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Figuroa-García, Ricardo Iván; Vidal-Velazco, Eduardo Abraham; Díaz-Juárez, Cynthia Magaly; León-Torres, Juan Manuel; Sánchez-Sosa, Juan José

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Adaptation, validity, and reliability of the Resilience Scale SV-RES in hospital health professionals in Mexico

Ricardo Iván Figueroa-García,¹ Eduardo Abraham Vidal-Velazco,¹ Cynthia Magaly Díaz-Juárez,¹ Juan Manuel León-Torres,¹ Juan José Sánchez-Sosa¹

¹ Universidad Nacional Autónoma de México (UNAM), Ciudad de México, México.

Correspondence:

Ricardo Iván Figueroa-García
Universidad Nacional Autónoma de México.
Av. Universidad 3004, Edificio "D",
Laboratorio 15.
Phone: +52 55 2784 9647
and +52 55 5622 2332
Email: psic.ricardofg@gmail.com

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ABSTRACT

Introduction. Resilience is the capacity in which the qualities and resources of the individual help in the successful coping of adverse situations. Studying the construct of resilience requires seeing it as a process and not only a characteristic of the individual. Saavedra's resilient response is a model that fits this idea and explains resilience satisfactorily. Having a measuring instrument for health personnel working in hospitals would allow discovering its benefits as a protective factor in the workplace. **Objective.** Adapt and validate the Resilience Scale SV-RES in hospital health professionals in Mexico. **Method.** Based on recent research literature, including response models and modified and adapted items from the Resilience Scale SV-RES, a total of 909 health professionals responded. Distribution, factor analysis, and internal consistency tests were performed. **Results.** The process led to a scale of 28 items grouped into six factors with an overall internal consistency of ($\alpha = .908$) and 50.5% of explained variance. **Discussion and conclusion.** The Resilience Scale SV-RES has adequate psychometric properties that make it appropriate to measure the resilience capacity of hospital health professionals in Mexico.

Keywords: Resilience, health personnel, resilient response, psychometric scale.

RESUMEN

Introducción. La resiliencia es la capacidad en que las cualidades y recursos del individuo le ayudan al afrontamiento exitoso de situaciones adversas. Se ha advertido que estudiar el concepto de resiliencia requiere verse como un proceso y no sólo como elementos característicos del individuo, un modelo que explica de manera adecuada este proceso es el modelo de respuesta resiliente de Saavedra. Contar con un instrumento que permita su medición en personal de salud hospitalario permitiría descubrir su beneficio como factor protector en el lugar de trabajo y diseñar intervenciones preventivas o remediales. **Objetivo.** Adaptar y validar la Escala de Resiliencia SV-RES en profesionales de salud hospitalaria en México. **Método.** Se tomó como base la literatura de investigación científica contemporánea, modelos de respuesta resiliente y los reactivos de la Escala de Resiliencia SV-RES, adaptados y modificados, a los que respondieron 909 profesionales de la salud. Se realizaron pruebas de distribución, análisis factorial y consistencia interna. **Resultados.** Se obtuvo una escala conformada por 28 reactivos agrupados en seis factores con consistencia interna global de ($\alpha = .908$) y una varianza explicada de 50.5%. **Discusión y conclusión.** La Escala de Resiliencia SV-RES cuenta con propiedades psicométricas adecuadas que la hacen apropiada para medir la capacidad de resiliencia en profesionales de la salud hospitalaria de México.

Palabras clave: Resiliencia, personal de salud, respuesta resiliente, escala psicométrica.

INTRODUCTION

Health professionals working in hospitals are particularly vulnerable to suffering from various psychological affectations (Duarte, Velasco, Sánchez-Sosa, & Reyes-Lagunes, 2019; Fouilloux et al., 2020; Gómez-Urquiza et al., 2017; Vidal, Chávez-Negrete, Riveros, & Sánchez-Sosa, 2019). Various complaints are associated with health system conditions (González & Pérez, 2012; Polanco et al., 2013); interpersonal dynamics at work (Brooks, Gerada, & Chalder, 2011; Aguado Martín, Bátiz Cano, & Quintana Pérez, 2013) and individual aspects (Landa-Ramírez et al., 2017; Trifunovic, Jatic, & Kulenovic, 2017). The consequences affect the quality and way of interacting with patients and other health team members, imbalance between work and personal life, and various aspects of their health (Duarte et al., 2019; Reith, 2018; Shanafelt et al., 2012).

This background has prompted the investigation of factors that can function as protectors against these consequences. Among them, resilience has gained an important role due to its apparent association with low levels of stress, anxiety, and burnout, among others (Rushton, Batcheller, Schroeder, & Donohue, 2015; Ríos-Risquez, García-Izquierdo, Sabuco-Tebar, Carrillo-García, & Martínez-Roche, 2016; Deldar, Froutan, Dalvand, Gheshlagh, & Mazloum, 2018; Foster et al., 2019; Yu, Raphael, Mackay, Smith, & King, 2019).

The concept of resilience has been defined in diverse ways making it difficult to have consensual conventional concepts. This has contributed to a separation between resilience theory and practice. While there are core, widely accepted factors of resilience, such as social support (APA Help Center, 2019), others vary depending on the author and the instrument used to assess them.

Several commonalities have been found in the study of resilience (Connor & Davidson, 2003; García-Vesga & Domínguez-de la Ossa, 2013; Fernandes de Araújo & Bermúdez, 2015; Ortunio & Guevara, 2016; Stainton et al., 2019). These consistencies include perceived stress, adversity, and hostile work contexts. These contexts are not limited to extreme cases, such as losing a colleague or loved one. The context also functions as a protective factor to reduce everyday risk events, such as social, family, educational, and occupational vulnerability. When the individual successfully copes with these adversities, positive adaptation usually results.

Due to this conceptual complexity, resilience is considered a multifactorial phenomenon, where the qualities and resources of the individual contribute to the successful coping of the adverse situation (Connor & Davidson, 2003; García-Vesga & Domínguez-de la Ossa, 2013; Ortunio & Guevara, 2016). In general, resilience should be seen as a process and not only as an inherent or characteristic element of the individual (Stainton et al., 2019). Consistent with this

stance, Saavedra proposed a model of resilient response from the emergent case study (Saavedra, 2003; Saavedra & Villalta, 2008, p. 32).

This approach sees resilient responses as goal-oriented actions that meet three essential conditions: a) *Basic conditions*, including beliefs, values, experiences, and social ties that the subject has developed throughout his or her life. b) *Positive self-view*, which includes positive emotions and thoughts that the person identifies in him/herself in the face of adversity, and c) *Problem view*, an articulated and positive perception in which the problem appears surmountable.

Several authors refer to resilience as a critical protective factor in the workplace (Jackson, Firtko, & Edenborough, 2007; Howe, Smajdor, & Stöckl, 2012; Epstein & Krasner, 2013; Brennan, 2017; Sotile, Fallon, & Simonds, 2019; McKinley et al., 2019; Yu et al., 2019). However, most studies assessing resilience use instruments with poor theoretical congruence, i.e. different elements of resilience from one instrument to another; low inter-scale consistency, and weak or absent ecological validity (measurement under specific conditions present during measurement).

Thus, it is essential to have a consistent resilience instrument with good psychometric characteristics for the population of hospital health professionals. Such an instrument would allow the proper evaluation of this protective factor and contribute to designing and examining the effectiveness of interventions that promote resilience. Within a broader study that evaluates risk and protection variables in health personnel, it was decided to use the Resilience Scale SV-RES. Due to its flexibility of use and validity of items, the objective of this study was to adapt and validate a scale to measure the resilient response of hospital health professionals.

METHOD

Design of the study

Development process of a measurement scale.

Participants

A total of 909 health professionals (attending staff and students) from the various services and shifts of the hospital participated. Participation was voluntary and strictly anonymous after signing the corresponding informed consent form. Personnel under psychiatric or psychological treatment or participating in any other study that could bias the findings were excluded from the analysis. Also excluded were those who had not responded to at least 80% of the items. The invitation to the study was open to all hospital staff and students through invitations from service chairpersons, social networks, posters, and other similar means. Seventy percent of the total staff participated, enough to

be representative of said hospital. Data collection included from November 2018 to February 2019.

Measurement

The Resilience Scale SV-RES, initially developed by [Saavedra and Villalta \(2008\)](#) for the Chilean population, evaluates the concept of resilience based on Edith Grotberg's theory of resilient verbalizations and Saavedra's resilient response model. It is a 60-item scale grouped into 12 factors: identity, autonomy, satisfaction, pragmatism, links, networks, models, goals, affectivity, self-efficacy, learning, and generativity. The answers require responding to a Likert-type scale, ranging from "1 = totally disagree" to "5 = totally agree", leading to a score for each factor and a global score through the sum; a higher score greater resilience capacity.

The original Scale has internal consistency of $\alpha = .96$ (Cronbach's alpha) and validity through Pearson's coefficient of $r = .76, p < .05$ with the CD-RISC instrument ([Connor & Davidson, 2003](#)).

Procedure

Once the original author of the scale gave the proper authorization, the scale was submitted to a trial with 24 expert

health psychologists to examine comprehension (wording and structure) of the Mexican culture and to identify whether the items effectively evaluated relevant dimensions (content validity). Due to some initial inconsistencies in the results (Aiken coefficient less than .70), the next version got modified based on the most consistent suggestions stemming from the first procedure.

A second trial was carried out with 43 experts to evaluate factor assignment, adequacy to the Spanish language. Correct grammatical usage was assessed by an expert grammarian-philologist in Spanish. An interquartile deviation > 1.4 and a coefficient of variation $< 30\%$ were used as criteria for the discrimination capacity of the items, leading to a new version of 60 items.

The final version of the instrument was then administered to 909 health personnel to examine its main psychometric properties. The study is part of a larger project, the evaluation proceeded through a general battery composed of seven instruments. In order to avoid bias, the data corresponding to the resilience variable were recorded and analyzed separately. The capture and scoring of the items was carried out by means of a blind procedure and, in order to guarantee correct data capture, 30% of the captures were, again, randomly reviewed.

Table 1
Sociodemographic data of participants (N = 909).

Age		M = 35.35 SD = 11.49	
		N	%
Sex	Male	260	28.6
	Female	649	71.4
Marital status	Single	522	57.4
	Married	252	27.7
	In cohabitation	83	9.1
	Other	51	5.7
	Not specified	1	.1
Position	Nursing staff	371	40.9
	Graduate students (nursing)	37	4.0
	Social service/interns (nursing)	56	6.2
	Medical staff (attending)	122	13.5
	Resident physicians	199	21.9
	Social service/interns (medical)	66	7.2
	Licentiate degree medical interns	39	4.3
	Other (nutritionists, psychologists, dentists, etc).	19	2.0
Shift	Morning-afternoon, 6:00 to 14:00 hours	423	46.6
	Night shift 22:00 to 6:00 hours (nursing)	141	15.5
	Afternoon-evening 14:00 to 22:00.	118	13.0
	Special (weekends-holidays)	22	2.4
	Night shift, 22:00 to 6:00 (medicine)	10	1.1
Support services	Guards (medicine)	195	21.4
	Various schedules	34	

Notes: N = Number (frequency); M = Mean; SD = Standard Deviation.

Table 2
Factorial loading of items

Factor-items			Factors load
Factor 1	I can assume the risks of my actions when solving problems.		.760
	I can do my best to achieve the goals I set to solve the problem.		.639
	I can learn to be creative in finding solutions to problems.		.609
	I can visualize myself overcoming difficult moments.		.596
	I can learn to collaborate with others to improve my situation and that of others.		.570
	I find it difficult to generate solution options when presented with a problem.		-.568
	I find it difficult to set realistic goals when faced with problems.		-.559
	I can learn from my successes and mistakes when faced with a problem.		.531
	I find it difficult to learn how to make decisions in a difficult moment.		-.441
Total self-value: 8.9 % of variance: 31.8 Accumulated %: 31.8			
Factor 2	I am confident that the problems I face do not affect my work or school.		.735
	I am sure that my problems do not negatively affect my relationship with my partner.		.679
	I am sure that my problems negatively affect my relationship with family and friends.		-.544
Total self-value: 2.4 % of variance: 8.9 Accumulated %: 40.7			
Factor 3	There are people in my life who have given me strength.		.781
	There are people in my life who have helped me make sense of my life.		.653
	I do not have friends and family to turn to in difficult situations.		-.598
	I do not have people whose support makes me feel good when I have a problem		-.567
	There are people close to me that I trust.		.527
	My emotional relationships have not been strong.		.483
Total self-value: 1.7 % of variance: 6.2 Accumulated %: 46.9			
Factor 4	It is difficult for me to talk about my emotions.		-.667
	I have difficulty expressing affection to others.		-.693
	I cannot control my emotions and this makes it difficult for me to find effective solutions.		-.433
Total self-value: 1.5 % of variance: 5.4 Accumulated %: 52.4			
Factor 5	I have people who help me find a solution when I confide my problems to them.		.910
	I have people who help me anticipate the possible dangers or threats of a problem.		.679
	I count on people who, by telling me about their experiences with similar problems, help me make good decisions.		.651
Total self-value: 1.2 % of variance: 4.3 Accumulated %: 56.7			
Factor 6	I am a person who constantly doubts myself in difficult situations.		-.788
	I am a person who feels insecure about my projects and goals when facing problems.		-.781
	I am a person with low self-esteem.		-.556
	I am a person who feels self-confident, even if I am in a problematic environment.		.536
Total self-value: 1.1 % of variance: 3.9 Accumulated %: 60.7			
Eliminated Items			
	I am a person who has hope.		
	I am a person who is pessimistic about the future.		
	I am a person sure of my convictions.		
	I am a person in constant development from my experiences.		
	I am a person who finds it easy to reach out to family and friends in difficult times.		
	I am a person who is appreciated by others in difficult times.		
	I am not sure that a problem is an opportunity to move forward.		
	I am confident that overcoming difficulties makes me a positive example to others.		

Table 2
Factorial loading of items (Continued)

Eliminated Items

- I am a practical person when I solve problems.
 - I am a person who finds it difficult to set goals when faced with a problem.
 - I am a person who avoids facing problems.
 - I am a person who evaluates the meaning of life in difficult moments.
 - I am a person who thinks of various solutions when I have a problem.
 - My family has had poor relationships with each other.
 - I can access the public services and activities.
 - I need to feel and be a better person despite problems.
 - I have people who encourage my autonomy and initiative, making me feel competent to deal with difficult situations.
 - I have people who make me remember what I have achieved in life despite the difficulties.
 - I do not have people who guide and advise me to find the solution to a problem.
 - I do not have people who accompany me in the search for solutions when I have problems.
 - I have short-term goals that I keep despite problems.
 - I have difficulty keeping my goals clear in complicated situations.
 - I do not have people to help me take action to solve my problems.
 - Despite difficulties, I am convinced to act to maintain my goals and future projects.
 - I can solve my problems without affecting my goals and objectives.
 - I can trust people.
 - I can overcome emotional problems.
 - I can establish affective relationships with others.
 - I can propose solutions when problems arise.
 - When I feel bad, I cannot ask for help even though I know it would help solve my problem.
 - I can be a supportive person when others go through difficult times.
 - I can be responsible for what I do in the face of problems.
 - It is difficult for me to learn how to communicate appropriately to solve problems.
-

Notes: Extraction method: principal axis analysis.
Rotation method: Oblimin with Kaiser normalization.

Statistical analysis

Sociodemographic variables were examined through measures of central tendency and dispersion.

The analysis included frequency, Kolmogorov-Smirnov Z test, asymmetry and kurtosis, to identify the directionality and distribution of the data. The discriminative power of the items was examined employing two tests: a comparison of extreme groups for the total test (first and fourth quartiles) using the Mann Whitney U test. The total correlation of the test and each item used a correlation cutoff point above .30. (Construct validity) Factor analysis used the principal axis method with oblique rotation (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Ferrando & Anguiano-Carrasco, 2010; Beavers et al., 2013). To measure the relevance of the analysis, the Kaiser-Meyer-Olkin sample adequacy index (KMO = .920) and Bartlett's test of sphericity ($X^2 = 9979.492$; degrees of freedom = 378; $p \leq .001$) were com-

puted. Elimination criteria included factors with two or fewer grouped items and items with factor loadings less than .40 (Morales Vallejo, 2013; Ferrando & Anguiano-Carrasco, 2010). Finally, reliability (internal consistency) was assessed through Cronbach's Alpha formula (Hernández, Fernández, & Baptista, 2010; Quero, 2010; Kerlinger & Lee, 2002).

Ethical considerations

This research is part of a larger one approved by the Research and Research Ethics Committee of the Hospital General Dr. Manuel Gea González, with the title of "Association of burnout with psychological and organizational variables in medical and nursing students and staff of the Hospital General Dr. Manuel Gea González".

Registration number: 27-51-2018, August 30, 2018.

RESULTS

The results include data from 909 health professionals from 24 medical services and five shifts, with an average age of 35.35 years and a standard deviation of 11.49. Of the participants, 464 were students and staff from the nursing area, 426 from the medical area, and 19 from nutrition, dentistry, and psychology (Table 1).

The frequency analysis of the 60 items showed that the directionality of items 2, 3, 8, 9, 11, 14, 17, 18, 22, 23, 27, 28, 31, 35, 37, 38, 41, 42, 45, 46, 48, 52, 55, 56, and 57 was contrary to that of the rest, leading to inverting the score. In the data distribution for each item, the Kolmogorov-Smirnov Z test ranged between .178 and .370; $p < .001$, with negative asymmetries and leptokurtic kurtosis, indicating a skewed distribution.

Prior to the factorial analysis, item 19: "I am a person who evaluates the meaning of life in difficult moments", was eliminated since its correlation with the total of the test was less than .30 (.249; $p < .001$).

The final results of the factor analysis showed a grouping of 28 items in six factors, with loadings ranging from .433 to .910 and an explained variance of 60.7%. The first factor grouped nine items, the second, fourth and fifth with three; the third with six, and the sixth with four items. Thirty-two items were eliminated (Table 2).

Finally, the internal consistency test revealed a value of $\alpha = .908$, and for each factor, the reliability index ranged from $\alpha = .708$ to $\alpha = .882$.

According to the characteristics of their items, the factors obtained were theoretically matched with the resilient response model which supports the original instrument, as follows; General Resources (Factor 3, 4, and 6), Vision of oneself (Factor 1) and Vision of the problem (Factor 2 and 5).

DISCUSSION AND CONCLUSION

The objective of this study was to adapt and validate the SV-RES resilience scale for Mexican hospital health professionals. The instrument has good psychometric properties; content validity, construct validity, and internal consistency.

The exploratory factor analysis led to eliminating over because their factor load did not exceed the established limit of .40 or grouped into factors with two or fewer items. This procedure left 28 items with five response options, from 1 "totally disagree" to 5 "totally agree". The items belong to six factors, obtaining, through the sum, a total score on the resilience capacity in the face of problematic situations (resilient response) and each factor that composes it. The items whose rating is reversed are; 6,7,9,12,15,16,18,19,20,21,25, 26, and 27.

The factors were defined based on the relationship of the items and the relevant research literature (Saavedra & Villalta, 2008; Ortunio & Guevara, 2016; Stainton et al., 2019; Fernandes de Araújo & Bermúdez, 2015). The factors obtained coincide with the theoretical resilience model proposed by Saavedra, as follows: Base conditions

Table 3
Composition of the SV-RES Resilience Scale for health personnel.

Categories	Factors	Definition	Cronbach's α	No. Items	Example item
General resources	Factor 3: Emotional support	Refers to the perception, as a resource, of the affective bonding of the person with his/her close social environment.	.810	6	"I don't have people whose support makes me feel good when I have a problem."
	Factor 4: Emotional control	Refers to the person's learned way to manage and express his/her feelings and emotions.	.738	3	"I cannot control my emotions, and this makes it difficult for me to find effective solutions."
	Factor 6: Self-concept	Refers to the person's learned way to describe him/herself in the face of problems.	.786	4	"I am a person who constantly doubts him/herself in the face of difficult situations."
View of oneself	Factor 1: Self-efficacy	Set of skills and resources that the person perceives him/herself capable of using in a problematic situation.	.882	9	"I can do my best to achieve the goals I set to solve the problem."
Vision of the problem	Factor 2: Social relationships	Refers to the value and maintenance of close social ties in the face of problems.	.708	3	"I am sure that my problems do not negatively affect my relationship with my partner."
	Factor 5: Use of social support	Refers to the contribution of social networks that benefit a solution-directed orientation to problems.	.843	3	"I count on people who, by entrusting them with my problems, help me find a solution."

Note: Internal consistency reliability, Cronbach's alpha, total $\alpha = .908$.

(factors 3; Emotional support, 4; Emotional control, and 6; Self-concept), Vision of oneself (factor 1; Self-efficacy), Vision of a problem (factors 2; Social relationships and 5; Use of social support), and the score total (all factors), resilient response (Saavedra & Villalta, 2008; Saavedra, 2003; Table 3).

The identified factors describe resilience as a coping resource in widely documented situations requiring resilience as a process. They include coping, successful problem solving, and learning to resolve future conflicts (Stainton et al., 2019). This structure seeks to identify the present conditions and how they get perceived in the face of a problematic situation.

In the six factors obtained, social support, a proactive vision, self-confidence, and the management of feelings and emotions stand out (APA Help Center, 2019). Indeed, these are core dimensions to consider as pillars within the concept of resilience when seeking to homogenize the analysis of the concept in real situations and identify ways to design effective interventions. Finally, the instrument is a reliable option for assessing the resilience capacity of hospital health professionals. Also, the length of the scale will result in a shorter application time compared to its original version, which increases its viability of use in a population with work overload.

It is essential to note that this study is part of a broader one, which is why it required adaptation to the conditions set by the main project. For example, the application included a battery composed of six instruments, which extended the average answering time to 30 min, which could have influenced the participants' responses. This point should be relevant for future research in terms of practicality. Similarly, the present study involved an exploratory factor analysis. More exhaustive analysis (confirmatory factor analysis) would verify the factors obtained and their relationship with the three categories of Saavedra's resilient response model.

Finally, future research should consider the diversity of health professionals participating in these studies. The research literature generally reports high levels of resilience, but with minor differences in both students and staff (Chaukos et al., 2017; Dorote, 2018; Foster et al., 2019; McCain et al., 2017; Ríos-Risquez et al., 2016; Walpita & Arambepola, 2020; Yu et al., 2019).

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Conflict of interest

The authors declare they have no conflicts of interest.

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APPENDIX

SV-RES Resilience Scale for health professionals in Mexico

Instrucciones: De acuerdo con la siguiente escala. Evalúe el grado en que estas afirmaciones la/lo describen cuando enfrenta una situación complicada.

A = Totalmente en desacuerdo; B = En desacuerdo; C = Ni en desacuerdo ni de acuerdo; D = De acuerdo; E = Totalmente de acuerdo.

		A	B	C	D	E
1	Puedo asumir los riesgos de mis acciones al solucionar los problemas.					
2	Puedo esforzarme al máximo para lograr los objetivos que establecí para solucionar el problema.					
3	Puedo aprender ser creativo en la búsqueda de soluciones a los problemas.					
4	Puedo visualizarme superando momentos difíciles.					
5	Puedo aprender a colaborar con otros para mejorar mi situación y la de los demás.					
6	Se me dificulta generar opciones de solución cuando se me presenta un problema.*					
7	Se me dificulta fijarme metas realistas ante los problemas.*					
8	Puedo aprender de mis aciertos y errores ante un problema.					
9	Me resulta complicado aprender a tomar decisiones en un momento difícil.*					
10	Estoy seguro que los problemas que enfrento no afectan mi trabajo o escuela.					
11	Estoy seguro de que mis problemas no afectan negativamente mi relación de pareja.					
12	Estoy seguro de que mis problemas afectan negativamente mi relación con familiares y amigos.*					
13	Existen personas en mi vida que me han dado fortaleza.					
14	Existen personas en mi vida que me han ayudado a darle sentido a mi vida.					
15	No tengo amigos y familiares a quienes recurrir para sentirme mejor en situaciones difíciles.*					
16	No tengo personas que con su apoyo me hagan sentir bien cuando tengo algún problema.*					
17	Hay personas cercanas a mí en las que confío.					
18	Mis relaciones afectivas no han sido sólidas.*					
19	Se me dificulta poder hablar de mis emociones.*					
20	Se me dificulta poder expresar afecto a los demás.*					
21	No puedo controlar mis emociones y esto me dificulta encontrar soluciones efectivas.*					
22	Cuento con personas que al confiarles mis problemas me ayudan a encontrar una solución.					
23	Cuento con personas que me ayudan a anticipar los posibles peligros o amenazas de un problema.					
24	Cuento con personas que, al contarme sus experiencias en problemas similares, me ayudan a tomar buenas decisiones.					
25	Soy una persona que se siente insegura de mis proyectos y metas al enfrentar los problemas.*					
26	Soy una persona que constantemente duda de sí misma ante situaciones difíciles.*					
27	Soy una persona con baja autoestima.*					
28	Soy una persona que se siente segura de sí misma, incluso si me encuentro en un ambiente problemático.					

* Reactivo inverso.