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Psychosocial factors assessment for the mexican standard 035: a validation of the domain of workplace violence in the automotive industry

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Abstract

Objective: To contribute to the statistical validity and submit a confirmatory study of workplace violence, which, due to its high frequency and serious effects, is considered a public health problem in Mexico and throughout the world.
Methodology: This study includes 250 supervisors from the automotive industry. For data collection, the Reference Guide III proposed in NOM-035-STPS-2018 was used. A descriptive analysis of the psychosocial risk was developed, and a reliability analysis was conducted. Additionally, as factor analysis was feasible, the exploratory factor analysis (EFA), average variance extraction (AVE), and discriminant analysis were performed. Finally, the Structural Equation Modeling of the analyzed domain was performed to determine the validity of the construct.
Results: Most of the participants were men (61.44%). Their ages ranged from 30 to 55 years. In addition, 59% of the supervisors in the sample are at high psychosocial risk. The correlation test values were greater than 0,50, while for reliability, both Cronbach's alpha and McDonald's Omega coeffic Evaluación de Factores Psicosociales para la Norma Mexicana 035: Una Validación del Dominio de la Violencia Laboral en la Industria Automotriz ient were greater than 0,90. In addition, the feasibility of factor analysis was ensured, and a single factor was extracted from the EFA, representing 86.073% of the explained variance. Likewise, AVE = 0,8895 was obtained. On the other hand, in the discriminant analysis, the variable related to the participants' companies did not have enough power to differentiate which worker belonged to each. Finally, Structural Equation Modeling confirmed a good fit of the model.
Conclusion: The instrument is valid for measuring workplace violence as a psychosocial risk since its statistical psychometrics were acceptable, and it can be used to identify and measure the level of psychosocial risk derived from workplace violence.

----------Key words: Validation studies; workplace violence; Industry.

Evaluación de factores psicosociales por la norma mexicana 035: Una Validación del dominio de la violencia laboral en la industria automotriz

Resumen

Objetivo: Contribuir a su validez estadística y enviar un estudio confirmatorio del ámbito de violencia laboral, que, debido a su frecuencia elevada y efectos serios, se considera un problema de salud pública en México y en todo el mundo.
Metodología: Este estudio incluye a 250 supervisores de la industria automotriz. Para la recolección de datos, se usó la Guía de Referencia III propuesta en la norma NOM-035-STPS-2018. Se desarrolló un análisis descriptivo del riesgo psicosocial junto con un análisis de confiabilidad. Además, dado que el análisis factorial era viable, se llevó a cabo un análisis factorial exploratorio (AFE), de varianza media extraída (VME) y un análisis discriminante. Por último, se realizó un modelo de ecuaciones estructurales del campo analizado para determinar la validez del constructo.
Resultados: La mayoría de los participantes eran hombres (61,44 %) con edades entre los 30 y 55 años. Además, un 59 % de los supervisores en la muestra tienen un riesgo psicosocial alto. Los valores de la prueba de correlación fueron mayores a 0,50; mientras que la confiabilidad, tanto para el Alfa de Cronbach como para el coeficiente omega de McDonald, superó los 0,90. Se aseguró la viabilidad del análisis factorial y se extrajo un factor único del AFE, que representa un 86,073 % de la varianza explicada. Asimismo, se obtuvo una VME de 0,8895. En el análisis discriminante, la variable relacionada con las empresas de los participantes no permitió diferenciar el lugar al que pertenecía cada trabajador. Por último, el modelo de ecuaciones estructurales confirmó la bondad de ajuste del modelo.
Conclusión: El instrumento es válido para medir la violencia laboral como un riesgo psicosocial puesto que su psicometría estadística fue aceptable, y puede usarse para identificar y medir el nivel de riesgo psicosocial derivado de la violencia laboral.

----------*Palabras clave:* Estudios de validación; violencia laboral; industria.

Avaliação de fatores psicossociais pela norma mexicana 035: uma validação do domínio da violência laboral na indústria automotiva

Resumo

Objetivo: Contribuir para sua validade estatística e enviar um estudo confirmatório do âmbito da violência laboral, que, devido a sua elevada frequência e aos seus graves efeitos, se considera um problema de saúde pública no México e no mundo inteiro.
Metodologia: Este estudo inclui 250 supervisores da indústria automotiva. O Guia de Referência III proposto na norma NOM-035-STPS-2018 foi usado para a coleta de dados. Desenvolveu-se uma análise descritiva do risco psicossocial junto com uma análise de confiabilidade. Além disso, devido a que a análise fatorial era viável, desenvolveu-se uma análise fatorial exploratória (AFE), de variância média extraída (VME) e uma análise discriminante. Por último, realizou-se um modelo de equações estruturais do campo analisado para determinar a validade do construto.
Resultados: A maioria dos participantes eram homens (61,44%) com idades entre os 30 e 55 anos. Além disso, 59% dos supervisores da amostra têm um risco psicossocial alto. Os valores dos testes de correlação foram maiores a 0,50; enquanto a confiabilidade, tanto para o Alfa de Cronbach como para o coeficiente ômega de McDonald, superou os 0,90. Garantiu-se a viabilidade da análise fatorial e extraiu-se um fator único da AFE, que representa 86,073% da variância explicada. Da mesma maneira, obteve-se uma VME de 0,8895. Na análise discriminante, a variável relacionada com as empresas dos participantes não permitiu diferenciar o lugar ao que pertencia cada trabalhador. Por último, o modelo de equações estruturais confirmou a bondade de ajuste do modelo.
Conclusão: O instrumento é valido para medir a violência laboral como um risco psicossocial devido a que sua psicometria estatística foi aceitável e pode ser usada para identificar e medir o nível de risco psicossocial derivado da violência laboral.

----------*Palavras chave:* Estudos de validação, violência laboral; indústria

Introduction

The psychosocial factors inherent to work have gained relevance because they harm people's well-being and work performance [1]. For this reason, its increase is considered a public health problem. This study was carried out in a manufacturing company as these companies are a pillar in the economy, contributing 73% of formal employment in Mexico. Specifically, Chihuahua ranks third nationally with 480 plants. Of these, 321 (65%) are located in Ciudad Juárez, contributing to 12% of formal jobs nationwide. The predominant sectors are electronics and automotive [2]. Therefore, addressing the psychosocial risk factors to which workers in these companies are exposed is necessary. These factors correspond to the worker's perception of the balance between the characteristics of the job and their individual qualities. For Martínez-Mejía, the broad spectrum in which psychosocial factors are evaluated entails psychosocial protectors and risks. The latter occurs when the characteristics of the job and the organization outweigh the worker's characteristics [3].

In this sense, the joint International Labour Organization-World Health Organization (ILO-WHO) commission states that it is necessary to consider both the working conditions (the interaction between work, environment, job satisfaction, and organizational characteristics) and the characteristics of the worker (their abilities, needs, culture, among others) to analyze the impact of psychosocial risk factors on health and work performance [1]. In this respect, Patlán states that these factors can cause alterations to the worker's physical, mental, and social health [4]. On a physical level, there is obesity, pain, and psychosomatic diseases. Additionally, psychosomatic diseases such as anxiety, sleep problems, irritability, nervousness, feelings of failure, depression, and even suicidal thoughts are effects on a mental level. On a social level, there is distrust, insecurity, isolation, aggressiveness, and social maladjustment, among others [3–5]. While at the organizational level, there is absenteeism, job dissatisfaction, as well as an increase in disability due to accidents and occupational diseases [5]. Additionally, accidents, poor performance, turnover, and conflictive work environments are increased [6]. Kalimo affirms that these factors can cause and aggravate an illness and recovery time. Thus, in the automotive industry, workplace violence as a psychosocial factor is the result of poor working conditions and interpersonal relationships [7].

Hence, it is important to adapt strategies to identify and prevent this and other psychological factors in this context [8]. Accordingly, although researchers and employers have addressed these risks through several initiatives, including salary increases, strengthening promotion possibilities, generating trust environments, and flexible schedules, strategies have yet to be defined [6,9]. Psychosocial risk factors are considered a contemporary challenge that impacts the health of the worker, and it is perceived through stress, violence, and intimidation [10].

Description of the NOM 035 Psychosocial Factors

In response to the recommendations of international organizations, the NOM-035-STPS-2018 was created in Mexico, whose objective is the identification, analysis, and prevention of psychosocial risk factors in addition to promoting a healthy organizational environment, which is auditable as of October 23, 2020. This regulation proposes three instruments according to the number of workers. Reference Guide III was used for this case, given that the company had 50 workers. This instrument consists of five general categories broken down into ten domains and divided into twenty-five dimensions. Table 1 shows factors that need to be identified and addressed by the NOM 035 [11].

Table 1. Psychosocial risk factors contemplated in NOM-035-STPS-2018

Psychosocial Risk Factors	Description
Conditions in the work environment	Unsafe and unsanitary conditions in the workplace, require additional effort from the worker to adapt.
Workloads	It contemplates the demands on the worker, which can be quantitative, cognitive, emotional, responsibility, as well as contradictory that exceed the worker's capacity.
Lack of control	It refers to limiting the worker's ability to influence and make decisions about the way in which he or she carries out his or her activities.
Working hours and shift rotation	It happens when you work longer hours than those established by law, with rotation of shifts, night shifts without breaks or periodic breaks.

Psychosocial Risk Factors	Description
Interference in the work-family relationship	It arises when work matters are constantly attended to outside of working hours.
Negative Leadership	This refers to the imposition or aggressive attitudes of the employer towards the workers, in addition to a lack of clarity in the functions and little recognition and/or feedback on performance.
Negative Relationships	It is the impossibility of relating to co-workers with poor teamwork and no social support.
Workplace Violence	This covers ill-treatment, harassment and bullying, and psychological harassment (except sexual harassment).

This study only used the items comprising the violence domain. This domain is measured by eight items, seven of which used a five-point Likert scale with the following equivalences: 0 = Never, 1 = Almost never, 2 = Sometimes, 3 = Almost always, and 4 = Always; the remaining item used the same scale but inversely. Table 2 presents these eight items' descriptions, point values, and cut-off points. Once each item was scored, the eight items were added to obtain the value of the level of psychosocial risk to which workers were exposed ($C_{violence}$) according to the cut-off points.

Table 2. Items from the NOM-035, the domain of workplace violence

	Items and their Descriptions	Point Value
57	At work, I can express myself freely without interruptions.	4–0
58	I receive constant criticism about myself and/or my work.	0–4
59	I am mocked, slandered, defamed, humiliated, or ridiculed.	
60	My presence should be addressed and included in work meetings and decision-making processes.	
61	Work situations are manipulated to make me look like a bad worker.	
62	My work successes are ignored and attributed to other workers.	
63	I am blocked or prevented from opportunities for advancement or improvement in my job.	
64	I have witnessed acts of violence in my workplace.	
	Risk Level Cut-Off	
	$C_{violence} > 16$	Very High
	$13 <= C_{violence} < 16$	High
	$10 <= C_{violence} < 13$	Medium
	$7 <= C_{violence} < 10$	Low
	$C_{violence} < 7$	Zero/Null

Workplace Violence

Technological advancements have significantly changed the work environment, especially in job classification, organizational aspects, and labor relations. Therefore, new regulations must be adapted to guarantee access to adequate work conditions. Worldwide, workplace violence is considered an alarming phenomenon that is directly impacting public health [12]. Additionally, the studies carried out show a very superficial perspective mainly based only on physical violence. Likewise, the authors state that workplace violence is one of the causes of a large number of injuries and deaths at work; however, so far, few researchers have addressed the problem as an occupational risk [13]. Workplace violence makes no distinction between workplaces. It can occur in private and public sectors [14,15]. In addition, it harms workers' physical and mental health and the company's productivity. Thus, international organizations launched an alert intending to thoroughly analyze the problem of workplace violence and its repercussions at the individual, company, and public health levels [1].

The ILO defines workplace violence as "any action, incident, or behavior that departs from reasonable conduct, in which a person is assaulted, threatened, harmed, and injured in the course of, or as a direct result of, his or her work." Moreover, it classifies physical aggression, perceived injustice, electronic surveillance or harassment, and job uncertainty [16]. On the other hand, according to the Occupational Safety and Health Administration (OSHA), the term implies "any act or threat of physical violence, harassment, intimidation, or other threatening and disruptive behavior that occurs at the work site. It ranges from threats and verbal abuse to physical assaults and even homicide" [17]. In Mexico, the NOM-035-STPS-2018 defines it as "those acts of harassment, bullying, or mistreatment against workers which can damage their integrity or health" [11]. As can be seen, the term lacks homogeneity, and the most widely accepted definitions in the world refer to it as the presence of abusive attitudes or acts from one employee or employees to another or others [18].

Additionally, its prevalence has been increasing recently, and the United Nations (UN) and the ILO have reported that 22.8% of formal workers have been exposed to violence and harassment at work [19]. Studies in Mexico show that 80% of workers have suffered violence in the workplace in the form of psychological pressure, extemporaneous or after-hour work assignments, unequal treatment, mockery, insults, and sexual violence [20]. Thus, regardless of its manifestation, violence in the workplace is a global problem that involves the employers and employees of an entire organization [20,21].

In this context, according to Study Tips Anonymous (STA) [22], violence in the workplace in the Mexican manufacturing industry increased in one year from 20% to 28%. Additionally, it takes place vertically within organizations, which can be ascendant (when a subordinate shows it toward a leader) or descendant (when someone from higher hierarchy shows it toward an associate) [23]. Nowadays, middle managers or supervisors have uncomfortable and ambiguous roles. They are particularly vulnerable since they are exposed to various role stressors and high levels of responsibilities, such as work overload [16,24]. Moreover, according to the ILO, exporting industry types, such as maquiladoras, are more prone to creating working conditions that lead to violence [24]. However, studies addressing violence in the workplace in middle management are scarce and represent further research opportunities [25]. Thus, implementing actions for the early diagnosis of violence in the workplace is a priority.

Workplace violence measurement instruments

Globally, countries have changed and implemented policies to address, prevent, and reduce the problem. A variety of instruments and self-administered scales are available for its study, and among the most widely used instruments are the Leymann Inventory of Psychological Terror (LIPT) [26] and the CISNEROS Barometer [27]. However, before adopting an instrument, examining the context and characteristics of the population where it will be used is advisable. Thus, several authors have observed among the Mexican population behaviors that range from direct verbal violence to covert discrimination and sexual harassment and which have not been analyzed using international instruments [28]. Consequently, two instruments have been developed in Mexico, whose reliability and validity in measuring this construct are supported by numerous studies [29]. Thus, to analyze and prevent the effects of psychosocial factors on employees, the standard NOM-035-STPS-2018 came into force in 2019 [11] and is applicable in all workplaces in Mexican territory; violence in the workplace is studied as a dimension of the domain under the same name. It is measured by eight items that elicit the worker's perception of teasing, disqualifications, and acts of violence in the workplace, among others.

Part of the problem that this work is addressing lies in the fact that (at the time of writing this manuscript) the Mexican Ministry of Labor and Social Security (STPS is its Spanish acronym) lacked psychometric results from Reference Guide III to confirm the reliability and construct validity of the NOM-035-STPS-2018 [30]. On the one hand, the standard presents five constructs that aim to identify psychosocial risk. However, the theoretical foundation that supports the construction of these instruments and their respective psychometric tests needs to be presented. Although workplace violence is a complex factor to evaluate due to the different forms in which it occurs and how subjective it can be, the standard addresses it through only eight items, which is deficient when analyzing this risk. In addition, the standard excluded sexual harassment (even though this type of violence is on the rise in the workplace). Additionally, the studies that have validated this instrument are scarce, and there are discrepancies among their confirmatory analyses [31,32]. Besides, the lack of descriptive studies showing the presence of violence in the contexts studied restrict recognizing the problem's magnitude.

Furthermore, the unidimensional workplace violence domain is challenging to measure in terms of validity and reliability. The aim of this work is therefore to contribute to its statistical validity and to submit a confirmatory study of the domain of workplace violence, which, due to its high incidence and serious effects, is considered a priority problem, both in Mexico and throughout the world. In addition, it was addressed in one of the sectors that generate the majority of jobs to identify the level of risk in these workers and, in turn, measure the impact on public health.

Methodology

Type of study

Cross-sectional validation study of the Reference Guide III provided by the NOM-035-STPS-2018 with descriptive scope. The design of the research was non-experimental, as there was no manipulation of the variables.

Population and Sample

The instrument was applied to 250 employees which represent 100% of the employees occupying management and supervising positions. Convenience sampling was conducted due to the small number of supervisors in the firms. The sample size in this study was sufficient for obtaining reliable conclusions, as there were indeed ten responses per item [33]. Finally, the participants were interviewed between August 2019 and March 2020.

Instrument

The domain corresponding to workplace violence proposed in Reference Guide III of NOM-035-STPS-2018 was used as a collection instrument (Table 2). The database was analyzed using IBM SPSS Statistics® (IBM, NY, U.S.A.) and AMOS® software version 22 (IBM, NY, U.S.A.).

Case of study

The methodology of this case study is supported by the steps proposed by HAIR [33] for the analysis of multivariate data as well as the process necessary for the validation of an instrument or construct (Figure 1).

The study was conducted by the Declaration of Helsinki and ethical regulations in Colombia —Resolution 8430/1993 and approved by the Ethics Committee of the campus of the National Technological Institute of Mexico, Ciudad Juárez (protocol code DEPI/ITCJ/001/19, approved on 18 February 2019) for studies involving humans.

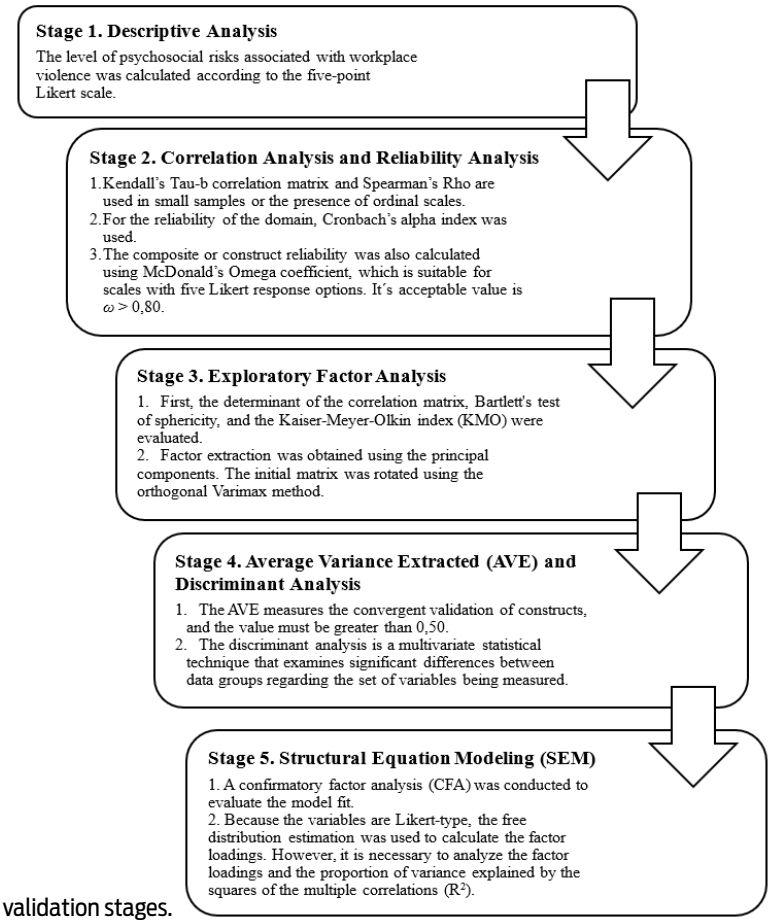

Figure 1. Instrument validation stages.

Results

Sample Characteristics

The sample consisted of 250 supervisors whose ages ranged from 30 to 55 years old (mean ± SD: 35,08 ± 6,23); 61,44% were men, and 38,56% were women. For reasons of confidentiality, only this data was provided by the company.

Stage 1. Descriptive Analysis

Table 3 shows the descriptive statistics for each item and the level of risk obtained. In addition, non-normal items are indicated. Based on the results, it is observed that the sample does not meet the assumption of normality (Kurtosis values are outside the range of -1 to 1). Accordingly, non-parametric statistical methods were applied.

Table 3. Sample's descriptive statistics.

Statistic	Item 57	Item 58	Item 59	Item 60	Item 61	Item 62	Item 63	Item 64	Risk	Medium**
Average	0,9800	1,7440	1,6320	1,6040	1,5160	1,5240	1,5640	1,5440	12,11	
Kurtosis	0,592	−0,975	−1,572*	−1,499*	−1,463*	−1,405*	−1,498*	−1,447*	-1,466*	

*Non-normal data.
** Es el nivel de riesgo psicosocial de la muestra de acuerdo con los puntos de corte del instrumento

The answers were scored based on the stipulations in the NOM-035-STPS-2018, and their average values by item are shown in Table 3. Then, the cut-off points were used to identify the average level of risk of the sample (12,11) corresponding to a medium level. In addition, descriptive analysis of the sample by risk level is Medium. Additionally, the results show that 57% of supervisors have a very high level of risk, 2% high, 7% medium, 7% low, and 27% zero or no risk.

Stage 2 Results. Correlation and Reliability Analysis

At this stage, the bivariate correlation was calculated using Spearman's Rho and Kendall's tau. The correlation between the items is greater than 0,50, and most are significant, concerning a confidence level of 95% and 99%, respectively. This shows a high correlation among almost all items except for Item_57. Once this was done, it was necessary to test the reliability using Cronbach's alpha for the violence domain. It yielded a value of 0,95. Its value indicates that this domain has excellent internal consistency. In addition, since Item_57 does not contribute significantly to the construct, removing it increased reliability. Accordingly, it was decided to remove it from the statistical analyses in the following stages. Construct reliability was 0,97, a value higher than that of 0,80.

Stage 3 Results. Factorial Analysis

First, its feasibility was demonstrated using SPSS® v22 software, and the results were significant in all cases. In the results, the determinant was 0,000023; the significance in Bartlett's test of sphericity stands out (p-value = 0,00) and KMO = 0,93; which guarantee the feasibility of the factorial analysis. When considering the correlation and reliability results, it was deemed pertinent to perform the analysis excluding the first item since it did not contribute significantly. In addition, measurement of sampling adequacy (MSA) showed values greater than adequate. The EFA was performed for the remaining seven items, constituting the violence domain. One factor (dimensions) with a value of 6,03, which represented 86,07% of the total variance explained, was excluded. The variables that constitute the factor were compared to the 0,4 value to determine the element's influence on said factor. Once the significant loadings were identified, the analysis of commonalities showed the extent to which an item correlated with the others and represented the amount of deviation explained for the factor model in terms of each variable. In this case, the values obtained ranged from 0,63 to 0,94.

Stage 4 Results. Average Variance Extracted (AVE) and Discriminant Analysis

The convergent construct validation yielded an AVE = 0,89, higher than the required 0,50, and the construct can be measured appropriately. Conversely, according to the discriminant analysis, the Box M test showed a significant statistic difference ($p \leq 0,05$) for the F statistic, indicating that variance and covariance matrices differ. This assumption was not satisfied by the sample. However, it is necessary to consider that this test is sensitive to large samples and data's non-normality [34]. Based on the results obtained, the variable used to perform the discriminant analysis did not have the ability to diffe-

rentiate exposure to workplace violence according to the company to which the participants belonged.

Stage 5. Structural Equation Modeling (SEM)

The CFA was used to evaluate the quality of the results to test the validity of the conclusions obtained using AMOS® v22 software [35]. This analysis aims to confirm whether the violence domain meets the statistical parameters. Table 4 shows the indicators that corroborate the model's fit. Although the chi-square ($\chi 2$) was significant, the characteristics of the sample made it convenient to consider the Chi-Square Ratio about the degrees of freedom ($\chi 2/df$), which is less than 5. The absolute fit of the model showed a Root-Mean-Square Error of Approximation (RMSEA) of 0,07, while the Goodness-of-Fit Index (GFI) and Adjusted Goodness-of-Fit Index (AGFI) showed values above 0,90. In addition, the incremental fit parameters Tucker-Lewis Index (TLI), and Normed Fit Index (NFI) were greater than 0,90.

Table 4. Structural confirmatory model—the NOM-035, workplace violence domain.

Index	Value	Recommended
Model Fit		
Chi-square of the estimated model	30,96 df = 14 Value *p* = 0,006	*p* > 0,05
$\chi 2/df$	2,21	<5
Absolute Fit Measures		
RMSEA	0,070	valor ≤ 0,08
IC 90% RMSEA	(0,036; 0,10)	
GFI	0,98	>0,90
AGFI	0,96	>0,90
Incremental Fit Measures		
TLI	0,96	>0,90
NFI	0,95	>0,90
CFI	0,97	>0,95

Note: Chi-square of the estimated model ($\chi 2$), Chi-Square Ratio about the degrees of freedom ($\chi 2/df$), Root-Mean-Square Error of Approximation (RMSEA), Goodness-of Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Tucker-Lewis Index (TLI), Normed Fit Index (NFI), Comparative Fit Index (CFI)

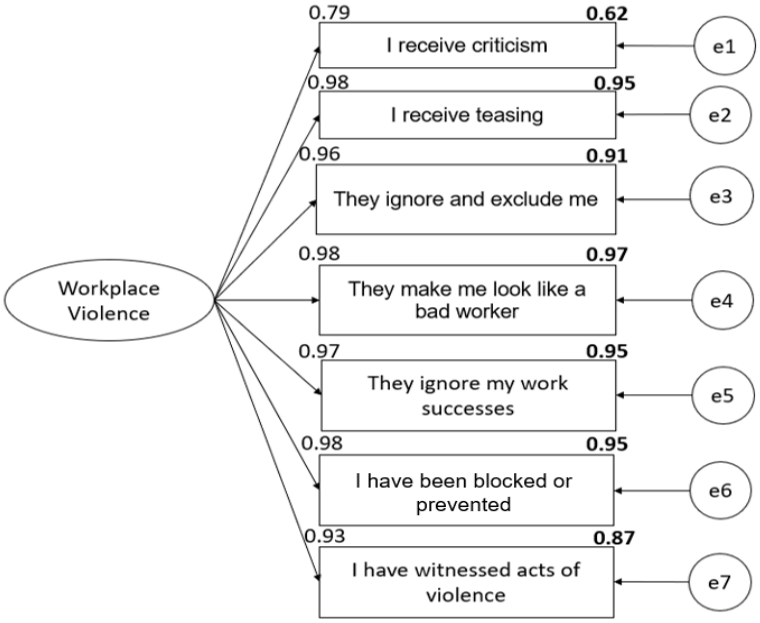

Figure 2. Path diagram: violence domain.

Note: The data on the left corresponds to the factor load. For example, the factor load for the first item was 0.79. The values in bold correspond to the coefficients of determination and e represent the errors.

The path diagram indicates the factor loadings and the proportion of variance explained, as expressed by the R2 coefficient of determination. Finally, the errors (e) make up the variance that cannot be explained by the item (Figure 2). These results demonstrate the validity of the violence construct as applied to supervisors of automotive manufacturing companies.

Discussion

Workplace violence has become a public health issue since studies have shown a considerable increase at the national and international levels [1,19]. The authors highlight the importance of approaching the problem from a public health point of view due to its effects on health and work performance. Additionally, they emphasize the importance of analyzing psychosocial factors as protective and risk factors [3,7] to design strategies to enhance the protective factors and reduce the risk ones. Thus, Mexico implemented NOM-035-STPS-2018 to address psychosocial risk factors at work. However, the STPS has yet to provide the theoretical basis or statistical evidence to ensure the reliability and validity of the instrument. Studies have reported levels of overall and category-acceptable reliability, and the results obtained in this research align with results from earlier investigations.

Additionally, construct validity is achieved, whereas none of the previous studies have reported this validity [31,32] nor descriptive results and level of risk of employees. Furthermore, the automotive sector of maquiladoras is the city's primary employment source. Consequently, it is essential to address the problem in this sector because of the changes resulting from globalization. Thus, implementing the standard NOM-035 correctly and promptly to identify workplace violence will reduce accidents, poor performance, and disabilities [11], while promoting healthier work environments and improving the quality of life of employees in the Mexican automotive industry.

In this context, this paper provides workplace violence results in a sample from Mexico's manufacturing industry. The results confirm the reliability and validity of the construct of workplace violence. Unlike previous works, this study offers a descriptive analysis, providing the level of psychosocial risk that violence in the workplace features. It reports that most supervisors are at an importantly high level of risk (59%). Later, the model underwent a CFA to help study construct validity. However, very few studies still address its validation, and these few studies show differences in their results.

In addition, validating the workplace violence domain is an important starting point. Accordingly, this study was a considerable advance for the companies that participated in the training that allows the knowledge and identification of workplace violence situations. Likewise, this paper can contribute to the study and prevention of workplace violence by increasing the knowledge about it inside the understudied yet significant economic activity of the automotive industry in the north of Mexico, specifically among middle management positions. In addition, progress was made in implementing this standard, which has been auditable since October 23, 2020. This study's objective was reached, as it shows statistical evidence of its prevalence and construct validity. Therefore, this instrument can be used to measure workplace violence, as well as to facilitate, promote, and recommend the development of new studies aimed at timely intervention in the search for a balance between workers' well-being and company productivity.

However, one of the study's limitations is that it was conducted only in automotive companies in Ciudad Juárez. In addition, due to uncertainty about the standard and its scope, the questionnaire was administered confidentially. That is, the instrument did not ask for any data with which the participant could be traced. In this regard, sociodemographic data was generally provided by the company.

Therefore, the creation and implementation of strategies that allow us to know and evaluate psychosocial factors is essential. There is also a need for government, employers, occupational physicians, ergonomists, and organizational psychologists to become aware of the impact of these factors and to integrate psychosocial factors and mental overload as occupational hazards. In other words, it is relevant that government, businesses, and workers do their part in implementing policies and action plans that lead to favorable working conditions. The business sector is opting for more flexible schedules, rotation of staff on night shifts, salary increases, greater benefits, and even the incorporation of mid-week teleworking (specifically for administrative staff).

Based on this, it is suggested that future research be conducted in which the instrument proposed by the standard is applied in different types of industries and the sample size be increased in order to obtain a more robust validation. It is also recommended that all staff be trained on the facts of psychosocial risk, to improve their understanding of the subject and promote the timely identification of the different psychosocial risks to which they are exposed. In addition, it is essential to have timely follow-up to ensure the right conditions for carrying out their work. On the other hand, it is essential to carry out studies that compare the level of psychosocial risk before and after the pandemic. It has even been suggested that workplace violence from a work-home perspective be analyzed. The results would be a great contribution to knowing whether the level of risk increases or decreases as a result of specific circumstances.

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Authors' contribution statement

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