



# Evaluation of the validity of the questionnaire of psychosocial risk factors and evaluation of the organizational environment proposed by NOM-035-STPS-2018

*Evaluación de la validez del cuestionario de los factores de riesgo psicosocial y evaluación del entorno organizacional propuesto por la NOM035-STPS-2018*

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Received April 10, 2021; accepted March 3, 2022

Available online October 25, 2022

## Abstract

The purpose of the study was to evaluate the psychometric properties of the instrument Identification of Psychosocial Risk Factors and Evaluation of the Organizational Environment (GRIII), proposed in 2018 by the Ministry of Labor and Social Security (STPS) in NOM-035-STPS- 2018, in a company in northern Mexico. Construct validity was considered with confirmatory factor analysis (CFA), Structural Equation Modeling, and reliability levels with Cronbach's Alpha and Omega. A census was carried out with 403 workers. The results determine that the instrument is not valid to evaluate the dimensions of a poor relationship with supervised collaborators, of the work relationships domain of the Leadership and work relationships category, and emotional psychological loads of the workload domain of the activity factors category, and the use of other instruments and methodologies are fundamentally suggested. The authors highlight the scarce national reports on the psychometric properties of the instrument.

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Peer Review under the responsibility of Universidad Nacional Autónoma de México.

<http://dx.doi.org/10.22201/fca.24488410e.2022.3306>

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*JEL Code:* C39, J83, M54

*Keywords:* psychosocial risk factors; validity; confirmatory factor analysis

## Resumen

El estudio tuvo como propósito, evaluar las propiedades psicométricas del instrumento Identificación de los Factores de Riesgo Psicosocial y Evaluación del Entorno Organizacional (GRIII), propuesto en 2018 por la Secretaría del Trabajo y Previsión Social (STPS) en la NOM-035-STPS-2018, en una empresa del norte de México. Se consideró la validez de constructo con un análisis factorial confirmatorio (AFC), Modelos de Ecuaciones Estructurales y los niveles de confiabilidad con Alfa de Cronbach y Omega. Se trabajó a través de censo con 403 trabajadores. Los resultados determinan que el instrumento no es válido para evaluar las dimensiones deficiente relación con los colaboradores que supervisa, del dominio relaciones en el trabajo de la categoría Liderazgo y relaciones en el trabajo y cargas psicológicas emocionales del dominio carga de trabajo de la categoría factores propios de la actividad fundamentalmente y se sugiere el uso de otros instrumentos y metodologías. Los autores destacan los escasos reportes nacionales sobre las propiedades psicométricas del instrumento.

*Código JEL:* C39, J83, M54

*Palabras clave:* factores de riesgos psicosociales; validez; análisis factorial confirmatorio

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## Introduction

Business dynamics currently take place in a global and complex system that is the result of the socioeconomic and political changes of the last decades, characterized by volatility, uncertainty, complexity, and ambiguity (VUCA), which refers to a volatile world characterized by uncertainty and economic, political, and social complexity and the ambiguous nature of discourses, social positions, and labor relations (Lawrence, 2013; Terlato, 2019). Technology, decentralization, the rise of non-state actors, the recent interdependence of organizations and sectors, and the globalization of interactions have accelerated the rise of VUCA environments in all fields, including business (Covarrubias-Moreno, 2020). This leads to an increase in the presence of psychosocial risk factors (PSRFs) and psychosocial risks and the concern, at all levels, to address them in the light of the significant effects they cause on the health-illness process of the worker.

Work-related diseases and accidents resulting from these global conditions, according to the characteristics of each context, present particular features that determine the study of PSRFs, related legislation to prevent stress, violence, and harassment at work, and contractual insecurity, burnout, family-work conflict, and emotional labor (Peiró, 2004; Gil-Monte, 2014; Neffa, 2016). The economic and social cost of PSRFs positions them as a public health problem and implies, as suggested by Beck (2002), the questioning of traditional conceptions of social and labor relations in terms of a different way of understanding life and the new demands posed by the "society of risk." It is necessary to confront the

parameters that govern modern society with the consequent problems derived from industrial society. The effects of modern society must be approached from new perspectives in the political, legal, cultural, economic, social, and scientific spheres concerning the prevention of risks and the factors that determine them.

An international reference for its significant work from public policies to micro levels is the consortium led by the British Institute of Work, Health and Organizations, in liaison with the University of Nottingham, the Social Dialogue department of the International Labor Organization, the Occupational Health area of the World Health Organization, and state technical agencies in occupational health in five countries (Germany, Italy, Holland, Poland, and Finland). PRIMA-EF is an acronym for Psychosocial Risk Management-Excellence Framework (Jain, Leka, & Zwetsloot, 2018; Vega, 2015). This alliance aims to provide a framework for action to promote psychosocial risk management policies and practices in the European Union. It is a structure that makes it possible to apply policy and knowledge to manage effective practice in work organizations. PRIMA-EF consists of a practical, systematic, and evidence-based problem-solving strategy. The model comprises four necessary elements: scientific evidence, legal framework, guidelines, and recommendations for action and consensus based on social dialogue. It fundamentally focuses on the business field, assuming the need for learning, innovation, quality, and productivity as challenges, and determines a joint mode of action with governmental, legal, and social-labor support to deal with PSRFs and their consequences.

According to the different political-legal contexts and regulatory frameworks of reference of the PSRF, two trends can be found that are directed from regulatory models, which can be undifferentiated and differentiated. In the case of the former, they are adopted by countries such as Spain, the United Kingdom, Ireland, Canada, and Australia; from these models, the PSRFs are legislated together with other occupational and professional risks. In the case of the differentiated regulatory models, also called specific, PSRFs are legislated in a particular way. They are adopted by countries such as Belgium, Denmark, France, Italy, the Netherlands, Sweden, Colombia, and Mexico (Fernández-Avilés, González, & Arague, 2019).

PSRFs, as a scientific construct, must be differentiated from psychosocial factors and psychosocial risks since they are sources of occupational stress that threaten workers' health and have their own particular features. Among them, the most significant are: 1) they are difficult to objectify, 2) they affect other risks, 3) they have little legal visibility, 4) they are moderated by other factors, and 5) they may be difficult to modify. For their part, psychosocial risks affect the worker's fundamental rights, have global effects on the worker's health, affect the workers' mental health, and have forms of legal coverage (Ballester & Garcia, 2017; Moreno, 2011; Neffa, 2016). The analysis of PSRF must be done from three levels that start from the definitions stated above. The first level corresponds to psychosocial

factors present in any organization, which can be positive or negative. If they are negative, they constitute psychosocial risk factors; this is the second level of analysis. The third level corresponds to psychosocial risks, which result from psychosocial risk factors, i.e., the latter are predictors of work stress, violence, harassment, contractual insecurity, burnout, work-family conflict, and emotional labor (Díaz, 2011; Moreno & Báez, 2010). Job stress is considered the most global psychosocial risk. Psychosocial risks have legal coverage in several countries (Hermosa & Perilla, 2015; Gil-Monte, 2014; International Labor Organization, 2016).

Although PSRFs are a public health, legal, and political problem, the contributions are insufficient from a scientific point of view. A study that aimed to describe through bibliometric indicators the scientific literature related to psychosocial occupational risk, in the ProQuest and PsycArticles databases, during the period 2000-2010, with a descriptive quantitative design and using bibliometrics as a method, on the state of development of the subject in Colombia, reported as the most significant results that most of the studies are based on the Karasek demand-control model and related to the social support variable. This highlights that 39% of the 52 articles reviewed by the author are not based on theoretical models, which may be related to the fact that most of the models on which these investigations are based are on occupational stress and term these psychosocial risk factors stressors. The studies focus more on individual and intra-labor risk factors, and to a lesser extent on extra-labor ones. It is concluded in the study that research on psychosocial risk factors indicates that the development of the field is at an exploratory-descriptive level. Qualitative and mixed approaches are recommended, as well as quasi-experimental and experimental designs that make possible the analysis of psychosocial risk factors and their consequences on occupational health (Pulido, 2015).

In the Latin American context, the Colombian Resolution 2646 stands out, through which provisions and responsibilities are established to identify, evaluate, prevent, intervene systematically, and monitor exposure to psychosocial risk factors at work, and their incidence in the appearance of pathologies derived from occupational stress. Failure to comply with these issues has legal consequences for companies and is enforced by the territorial directorates of the Ministry of Labor in Colombia (López, 2015).

In the case of Mexico, the study of psychosocial risk factors that predispose to work-related stress and other risks is urgent for guaranteeing labor rights and preserving Mexican workers' physical and mental health. According to data from the Organization for Economic Co-operation and Development (OECD), the country is in first place in number of working hours, with employees working more than 2220 hours as an annual average (Organization for Economic Co-operation and Development, 2020). It is also highlighted that the country ranks first in work stress, surpassing China and the USA (Rodríguez & Moreno, 2015). Although complex, the need to widen studies and measures to reduce these figures is a

priority not only at the organizational level but also at the governmental level and from a legal, political, and occupational health perspective.

In Mexico, according to Juárez (2018), the most important psychosocial factors are those concerning psychosocial risk factors, such as demands due to the workload, the pace of work, high levels of responsibility and danger, workday, shifts and schedules involving physical effort, physical environment, work harassment expressed in psychological harassment by bosses and colleagues, stressful management due to abusive supervision, work-family imbalance expressed in a double workday, family to work effects, work to family effects, inadequate rewards and recognition expressed in work injustice, dissatisfaction with remuneration, lack of recognition and feedback, limited development possibilities, and job insecurity. Regarding the effects of psychosocial risk factors in Mexico, which translate into psychosocial risks, the most studied are burnout, distress, psychological weariness, and presenteeism. Risks predispose the worker to exhaustion, depersonalization, lack of achievement, anxiety, psychosomatic disorders, indifference, disillusionment, dislike of work, presenteeism due to health, and dissatisfaction. Juárez (2018) states that, despite descriptive studies, research from a preventive approach is scarce. The programs developed are generally only accessible to large companies, representing a minority of organizations in the country.

The proposals on PSRF in Mexico understand regulations to be the most effective prevention method (Aldrete & Cruz, 2013; Pando et al., 2008; Uribe, 2011). The legislation in the country aimed at preventing risk factors began with the modification to the Federal Regulation on Safety and Health at Work (2014), which included a section that defines the Psychosocial Risk Factors at Work (PSRF-T), which are defined according to their effects and consequences within the framework of non-organic anxiety disorders, effects on the sleep-wake cycle, severe and adaptive stress, derived from the nature of the job functions, the type of workday, and exposure to severe traumatic events or acts of workplace violence due to the work performed. This was the starting point for the legalization and prevention of psychosocial risk factors through the Official Mexican Standard NOM-035-STPS-2018 Psychosocial risk factors at work-Identification, analysis, and prevention. It was approved as a draft on September 26, 2016, and entered into force in 2018. The psychosocial risk factors evaluated in the standard are: a) conditions in the work environment, b) workloads, c) lack of control over work, d) working hours and shift rotation that exceed what is established in the Federal Labor Law, e) interference in the work-family relationship, f) leadership and relationships at work, g) workplace violence (NOM-035-STPS-2018, 2018).

NOM-035-STPS-2018 proposes three questionnaires. The first is an instrument that surveys severe traumatic events, and the other two aim to identify the presence of psychosocial risk factors in organizations. The first can be applied to any company, and the second and third will depend on the number of workers. The second, described in Reference Guide II, applies to companies with fewer than

50 workers. The third applies to companies with more than 50 workers, and a dimension is added to evaluate the organizational environment. This last version is described in Reference Guide III (GRIII) and was the one selected to conduct this research (NOM-035-STPS-2018, 2018).

According to NOM-035-STPS-2018, the GRIII is not mandatory and makes it possible for workplaces to design and apply their instruments, depending on the characteristics of both the work environment and working conditions. However, NOM-035, numeral 7.5, establishes the requirements that must be observed:

- a) The validation must be performed on workers whose workplace is located in the national territory
- b) The number of persons used for validation should be greater than or equal to 10 times each item initially considered
- c) The instrument should have internal consistency measures with the following coefficients:
  - a. Reliability (Cronbach's alpha) greater than .7
  - b. Correlation (Pearson or Spearman) with  $r$  greater than .5 and significance less than or equal to .05
  - d) Have construct validity through confirmatory factor analysis complying with the following measures and fit indices:
    1. Absolute adjustment with the indices:
      - 1.1.1. Goodness of Fit Index (GFI) greater than .90
      - 1.1.2. Root Mean Square Residual (RMSR) close to 0 and maximum of .08
      - 1.1.3. Root Mean Square Error of Approximation (RMSEA) less than .08
    2. Incremental or relative fit with the Normed Fit Index (NFI) greater than .90
    3. Parsimony with the normalized Chi-square index:  $X^2/df$  less than or equal to 5
  - e) Applied to a working population with similar characteristics to the population in which it was validated.

The recent legislation on psychosocial risk factors in the workplace is extremely important to begin a process of promotion, prevention, and intervention in occupational health in Mexico; however, there are not enough studies reported that account for these instruments' psychometric properties. There are only two that serve as direct antecedents to this research. The first one had the purpose of presenting in a critical-creative way the psychometric properties of the scale Identification of Psychosocial Risk Factors and Evaluation of the Organizational Environment with a sample stratified by gender of workers of a service company ( $n=114$ ) from Mexico City and the interior of the Republic. According to the results of this study, the scale shows reliability, but the results of the Confirmatory Factor Analysis (CFA) do not

validate by adjustments and qualifications. Therefore, it was recommended to the Secretariat of Labor and Social Security of the Mexican government (Spanish: Secretaría del Trabajo y Previsión Social, STPS) to consider the discrimination of items, to add items, to evaluate a proposal of a sample size of 10 subjects per item, and to analyze by principal components and with second-order factor analysis (Uribe, Gutiérrez, & Amézquita, 2019).

In the case of the second study, its aim was to evaluate the reliability and validity of the 5 categories of the GRIII. This questionnaire was applied to a sample of 1,247 full-time workers working in a coffee and food company in Mexico in September and October 2019. The research results confirm that the categories proposed by NOM-035-STPS-2018 comply with a minimum Cronbach's Alpha of .70. However, the construct validity criteria derived from an Exploratory Factor Analysis and a Confirmatory Factor Analysis are not confirmed. It is recommended to review the theoretical conceptualization of the PSRF involved and the design of the questionnaire (Littlewood-Zimmerman, Uribe, & Gurrola, 2020). It is necessary to highlight that the legal implications and the processes derived from PSRF assessments in Mexico are still in the process of development and delimitation from the legal framework; although there is legislation, the STPS states that:

"The standard does not contain any instrument for measuring stress, so it is false that workplaces will have to pay fines due to worker stress. It is not an instrument to perform a psychological evaluation of workers, nor does it oblige workplaces to perform it, and it does not contain a questionnaire to identify mental disorders or a method to identify internal psychological variables of the individual, such as attitudes, values, personality, among others." (Secretaría del Trabajo y Previsión Social del Gobierno de México, 2019).

This study aimed to evaluate the validity of the psychometric properties of the GRIII proposed in 2018 by the Secretariat of Labor and Social Welfare (STPS) in the NOM-035-STPS-2018 in Mexico. The construct validation with confirmatory factor analysis (CFA), Structural Equation Modeling, and reliability levels through Cronbach's Alpha and Omega were then proposed. Determining the psychometric properties of the instruments proposed by NOM-035-STPS-2018 will make possible a more rigorous process of identifying and managing psychosocial risk factors and provide the STPS and researchers with scientific results that validate, confirm, and improve the legislated proposal since they are applied according to regulatory principles. It is necessary to shed light on the validity of the proposed instruments.

## **Method**

### *Design*

The design of the following study is cross-sectional and correlational. It is research with an instrumental perspective evaluating psychosocial risk factors at work.

### *Participants*

In the present research, given the conditions of accessibility and availability of the company workers, it was decided to work through a census. Therefore, the instrument was given to 403 subjects representing 100% of the population. Table 1 shows the sociodemographic characteristics of the participants. The personnel is mainly in the adult and middle adult stages: married workers (37.7%), followed by single workers (32.3%), and workers in free union (24.6%), with widowers and divorcees being the least frequent. This can be seen in Table 1. The predominant level of schooling is junior high school and high school (40.7% and 15.6%, respectively). The predominant group of those surveyed were operators, representing 70% of the total workers, and technical professionals, with 21.8%, as illustrated in Table 1.

### *Ethical considerations of the research*

This study considered the provisions of Chapter 3 on the research of the Code of Ethics of the Psychologist of the Mexican Society of Psychology. This considers in its general principles the convenience of research, according to its usefulness for the progress of psychology and the promotion of human welfare. Research should be qualified according to its level of necessity, scope, risks, and ethical principles for working with human beings (Code of Ethics Chapter 3, 2007).



Table 1  
 Sociodemographic characteristics of the participants

Variable	f	%
Age		
15-19	5	1.2
20-24	22	5.5
25-29	43	10.7
30-34	36	8.9
35-39	58	14.4
40-44	70	17.4
45-49	64	15.9
50-54	68	16.9
55-59	34	8.4
60-64	3	0.7
Marital Status		
Married	157	37.7
Single	130	32.3
Free union	99	24.6
Divorced	16	4.0
Widower	6	1.5
Sex		
Male	159	39.5
Female	244	60.5
Level of education		
Incomplete elementary school	1	0.2
Completed elementary school	14	3.5
Incomplete middle school	21	5.2
Completed middle school	169	40.7
Incomplete preparatory school or high school	47	11.7
Completed preparatory school or high school	63	15.6
Incomplete technical college	7	1.7
Completed technical college	27	6.7
Incomplete Bachelor's degree	14	3.5
Completed Bachelor's degree	38	9.4
Incomplete Master's degree	4	1
Completed Master's degree	2	0.5
Incomplete doctorate	1	0.2
Job title		
Operators	294	73
Professionals and technicians	88	21.8
Supervisors	14	3.5
Managers	7	1.7

Source: created by the author

## Instrument

The instrument selected was the GRIII of the procedure proposed by NOM-035-STPS-2018. This instrument is based on regulatory criteria for its application; it comprises 72 items, of which 35 are evaluated directly on a Likert scale: 0 always, 1 almost always, 2 sometimes, 3 almost never, and 4 never. 37 of the items are evaluated inversely. The instrument is organized by categories, domains, and dimensions (NOM-035-STPS-2018, 2018), as shown in Table 2:

Table 2  
 Categories, domains, dimensions, and reagents of the GRIII

Category	Domain	Dimension	item
Work environment (AMB)	Conditions in the working environment (CAT)	(CAT1) Hazardous and unsafe conditions	1, 3
		(CAT2) Substandard and unsanitary conditions	2, 4
		(CAT3) Hazardous work	5
		(CT1) Quantitative workloads	6, 12
		(CT2) Accelerated work rhythms	7, 8
	Workload (CT)	(CT3) Mental workload	9, 10, 11
		(CT4) Emotional and psychological burdens	65, 66, 67, 68
		(CT5) High-responsibility workloads	13, 14
		(CT6) Contradictory or inconsistent workloads	15, 16
		(FCT1) Lack of control and autonomy in work	25, 26, 27, 28
Activity-specific factors (FPA)	Lack of control over work (FCT)	(FCT2) Limited or no possibility of development	23, 24
		(FCT3) Insufficient participation and management of change	29, 30
		(FCT4) Limited or no training	35, 36
		(JT1) Long workdays	17, 18
Organization of working time (OTT)	Workday (JT)	(IRT1) Influence of off-site work	19, 20
	Interference in the work-family relationship (IRT)	(IRT2) Influence of family responsibilities	21, 22
		(L1) Lack of clarity of functions	31, 32, 33, 34
	Leadership (L)	(L2) Leadership characteristics	37, 38, 39, 40, 41
Leadership and Labor Relations (LR)	Labor relationships (RT)	(RT1) Social relations at work	42, 43, 44, 45, 46
		(RT2) Deficient relationship with supervised employees	69, 70, 71, 72
	Violence (V)	(V1) Workplace violence	57, 58, 59, 60, 61, 62, 63, 64
Organizational environment (EO)	Performance Recognition (RD)	(RD1) Little or no feedback on performance	47, 48

	(RD2) Little or no recognition and compensation	49, 50, 51, 52
Insufficient sense of belonging, instability (ISPI)	(ISPI1) Limited sense of belonging	55, 56
	(ISPI2) Employment instability	53, 54

Source: adapted from groups of items by dimension, domain, and category; [https://www.dof.gob.mx/nota\\_detalle.php?codigo=5541828&fecha=23/10/2018](https://www.dof.gob.mx/nota_detalle.php?codigo=5541828&fecha=23/10/2018)

### *Procedure*

The principles provided by NOM-035-STPS-2018 were considered first to carry out the following research. The GRIII was selected because it is oriented to companies with more than 50 workers. The accessibility of the organization to carry out the research was also considered. An application and a research protocol were sent to the relevant authorities once the informed consents and assents were signed; the instrument was then made available on an online platform. The time to answer the questionnaire was approximately 1 hour.

### *Statistical analysis*

AMOS version 24 and SPSS version 25 statistical software were used. Item analysis: the correlation of each item with the scale's total score was analyzed using Pearson's correlation coefficient, and the concordance between items was analyzed using the intraclass correlation coefficient (ICC). The internal consistency was analyzed using Cronbach's alpha for each dimension and for the total scale, using the considerations of Campo-Arias and Oviedo (2018). The Omega coefficient was calculated; the latter is suggested for having less bias for categorical scales and when the factorial structure dictates it. The criterion validity was analyzed by confirmatory factor analysis (CFA), following the recommendations of Lloret-Segura, Ferreres-Traver, and Hernández-Baez (2014). The CFA was performed by structural equation analysis, following the recommendations of Hooper, Coughlan, and Mullen (2008).

The main goodness-of-fit indices were considered, such as the absolute goodness-of-fit index, the goodness-of-fit index (GFI), the root mean square error of approximation (RMSEA), and the comparative goodness-of-fit index (CFI) (Jöreskog & Sörbom, 1981). The study used frequencies and percentages to analyze the sociodemographic data.

## Results

### *Construct validity analysis*

When the reliability and confirmatory analyses were performed on the originally proposed structure, it was determined that Cronbach's alpha coefficient is valid above .70 and the overall coefficient .90, except in the categories of work environment and organization of working time. However, they are close to the desired value.

Concerning the CFA, the absolute fit indices are not the desired ones (Table 3), according to Jöreskog and Sörbom (1981). Several items were obtained as non-significant--values lower than 0.1--and are shown below:

Item 25: During the workday, you can take breaks when you need them, from the dimension of the activity factors, from the domain, workload, and the dimension of lack of control and autonomy in the work. The way it is worded means it can be answered according to the workload and working time, which determines that it is valued, if it measures what is proposed, according to the domain and the category where it is located (the worker can take breaks or not and this does not necessarily mean that they have autonomy and control or not in their work). Something similar happens with item 30: When changes occur in my work, my ideas or contributions are considered in the category of factors specific to the activity, in the domain of lack of control over the work and in the dimension of insufficient participation and management of change. It should be investigated whether how items 25 and 30 are posed is accurate according to what is to be measured or if it generates some kind of conflict and doubt in the workers when answering them.

The following items are also non-significant:

Item 65: Do you deal with very angry clients or users? This question focuses on the relationships established with clients. It should be reviewed because, in this case, it is not significant in the dimension of emotional and psychological burdens of the workload domain of the activity factors category. This is also the case with item 66: The work requires dealing with people in need of help or sick people; item 67: To do the work, I must show feelings different from my own; and item 68: The work requires addressing situations of violence of this dimension. Item 66, due to the mission and vision of the company, may not apply. In item 68, the term violence may be ambiguous in this context. Theoretically, several positions define it, and it is also polysemic in colloquial language. It is recommended to review these items more precisely according to what they seek to measure. It is also suggested to revise item 54 because it is not significant. Item 54: There is continuous turnover in my work in the organizational environment category, of the insufficient sense of belonging and instability domain, of the labor instability dimension is more

focused on or understood as personnel turnover, and it should be reviewed if it should go in this category of organizational environment concerning labor instability and according to the characteristics of the company.

Item 69: Late communication of work issues; 70: They hinder the achievement of work results; 71: Little cooperation when needed; and 72: They ignore suggestions to improve their work in the leadership and work relations category of the social relations at work dimension, and in the deficient relationship with the employees they supervise domain, were also not significant. This dimension seeks to measure the relations of managers and supervisors with subordinates. In the test items, given what is asked, it would seem that the aim is to identify bad practices in the processes of organizational management and direction rather than the leadership practices in the company, as stated in the category, the domain, and the dimension if the starting point is the theoretical bases of the leadership construct from a scientific point of view.

Table 3  
 Cronbach's alpha values by GRIII factor and CFA values in model 1

Model 1	Reliability values	Values in the factorial model fit			
Category	Alpha	CMIN/DF	GFI	CFI	RMSA
Model total	0.924	4.069	0.485	.454	0.08
Work environment	0.624				
Factors specific to the activity	0.759				
Organization of working time	0.669				
Leadership and relationships at work	0.913				
Organizational environment	0.774				

Source: created by the author

In this model 1 (Table 3), the reliability value Omega was not included as an additional analysis to the calculation of Alpha since the original model of the GRIII was replicated. Furthermore, since it does not present concatenations (links between errors), the Omega is not relevant (Viladrich et al., 2017). However, the model proposed in the present work (Table 4) eliminated some items and dimensions that were not significant, in addition to incorporating concatenations (Figure 1), so the Omega was integrated. The latter model showed adequate absolute goodness-of-fit indices, whose values  $\leq 3$  are considered a good fit (Jöreskog & Sörbom, 1981) and Cronbach's alpha and Omega coefficients, as seen in Table 4.

Table 4  
 GRIII alpha and omega by factor and CFA values in Model 2

Model 2	Reliability values		Values in the factorial model fit			
	Alpha	Omega	CMIN/DF	GFI	CFI	RMSA
Model total	0.924	0.926	2.68	0.654	0.722	0.066
Work environment	0.624	0.771				
Factors specific to the activity	0.759	0.819				
Organization of working time	0.669	0.788				
Leadership and relationships at work	0.921	0.929				
Organizational environment	0.8204	0.856				

Source: created by the author

It is recommended that the company use other instruments and methodologies to identify and evaluate the PSRFs, considering the items and dimensions which were excluded according to the statistical results. The results on the construct validity of the GRIII of the NOM-035-STPS-2018 indicate that the instrument alone is not sufficient to address all the Psychosocial Risk Factors proposed by the standard; therefore, its application must be evaluated with ethical and scientific rigor, particularly the results of the dimension of a poor relationship with supervised employees, of the work relationships domain belonging to the category Leadership and work relationships (although they are kept in the model for a better fit), and the dimension of emotional and psychological burdens of the workload domain of the category activity-specific factors.

Evaluating these dimensions with other instruments and the rest of the items that were not significant is suggested. These results put the scientific discussion on the validity of the instruments proposed by NOM-035-STPS-2018 in context.

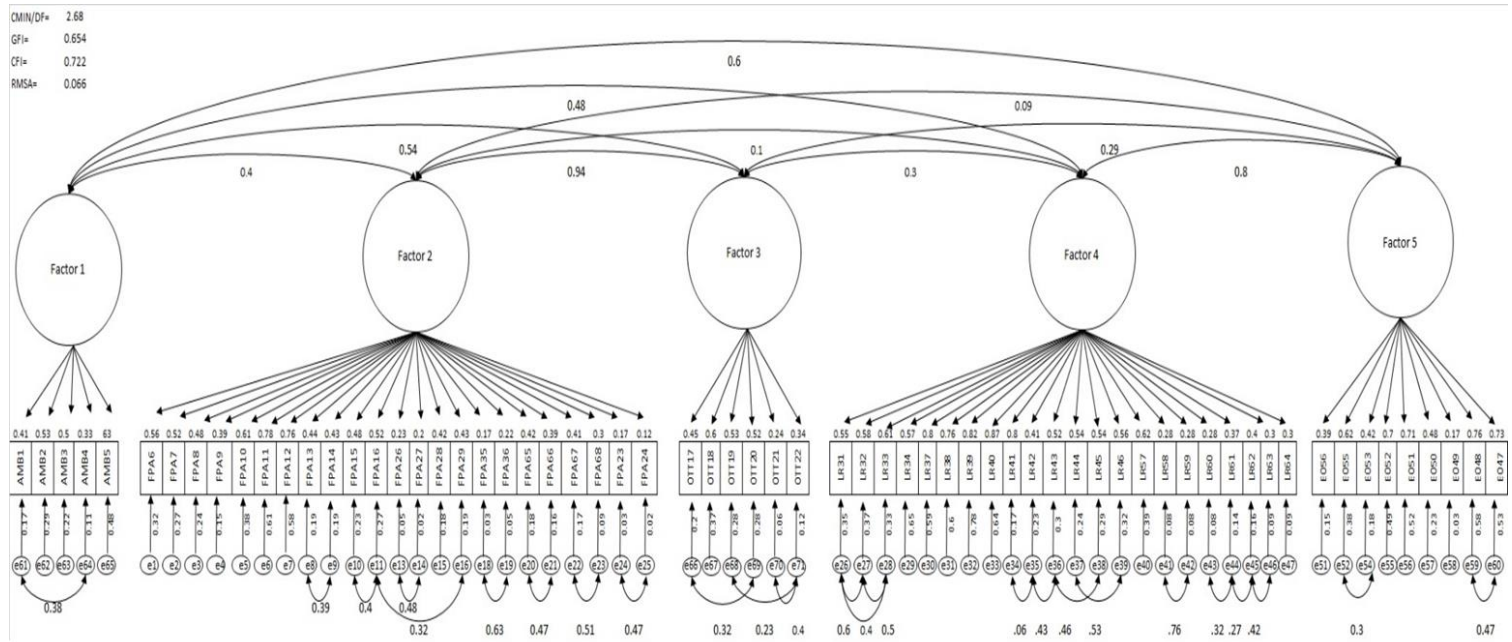


Figure 1. CFA of model 2 of NOM-035-STPS-2018

Note: Factor 1 = Work environment; Factor 2 = Activity-specific factors; Factor 3 = Organization of working time; Factor 4 = Leadership and work relationships; Factor 5 = Organizational environment

Source: created by the author

## Discussion

According to Arias-Galicia (2018), psychological instruments in the organizational area in Mexico should be improved. The rigorousness protocols regarding the theoretical approaches that support the instruments, the evidence of reliability, validity, biases, and shortcomings, and the interpretation of results in a contextualized manner should constitute principles to develop an effective use with scientific rigor of the techniques being proposed. This study aims to evaluate the validity of the scale's psychometric properties for the Identification of Psychosocial Risk Factors and Evaluation of the Organizational Environment proposed by NOM-035-STPS-2018 in Mexico.

Currently, there are not enough studies to compare these results and triangulate the information obtained in order to generate final proposals on the instrument. Only two studies (which constitute the most important direct antecedent of this research) highlight that reliability is relevant for instrument measurement and that the STPS has proposed NOM-035-STPS-2018 without providing the instrument's psychometric properties and suggests its application throughout the country. The questionnaire was analyzed psychometrically to propose improvements to the STPS, and it is recognized in both research reports that there are no valid instruments to measure psychosocial factors jointly in Mexico. Therefore, there is no Mexican theoretical framework to support the NOM-035-STPS-2018 proposed by the STPS. The proposal is perceived as strictly pragmatic, as research intended to criticize and propose improvements with an exploratory scope (Uribe et al., 2019; Littlewood-Zimmerman et al., 2020).

Given these results, it is considered pertinent to present, in the theoretical-methodological aspect, evaluations regarding the application of the GRIII in this specific company:

1. The STPS has not disclosed the psychometric properties of the GRIII, which raises questions about the instrument's validity from a psychometric perspective (Uribe et al., 2019). However, the authors of this study value the rigorous work in the development of the proposal carried out by the STPS to identify, evaluate, control, and reduce FRPS in Mexican organizations.

2. Starting from the CFA carried out in this study, it coincides with Uribe et al. (2019) in the need to eliminate items in order to redesign the instrument to have an appropriate and culturally relevant version for the labor conditions of Mexican companies.

3. As specific contributions of the present work, it should be noted that in the case of the company under study, CFAs are recommended to delimit, according to the results, the methodological and practical strategies to be followed if some dimensions are not valid. In this research, specifically in the dimension of deficient relationship with supervised collaborators, of the work relationships domain of the Leadership and social relationships at work category and in the dimension of emotional and psychological burdens of the workload domain of the activity factors category, it is suggested to work with qualitative or quantitative methods that make possible the evaluation of these dimensions. The use



of the Multifactor Leadership Questionnaire (MLQ) can be proposed to the company as an alternative for evaluating leadership and its styles. Mendoza (2005) validated this instrument in Mexico and had results validated in several companies; therefore, it can be a starting point for designing specific intervention programs focused on the relationship between company managers and subordinates. Psychological interviews and focus groups can be useful for understanding the organization's employees' emotional and psychological burdens. Regarding the items that were not significant, it is necessary to know what the workers understood and whether there were difficulties in answering them. This result can be investigated through discussion groups and group interviews. It is important to note that NOM-035-STPS-2018 also proposes qualitative methods.

4. In addition, when redesigning the evaluation instrument, in accordance with what is indicated in numeral 7.5 of NOM-035-STPS-2018, it is recommended to establish a process of discussion of the questionnaires before applying them and that this makes it possible to gain clarity as to what is to be measured by the evaluators and in accordance with what is understood by the workers according to the characteristics of the companies to be studied. The latter is to evaluate and contrast quantitative and qualitative results according to the possible biases of the GRIII in accordance with authentic situations and business contexts.

5. The reality of organizations in a VUCA world, characterized by constant change, complex social relations, and psychosocial risks derived from work, implies considering the instruments in terms of validity and reliability according to the application contexts. In general, it is not idle to say that the instrument has psychometric properties that should be studied in different organizations to contrast results and improve the evaluation processes of psychosocial risk factors in Mexican companies. This constitutes a governmental priority, which has become prominent in this standard; however, it requires rigorousness in matters of refutability to guarantee a scientific framework that enables Mexican institutions to preserve the occupational health of workers. Therefore, there is a need for research with results where the efficiency, effectiveness, and efficacy of the application of NOM-035-STPS-2018 are scientifically demonstrated from its theoretical, methodological, and technical-instrumental proposal and concerning the prevention of psychosocial risks in business contexts in Mexico.

It is assumed that the results obtained are part of a complex process of research and measures that are under construction to identify, control, intervene, and reduce PSRFs in this particular company in northern Mexico, considering the validity criteria of the instrument applied critically and proactively in terms of scope and limitations.

The need for studies in other contexts is recommended, as well as to assess replicability in terms of improving the application processes of the instrument and the possible results that should be subject to criteria of reliability, trustworthiness, and validity in order to address PSRFs in Mexican companies. The

authors of this study recognize the difficulty of finding national scientific reports that make it possible to contrast results and propose, if necessary, improvements to the necessary and useful proposal of the STPS in NOM-035-STPS-2018.

## Conclusions

The results on the construct validity GRIII of the NOM-035-STPS-2018 determine that the instrument alone is not sufficient to address all the Psychosocial Risk Factors that NOM-035-STPS-2018 proposes; therefore, at least in this company, the dimensions of a poor relationship with supervised collaborators, of the work relationships domain of the category Leadership and work relationships, and the dimension emotional and psychological burdens of the workload domain of the category activity factors should be evaluated with ethical and scientific rigor. It is suggested that the dimensions of a poor relationship with supervised collaborators of the category Leadership and work relationships and the dimension emotional and psychological burdens of the workload domain of the category activity factors, and non-significant items be evaluated with other instruments or methodologies, such as focus groups and psychological interviews, to gain clarity regarding what is to be measured by the evaluators and what is understood by the workers in the companies. It is necessary to triangulate quantitative and qualitative results and to evaluate the possible biases of the GRIII according to authentic situations and business contexts. It is considered pertinent to state that similar studies should become more prominent from a political and scientific point of view to contrast and discuss contributions in order to improve the instruments proposed by the STPS in NOM-035-STPS-2018.

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