of countries can be integrated in addition to Mexico. It is necessary to clarify that the university contexts are not the same in the various countries of the world and depend on the system that each country has. However, university professors are continually under the scrutiny of society without taking into account that this type of work also presents risks that must be evaluated.

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