

**Psychometric properties of a quality of life instrument****Propiedades psicométricas de un instrumento de calidad de vida laboral**

GALVAN-CORRAL, Alberto†, MURILLO-FÉLIX, Cecilia Aurora, ACOSTA-MELLADO, Erika Ivett and QUIROZ-CAMPAS, Celia Yaneth

*Instituto Tecnológico de Sonora, Mexico.*

ID 1<sup>st</sup> Author: *Alberto, Galvan-Corral* / **ORC ID:** 0000-0002-9625-0324, **CVU CONACYT ID:** 93702

ID 1<sup>st</sup> Coauthor: *Cecilia Aurora, Murillo-Félix* / **ORC ID:** 0000-0002-2214-9880, **CVU CONACYT ID:** 971874

ID 2<sup>nd</sup> Coauthor: *Erika Ivett, Acosta-Mellado* / **ORC ID:** 0000-0003-3526-8923, **CVU CONACYT ID:** 282641

ID 3<sup>rd</sup> Coauthor: *Celia Yaneth, Quiroz-Campas* / **ORC ID:** 0000-0002-6068-1552, **CVU CONACYT ID:** 281305

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**Abstract**

The objective of the present research was to determine the degree of validity and reliability of an instrument that measures the perception of the Quality of Work Life to provide elements on the strength of its psychometric properties. A quantitative methodology was used, with a non-experimental design, cross-sectional scope and descriptive type. The sample consisted of 202 workers from three organizations, located in the municipality of Navojoa, Sonora, Mexico, the type of sampling was a convenience fee. Construct validity and reliability tests were formulated for internal consistency. Validity results by varimax rotation indicate that the 15 dimensions of the instrument explain 65.9% of the variance of the instrument results, while the Cronbach's alpha coefficient for the global scale shows a value of 0.974, both results are considered adequate. It is concluded that the instrument has acceptable validity and reliability properties that allow it to continue with tests to strengthen such properties, as well as being valid and reliable to collect the perception of the quality of work life in workers.

**Quality of working life, validation, reliability****Resumen**

El objetivo de la presente investigación fue determinar el grado de validez y confiabilidad de un instrumento que mide la percepción de la Calidad de Vida Laboral para aportar elementos sobre la solidez de sus propiedades psicométricas. Se utilizó una metodología cuantitativa, con diseño no experimental, alcance transversal y de tipo descriptivo. La muestra estuvo compuesta por 202 trabajadores de tres organizaciones, ubicadas en el municipio de Navojoa, Sonora, México, el tipo de muestreo fue de cuota por conveniencia. Se formularon pruebas de validez de constructo y de confiabilidad por consistencia interna. Los resultados de validez mediante rotación varimax indican que las 15 dimensiones del instrumento explican el 65.9% de la varianza de los resultados del instrumento, mientras que el coeficiente alfa de Cronbach para la escala global observa un valor de 0.974, ambos resultados se consideran adecuados. Se concluye que el instrumento posee propiedades de validez y confiabilidad aceptables que le permiten continuar con la realización de pruebas para fortalecer tales propiedades, además de ser válido y confiable para recoger la percepción de la calidad de vida laboral en trabajadores.

**Calidad de vida laboral, Validez, Confiabilidad**

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† Investigador contribuyendo como primer autor.

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## Introduction

Work is an essential act of every person, it represents the most important source of income for the generality of individuals, it offers the possibility of professional and personal development to workers, in addition to contributing to their socioeconomic stability; however, mainly due to globalization, work has been constantly transformed over time, especially in recent years; These variations refer to the integration of new information and communication technologies into the workplace, new ways of organizing work, innovations in production systems, among others, that have altered the labor, social and individual context of workers (Uribe- Rodríguez et al., 2011).

Globalization, together with the internationalization of companies, have caused important variations, generating a more demanding work environment, which involves the use of intense pressure in order to increase productivity and reduce costs (Garrido-Pinzón et al., 2011).

Due to the above, the organizations have increased the responsibilities of their workers, altering the agreed labor relations; migrating from a society where employment relationships were forged for an indefinite time, full-time shifts, among other elements, to a society that is distinguished by precarious circumstances for workers, influenced by atypical forms of work that promote flexibility and labor instability ( Id. Uribe-Rodríguez).

Consequently, while the work environment becomes increasingly competitive and complex, psychosocial risks have emerged, driven by work organization modes that lead to individualized and sectorized work, flat structures, temporary employment and outsourcing, increased labor flexibility and for a service-oriented society; which has caused a permanent demand for more specialization, an increase in work rates and productivity, to the detriment of the worker's quality of life (Id. Garrido-Pinzón).

If the thesis is accepted, that one of the purposes of any organization is to ensure the integrity, both physical and mental, of the worker, protecting him from the health risks inherent to his work environment and enabling the permanent improvement of his quality of working life (CVL), the need to formulate studies that aim to improve working conditions and satisfy the needs of workers regarding the reduction of psychosocial risk factors will also be accepted, which will impact the quality of working life of the workers (Id. Uribe-Rodríguez).

The importance of quality of work life studies is strengthened to the extent that the psychometric properties of the instrument used are reported based on the responses collected in each investigation, it is not enough to reference the properties of the instrument in previous applications or investigations Since these may vary depending on the different populations in which the instrument is applied, not reporting them considerably limits the validity and reliability of the results, as well as their inference capacity about the population, which it has a significant impact on the quality of the research itself.

Based on the above, the objective of this research was to determine the degree of validity and reliability of an instrument that measures the perception of the CVL to provide elements on the strength of its psychometric properties, thus enabling its application in workers of various types of public and private organizations.

This document is composed of five parts, the first corresponds to the introduction that contains arguments about the importance of CVL and its study, as well as the objective of the research; The second part considers aspects of the CVL such as its antecedents, definition, perspectives or conditions and main factors; The third part comprises the method, integrated descriptions of the type of research, participants, instrument, data analysis and procedure; The fourth part presents the results and their discussion, in the first place the tests of construct validity and later presents the reliability tests by internal consistency, as the fifth and last part, the conclusions of the research are presented.

**Quality of working life****History of the quality of working life**

According to Huerta et al. (2011) the term of quality of work life was introduced by Davis in 1972, it emerged as a discipline in the United States using the phrase democratization of work in the Arden House conference of Columbia University; Additionally, at the end of the 60s of the 20th century, the human dimensions of work gained strength and the studies of the time were oriented towards the quality of the relationship between workers and their work environment.

The foregoing coincides with the point of Gómez (2010) who affirms that the expression CVL was formulated by Louis Davis, through the term an attempt was made to point out the concern, of all institutions, for the well-being and health of workers so that they comply optimally with your tasks and responsibilities. Gómez (2010a) also pronounces in this sense, who argues that the notion of CVL was used in 1972, at a conference on international labor relations; In addition, the issue took on greater notoriety after the workers of Autos Unidos and General Motors undertook a series of changes in their perceived CVL programs.

For Camacaro (2010) CVL studies emerged in the 70s of the last century, taking special importance due to international treaties, provisions and agreements aimed at legalizing the right to protection of work, specifically its impacts on the qualitative improvement of conditions socio-labor of the workers.

For his part, Cruz (2018) states that the CVL's antecedents go back to the beginning of the 20th century, where the Fordist administrative model and serial production based on Taylor's administrative aspects prevailed, so the interest was focused in increasing the efficiency and production levels of workers in order to reduce costs, in addition, CVL was not a relevant factor in organizational management, as were productivity, efficiency and the use of time and resources, which that caused high levels of absenteeism, demotivation, staff turnover, among other aspects.

In the face of organizational problems, new currents of administrative thought arise, one of them was the theory of human relations, of which Elton Mayo is considered one of its main representatives, under this approach the central interest is in the personnel and their potential for organizations as an important and valuable factor; which coincides with the point of Gómez (2010a).

**Definition of CVL**

Regarding the definition, there are several in the literature, especially Müller et al. (2013: 163) indicate that "CVL points to the level of satisfaction, motivation, commitment and involvement that people experience around their work". Consequently, an adequate work environment favors a high CVL, which is reflected in high levels of satisfaction and performance, first individually and later organizationally. For Uribe-Rodríguez et al. (2011), CVL is the feeling that workers have about working conditions, the work environment and the concordance between work, personal and family life.

For their part, Gómez (2010a) and Huerta et al. (2011) define CVL as a process by which the organization corresponds to the requirement of workers to formulate mechanisms that enable them to participate in decision-making on the design of their working lives. While Gómez (2010) and Pando et al. (2018) define CVL as a multidimensional notion that is constituted when the worker, through their employment and particular appreciation, sees their needs for institutional support, security, integration and job satisfaction covered, determining the well-being obtained through their work, achieved personal development and free time management.

For Stecher et al. (2012) the CVL, like Gómez (2010) define it as a multidimensional term that reflects people's feelings about their work, their future in the organization, the motivation to keep their jobs, to properly carry out their work and the how work fits with personal life and values. The CVL as a multidimensional term based on a series of beliefs, which includes actions to increase productivity, raise the morale, participation, dignity and motivation of workers, even suppress the problems of functionality of the organizational hierarchy, is considered by Canales-Vergara et al. (2018).

Camacaro (2010) considers it as a philosophy or a system of beliefs and values that include efforts aimed at improving the productivity and morale of the employees of an organization, highlighting the recognition of the dignity of the human being, their intellectual potential and the increase of the participation of workers in their work under a continuous system. For their part, Hernández-Vicente et al. (2017) conceive CVL in a similar way to Id. Camacaro, since they understand it as an active and constant process of the organization that favors human development, in order to increase productivity and prosperity of workers and their environment.

Martínez & Ros (2011: 10) identify the dominant CVL model that defines it "as the result of the perception of the subjects of the characteristics of the company and the organization, and as such an individual and group product"; This definition contemplates two types of perception, personal and collective. While Pérez-Zapata et al. (2014: 542) define CVL "as the personal experience of employees regarding their involvement in the exercise of an occupation".

### **CVL Perspectives**

In addition, the term CVL comprises two types of conditions or perspectives: objective and subjective (Id. Camacaro; Id. Uribe-Rodríguez; Stecher; García & Forero, 2016; Restrepo & López, 2016; Id. Hernández-Vicente; Id. Canales-Vergara and Id. Pando)

As for the objective conditions, they are associated with the conditions of the work environment, such as security, lighting, ergonomics, technology, among others; also aspects related to the job position, administration systems, as well as organizational features and processes (Id. Camacaro, Id. Canales-Vergara); For Id. Uribe-Rodríguez, objective conditions are safety, hygiene, salary, among others; Id. García affirm that they globally value the organization as a system, considering the physical and environmental characteristics of the job, that is, they are elements that make up the work environment, such as working conditions, salary, health, among others; Restrepo & López (2016) argue that they correspond to the conditions of the work environment.

Continuing with the objective conditions, for Hernández-Vicente et al. (2017) are aspects that are related to the institution and its environment; For Martínez & Ros (2011) they consider that these conditions are centered under an organizational perspective, focused on how to increase the quality of life of workers to obtain greater benefits and maximum productivity, considering aspects such as facilities, organizational structure, technology, job design, remuneration, benefits and services; Finally, for Arrieta-Díaz (2018b) they include aspects of the work environment, such as working conditions, salary, health, among other factors.

While subjective conditions refer to the way the worker lives (Uribe-Rodríguez et al., 2011), for Camacaro (2010) and Canales-Vergara et al. (2018) include aspects such as meeting needs, job satisfaction, relationships with senior and middle management, attitudes and values about work such as motivation, commitment, pride, identity, among others; García & Forero (2016) affirm that they are subjective from the perspective of the worker and include factors that directly affect the way they perceive their work, understanding the personal traits that allow to form expectations about the work; Id. Restrepo argue that it implies the subjective appreciation of work, which is equivalent to the way in which workers experience and interpret their work.

Continuing with the subjective conditions, for Id. Hernández-Vicente these measure the responses of the workers to the presence or absence of certain experiences, perceptions, affectivity and attitudes; For his part, Id. Martínez located them as psychological conditions, which denote a greater interest in the worker, involving factors such as satisfaction, well-being, health, expectations about the future of the worker in the company, attitudes towards work ; lastly, for Id. Arrieta-Díaz) concern the worker's convictions produced by his perception of the labor reality.

The foregoing allows us to appreciate the complexity of the CVL term and the inherent difficulties in making the term operational, consequently conducting studies that allow progress in this regard will be welcome.

## Method

### Kind of investigation

A quantitative methodology was used, with a non-experimental design, with a cross-sectional scope and of a descriptive type to determine the degree of validity and reliability of a quality of work life instrument in workers of companies in Navojoa, Sonora, Mexico. It is considered quantitative because data collection was used to test hypotheses based on numerical measurement and statistical analysis (Sierra, 2001; Briones, 2002; Creswell, 2003; Kerlinger & Lee, 2008 and Hernández et al., 2014), with non-experimental design due to the fact that the variables (Id. Sierra; Id. Briones; Id. Kerlinger and Id. Hernández) were not manipulated, with transversal scope because the information was collected only once in time (Id. Briones and Id. Hernández) and of a descriptive type since the specification of the important properties and features of the phenomenon to be analyzed is examined, particularly the psychometric properties of a CVL instrument. (Id. Hernández).

### Participants

The sample was composed of 202 workers from three organizations, two public and one private, the relative participation in the sample was 42.6 percent from the public organization1, 25.7 percent was from the public company 2 and 31.7 percent They were participants of the private company, the three institutions are located in the municipality of Navojoa, Sonora, Mexico, in the three organizations the percentage of participation was higher than 70 percent of the universe of workers. 38.1 percent of the participants were male and 61.9 percent female. The type of sampling was a convenience fee, the inclusion criterion was the interest to participate, voluntarily, responding to the instrument.

### Instrument

The instrument applied was the one designed by Arrieta-Díaz (2018, 2018b) which consists of three parts: The first contains the name of the instrument and the instructions to answer it, the second part contains the reagents that measure the quality of work life, the third section retrieves information on categorical variables, such as sex, age, education, marital status, seniority in the organization, area or department of assignment.

In particular, the second part of the instrument, relating to the quality of work life items, has 70 items written in an affirmative and positive way, which are integrated into 15 dimensions, the items for each dimension are shown in Table 1.

For the interpretation of the collected results obtained by the instrument, a Likert-type scale was used, in which each answer had a numerical value, Strongly agree = 5, Agree = 4, Regularly agree = 3, Disagree = 2, Strongly disagree = 1, Indifferent = 0.

| Dimension                     | Number of items | Question number                |
|-------------------------------|-----------------|--------------------------------|
| Safety and working conditions | 7               | 3, 11, 16, 20, 29,45, 50       |
| Occupational health           | 7               | 8, 18, 22,31, 38, 13, 47       |
| Moral                         | 7               | 6, 17, 26, 32, 37, 43, 53      |
| Remuneration                  | 6               | 5, 19, 28, 34, 42, 68          |
| Organizational Participation  | 7               | 12, 14, 25, 33, 41, 52, 55     |
| Communication                 | 7               | 15, 23, 44, 51, 57, 61, 70     |
| Identity                      | 7               | 9, 14,27, 36, 46, 53, 58       |
| Direction and leadership      | 7               | 10, 23, 37, 49, 56, 62, 54     |
| Post design                   | 7               | 4, 7, 21, 30, 48, 59, 63       |
| Organizational Justice        | 7               | 2, 39, 60, 64, 65, 67, 69      |
| Work satisfaction             | 8               | 5, 19, 28, 35, 42, 48, 52,63   |
| Intrinsic motivation          | 8               | 12 25, 33, 37, 41, 43, 53, 52  |
| Extrinsic Motivation          | 8               | 17, 19, 39, 42, 45, 49, 54, 62 |
| Motivation with equity        | 8               | 5, 12, 19, 28, 30, 48, 65,68   |
| Global perception             | 4               | 1, 24, 40, 66                  |

**Table 1** Relationship of dimensions and questions  
Source: Taken from Arrieta-Díaz (2018, 2018b)

## Procedure

The procedure followed was: selection of the instrument to which categorical variables were added to obtain information from the participants, then the instrument was applied to the personnel of the different organizations, after requesting support from the corresponding authorities and at the time of the application, the participation of the workers was requested, as well as the objective of the investigation and the instrument were explained to them, who decided voluntarily and anonymously to respond to the instrument.

## Data analysis

The SPSS version 24.0 program was used to analyze the results. To start with the validity analysis, firstly, the Bartlett and Kaiser-Meyer-Olkin (KMO) sphericity tests were performed, which helped to determine whether it was convenient to perform the Exploratory Factor Analysis (EFA); Once the suitability of the EFA was confirmed, the factor extraction was carried out through the principal components method, relevant factors were considered those that presented factorial loads higher than the absolute value of 0.250, since it was expected that the factors presented a significant relationship were used the varimax rotation to obtain the solution of them. Additionally, the contrasted groups test was formulated to identify the construct validity, this test allows to identify if the subjects with high and low scores discriminate their responses, this test uses a hypothesis test using the Student's t statistic.

The reliability analysis was determined by calculating the Cronbach's alpha coefficient for the instrument in a total or global way and for each of the factors considered by the author of the same, additionally the test of halves was formulated, considering Cronbach's alpha for each half, as well as the Spearman-Brown Coefficient and the Guttman Coefficient of Two Halves.

## Results and their discussion

### Construct validity results

First, the collective significance of the items was verified to justify the execution of the exploratory factor analysis, using the Kaiser-Meyer-Olkin (KMO) sample adequacy statistic and the Bartlett sphericity test. Regarding the Bartlett's sphericity test, a high chi-square with a probability value less than 0.05 is expected, while the KMO statistic is expected to be close to 1, to proceed with the factor analysis (Barraza, 2008; De la Ossa et al., 2009; Campo-Arias, 2013; Campo-Arias et al., 2013; Giraud-Herrera & Morantes-Quintan, 2017; Müller et al., 2013; Moliner et al., 2017; Díaz-Arrieta, 2018; Pando et al., 2018; Pujol & Arraigada, 2018; Salessi & Omar, 2018, Molina, 2020; Palomino, 2020; Ramírez, 2020, Sanchez, 2020) the results are shown in Table 2.

As can be seen, the KMO statistic presents a value close to 1 and greater than 0.8, in addition the level of significance of the Bartlett test presents a level of significance less than 0.05, so both tests indicate that the formulation of the analysis is adequate. exploratory factorial. These results are consistent with those obtained by Id. Arrieta-Díaz since it reports a KMO of 0.870 and a significance level for the Bartlett test (0.000) less than the reference value of 0.05.

| Kaiser-Meyer-Olkin measure of sampling adequacy |         |             |          | .879 |
|---|---------|-------------|----------|------|
| Bartlett's test of sphericity                   | Approx. | Chi squared | 8398.896 |      |
|   | Gl      |             | 2415     |      |
|   | Sig.    |             | .000     |      |

**Table 2** KMO and Bartlett tests for Exploratory Factor Analysis

Source: Elaboration with data from the instrumen

To determine the construct validity, the principal components and the varimax rotation were used as the factor extraction method as the rotation method, which coincides with Arrieta-Díaz (2018b) also with Id. Barraza; Blanch et al. (2010a); Blanch et al. (2010b); Sánchez et al. (2011); Restrepo & López (2016); Gil-Monte et al. (2017); Id. Giraud-Herrera; Hernández-Vicente et al. (2017); Id. Moliner and Id. Pando.

However, since the instrument used was designed by Id. Arrieta-Díaz, the extraction method will be conditioned to consider 15 factors, which are those contemplated in the instrument by its author.

Table 3 shows the factors extracted with the principal components method, the 15 factors explain 65.93 percent of the variance of the results, which is adequate for this type of instrument, in this sense this result presents some consistency with the determined by Arrieta-Díaz (2018b), since it reports 75 percent of the variance of the results; However, it is convenient to point out that Id. Arrieta-Díaz in her analysis identifies 2 factors, which represents a significant difference with respect to our results.

| Component | Initial eigenvalues |              |                | Squared extraction sums |              |                | load   |              |                | Rotation sums of |              |                |
|-----------|---------------------|--------------|----------------|-------------------------|--------------|----------------|--------|--------------|----------------|------------------|--------------|----------------|
|           | Total*              | % variance * | % accumulated* | Total*                  | % variance * | % accumulated* | Total* | % variance * | % accumulated* | Total*           | % variance * | % accumulated* |
| 1         | 19.62               | 28.03        | 28.03          | 19.62                   | 28.03        | 28.03          | 7.98   | 11.40        | 11.40          |                  |              |                |
| 2         | 4.20                | 6.00         | 34.03          | 4.20                    | 6.00         | 34.03          | 4.74   | 6.77         | 18.18          |                  |              |                |
| 3         | 2.86                | 4.09         | 38.13          | 2.86                    | 4.09         | 38.13          | 4.17   | 5.96         | 24.15          |                  |              |                |
| 4         | 2.37                | 3.39         | 41.53          | 2.37                    | 3.39         | 41.53          | 3.95   | 5.64         | 29.79          |                  |              |                |
| 5         | 2.25                | 3.21         | 44.74          | 2.25                    | 3.21         | 44.74          | 3.21   | 4.58         | 34.38          |                  |              |                |
| 6         | 1.91                | 2.73         | 47.48          | 1.91                    | 2.73         | 47.48          | 2.99   | 4.28         | 38.66          |                  |              |                |
| 7         | 1.83                | 2.62         | 50.10          | 1.83                    | 2.62         | 50.10          | 2.72   | 3.89         | 42.55          |                  |              |                |
| 8         | 1.77                | 2.53         | 52.63          | 1.77                    | 2.53         | 52.63          | 2.66   | 3.80         | 46.36          |                  |              |                |
| 9         | 1.56                | 2.23         | 54.86          | 1.56                    | 2.23         | 54.86          | 2.32   | 3.32         | 49.68          |                  |              |                |
| 10        | 1.54                | 2.20         | 57.07          | 1.54                    | 2.20         | 57.07          | 2.18   | 3.12         | 52.80          |                  |              |                |
| 11        | 1.36                | 1.94         | 59.01          | 1.36                    | 1.94         | 59.01          | 2.03   | 2.90         | 55.71          |                  |              |                |
| 12        | 1.30                | 1.86         | 60.88          | 1.30                    | 1.86         | 60.88          | 2.00   | 2.86         | 58.57          |                  |              |                |
| 13        | 1.23                | 1.76         | 62.64          | 1.23                    | 1.76         | 62.64          | 1.89   | 2.71         | 61.28          |                  |              |                |
| 14        | 1.19                | 1.70         | 64.35          | 1.19                    | 1.70         | 64.35          | 1.63   | 2.32         | 63.61          |                  |              |                |
| 15        | 1.11                | 1.58         | 65.93          | 1.11                    | 1.58         | 65.93          | 1.62   | 2.32         | 65.93          |                  |              |                |

Extraction method: principal component analysis.  
\* Values were truncated to 2 decimal places, due to space.

**Table 3** Extracted factors and explained total variance of the results

Source: Elaboration with data from the instrument

Table 4 shows the rotated components, that is, the factorial analysis with varimax rotation, only factorial loads greater than 0.25 were considered for the identified factors, which allows us to appreciate that only item 16 presented a negative factorial load, due to the fact that Arrieta-Díaz (2018, 2018b) does not present the results of the matrix of rotated components, the similarity or discrepancy in the results cannot be verified, additionally, it is convenient to point out that the results are not presented in the original format of the matrix of rotated components. Due to the length of the Table, so an adaptation of the Table was made to facilitate its appreciation on the same page of the text, the factorial load of each factor is presented in parentheses on one side of the item.

|              |  |
|--------------|--|
| Component 1  | P2(.724), P7(.448), P10(.455), P22(.442), P23(.760), P25(.526), P26(.793), P29(.402), P35(.695), P37(.631), P51(.603), P54(.587) y P65(.554) |
| Component 2  | P9(.493), P14(.660), P30(.484), P31(.622), P33(.415), P67(.500), P68(.451), P69(.466), P70(.515)   |
| Component 3  | P11(.583), P17(.447), P20(.681), P57(.623), P58(.709)  |
| Component 4  | P36(.539), P41(.553), P45(.361), P48(.613), P50(.605)  |
| Component 5  | P15(.469), P44(.501), P49(.635), P56(.634), P60(.717), P62(.743)   |
| Component 6  | P5(.672), P19(.634), P28(.558), P66(.488)  |
| Component 7  | P21(.436), P24(.460), P27(.453), P40(.702)   |
| Component 8  | P32(.519), P38(.404), P43(.489), P59(.675), P61(.484)  |
| Component 9  | P3(.703), P4(.506), P16(-.688)   |
| Component 10 | P42(.294), P46(.568), P47(.504)  |
| Component 11 | P1(.398), P8(.769), P18(.708)  |
| Component 12 | P39(.446), P63(.575), P64(.455)  |
| Component 13 | P12(.344), P13(.599), P52(.580)  |
| Component 14 | P6(.715), P34(.422)  |
| Component 15 | P53(.626), P55(.441)   |

Extraction method: principal component analysis.  
Rotation method: Varimax with Kaiser normalization.  
a. The rotation has converged in 34 iterations.

**Table 4** Rotated components

Source: Elaboration with data from the instrument

Comparing the structure obtained in the present analysis with the one designed in the instrument by Arrieta-Díaz (2018, 2018b), considerable discrepancies are found, so the results of the structure according to the method of extraction of principal components with varimax rotation must be taken with caution.

To find more evidence in relation to the construct validity, the test of contrasted groups was formulated, the results are presented in Table 5, only the level of bilateral significance is included, with which the hypothesis of equality of means is accepted or rejected For each item, the reference value of bilateral significance was less than or equal to 0.05 to reject the hypothesis of equality of means, based on the Student's t statistic, as suggested by Sierra (2001), Kerlinger & Lee (2008) and Anastasi & Urbina (2009).

| Reagent | Significance (bilateral) |
|---------|--------------------------|---------|--------------------------|---------|--------------------------|---------|--------------------------|
| P1      | .000                     | P19     | .000                     | P37     | .000                     | P55     | .000                     |
| P2      | .000                     | P20     | .000                     | P38     | .048                     | P56     | .000                     |
| P3      | .000                     | P21     | .002                     | P39     | .000                     | P57     | .000                     |
| P4      | .000                     | P22     | .000                     | P40     | .000                     | P58     | .000                     |
| P5      | .000                     | P23     | .000                     | P41     | .000                     | P59     | .000                     |
| P6      | .173                     | P24     | .000                     | P42     | .000                     | P60     | .018                     |
| P7      | .000                     | P25     | .000                     | P43     | .000                     | P61     | .000                     |
| P8      | .007                     | P26     | .000                     | P44     | .252                     | P62     | .029                     |
| P9      | .000                     | P27     | .000                     | P45     | .000                     | P63     | .000                     |
| P10     | .000                     | P28     | .000                     | P46     | .000                     | P64     | .000                     |
| P11     | .000                     | P29     | .000                     | P47     | .000                     | P65     | .000                     |
| P12     | .000                     | P30     | .000                     | P48     | .000                     | P66     | .000                     |
| P13     | .000                     | P31     | .000                     | P49     | .000                     | P67     | .000                     |
| P14     | .000                     | P32     | .000                     | P50     | .000                     | P68     | .000                     |
| P15     | .638                     | P33     | .000                     | P51     | .000                     | P69     | .000                     |
| P16     | .344                     | P34     | .000                     | P52     | .000                     | P70     | .000                     |
| P17     | .000                     | P35     | .000                     | P53     | .000                     |         |                          |
| P18     | .001                     | P36     | .000                     | P54     | .000                     |         |                          |

**Table 5** Construct validity results by contrasted groups  
Source: Elaboration with data from the instrument

The results of the contrasted groups test allow rejecting the hypothesis for equality of means for items 6, 15, 16 and 44, which from this perspective is interpreted that these items do not have construct validity.

In general terms, the instrument has adequate levels of validity, considering that the 70 items, grouped into 15 factors, explain 65.9 percent of the variance of the results, in addition 66 items presented construct validity through the test of contrasted groups, on the 4 reagents that did not show validity, recommendations will be made in the next section.

### Reliability results for internal consistency

Once the tests to determine the validity of the instrument had been carried out, the reliability was determined by internal consistency. Table 6 shows the results of the alpha coefficients for the entire instrument and by dimension, additionally, the alpha coefficients are presented without taking into account the 4 items that did not present construct validity through the test of contrasted groups, to measure their impact on reliability by not being included in the reliability analysis.

| Dimension                     | Number of items | Number of questions            | Cronbach's Alpha | Cronbach's alpha if the item is removed (items 6, 15, 16 and 44 for not presenting validity) |
|-------------------------------|-----------------|--------------------------------|------------------|--|
| Global                        | 70              | 1 al 70                        | 0.974            | 0.953  |
| Safety and working conditions | 7               | 3, 11, 16, 20, 29, 45, 50      | 0.561            | 0.724  |
| Occupational health           | 7               | 8, 18, 22, 31, 38, 13, 47      | 0.569            |  |
| Moral                         | 7               | 6, 17, 26, 32, 37, 43, 53      | 0.667            | 0.762  |
| Remuneration                  | 6               | 5, 19, 28, 34, 42, 68          | 0.660            |  |
| Organizational Participation  | 7               | 12, 14, 25, 33, 41, 52, 55     | 0.716            |  |
| Communication                 | 7               | 15, 23, 44, 51, 57, 61, 70     | 0.515            | 0.750  |
| Identity                      | 7               | 9, 14, 27, 36, 46, 53, 58      | 0.749            |  |
| Direction and leadership      | 7               | 10, 23, 37, 49, 56, 62, 54     | 0.658            |  |
| Post design                   | 7               | 4, 7, 21, 30, 48, 59, 63       | 0.736            |  |
| Organizational Justice        | 7               | 2, 39, 60, 64, 65, 67, 69      | 0.704            |  |
| Work satisfaction             | 8               | 5, 19, 28, 35, 42, 48, 52, 63  | 0.756            |  |
| Intrinsic motivation          | 8               | 12, 25, 33, 37, 41, 43, 53, 52 | 0.761            |  |
| Extrinsic Motivation          | 8               | 17, 19, 39, 42, 45, 49, 54, 62 | 0.623            |  |
| Motivation with equity        | 8               | 5, 12, 19, 28, 30, 48, 65, 68  | 0.835            |  |
| Global perception             | 4               | 1, 24, 40, 66                  | 0.644            |  |

**Table 6** Cronbach's alpha, global and by dimension  
Source: Elaboration with data from the instrument

The reliability results show that the CVL scale, at the global level, presents an acceptable level of reliability due to internal consistency, in terms of reliability by dimension, some could be considered, from a demanding perspective, as low. These results are consistent, at a global level, with those obtained by Arrieta-Díaz (2018, 2018b) since it provides a global alpha of 0.952 in both cases, however, in the present investigation some alpha coefficients per dimension have relatively low values, especially if it is considered that for Arrieta-Díaz a value higher than 0.7 is acceptable.

Next, in Table 7 the results of reliability by internal consistency are presented by means of the split halves test, the results are presented taking into account the 70 reagents, as well as with 66 reagents, after eliminating the 4 that did not present validity of construct.

|  |                             | 70<br>reagents     | 66<br>reagents  |                 |
|--|-----------------------------|--------------------|-----------------|-----------------|
| Cronbach's<br>alpha  | Part 1                      | Value              | .899            | 0.923           |
|  |                             | No. of<br>elements | 35 <sup>a</sup> | 33 <sup>c</sup> |
|  | Part 2                      | Value              | .907            | .906            |
|  |                             | No. of<br>elements | 35 <sup>b</sup> | 33 <sup>d</sup> |
|  | Total number of<br>elements |                    | 70              | 66              |
| Correlation between forms  |                             | .841               | .851            |                 |
| Spearman-<br>Brown<br>coefficient  | Equal length                | .914               | .919            |                 |
|  | Uneven length               | .914               | .919            |                 |
| Guttman's coefficient of two<br>halves   |                             | .911               | .919            |                 |
| a. Los elementos son: P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P18, P19, P20, P21, P22, P23, P24, P25, P26, P27, P28, P29, P30, P31, P32, P33, P34, P35.          |                             |                    |                 |                 |
| c. Los elementos son: P1, P2, P3, P4, P5, P7, P8, P9, P10, P11, P12, P13, P14, P17, P18, P19, P20, P21, P22, P23, P24, P25, P26, P27, P28, P29, P30, P31, P32, P33, P34, P35, P36.                   |                             |                    |                 |                 |
| b. Los elementos son: P36, P37, P38, P39, P40, P41, P42, P43, P44, P45, P46, P47, P48, P49, P50, P51, P52, P53, P54, P55, P56, P57, P58, P59, P60, P61, P62, P63, P64, P65, P66, P67, P68, P69, P70. |                             |                    |                 |                 |
| d. Los elementos son: P37, P38, P39, P40, P41, P42, P43, P45, P46, P47, P48, P49, P50, P51, P52, P53, P54, P55, P56, P57, P58, P59, P60, P61, P62, P63, P64, P65, P66, P67, P68, P69, P70.           |                             |                    |                 |                 |

**Table 7** Reliability results by split halves

Source: Elaboration with data from the instrument

Reliability results by split halves are adequate for both halves, both for the survey considering the 70 items, and for the survey considering 66 items. Additionally, the Spearman-Brown coefficients and the Guttman coefficient are also satisfactory in both cases, so the instrument presents a level of reliability with acceptable internal consistency.

Regarding the reference value to determine reliability, Kerlinger & Lee (2008) argue that various authors accept the value of 0.7 as the reference value to determine adequate and inadequate reliability; However, they affirm that there is no evidence to support this criterion as it is considered arbitrary, they point out that an adequate level of reliability depends on how the measure is used. They recognize that in some cases values of 0.5 or 0.6 are acceptable, while in other cases values of 0.9 are barely acceptable.

In this regard, Anastasi & Urbina (2009) do not indicate a reference value for reliability; while Hernández et al. (2014) agree with Id. Kerlinger since they argue the non-existence of a reference value to decree the reliability or unreliability of an instrument; In summary, a low reliability value can be accepted if the instrument has high validity. Additionally, if the decision to be made based on the instrument is reversible, concerns groups and not individuals, or has temporary effects, a low reliability value is acceptable (Kerlinger & Lee, 2008). For the purposes of the present research, 0.6 (Palomino, 2020) is considered as a reliability reference value, because the instrument has high construct validity and that the decisions that will be made based on the results of the instrument can be considered reversible diagnoses would involve the staff of a general organization (Id, Kerlinger).

Under the same order of ideas, Argibay (2006) argues that it is imperative to be demanding in reliability when the purpose is individual psychodiagnostic, but not necessarily when the instrument will be used to make group decisions or to obtain group mean values. Finally, Prieto & Delgado (2010) argue that reliability and validity should be assumed as matters of degree and not as a characteristic that instruments have or do not have.

## Conclusions

Based on the results of the previous section, the following conclusions are formulated:

- The CVL instrument formulated by Arieta Díaz (2018, 2018b) presents an acceptable degree of construct validity, since the results of factor extraction by main components, varimax rotation and contrasted groups support this.
- The CVL instrument, based on its level of validity, measures what it claims to measure, that is, it measures the Quality of Work Life construct.

- It also has an acceptable level of reliability due to internal consistency, taking as a reference the results by Cronbach's alpha and by divided halves, especially if it is considered that the decisions that will be made based on the results of its application will be general or for group effects that can be considered diagnostic or exploratory, as well as reversible.
- Based on its level of reliability, the CVL instrument accurately measures CVL.
- Reagents 6, 15, 16 and 44 did not show validity through the contrasting groups test, so decisions must be made in this regard, being able to choose to improve the writing of the reagents for future applications or eliminate them, in order to report the CVL values. Based on the participants in this sample, these reagents should not be considered, as they were omitted for analysis in this report.
- In general terms, evidence was found to affirm that the CVL instrument designed by Id. Arrieta-Díaz presents acceptable degrees of validity and reliability, so it can be applied to determine the CVL level in workers.

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