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Psychometric analysis of the scale of attitudes towards gender violence in Arequipa

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Abstract---Gender-based violence has a negative impact on the psychological well-being of those who suffer it. In its measurement, there is no standard measure to assess and typify it. The objective of the study was to analyze the psychometric properties of the gender violence scale in Arequipa. A total of 1,427 people participated, of whom 828 were female (58.02%), 591 were male (41.42%) and 8 were of another gender (0.56%). The scale of attitudes towards gender

violence was used, which has 3 dimensions (cognitive, affective, behavioral) and 12 items. An exploratory factor analysis (EFA) was applied with the 12 items with oblique rotation (oblimin) and Confirmatory Factor Analysis (CFA), showing a two-factor structure: F1 - Cognitive Affective and F2 - Behavioral, with 10 items. The internal consistency analysis showed an Omega coefficient of .84 (95% CI= .81 - .88) and .74 (95% CI= .70 - .78) for each factor respectively. When evaluating the equivalence of the measurement according to sex, the instrument showed measurement invariance. It is concluded that the scale is valid and reliable for the assessment of attitudes towards gender violence.

Keywords---gender violence, psychometrics, validation, reliability, measurement invariance.

Introduction

Gender-based violence is strongly associated with power relations between women and men that produce an imbalance and inequity between the sexes, generating a psychological impact on those who suffer it and has increased significantly during the pandemic (Calle-Ramírez et al., 2022). Likewise, gender-based violence is related to the use of violence following expectations about the roles that are linked to each gender (Poggi, 2019). This type of violence is instituted within the social structure and maintained by culture, involving the violation of human rights, control, exclusion and inequity (Jaramillo & Canaval, 2020). In addition, it is perceived as something habitual and mostly related to men (Poggi, 2019; Jaramillo & Canaval, 2020); bringing as a result of violence in its different modalities a negative impact on the psychological well-being of whoever suffers it (Quiñonez, 2017).

Since the year 2013, the World Health Organization (WHO) reported that 35% of women in the world have experienced physical and/or sexual violence by their partner or sexual violence by another person (World Health Organization [WHO], 2013). Likewise, the WHO for the year 2018, reports a prevalence of physical and/or sexual violence in 31% of women between 15 to 49 years and 30% with an age range of 15 years, estimating that 1 in 3 women have suffered this type of violence (WHO, 2021). As can be seen, the prevalence of gender violence is very high worldwide, however, the data did not cover all countries and the measurements could be biased and underrepresented, however, the same organization reports that in the last year (2021), due to the confinement of the pandemic, the exposure of women to their partners increased, evidencing abusive behaviors that have only ended up exacerbating this problem.

In Latin America and the Caribbean, gender violence has a very high incidence, where social inequality, economic changes and political crisis seem to increase it (Nieves, 1996). In Latin America and the Caribbean, femicide is presented as an extreme form of gender violence in 26 countries, a problem that constitutes a difficulty in achieving development and equality in society (Comisión Económica para América Latina y el Caribe, 2021). In the Peruvian case, the expressions of

violence in recent years reflect a high rate of violence against women. According to the Demographic and Family Health Survey (ENDES), women between the ages of 15-49 have suffered violence at some point in their lives from their partners (ENDES, 2021). In Peru, in recent years there has been a decrease in the number of cases of gender violence (ENDES 2020), but during the pandemic, there was an increase of up to 130% of complaints of gender and family violence (Diario Gestión, 2021), alarming figures that show a latent problem in the context.

Because of its importance, multiple studies seek to describe and typify gender violence, as well as to validate instruments for its detection. Qualitative analyses have shown important indicators of psychological and physical violence (Muñoz and Iniestas, 2017), as well as sexual (Trujillo and Pastor, 2021). Psychometric studies have validated the WHO instrument on psychological, physical and sexual violence against women perpetrated by their partners (Blima et al., 2010). They evaluated 2,128 participants in São Paulo and Zona da Mata. They obtained acceptable validity indicators for a questionnaire of 13 questions on psychological (4), physical (6) and sexual (3) violence. In addition, they obtained Cronbach's Alpha coefficients of 0.88 in São Paulo and 0.89 in Zona da Mata; indicating high internal consistency and being adequate to measure gender-based violence against women. In Peru, Seminario (2019) investigated multiparous women ($n=32$) for the presence of gender-based violence. She used a survey composed of 19 questions, which resulted in 93.75% with this incidence, with psychological violence being more frequent with 48.1%, as well as the presence of a significant relationship between the different types of violence and multiparity.

Another study highlighted by González (2019) determined the influence of gender violence on the behavior of women victims of abuse. For this purpose, he applied the questionnaire on gender violence and behavior of women victims, of his elaboration that has 6 dimensions: power motivation, attributing violence, impulsivity, feelings of inferiority, isolation and emotional instability. He observed a correlation coefficient of Spearman's Rho equal to R (0.348). Likewise, Ramis (2018) has a study with a sample of 163 students, where one of his instruments focused on gender violence. The questionnaire on gender violence prevention consisted of 15 questions with a rating scale from 1 to 5 measuring physical (5), psychological (5) and sexual (5) violence, obtaining a Cronbach's Alpha of 0.840. And Chamorro and Salas (2019) conducted their research on 800 students for the construction of the scale of attitudes towards gender violence (EAHV) made up of 14 items and 3 dimensions: behavioral (5), affective (4) and cognitive (5), with a response rating ranging from 1 to 5. They observed high reliability for the 3 dimensions: behavioral ($\omega=.88$ [95%CI = .86 - .90]), affective ($\omega=.85$ [95%CI = .83 - .88]) and cognitive ($\omega=.85$ [95%CI = .82 - .87]).

Method

Participants

A non-probabilistic sample of 1,427 participants was used, taking as inclusion criteria persons over 18 years of age, literate and not having severe sensory problems. The sample consisted of 828 female participants (58.02%), 591 male participants (41.42%) and 8 respondents of another gender (0.56%). Regarding

age, 1259 (88.2%) were between 18 and 29 years old and 168 (11.8%) were between 30 and 44 years old. According to marital status, 1123 (78.7%) are single, 196 (13.7%) are cohabiting, 88 (6.17%) are married, 16 (1.12%) are divorced and 4 (0.28%) are widowed. According to their level of education, 65 (4.56%) have an incomplete secondary school, 871 (61.0%) have a complete secondary school, 232 (16.3%) have complete technical studies and 259 (18.1%) have complete university studies.

Instrument

The scale of attitudes towards gender violence was used, adapted by Espinoza (2021), which has 3 dimensions and 12 items: Cognitive (items 1,2,3,4), affective (items 5,6,7,8), and behavioral (items 9,10,11,12) The items were formulated as statements, in Likert-type response offering five response alternatives (totally disagree, disagree, no opinion, agree and totally agree). In addition, the instrument included sociodemographic characteristics such as age, sex, marital status and level of education. Informed consent data were also included.

Procedure

The scale was adapted to the Google forms format and was applied to the participants via social networks and e-mails, who were responsible for answering the instrument individually. In addition, the evaluation was supported by the voluntary participation of the individuals after they were informed of the objectives of the research, informed consent and total confidentiality of individual information.

Statistical and psychometric analysis

The statistical software R version 4.0.5 (R Core Team, 2020) and its development environment RStudio version 1.4.1106 (RStudio Team, 2020) were used for data analysis. The haven package (Wickham & Miller, 2020) was used for data import, and the tidyverse (Wickham et al., 2019) and psych (Revelle, 2020) packages were used for data manipulation, cleaning and descriptive statistical analysis. It is decided to analyze the factor structure through an Exploratory Factor Analysis on half of the sample data, and subsequently a Confirmatory Factor Analysis for structure validation. The following packages were used: GPA rotation (Bernaards & Jennrich, 2005), nfactors (Raiche & Magis, 2020) and semTools (Jorgensen et al., 2020). The packages lavaan (Rosseel, 2012) and semPlot (Epskamp et al., 2019) were used for confirmatory factor analysis. Polychoric correlation matrices were calculated and weighted least squares robust (WLSMV) was used as the estimation method. For the evaluation of the fit indices, the following criteria were taken into account: values $\geq .90$ and $\geq .95$ in the CFI and TLI as adequate fit and good fit respectively, and values $\leq .08$ and $\leq .05$ in the RMSEA as adequate fit and good fit respectively and for the SRMR, values $\leq .08$ and $\leq .06$ were considered as a good fit and ideal fit respectively (Keith, 2015). For measurement invariance, the procedure developed by Wu & Estabrook (2016) was used. As criteria for assessing invariance, the sample size (>300) is considered, and the possibility of non-invariance is established when $\Delta CFI \geq .010$, $\Delta TLI \geq .010$, $\Delta SRMR \geq .030$ and $\Delta RMSEA \geq .015$ (Chen, 2007; Svetina et al., 2019).

Results

The results are presented as follows: first, the descriptive analyses of the items; second, the exploratory factor analysis; third, the confirmatory factor analysis; fourth, the measurement invariance; fifth, the reliability of the items; and finally, the reliability of the items.

Descriptive analysis of the items

Table 1 shows the descriptive statistics for the 12 items. There were no missing values. Regarding the descriptive analysis, the means ranged between 2.80 (item 12) and 4.45 (item 1), the skewness for all items was less than 2, however, eight items had values greater than 1; and in the kurtosis, two items (item 1 and item 4) presented values greater than 2 (4.02 and 2.95 respectively).

Table 1
Descriptive statistics of the items

	<i>M</i>	<i>DE</i>	<i>Asymmetry</i>	<i>Kurtosis</i>
Item1	4.45	0.90	-1.99	4.02
Item2	4.20	1.04	-1.47	1.78
Item3	4.21	1.09	-1.52	1.68
Item4	4.39	0.89	-1.69	2.95
Item5	4.32	0.88	-1.39	1.92
Item6	4.31	0.92	-1.46	1.95
Item7	4.24	0.91	-1.29	1.66
Item8	3.92	0.95	-0.73	0.23
Item9	4.02	0.94	-0.91	0.64
Item10	4.09	0.95	-1.12	1.17
Item11	3.31	1.43	-0.26	-1.27
Item12	2.80	1.50	0.17	-1.40

Table 2 shows the matrix of polychoric correlations among the items. The correlations ranged from -.73 to .78. It can be seen that between items 1 through item 10, the correlations have values greater than .3, but when correlated with item 11 and item 12, they have low or negative values with the rest of the items. These results are taken into account in the subsequent analyses.

Table 2
Matrix of polychoric item correlations

	Item1	Item2	Item3	Item4	Item5	Item6	Item7	Item8	Item9	Item10	Item11	Item12
Item1												
Item2	.64											
Item3	.61	.64										
Item4	.68	.64	.63									
Item5	.59	.52	.56	.65								
Item6	.58	.56	.53	.66	.78							
Item7	.57	.5	.52	.6	.64	.62						
Item8	.37	.33	.37	.37	.47	.49	.52					

Item9	.37	.34	.37	.39	.46	.45	.45	.59			
Item10	.48	.45	.47	.53	.58	.63	.55	.56	.59		
Item11	.07	.03	.07	.2	.08	.09	.08	-.17	-.1	-.04	
Item12	-.03	-.05	-.04	-.17	-.06	-.07	-.05	.17	.12	.09	-.73

To analyze the evidence of validity based on structure, it was decided to develop it in two phases. First, the sample is randomly divided into two halves, in the first half ($n_1 = 713$) an exploratory factor analysis is applied to establish a structure suggested by the analysis, and in the second half ($n_2 = 714$) a confirmatory factor analysis is applied to evaluate the adequacy of the structure found in the AFE.

Exploratory Factor Analysis

An exploratory factor analysis was applied to the 12 items with oblique rotation (oblimin). The Kaiser-Meyer-Olkin coefficient showed the adequacy of the data for the analyses $KMO = .88$ and all KMO values for the individual items were greater than .54. It should be noted that items 11 and 12 had the lowest KMO (.54 and .55 respectively), the rest of the items had values greater than .88. Bartlett's test of sphericity $\chi^2(66) = 3716.63$, $p < .001$, indicate that the correlations between items were high enough for the AFE. The analysis suggests that the instrument has 3 dimensions that explain 42.86% of the variance. The factor loadings are presented in Table 3.

Table 3.
Factor loadings of the AFE with 3 factors

Item	F1	F2	F3
2. I believe that bullying a person because of their gender does not solve the problem.	.92		
1. I believe that when a person is assaulted it should be denounced, regardless of gender.	.82		
4. I believe that the law must comply with guaranteeing the protection of the family in cases of gender violence.	.78		
3. I believe that mistreatment of a person should not be justified regardless of gender.	.67		
5. It makes me uncomfortable to see a person insulted because of their gender.	.57		
6. It bothers me when a person says obscene things to another person because of their gender.	.56		
7. I am concerned when a person does not report their abuser.	.44		
8. I complained to people who speak rudely to a person regardless of their gender.		.76	
9. When a person of the opposite sex is beaten, I go and support him/her.		.75	
10. I do not accept obscenities being said to people of the opposite sex.		.69	
11. In my family it is not customary to report cases of gender violence "for fear of what people will say.			.88
12. In my family it is frowned upon for people to be involved			-.81

in stereotypical activities (cooking, driving, etc.) according to their gender.

Table 3 shows that Factor 1 comprises items 2, 1, 4, 3, 5, 6 and 7. The content of these items alludes to the beliefs, thoughts and emotions of the participants, which is why it is called Affective Cognitive. In Factor 2, items 8, 9 and 10 comprise behavioral aspects involved in gender violence, so it is called Behavioral. Factor 3 has only 2 items, so it was decided to remove items 11 and 12 from the analysis.

Confirmatory Factor Analysis

A CFA is applied in the 3-factor structure using WLSMV as an estimator. The results show an adequate fit (Table 4). It is observed that the RMSEA fit index does not present an adequate value, so the model is re-specified, finding an improvement in the fit indexes, including the RMSEA. However, the RMSEA does not reach the adequate range.

Table 4
Model goodness-of-fit indices

Models	χ^2	<i>gl</i>	<i>CFI</i>	<i>TLI</i>	<i>RMSEA</i>	<i>SRMR</i>
2-factor model	341.56	34	.943	.924	.113	.052
2-factor model with errors Viol2 ~~ Viol3	269.62	33	.956	.940	.100	.047

Note: CFI = Comparative fit index, TLI = Tucker Lewis Index, RMSEA = root mean square error of approximation, SRMR = root of the standardized mean residual
* $p < .001$.

Figure 1 shows the factor loadings of the final model. It can be seen that all the factor loadings were greater than .67.

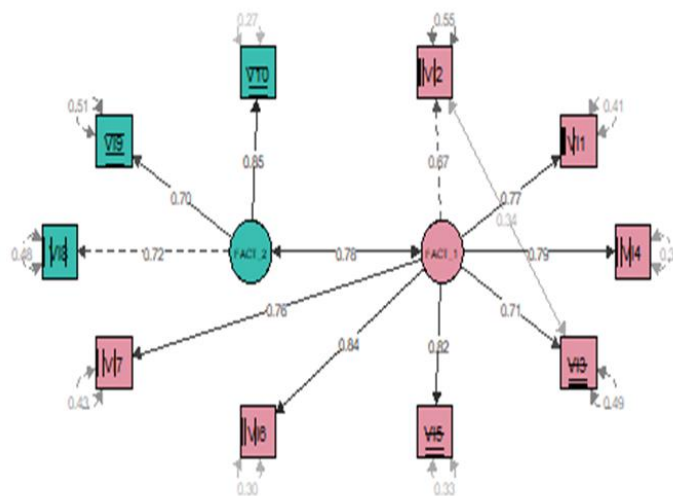


Figure 1. Factor loadings of the final model according to AFC

Internal Consistency

The result of the internal consistency analysis with the Omega coefficient for the final model shows the following coefficients: for Factor 1, a coefficient of .84 (95% CI: .81 - .88) was obtained; and for Factor 2, a coefficient of .74 (95% CI: .70 - .78) was obtained.

Factorial invariance

For this analysis, individuals claiming to have a gender other than male or female ($n = 8$) had to be removed. The equivalence of the factorial structure according to gender is evaluated. Table 5 shows that the factor structure of the scale according to gender obtained good fit indices at the configural, threshold, metric, scalar and strict levels. The differences between the fit indices were less than the established values. This means that the factorial structure of the instrument presents measurement invariance and is equivalent for both groups (male and female).

Table 5
Measurement invariance by gender

Model	X ²	gl	CFI	TLI	RMSEA	SRMR	CFI	TLI	RMSEA	SRMR
Configural	570.22	66	.960	.945	.104	.047				
Threshold	640.43	86	.956	.954	.095	.047	-.004	.009	-.008	.000
Metrics	599.61	94	.960	.962	.087	.047	.004	.008	-.008	.000
Scale	586.53	102	.962	.966	.082	.047	.002	.004	-.005	.000
Strict	602.09	112	.961	.969	.079	.049	.000	.003	-.003	.002

Discussion

The objective of the present study was to analyze the psychometric properties of the Attitudes towards Gender Violence Test, which after the statistical and psychometric analysis showed a two-factor structure: F1 - Cognitive Affective and F2 - Behavioral, also the internal consistency analysis showed an Omega coefficient of .84 (95% CI = .81 - .88) and .74 (95% CI = .70 - .78) respectively. It should be added that most of the items of Factor 1 are linked to the perception, beliefs, opinions and ideas that one has towards gender violence, as well as the feelings and emotional reactions that arise in a situation of this nature; as for Factor 2, the items refer to the acts of behavior, inclinations and intentions that one has in the face of this type of violence.

In the evaluation carried out employing the exploratory factor analysis, the 12 items were grouped into 3 factors, the last factor is made up of only two items that obtained KMO values below .55 and when this structure was subjected to the Confirmatory Factor Analysis, an adequate adjustment was not obtained. The similar difficulty was evidenced in the study of Espinoza, Salas and Flores (2017), who developed a 20-item instrument focused on detecting attitudes towards gender violence in university students, allowing to obtain an assessment of these attitudes in three dimensions: cognitive (6 items), behavioral (9 items) and affective (5 items), because after the construct validation they identified that the affective dimension had problems to conform clearly. Because of this situation, it

was decided to eliminate factor 3, thus achieving a structure with an improvement in the fit indexes.

Concerning the latter, the structure found presents differences with previous studies such as that of Chamorro and Salas (2019) and their instrument for the detection of attitudes towards gender violence made up of 14 items and distributed in three dimensions: cognitive (5 items) with an Omega coefficient of .85 (IC95% = .82 - .87), behavioral (5 items) with an Omega coefficient of .88 (IC95% = .86 - .90) and affective (4 items) with an Omega coefficient of .85 (IC95% = .83 - .88); or the study by Espinoza (2021) who, in developing this questionnaire of gender violence in young university students, showed that it can be measured by three dimensions: cognitive, affective and behavioral, demonstrating acceptable reliability with a Cronbach's Alpha coefficient of .865.

These differences found allow providing a new proposal to explore the dimensionality of attitudes towards gender violence by identifying an affective cognitive dimension that aims to link individual experiences (cognitions and emotions) with the structural conditions in which they occur and these being evidenced in a behavioral reaction, as it is necessary to remember that this type of violence is rooted in the expectations about the roles that are linked to each gender (Poggi, 2019), as well as its establishment within the social structure and maintained by culture (Jaramillo & Canaval, 2020). This largely explains the need for valid and reliable instruments according to the characteristics of the population in Arequipa and taking into consideration the socio-cultural and psychological differences of women and men and young adults, given that demographic surveys identify this age range (15-49 years) as a vulnerable group that has suffered at some point in their lives violence by a spouse or partner (ENDES, 2021). It is evident then, to have instruments available, which do not come from English translations, since they are developed in other contexts.

Based on what has been discussed, the main contribution of the proposal of an instrument for the evaluation of attitudes towards gender violence is to help specify the dimensions that make up this construct and based on the results of its factorial structure, the instrument presents measurement invariance in both groups (male and female), which is crucial to support diagnostic, treatment and intervention processes, as well as the development of epidemiological studies that help formulate public health policies, so necessary for this phenomenon that is evident in the reality of Arequipa. There were some limitations in the development of the study, violence is a complex and sensitive issue, and it is difficult for those who go through this situation to expose it, in addition, the context of the pandemic limited the application of the instrument in person, evidencing the refusal of some people to answer the questionnaire by personal decision, therefore, it was understood that they did not want to participate, however, taking into consideration these limitations, the validation of the instrument presents a good capacity of effectiveness, usefulness and reliability. In sum, based on the above, the instrument presented is part of a series of proposals for the valid and reliable measurement of dimensions of attitudes towards gender violence in the population of Arequipa in the age range of 18 to 44 years, with the invariance of measurement, which can be applied individually or in groups to identify attitudes

towards this type of violence to improve early intervention in cases of gender violence.

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