RESEARCH

Relation of self-efficacy to weight control and resilience in Mexican women

Relación de autoeficacia para el control de peso y resiliencia en mujeres mexicanas

A relação de autoeficácia para o controle de peso e resiliência em mulheres de México

Gricelda Rodríguez-Rojas[1]
https://orcid.org/0000-0002-9997-9903

Patricia Cossío-Torres[2*]
https://orcid.org/0000-0002-7626-8949

Rosa María Galicia-Aguila[3]
https://orcid.org/0000-0002-0933-124X

Erick Landeros-Olvera[4]
https://orcid.org/0000-0001-6270-1759

1. Research Professor, Postgraduate Nursing, Universidad Popular Autónoma del Estado de Puebla, Mexico.
2. Research Professor, Department of Public Health and Medical Sciences, Faculty of Medicine, Universidad Autónoma de San Luis Potosi, Mexico.
3. Research Professor, Nursing School, Benemérita Universidad Autónoma de Puebla, Mexico.
4. Research Professor, Nursing School, Benemérita Universidad Autónoma de Puebla, Mexico.

* Corresponding author: patricia.cossio@uaslp.mx

Abstract

Introduction: Currently, obesity has become an emerging and complex public health problem whose mechanism is etiopathogenetic and multifactorial. Obesity has been studied from the biomolecular and genetic approach as well as through interventions to improve lifestyles. However, studies linking the concepts of self-efficacy and resilience have not been included in this issue. **Objective:** Evaluate the relationship between self-efficacy for weight control and resilience in Mexican women. **Methodology:** Correlational-cross-sectional study in 174 women, with or without obesity, enrolled in a job-training center of Puebla and San Luis Potosi, Mexico; non-probabilistic sampling was used. These two instruments Self-Efficacy Inventory for Weight Control and Mexican Resilience Scale, validated in the Mexican population were applied: with Cronbach's alpha .945 and .950, respectively. This study carried out in accordance with the General Health Act for Research. The results were analyzed using descriptive statistics, normality tests, and Spearman's *r* correlation. **Results:** The mean age was 34.6±14.7, mean BMI 26.4±4.5, 49.7% and 81.7% were high levels of self-efficacy and resilience, respectively. The relationship was positive, medium effect size and statistically significant p=.001, with an explained variance of 22.6%. **Conclusions:** The Mexican women shown that the greater the resilience, the greater the self-efficacy for weight control. We suggest integrating resilience in managing obesity, which allows the development of mechanisms for the acquisition of more sustainable healthy lifestyles.

Key words: Self-efficacy, resilience, weight control, women, nursing (DeCS).

Resumen

Introducción: Actualmente la obesidad se ha convertido en un problema de salud pública emergente y complejo, cuyo mecanismo es etiopatogénico y multifactorial. Ha sido estudiada desde el enfoque biomolecular, genético y mediante intervenciones para mejorar los estilos de vida; sin embargo, no se han incluido estudios que relacionen la autoeficacia y resiliencia en este problema. **Objetivo:** Evaluar la relación de autoeficacia para el control de peso con la resiliencia, en mujeres mexicanas. **Metodología**: Estudio correlacional transversal, en 174 mujeres, con o sin obesidad, inscritas en un centro de capacitación para el trabajo en Puebla y San Luis Potosí, México, se empleó muestreo no probabilistico. Se aplicó el instrumento validado en población mexicana: Inventario de Autoeficacia para el control de peso y Escala de Resiliencia Mexicana; con alfa de Cronbach .945 y .950 respectivamente; estudio realizado con apego a la Ley General de Salud en materia de investigación. El análisis de los resultados fue con estadística descriptiva, pruebas de normalidad y correlación *r* de Spearman. **Resultados:** El promedio de edad fue 34.6 ± 14.7, media de IMC 26.4 ± 4.5, un 49.7 % y un 81.7 % obtuvo niveles de autoeficacia y resiliencia altos respectivamente. La relación fue positiva, tamaño de efecto medio y estadísticamente significativo p=.001, con una varianza explicada del 22.6%. **Conclusiones:** Las mujeres mexicanas mostraron que a mayor resiliencia mayor autoeficacia para el control de peso. Se sugiere integrar la resiliencia en el manejo de la obesidad, que permita el desarrollo de mecanismos para la adquisición de estilos de vida saludables más sustentables.

Palabras clave: Autoeficacia; Resiliencia; Control de peso; Mujeres; Enfermería (DeCS).

Abstrato

Introdução: Atualmente, a obesidade tornou-se um problema de saúde pública emergente e complexo, cujo mecanismo é etiopatogênico e multifatorial. Tem sido estudado a partir da abordagem biomolecular e genética e através de intervenções para melhorar os estilos de vida, no entanto, não foram incluídos estudos que relacionem autoeficácia e resiliência neste problema. **Objetivo:** Avaliar a relação entre autoeficácia para

controle de peso e resiliência em mulheres mexicanas. **Método**: Estudo correlacional e transversal, em 174 mulheres, com ou sem obesidade, matriculadas em um centro de treinamento para o trabalho em Puebla e San Luis Potosí, México, amostra de conveniência. Foram aplicados os instrumentos validados na população mexicana: Inventário de Autoeficácia para o controle de peso e Escala de Resiliência Mexicana, com alfa de Cronbach 0,945 e 9,50 respectivamente, o estudo foi realizado de acordo com a lei geral de saúde sobre pesquisa. A análise dos resultados foi realizada com estatística descritiva, testes de normalidade e correlação r de Spearman. **Resultados:** A média de idade foi de 34,6±14,7, a média de IMC 26,4±4,5, 49.7% e 81.7% obtiveram níveis altos de autoeficácia e resiliência respectivamente. A relação foi positiva, de tamanho médio do efeito e estatisticamente significativo (p=.001), com uma variância explicada de 22,6%. **Conclusão:** Mulheres mexicanas mostraram que, quanto maior a resiliência, maior a autoeficácia para o controle do peso. Sugere-se integrar a resiliência na gestão da obesidade, o que permite o desenvolvimento de mecanismos para a aquisição de estilos de vida saudáveis mais sustentáveis.

Palavras-chave: Autoeficácia, resiliência, controle de peso, mulheres, enfermagem (DeCS).

Introduction

Obesity is considered a public health problem, which is related to some of the main causes of death such as cardiovascular disease, diabetes, and certain types of cancer standing out [1, 2]. Worldwide, 39% of the adult population is overweight and 13% obese [2]; it is estimated that by year 2025, global prevalence of obesity in women will exceed 21% [3]. In Latin America, the situation is similar, for example, in Mexico, 51.2% of population are women [4], of which 76.8% is overweight and obese [5], which leads to identifying the problem as an epidemic due their prevalence rates.

In Mexico, these are strategies to address the problem of obesity, including prevention, control, and treatment [6, 7, 8], and even new policies for the creation of a front labeling system for food and drinks, which provides information for healthy food choices [9, 10]. Obesity has been analyzed with regulatory measures aimed at improving social, cultural, economic, and environmental determinants that favor physical activity [11], with exercise and dietary changes [12] and with surgical treatment [13]. However, despite all these strategies, attention to the psychological factor continues to be undervalued to strengthen the programs, which can even be treated as protection mechanisms such as self-efficacy (SE) and resilience (RE).

Regarding SE, Bandura and other authors [14-16] mention it as the confidence that the individual has to carry out the necessary actions that allow him to achieve the desired results in a certain behavior. The author

explains that SE is an important factor in health behaviors, because it allows recognizing the difficulty of motivating the adoption of behaviors that promote health and consists of a series of interactions of personal factors, behaviors, and events in the environment [17, 18]. Some concepts may be related to SE, for example, with RE, which is determined as a set of attributes of the subject, in interaction with family, social and cultural environments, which, under difficult conditions, will indicate a normal development [19 -22]. In other words, RE is a psychic process that presents itself as a mixture of strength and fragility, which allows one to navigate the torrents of extreme difficulties and come out stronger in the end to continue with life [23, 25-28].

The relationship between these two concepts of interest is that SE is one of the factors that promote RE [24]. However, despite the fact that SE has been shown to be a protective element that promotes motivation, persistence, and effort to promote beneficial behavior, its relationship with RE is not clear. Nevertheless, the theoretical reasoning is as follows: if there is no motivation in woman by the family and society, it will be difficult for her to have confidence in order to generate healthy behaviors to control her weight [20-23], then, the achievement of goals, perseverance in the face of difficulties and its resistance to failures is determined by the relationship between SE and RE.

Theoretically, SE and RE could be complementary elements. It would be interesting to identify the relationship between these concepts in overweight and obese women, given that it is important to encourage the promotion of RE skills to prevent damage to health, especially on issues related to healthy habits that imply in this case a benefit to weight control. The construct associated with RE is SE, since overcoming adversities means an experience that modifies SE's beliefs to exercise self-control in life. Nurses should consider integrating both concepts in nutritional treatment and the prescription of a dose of exercise, aimed at weight control, with a comprehensive vision in favor of the health of individuals.

The relationship between SE for weight control and RE has not been published. The studies carried out on these concepts in overweight and obese people have been done separately. Given the lack of evidence that relates the cognitive concepts of SE for weight control and RE, reason why the research question was

enunciated as follows: What is the relationship of SE for weight control and RE in Mexican women? Thus, the objective of evaluating the relationship of SE for weight control with RE in Mexican women was raised.

Methodology

In this correlational and cross-sectional study of SE for weight control and RE, the variables were defined based on their theoretical and psychometric principles [28-30]. The participants were women enrolled in federal training centers for adult education in the states of Puebla and San Luis Potosi, Mexico. In Puebla, 90 women participated and in San Luis Potosi there were 85 participants, with a total of 175 women.

Women of legal age were included, who were registered in the chosen educational institution and who agreed to participate. Those with nutrition treatment for weight control, but who reported suffering from chronic diseases and pregnancy were excluded.

To measure the level of SE, the Perceived SE Inventory for weight control, validated in the Mexican population, was applied [29]. The instrument contains 37 items distributed in three domains: diet with 20 statements, exercise with 9, and physical activity with 8. The items are designed on a Likert-type scale, with response options ranging from 1= incapable of doing so, 2 = little capable of doing so, 3= quite capable of doing so, up to 4= quite sure to do so. The maximum score was 148 points and the minimum was 37 points, with Cronbach's α coefficient values for this study of 0.916, 0.904 and 0.830 respectively.

To measure RE, the Mexican Resilience Scale (RESI-M) [30] was used. It contains five dimensions, a) strength and self-confidence, which are the positive perceptions about oneself or the ability to accept or cope with stressful events, b) Social competence, or the subject's ability to interact successfully with her environment and achieve legitimate satisfaction of her needs, c) Family support, which is the time shared by family members, the existing loyalty and the strength of their ties, d) Social support, which are the links between the subject and a defined group of people, with whom there is communication, solidarity and trust, and e) Personal structure, or the activities that facilitate organization and order in life. The scale is made up of 43 items, on a Likert-type scale, with response options ranging from 1= totally agree, 2= agree, 3= disagree to

4= totally disagree. A score of 0 to 33 is categorized as a low level of RE, a medium level of 34 to 66, and a high level of 67 to 100. Studies in the Mexican population reported Cronbach's Alpha of 0.87. Sociodemographic variables such as age, education in years, marital status and occupation were evaluated, in addition the Body Mass Index (BMI) was measured.

To collect data, authorization was requested from each campus. Subsequently, a written informed consent was obtained from the participants. The procedures followed the regulations of the General Health Law on Health Research [31]; additionally, the research was approved by the Ethics and Research Committee. The data were processed using the statistical program named Statistical Package for the Social Sciences (SPSS) version 18. Descriptive statistics were used through measures of central tendency, as well as inferential tatistics for non-parametric variables, Student's T test for SE for weight control and BMI and Mann-Whitney U for RE, Spearman correlation and linear regression (SE dependent variable and independent RE).

Results

The average age of the participants ranged from 34.6 ± 14.7 years, with years of schooling of 11.9 ± 3.10. Regarding the BMI, 26.4 ± 4.5 showed overweight, (Table 1).

Table 1. Sociodemographic and anthropometric variables of the participating women, 2016. (n=175).

Variable	$\bar{x}\pm$ SD	Minimum	Maximum
Age	34.6 ± 14.7	18	69
Schooling in years	11.92 ± 3.10	6	19
Body mass index	26.4 ± 4.5	16.6	44.7

Source: Own development

In SE for weight control, the highest percentage showed a high level with 49.7%, as well as in RE with 81.7% (Table 2). Regarding the reliability of the instruments, SE for weight control and RESI-M had a general Cronbach's alpha of 0.945 and 0.950 respectively.

Table 2. Level of self-efficacy and resilience of the participating women, 2016 (n=175).

Cut-off points	Level	Self-efficacy		Resilience	
		f	%	f	%
0-33	Low	7	4.0	0	0
34-66	Medium	81	46.3	32	18.3
67-100	High	87	49.7	143	81.7

Source: Own development

In the correlation of variables, a medium effect size is shown, a moderate magnitude and statistically significant (p=0.001). In the relationships of each of the domains and factors of the instrument used, statistical significance is shown in all relationships (p=0.001), except social support regarding diet (r=0.134, p=0.078). However, diet is the domain with the highest and most significant correlations with the other RE domains (Table 3).

Table 3. Relationship between Self-efficacy and Resilience, 2016.

	SE	D	Ex	PA	RE	S & C	SC	FS	SS
Self-efficacy (SE)	1								
Diet (D)		1							
Exercise (Ex)		.618**	1						
Physical Activity (PA)		.614**	.561**	1					
Resilience (RE)	.454**				1				
Strength and Confidence (S & C)		.464**	.361**	.375**		1			
Social Competence (SC)		.387**	.259**	.297**		.514**	1		
Family Support (FS)		.316**	.254**	.327**		.560**	.471**	1	
Social Support (SS)		.134	.182**	.249**		.464**	.422**	.607**	1
Structure (St)		.396**	.283**	.272**		.570**	.511**	.531**	.392**

Source: Own development

Figure 1 shows a scatter graph with a positive direction, some of the subjects with SE and low RE are the most dispersed; however, the majority tend to form clusters, indicating a statistically significant correlation.

Figure 1. Graphic correlation between Self-efficacy and Resilience, 2016.
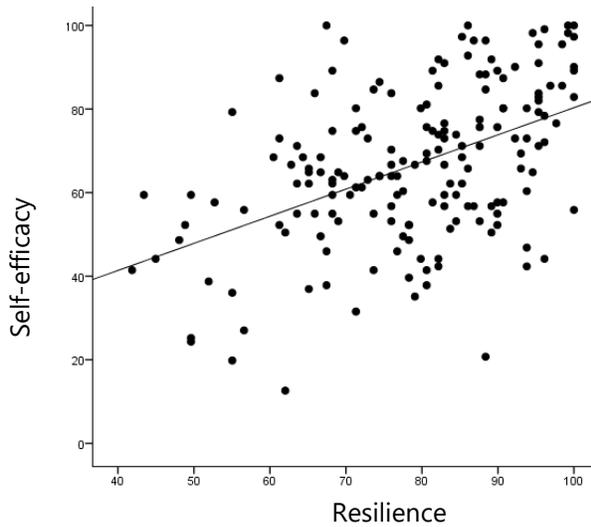
Source: Own development

A simple linear regression model was adjusted, where RE was introduced as the independent variable and SE as the dependent variable, an adjusted R^2 of 0.226 was obtained; therefore, the percentage of the explained variation of SE over the variability of the RE is 22.6 %, (Table 4).

Table 4. Simple linear regression

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.475[a]	.226	.222	16.454	.226	50.533	1	173	.000

a. Predictors: (Constant), Index

Given that the sample was drawn from two geographical areas (Puebla and San Luis Potosí), it was decided to carry out an additional analysis to make comparisons of the arithmetic means of the study variables of the States; with respect to the RE, a range difference of 4.26 points was seen, presenting the highest score for women from San Luis Potosi, compared to women from Puebla. When performing the comparison of ranges through the Mann-Whitney U, it was possible to see that there was no statistically significant difference with respect to the two study groups (p>0.05). Therefore, the SE variable for weight control and

RE are not different in women from the State of San Luis Potosi compared to women from the State of Puebla (Table 5).

Table 5. Contrast statistical tests.

Variable	Levene's test of equality of variance		Student's t-test for unrelated samples		
	F	Sig.	95% Confidence interval	t	p
Self-efficacy	0.293	0.589	-3.997, 7.159	0.579	.577
Variable	State	Middle range	Sum of ranges	Mann–Whitney U	p
	SLP	90.19	7666.00		
Resilience	Puebla	85.93	7734.00	3639.00	.579

Source: Own development
SLP: San Luis Potosi

Discussion

The objective was to evaluate the relationships of SE for weight control with RE, in Mexican women from Puebla and San Luis Potosi, Mexico, in addition to determining if there were differences between the study groups. The descriptive data showed an arithmetic mean of age that tends to represent young adults, although the standard deviation is wide and covers other age groups (adolescence and adulthood), matching the studies from Brazil [13] and Mexico [27]. The average age presented is an economically productive stage. This was expected because the school where the study was carried out offers training courses for industrial work and courses with a certain occupation identified in the labor market. The results presented represent the demographic transition process in Mexico, one of its consequences is that the current population structure presents a higher proportion of people in productive ages [6]. Regarding schooling, the majority had completed secondary and upper middle education, similar to the study in Brazil [13]; in contrast to a research carried out in Baja California, Mexico [27], such coincidences are due to the fact that this study was carried out in a job-training center where one of the entry requirements is to have high school degree. Regarding marital status, in general the majority was single, a fact that contrasts with the study in Brazil [13]; the results reflect the national Mexican situation, since 31.5% of women are single and 15% of women are without a partner once they left a marital union [4]. Regarding BMI, the arithmetic mean

showed overweight according to the WHO classification [2], which corresponds to overweight and obesity that are present in more than 70% of the Mexican population [5].

In SE for weight control, the highest percentage was at the high level, results that theoretically present possibilities to control their weight [27]. However, the results must be considered with reservation, since the SE only represents the confidence or the intention and is not the action itself. However, literature mentions the relationship between appropriate behaviors and high RE, which suggested the impact of RE on the ability to manage treatment and healthy lifestyle habits [20, 24, 25].

The RE scores showed a high level for the most part, women are more resilient [30], even in adverse conditions, because the RE is the result not only of protective and risk factors, but also of protective mechanisms that are triggered [26]. The RE is then the manifested result in the development of the well-being and health of people, since it allows them to face adversity in a better way [25].

This work showed that, if RE is high, SE for weight control will also be high, since as a protective factor it promotes it, creating strength and confidence to generate healthy behaviors, as mentioned by various authors [24] such as a positive impact on physical and mental health. As long as the woman is accepted by significant others and has informal support networks in the community, there are positive family and social conditions to favor RE, a situation that was clarified given the results of the correlation [25, 26].

The SE correlations for weight control with diet, exercise, and physical activity, RE factors with strength and self-confidence, social competence, family support, social support, and personal structure, from the theoretical point of view the relationships were found with a medium effect size, statistically significant and more indicators are those carried out with each one of the domains of SE, with the strength and self-confidence factor of RE. These relationships may be due to the fact that women produce their efficacy beliefs through the processes: cognitive, motivational, affective and selective, they are self-regulatory of their own behavior that mediate between intentions and actions, even with the presence of environmental factors or biological, the volitional process contains plans and action control and is strongly influenced by the

expectations of SE, so that it can carry out actions in favor of her health such as dieting, exercising or physical activity [24].

The relationship between the RE dimensions and the SE domains refers to a set of positive expectations, participating cognitive and affective protective factors such as self-esteem, motivation to achievement, the feeling of self-sufficiency and confidence that makes them think that problems will be solved; so, these results agree with a study [30] being the most important factor to measure the RE since it explained a greater percentage of the variance of the concept in relation to the SE.

In this context, if the SE principles are activated in women, acting as a protective factor to promote RE, motivation, persistence, effort, goal achievement, the time they persevere in the face of difficulties, and their resistance to failures increase [24], theoretically the subject overcomes adversities to build strength and self-confidence, generating healthy behaviors to control her weight. This work confirms that SE may be a variable that favors adherence to changes in food intake and consequently weight loss.

Diet relationships with social competence, family support and structure have a medium and statistically significant effect size. It is possible that this positive relationship is due to the woman's ability to interact with her environment and achieve the legitimate satisfaction of her priorities by influencing her peers. This is related to emotional adjustment (social competence), loyalty and strength among the members of her family who provide her with the support to carry out a healthy diet (family support), the rules and organization carried out by women, makes it easier for them to carry out a personal structure represented by carrying out a diet [30]. This has a positive impact when having emotional activation and verbal persuasion by the family, principles to achieve the SE beliefs that regulate significant goals [24].

Within the correlation model, only one interaction was not significant, social support with diet, if there is no interaction with these personal and behavioral factors, the thoughts that a person has about her ability and self-regulation to implement healthy behaviors will not be favorable, since the perceived SE is related to positive thoughts and aspirations about performing the behavior successfully [24, 27]. If a woman is not

motivated, the perception of her actions will not be effective, if she does not have the conviction of having skills to regulate actions that allow her to carry out a healthy diet, she will not be able to control her weight. This may be due to the stigma society places on people who are overweight and obese, indicating that they are not capable of healthy diet and exercise behaviors. Regarding social support, it is likely that the existing links between a woman and the people she lives with do not provide her with that solidarity to carry out actions in favor of her health, such as weight control.

The relationships of exercise with social competence, family support, social support and structure are positive with a medium and statistically significant effect size, given that they receive family and social support to carry out the exercise, coinciding with studies that report the influence of the sociocultural environment that overweight and obese people have to exercise [12]. If women are influenced by other people's behaviors or achievements (vicarious experience) along with verbal persuasion and emotional activation, SE expectations are stronger, believing they have capabilities to perform exercise and diet successfully [24], a situation that can explain resilient behaviors, emotional motivation, beliefs about the ability (performance achievements) thus achieving actions in favor of their health.

The limitations of this research were the cross-sectional design, the sample size and that it was only carried out on women. It would be interesting to make correlations between these two cognitive variables in men and in school-age children. It should be noted that correlation of variables has been little explored by researchers. For this reason, the study provides preliminary data to carry out intervention work.

Conclusions

The findings show that the higher the RE, the higher the SE for weight control. The effect size of the correlation was average; the percentage of variance explained was high. These results suggested the importance of integrating the promotion of RE pillars in the care and weight control of the client or user, in such a way that it allows her to obtain coping tools for a more efficient weight control and therefore improve her health through the inclusion of healthier lifestyles. RE is a process that can be learned and developed

allowing the individual to face adversity and come out stronger, as a result of a combination of individual characteristics and the environment. That is why its inclusion in nursing care plans is highly relevant, since it promotes other protective mechanisms, such as SE in this case.

Conflicts of interests

The authors stated there was no conflict of interest.

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