Revista Iberoamericana para la Investigación y el Desarrollo Educativo
ISSN 2007 - 7467

https://doi.org/10.23913/ride.v12i24.1223

Artículos científicos

Norma Oficial Mexicana 035, Factores de riesgo psicosocial en el trabajo: validación del dominio relaciones en el trabajo

Mexican Standard 035, Psychosocial Risk Factors at Work: A Dimensional Validation for the Work's Relationships Dominium

Norma Oficial Mexicana 035, Fatores de risco psicossocial no trabalho: validação do domínio relações de trabalho

Mónica Gabriela Gutiérrez Hernández
Tecnológico Nacional de México, Instituto Tecnológico de Ciudad Juárez, México
monica.gh@cdjuarez.tecnm.mx
https://orcid.org/0000-0003-4866-4933

Rosa María Reyes Martínez
Tecnológico Nacional de México, Instituto Tecnológico de Ciudad Juárez, México
rosyreyes2001@yahoo.com
https://orcid.org/0000-0003-4950-5045

Jorge De La Riva Rodríguez
Tecnológico Nacional de México, Instituto Tecnológico de Ciudad Juárez, México
jriva@itcj.edu.mx
https://orcid.org/0000-0001-8402-0065

Aidé Aracely Maldonado Macias
Tecnológico Nacional de México, Instituto Tecnológico de Ciudad Juárez, México
amaldona@uacj.mx
https://orcid.org/0000-0002-4959-161X

Revista Iberoamericana para la Investigación y el Desarrollo Educativo
ISSN 2007 - 7467

Humberto García Castellanos
Tecnológico Nacional de México, Instituto Tecnológico de Ciudad Juárez, México
humber.gc@cdjuarez.tecnm.mx
https://orcid.org/0000-0002-4684-4888

Resumen

El objetivo de este trabajo fue validar la confiabilidad y validez estadística de la NOM-035-STPS-2018, en específico del dominio Relaciones en el trabajo. Metodológicamente, se aplicó la Guía de Referencia III para recopilar datos mediante un muestreo no probabilístico en tres compañías automotrices de Ciudad Juárez, México. En total, 250 supervisores respondieron el instrumento. En primer lugar, se verificó la confiabilidad mediante el alfa de Cronbach y alfa ordinal. Posteriormente se realizó la prueba de Kaiser-Meyer-Olkin (KMO) y Bartlett. Entre los resultados, el dominio Relaciones en el trabajo obtuvo un alfa de Cronbach de 0.913, mientras que las dimensiones "Relaciones sociales en el trabajo" y "Deficiente relación con los colaboradores que supervisa" obtuvieron valores de este indicador de 0.879 y 0.975, respectivamente. Por otro lado, el alfa ordinal obtuvo valores superiores a 0.90 en las dos dimensiones. El KMO obtenido fue de 0.838 y la prueba de Bartlett resultó ser significativa (p = 0.000). En consecuencia, el análisis factorial exploratorio extrajo los dos factores propuestos por la norma. Dichos factores contribuyen a 79.11 % de la varianza acumulada. El análisis factorial confirmatorio mostró un buen ajuste del modelo. En conclusión, el instrumento y las dimensiones propuestas pueden ser utilizados como herramienta de evaluación para medir el factor psicosocial Relaciones en el trabajo (dominio de la NOM-035), ya que muestran valores aceptables en términos de confiabilidad estadística.

Palabras clave: confiabilidad, factores psicosociales, relaciones en el trabajo, validez.

Abstract

The objective of this work was to validate the reliability and statistical validity of the NOM-035-STPS-2018, specifically in the domain Relations at work. Methodologically, Reference Guide III was applied to collect data through non-probabilistic sampling in three automotive companies in Ciudad Juárez, Mexico. In total, 250 supervisors responded to the instrument.

First, reliability was verified using Cronbach's alpha and ordinal alpha. Subsequently, the Kaiser-Meyer-Olkin (KMO) and Bartlett test was performed. Among the results, the Relationships at work domain obtained a Cronbach's alpha of 0.913, while the dimensions "Social relationships at work" and "Poor relationship with the collaborators supervised" obtained values of this indicator of 0.879 and 0.975, respectively. On the other hand, the ordinal alpha obtained values higher than 0.90 in both dimensions. The KMO obtained was 0.838 and the Bartlett test was found to be significant (p = 0.000). Consequently, the exploratory factor analysis extracted the two factors proposed by the standard. These factors contribute to 79.11 % of the accumulated variance. Confirmatory factor analysis showed a good fit of the model. In conclusion, the instrument and the proposed dimensions can be used as an evaluation tool to measure the psychosocial factor Relations at work (domain of NOM-035), since they show acceptable values in terms of statistical reliability.

Keywords: reliability, psychosocial factors, relationships at work, validity.

Resumo

O objetivo deste trabalho foi validar a confiabilidade e validade estatística da NOM-035-STPS-2018, especificamente no domínio Relações no trabalho. Metodologicamente, o Guia de Referência III foi aplicado para coletar dados por meio de amostragem não probabilística em três empresas automotivas em Ciudad Juárez, México. No total, 250 supervisores responderam ao instrumento. Primeiramente, a confiabilidade foi verificada por meio do alfa de Cronbach e alfa ordinal. Posteriormente, foi realizado o teste de Kaiser-Meyer-Olkin (KMO) e de Bartlett. Dentre os resultados, o domínio Relacionamentos no trabalho obteve alfa de Cronbach de 0,913, enquanto as dimensões “Relacionamentos sociais no trabalho” e “Relação ruim com os colaboradores supervisionados” obtiveram valores desse indicador de 0,879 e 0,975, respectivamente. Por outro lado, o alfa ordinal obteve valores superiores a 0,90 em ambas as dimensões. O KMO obtido foi de 0,838 e o teste de Bartlett foi significativo (p = 0,000). Consequentemente, a análise fatorial exploratória extraiu os dois fatores

propostos pela norma. Esses fatores contribuem com 79,11% da variância acumulada. A análise fatorial confirmatória mostrou um bom ajuste do modelo. Em conclusão, o instrumento e as dimensões propostas podem ser utilizados como ferramenta de avaliação para mensurar o fator psicossocial Relações no trabalho (domínio do NOM-035), pois apresentam valores aceitáveis em termos de confiabilidade estatística.

Palavras-chave: confiabilidade, fatores psicossociais, relações de trabalho, validade.

Fecha Recepción: Noviembre 2021 **Fecha Aceptación:** Mayo 2022

Introduction

Globalization has brought with it considerable changes both in labor relations and in the organizational characteristics of work centers (Paoli, 1993). These changes have a direct impact on the health of workers, due to the increase in work demands and commitments, coupled with the increase in job instability that places psychosocial factors at work as a priority for occupational health (Zelaschi and Figari, 2010; Zelaschi, Cornelio, Reif and Amable, 2021). In fact, ergonomic risk factors such as non-neutral postures, use of excessive force, high repetitiveness of movements, long hours, lack of recovery periods, among others, have lost proportionality compared to those of a psychosocial nature, according to the Center for Applied Ergonomics [Cenea] (2021). These factors are present in both product and service companies, since the latter have had a growing development today.

In addition, in recent decades it has been possible to demonstrate the relationship between psychosocial factors at work and workers' health. Exposure to this type of risk factors affects various aspects of health such as psychosomatic disorders and illnesses (Landsbergis and Theorell, 2000). Also, it has been shown that they not only affect mental health, but also manifest themselves comprehensively through various phenomena of the

health-disease process, for example, musculoskeletal problems (Cardoso, Araújo, Carvalho, Fernandes and Farias, 2011). and cardiovascular (Gómez and Moreno, 2009), so it is important to address them as part of public health.

In an effort to prevent these health problems, various models have been developed for the study of psychosocial factors at work, which have shown that exposure to them cuts across occupations. In other words, it is independent of the content of the tasks since they are directly related to the organizational characteristics that companies adopt in search of productivity (Benzoni, 2018). This is because they create inadequate working conditions that lead to absenteeism, workplace accidents, material waste, poor performance, and decreased productivity, all of which raise economic costs (Güilgüiruca, Meza, Góngora, and Moya, 2015).

Therefore, the evaluation of psychosocial factors at work is a necessity that requires legal support whose objective is to prevent what compromises the health of workers (Zelaschi et al., 2021). On the other hand, it is important that the instruments used meet the desirable reliability and validity criteria. While reliability refers to the degree to which an instrument measures what it should measure, validity proves that the instrument measures what it wants to measure (Carvajal, Centeno, Watson, Martínez, & Sanz, 2011). The research focused on the analysis of the reliability and validity of the instruments is intended to ensure that they comply with the theoretical and cultural foundation of the population to be studied (Torres, Vega, Vinalay, Arenas and Rodríguez, 2015).

In this sense, the study of psychosocial factors in Mexico presents challenges due to the scarcity and inconsistency of information that make it difficult to establish priorities in public policies. And for this reason, it was not an easy task for the Ministry of Labor and Social Welfare (STPS) to approve and apply the Official Mexican Standard NOM-035-STPS-2018, Psychosocial risk factors, identification and prevention.

Now, within the obligations of the employer stipulated in the regulations in question, Moreno (2018) highlights that of identifying these factors and risks, evaluating, preventing and controlling them. To do this, the regulations include an instrument that allows measuring psychosocial risk factors and the organizational environment through 72 items. These are distributed through five categories: 1) Work environment, 2) Factors of the activity, 3) Organization of work time, 4) Leadership and relationships at work and 5) Organizational environment, which make up their time ten domains: 1) Conditions in the work environment, 2) Workloads, 3) Lack of control over work, 4) Work shifts, 5) Interference in the work-family relationship, 6) Leadership, 7) Relations at work, 8) Violence, 9) Recognition of performance and 10) insufficient sense of belonging and instability at work (STPS, October 23, 2018).

To date, the few studies that evaluate the validity and statistical reliability of the norm show discrepancies in their results, both by category and by domains. For example, Uribe, Gutiérrez and Amézquita (2020) evaluated the instrument by domain, and although the reliability corresponding to Relations at work —which is what interests us here— was 0.87 (Cronbach's alpha), it does not meet the criteria Statistical fit in confirmatory factor analysis (CFA) using structural equation modeling proposed by Hoyle (2012). On the other hand, in the study by Brito, Soto and Lago (2021), only the global reliability of the instrument is documented with 0.91 (Cronbach's alpha), that is, it omits the reliability by categories and domains.

Therefore, due to these contrasting results in terms of validity, this research focuses particularly on the Relations at work domain and on the two dimensions in which it is dissected: "Social relations at work" and "Poor relationship with the collaborators he supervises. The first evaluates the relationship with your work team, while the second dimension takes into account the relationship with your subordinates. Regarding the former, there is evidence that the motivation and commitment of employees are influenced by

interpersonal relationships within the work team (Salanova, Llorens, Cifre and Martínez, 2012). Regarding the latter, studies have determined that workers also respond to factors present in the relationship with their superiors, that is, the leader or leaders (Salanova, Rodríguez y Nielsen, 2022; Sivanathan, Arnold, Turner y Barling, 2004; Tee, 2015).

Based on the above, the general objective of this article is to analyze the validity of the construct and the reliability of the Relationships domain at work proposed in Reference Guide III, included in NOM-035-STPS-2018. It should be noted that the guide in question revolves around the identification and analysis of psychosocial risk factors and evaluation of the organizational environment in workplaces with more than 50 workers.

Materials and methods

Materials

Reference Guide III included in NOM-035-STPS-2018 was used as an instrument to collect data. This consists of five categories, from which 10 domains emerge and from these, in turn, 25 dimensions. In total, the instrument is made up of 72 items. For the development of this research, only the items that make up the Relationships at Work domain were used.

This domain is evaluated through two dimensions: "Social relationships at work" and "Poor relationship with the collaborators you supervise". For the first, a five-point Likert-type scale is used with the following equivalences: 0 = Always, 1 = Almost always, 2 = Sometimes, 3 = Almost never and 4 = Never. And for the second the same scale is used, but inverted. The database was analyzed using IBM SPSS Statistics version 22 software.

Population and sample

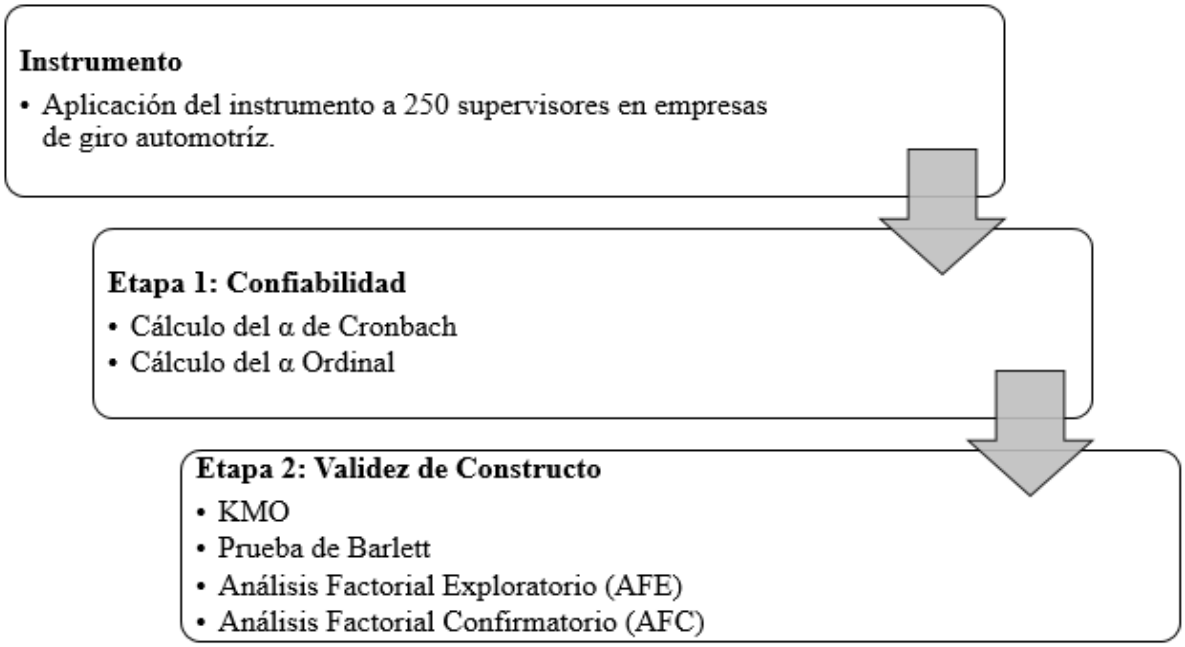
The sample was obtained using a non-probabilistic method. The people who participated in the study were 250 supervisors, who at the time of applying the instrument worked in three automotive companies located in Ciudad Juárez, Chihuahua. This sample size is sufficient to obtain reliable conclusions from the factorial analysis, since there are 10

responses for each item (Morales, 2012). The participants were interviewed in the period from August 2018 to May 2019.

Methods

The applied methods were developed to verify the fundamental characteristics of reliability based on the methodology proposed by Zelaschi et al. (2021) and Realyvásquez, García and Blanco (2016). Figure 1 displays this methodology.

Figura 1. Etapas para validación de un instrumento



Fuente: Elaboración propia

Stage 1. Reliability analysis

Rodríguez and Reguant (2020) state that reliability is a quality characteristic of an instrument, since it refers to the precision with which it measures the variables of interest. To this end, various indicators have been proposed. Among the most common is Cronbach's alpha. This allows estimating reliability from the correlation matrix between the items of the instrument (Barrios and Cosculluela, 2013). On the other hand, when the assumptions for the

use of Cronbach's alpha are not met, such as, for example, when there are binary response scales or Likert scales with a number equal to or less than five response options, another valid alternative is the ordinal alpha (Zumbo, Gadermann and Zeisser, 2007). Such is the case of this instrument, which, although it has five response options, the sample does not meet the assumption of normality.

The difference between ordinal alpha and Cronbach's alpha is that the former is calculated from a polychoric matrix, in addition to being an unbiased estimator. Therefore, it becomes the most appropriate estimator when working with ordinal data. It should be noted that despite the fact that several studies have suggested it, its use is still less with respect to Cronbach's alpha (Elosua and Zumbo, 2008; Gadermann, Guhn and Zumbo, 2012; Zumbo et al., 2007). For this reason, it was decided to perform the calculation with both Cronbach's alpha and ordinal alpha, so that both indicators are considered valid.

Stage 2. Factor analysis

The relevance of factor analysis was evaluated using the determinant of the correlation matrix, Bartlett's sphericity test, and the Kaiser-Meyer-Olkin (KMO) index. Exploratory factor analysis (EFA) was used to determine the number of factors and their composition. It is worth mentioning that the resulting factors correspond to the number of dimensions that constitute the domain.

Factor extraction was achieved through the use of principal components. Factors whose eigenvalue was greater than one were extracted. While the initial matrix was rotated using the orthogonal varimax method, which provides the clearest factor separation (Hair, Black, Babin, & Anderson, 2014) and, being independent of distributional assumptions, is less likely to produce inappropriate solutions. (Fabrigar, Wegener, MacCallum y Strahan, 1999).

Results

Sample Characteristics

The sample consisted of 250 supervisors, whose ages ranged between 30 and 55 years (mean ± SD: 35.08 ± 6.231), of which 38.56% were women and 61.44% men. Based on the above, it can be concluded that the sample does not have a normal distribution.

Results of Stage 1. Analysis of reliability and validity

To use instruments, scales and tests, it is required that these instruments be valid and reliable. When analyzing reliability using Cronbach's alpha and the ordinal alpha of the category, domain and both dimensions, values greater than 0.90 were obtained, which indicates that said domain has excellent internal consistency (table 1).

Tabla 1. Valores de confiabilidad

	Categoría Liderazgo y relaciones en el trabajo	Dominio Relaciones en el trabajo	Dimensión Relaciones sociales	Dimensión Mala relación con los subordinados
α de Cronbach	0.918	0.913	0.879	0.975
α ordinal	0.982	0.985	0.936	0.980

Fuente: Elaboración propia

Results of Stage 2. Factor Analysis

The purpose of the AFE was to demonstrate whether the structure of the resulting instrument coincided with what was proposed in the standard. Before carrying out the analysis, its feasibility was demonstrated and the results were significant in all cases. First of all, the determinant was 1.35563×10^(-4) for the correlation matrix, which is statistically different from zero. This indicates that there are variables with high correlation, so the

analysis is feasible. Additionally, Bartlett's sphericity test provided an identity matrix and yielded an approximate value of 2140.767, with 36 degrees of freedom and a p-value of 0.000. In this case, the null hypothesis is rejected, indicating that the correlation matrix is statistically different from the identity matrix. Finally, the KMO test used to determine if the sample is adequate gave a value of 0.838, which indicates an acceptable relationship between the variables (Kaiser and Rice, 1974).

On the other hand, the measurement of sampling adequacy (MSA), in which the results of each variable in the anti-image correlation matrix are examined, showed that all exceed the threshold value of 0.5 (Hair et al., 2014), which indicates that the reduction of the variables is adequate. The satisfactory results obtained at this stage guarantee that this database is suitable for performing factor analysis.

The EFA was carried out with the nine items that make up the Relationships at Work domain. Two factors (dimensions) whose values were 3,794 and 3,354, respectively, were extracted. Together, they represent 79.426% of the total explained variance. Due to the coincidence found with the grouping of the elements in the present sample, the resulting dimensions are named according to the original scale (Maslach, Schaufeli y Leiter, 2001).

Table 2 presents the variables that make up each factor considering a minimum value of 0.4 to determine the influence of the element on said factor. The grouping of the variables in the factors was clear in terms of the load, so no ambiguity was found to determine the factor to which they would belong.

Tabla 2. Matriz rotada de los componentes y comunalidades

Ítem		Factores		
		Colaboración	Social	Comunalidades
42	Puedo confiar en mis compañeros de trabajo.		0.782	0.614
43	Entre compañeros solucionamos los problemas de trabajo de manera respetuosa.		0.823	0.687
44	En mi trabajo me hacen sentir parte del grupo.		0.801	0.642
45	Cuando tenemos que realizar trabajo en equipo los compañeros colaboran.		0.879	0.777
46	Mis compañeros de trabajo me ayudan cuando tengo dificultades.		0.836	0.701
69	Comunican tarde los asuntos de trabajo.	0.970		0.941
70	Dificultan el logro de los resultados del trabajo.	0.968		0.938
71	Cooperan poco cuando se necesitan.	0.962		0.925
72	Ignoran las sugerencias para mejorar su trabajo.	0.961		0.923
	% Varianza	42.157	37.269	
	% Varianza total acumulada	42.157	79.426	

Fuente: Elaboración propia

According to the results, the factor corresponding to "Social relationships at work" is made up of items 42 to 46, which evaluate the relationship you have with your co-workers. While the factor "Poor relationship with the collaborators he supervises" is made up of items 69 to 72, which refer to the little collaboration of his subordinates.

Once the significant load is identified, the analysis of the communities shows the extent to which one element is correlated with the others; y represents the amount of deviation explained for the factorial model in terms of each variable.

On the other hand, the CFA evaluates the quality of the results whose objective is to corroborate the validity of the conclusions obtained (Hair et al., 2014). In particular, this analysis is intended to confirm whether the domain related to relationships at work meets the statistical parameters.

Discussion

Currently, Mexico lacks a theoretical framework related to the instrument proposed by the STPS (Juárez, 2015). Therefore, the objective of this study was to validate the Relationships at Work domain included in NOM-035-STPS-2018 through different psychometric tests. First, reliability was analyzed using Cronbach's alpha and ordinal alpha. For the category Leadership and relationships at work, a Cronbach's alpha of 0.918 and an ordinal alpha of 0.982 were obtained, while for the Relationships at Work domain it was a Cronbach's alpha of 0.913 and an ordinal alpha of 0.985, which represents evidence of construct reliability. The results coincide with those obtained by Brito et al. (2021) and Uribe et al. (2020).

Similarly, the AFE determined two well-defined factors that evaluate relationships at work from two points of view: "Social relationships at work" and "Poor relationship with the collaborators you supervise." These results were later subjected to a CFA; thus, the robustness of the factorial structure obtained was guaranteed.

However, despite this being the third study that addresses the validity of the standard, it is important to mention that, in terms of the global validation of the instrument, following Uribe et al. (2020), the goodness-of-fit indices were not met in several of the categories when evaluating them through structural equation modeling, among which is the category Leadership and relationships at work, so even more analysis of validation.

Conclusions

Based on the results presented, it is concluded that the measurement instrument proposed by the standard for the evaluation of the Relationships at Work domain is reliable and valid in supervisors of automotive manufacturing companies located in Ciudad Juárez, Chihuahua. In this sense, it can be affirmed that the proposed objective was fulfilled. Thus, there is statistical evidence to affirm that this instrument can be used for the diagnosis of relationships at work, and thus develop new studies that facilitate the implementation of interventions whose objective is to improve the levels of well-being and performance in workers.

In the international context, the International Labor Organization (ILO) declared that, while some risks in the workplace have decreased, others derived from new health conditions related to work and without the application of adequate prevention measures have increased. , protection and control. Psychosocial risk factors are included among these emerging risks in the workplace.

Therefore, the creation and application of public policies focused on guaranteeing the well-being of workers is necessary. In other words, psychosocial factors are present in the workplace and, therefore, it requires the commitment of the parties involved (Government, companies and workers) to establish and develop action plans with the objective of decent work.

Future lines of research

This work is part of an effort by researchers to contribute to the formation of the theoretical framework on the current norm in Mexico. As a result of this study, several opportunities to develop future research have been detected, such as:

1) Evaluate the instrument by modeling structural equations to confirm the suitability of the proposed variables to evaluate the domain.

2) Evaluate the measurement instrument both in manufacturing companies of other types of business and in companies dedicated to providing services.

3) Validate the rest of the domains proposed by the standard.

4) Evaluate the suitability of the instrument through second-order modeling, taking the five proposed categories as a reference.

References

Barrios, M. y Cosculluela, A. (2013). *Fiabilidad*. Barcelona, España: Universidad Oberta de Catalunya. Recuperado de http://openaccess.uoc.edu/webapps/o2/bitstream/10609/69325/3/Psicometr%c3%ada_M%c3%b3dulo%202_%20Fiabilidad.pdf.

Benzoni, P. E. (2018). A influência do estresse na condição de afastamento do trabalho por distúrbios osteomusculares. *Gerais: Revista Interinstitucional de Psicologia*, *11*(2), 294-305.

Brito, J. F., Soto, G. y Lago, A. (2021). Validación y consistencia interna del cuestionario para identificar los factores de riesgo psicosocial de la NOM-035-STPS-2018 en centros de trabajo ubicados en México. Recuperado de http://portaldeinvestigacion.ula.edu.mx/investigacion/index.php/validacion-y-consistencia-interna-del-cuestionario-para-identificar-los-factores-de-riesgo-psicosocial-de-la-nom-035-stps-2018-en-centros-de-trabajo-ubicados-en-mexico.

Cardoso, J. P., de Araújo, T. M., Carvalho, F. M., Fernandes, N. e Farias, E. J. (2011). Aspectos psicossociais do trabalho e dor musculoesquelética em professores. *Cadernos de Saúde Pública*, *27*(8), 1498-1506.

Carvajal, A., Centeno, C., Watson, R., Martínez, M. y Sanz, A. (2011). ¿Cómo validar un instrumento de medida de la salud? *Anales del Sistema Sanitario de Navarra, 34*(1), 63-72. Recuperado de http://scielo.isciii.es/pdf/asisna/v34n1/revision1.pdf.

Centro de Ergonomía Aplicada [Cenea]. (20 de abril de 2022). ¿Qué son los riesgos ergonómicos? Guía definitiva. Recuperado de https://www.cenea.eu/riesgos-ergonomicos/.

Elosua, P. y Zumbo, B. (2008). Coeficientes de fiabilidad para escalas de respuesta categórica ordenada. *Psicothema*, *20*(4), 896-901. Recuperado de http://www.psicothema.com/psicothema.asp?id=3572.

Fabrigar, L., Wegener, D., MacCallum, R. and Strahan, E. (1999). Evaluating the Use of Exploratory Factor Analysis in Psychological Research. *Psychological Methods*, *4*(3), 272-299. Retrieved from http://www.personal.psu.edu/jxb14/M554/articles/Fabrigaretal1999.pdf.

Gadermann, A., Guhn, M. and Zumbo, B. (2012). Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Practical Assessment, Research & Evaluation, 17*. Retrieved from https://doi.org/10.7275/n560-j767.

Gómez, V. y Moreno, L. (2009). Factores psicosociales del trabajo (demanda-control y desbalance esfuerzo-recompensa), salud mental y tensión arterial: un estudio con maestros escolares en Bogotá, Colombia. *Universitas Psychologica*, *9*(2), 393-407. Recuperado de http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1657-92672009000200008.

Güilgüiruca, M., Meza, K., Góngora, R. y Moya, C. (2015). Factores de riesgo psicosocial y estrés percibido en trabajadores de una empresa eléctrica en Chile. *Medicina y Seguridad del Trabajo, 61*(238). Recuperado de https://doi.org/10.4321/S0465-546X2015000100006.

Hair, J. F., Black, W. C., Babin, B. J. and Anderson, R. E. (2014). *Multivariate Data Analysis* (7th ed.). United States: Pearson Education Limited.

Hoyle, R. (2012). *Manual de modelado de ecuaciones estructurales.* Prensa Guilford.

Juárez, A. (2015). *Investigaciones psicométricas de escalas psicosociales en trabajadores mexicanos*. México: Universidad Autónoma del Estado de Morelos / Plaza y Valdés. Recuperado de https://www.researchgate.net/publication/297763387_Investigaciones_psicometricas_de_escalas_psicosociales_en_trabajadores_mexicanos.

Kaiser, H. and Rice, J. (1974). Little Jiffy, Mark IV. *Educational and Psychological Measurement, 34*, 111-117.

Landsbergis, P. y Theorell, T. (2000). Medición de variables de exposición psicosocial en el lugar de trabajo. *Medicina del Trabajo, 15*(1), 7-68.

Maslach, C., Schaufeli, W. and Leiter, M. (2001). Job Burnout. *Annual Review of Psychology, 52,* 397-422. Retrieved from https://doi.org/10.1146/annurev.psych.52.1.397.

Morales, P. (2012). Estadística aplicada a las Ciencias Sociales Tamaño necesario de la muestra: ¿Cuántos sujetos necesitamos? Recuperado de http://data.evalua.cdmx.gob.mx/docs/gral/taller2015/S0202EAC.pdf.

Moreno, J. D. (2018). Marco legal de los factores de riesgo psicosocial. Recuperado de http://imss.gob.mx/sites/all/statics/salud/estreslaboral/1erjornada/02-Marco-Legal.pdf.

Paoli, P. (1993). *Primera encuesta europea sobre el entorno de trabajo 1991-1992*. Luxemburgo: Oficina de Publicaciones de la Unión Europea. Recuperado de https://www.eurofound.europa.eu/publications/report/1993/working-conditions/first-european-survey-on-the-work-environment-1991-1992.

Realyvásquez, A., García, J. L. y Blanco, J. (2016). Desarrollo y validación de un cuestionario de compatibilidad macroergonómica. *Contaduría y*

Administración, *61*(3), 478-498. Recuperado de https://doi.org/10.1016/j.cya.2016.04.002.

Rodríguez, J. y Reguant, M. (2020). Calcular la fiabilidad de un cuestionario o escala mediante el SPSS: el coeficiente alfa de Cronbach. *REIRE: Revista D´Innovació i Recerca en Educació*, *13*(2). Recuperado de https://doi.org/10.1344/reire2020.13.230048.

Salanova, M., Llorens, S., Cifre, E. and Martínez, I. M. (2012). We Need a Hero! Toward a Validation of the Healthy and Resilient Organization (HERO) Model. *Group & Organization Management*, *37*(6), 785-822. Retrieved from https://doi.org/10.1177/1059601112470405.

Salanova, M., Rodríguez, A. M. and Nielsen, K. (202). The impact of group efficacy beliefs and transformational leadership on followers' self-efficacy: A multilevel-longitudinal study. *Current Psychology*, *41*(4), 2024-2033. Retrieved from https://doi.org/10.1007/s12144-020-00722-3.

Secretaría del Trabajo y Previsión Social [STPS]. (23 de octubre de 2018). Norma Oficial Mexicana NOM-035-STPS-2018, Factores de riesgo psicosocial en el trabajo-Identificación, análisis y prevención. *Diario Oficial de La Federación*. Recuperado de https://dof.gob.mx/nota_detalle.php?codigo=5541828&fecha=23%2F10%2F2018.

Sivanathan, N., Arnold, K. A., Turner, T. and Barling, J. (2004). Leading Well: Transformational Leadership and Well-Being. In Linley, P. A. and Joseph, S. (eds.), *Positive Psychology in Practice* (pp. 241-255). United States: John Wiley & Sons. Retrieved from https://www.researchgate.net/publication/232553222_Leading_Well_Transformational_Leadership_and_Well-Being#fullTextFileContent.

Tee, E. Y. J. (2015). The emotional link: Leadership and the role of implicit and explicit emotional contagion processes across multiple organizational levels. *The Leadership*

Quarterly, *26*(4), 654-670. Retrieved from https://doi.org/10.1016/j.leaqua.2015.05.009.

Torres, M. A., Vega, E. G., Vinalay, I., Arenas, G. y Rodríguez, E. (2015). Validación psicométrica de escalas PSS-14, AFA-R, HDRS, CES-D, EV en puérperas mexicanas con y sin preeclampsia. *Enfermería Universitaria, 12*(3), 122-133.

Uribe, J. F., Gutiérrez, J. C. y Amézquita, J. A. (2020). Crítica a las propiedades psicométricas de una escala de medición de factores de riesgo psicosocial propuesta en la NOM 035 de la STPS en México. *Contaduría y Administración, 65*(1), 1-32. Recuperado de https://doi.org/10.22201/fca.24488410e.2019.1569.

Zelaschi, M. C. y Figari, C. (2010). *Inestabilidad laboral, riesgos psicosociales y padecimientos en el trabajo: caso de los trabajadores operarios metalúrgicos de Villa Constitución.* (Tesis doctoral). Universidad de Buenos Aires, Buenos Aires. Recuperado de http://catalogosuba.sisbi.uba.ar/vufind/Record/http___www_sociales_uba_ar_tesis_ASO00000211/Description#tabnav.

Zelaschi, M. C., Cornelio, C., Reif, L. y Amable, M. (2021). Validación de un cuestionario de riesgos psicosociales en el trabajo en población trabajadora argentina (COPSOQII-ISTAS21). *Revista de Psicología, 20*(2), 2-17. Recuperado de https://doi.org/10.24215/2422572Xe084.

Zumbo, B. D., Gadermann, A. M. and Zeisser, C. (2007). Ordinal Versions of Coefficients Alpha and Theta for Likert Rating Scales. *Journal of Modern Applied Statistical Methods*, *6*(1), 21-29. Retrieved from https://doi.org/10.22237/jmasm/1177992180.

Rol de Contribución	Autor (es)
Conceptualización	Rosa María Reyes Martínez (principal) Jorge de la Riva Rodríguez (apoyo)
Metodología	Mónica Gabriela Gutierrez Hernández (Principal) Kenia Alejandra García Salas Víctor Manuel Ibarra León
Software	Humberto García Castellanos
Validación	Jaime Sánchez Leal
Análisis Formal	Mónica Gabriela Gutiérrez Hernández (principal) Aide Aracely Maldonado Macias Jaime Sánchez Leal
Investigación	Mónica Gabriela Gutierrez Hernández
Recursos	Empresas Manufactureras de giro automotriz, CONACYT
Curación de datos	Aide Aracely Maldonado Macias (principal) Mónica Gabriela Gutiérrez Hernández (que apoya)
Escritura - Preparación del borrador original	Mónica Gabriela Gutierrez Hernández
Escritura - Revisión y edición	Aide Aracely Maldonado Macias (principal) Mónica Gabriela Gutierrez Hernández (que apoya)
Visualización	Aide Aracely Maldonado Macias
Supervisión	Aide Aracely Maldonado Macias
Administración de Proyectos	Tecnológico Nacional de México/ IT ciudad Juárez
Adquisición de fondos	DEPI del Tecnológico de ciudad Juárez