

Mexican validation of the decisional balance scale for exercise Validación mexicana de la escala de balance decisional para el ejercicio

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Abstract. Decisional balance is a process that allows people to compare perceived benefits and costs of a certain behavior such as exercising. The aims of the present study were to translate the Decisional Balance Scale for physical exercise (DBS-E); adapt it to the Mexican context; examine its factorial structure; and assess its internal consistency and nomological validity. The sample was composed of 530 individuals (48.2% men and 51.8% women; mean age = 33.22 ± 15.27 years; $SD = 15.27$; age range = 11-76) from the metropolitan area of Monterrey, Nuevo Leon, Mexico. Results from both exploratory and confirmatory factorial analyses confirmed the structural validity of the Mexican version of the DBS-E. Satisfactory results were obtained for the coefficients of internal consistency. The variance of benefits, costs, and decisional balance through the stages of change was in line with the transtheoretical model, thus supporting the nomological validity of the Mexican version of the DBS-E.

Key words. Validation, Mexico, Decisional balance, Physical exercise, Stages of change.

Resumen. El balance decisional es el proceso mediante el cual las personas comparan los beneficios frente a los costos percibidos de realizar un comportamiento, por ejemplo, realizar ejercicio. Los objetivos del presente estudio fueron traducir y adaptar al español hablado en México, la escala de balance decisional para el ejercicio físico (EBD-E), examinar su estructura factorial y analizar su consistencia interna y validez nomológica. La muestra estuvo compuesta por 530 personas (48.2% varones y 51.8% mujeres; $M_{edad} = 33.22$ años; $DT=15.27$; Rango= 11-76), que viven en el área metropolitana de la ciudad de Monterrey, Nuevo León (México). Los resultados del análisis factorial exploratorio como los del confirmatorio brindan apoyo a la validez factorial de la versión mexicana de la EBD-E. Los resultados mostraron coeficientes de consistencia interna satisfactorios. La variación de los pros, contras y el balance decisional a través de las etapas de cambio se presentó conforme a los postulados establecidos en el modelo transteórico brindando apoyo a la validez nomológica de la versión mexicana de la EBD-E.

Palabras clave. Validación, México, Balance decisional, Ejercicio físico, Etapas de cambio.

Introduction

There are many benefits associated with physical activity. From a preventive–therapeutic point of view, exercise is considered a remedy for curing or preventing different diseases such as cardiovascular, diabetes, hypertension, high blood pressure, high cholesterol, infarcts, cancer, osteoporosis, sarcopenia, arthritis, and others (Kravitz, 2007). Psychologically, it helps improve mood, reduces depression and anxiety, increases stamina, improves self-esteem, and helps in coping with the stress of everyday life (Kravitz, 2007). The social context is also favored, since values, attitudes and individual and collective behaviors such as responsibility, discipline and teamwork which are learned through physical-sporting activity, improve social relationships in different domains of life such as work, school and family (Kravitz, 2007; Ramirez, Vinaccia, & Suarez, 2004).

Most people are aware of these benefits; however, there are few who truly adopt a physically active lifestyle because for them, the effort involved in modifying their behavior is greater than the benefits that can be achieved. In other words, some people give more importance to the positive aspects of exercise, i.e., focus on the advantages and benefits of this behavior, while others focus more on the negative aspects, that is, they give more importance to the disadvantages and effort involved in regular exercise. Therefore, decision making is a critical process in changing health-related behaviors (Velicer, DiClemente, Prochaska, & Brandenburg, 1985).

Within the Decision-Making Model (DMM) developed by Janis and Mann (1977), decision-making is a process that is seen as a model of conflict. In this approach, it is assumed that making an important decision involves careful examination of all relevant considerations, where a comparison between the potential gains and losses is made. In this process called *decisional balance*, people decide to engage in a particular behavior based on a comparison of the benefits (pros or advantages) versus the costs (cons or disadvantages) they perceive of that behavior (Prochaska et al., 1994).

In the context of exercise, a person will most likely be physically active if they believe that the benefits that such a behavior will bring (e.g., improve health or reduce stress) are more important than the costs

(e.g., put aside a period of time for activities that make you sweat) (Marcus & Forsyth, 2003).

The Transtheoretical Model (TTM) (Prochaska & Di Clemente, 1982; Prochaska, DiClemente, & Norcross, 1992), states that people trying to change their problematic behaviors in terms of health, such as physical inactivity, must pass through five stages of change called: precontemplation (stage where the subject is physically inactive and does not intend to change), contemplation (the subject is inactive but intends to change), preparation (the subject is active without complying with the recommendations of healthy practice), action (the subject is active, complies with the recommendations of healthy practice but has not surpassed six months of regularity) and maintenance (stage where the person has practiced healthy physical activity for more than six months). These stages represent a time dimension that allows us to understand when these changes in attitudes, intentions and behaviors occur (Marcus & Forsyth, 2003; Prochaska et al., 1992).

Within this model, decisional balance has become a key concept in behavior modification, since studies have shown that the perception of benefits increases gradually and reduces the number of disadvantages through stage changes in a variety of health-related behaviors (Marshall & Biddle, 2001; Prochaska et al., 1994).

Specifically, for the context of physical exercise, Marcus, Rakowski and Rossi (1992) developed an instrument to measure decisional balance. The participants were 778 workers (46% men and 54% women; $M_{age} = 41.5$, $SD = 11.0$) who were recruited as part of a project to promote health in four workplaces (a retail outlet, an industrial manufacturer, a government agency, and a medical center). The original version of this scale was composed of 40 items, 20 for the subscale of pros and 20 for the subscale of cons. After the analysis was performed, the final version of the scale consisted of 10 items for the pros and 6 for the cons; this scale is answered with a five-point Likert scale. The alpha coefficient for the dimension of pros was .79 and for the cons .95 with both presenting good internal consistency.

Subsequently, Plotnikoff, Blanchard, Hotz and Rhodes (2001) examined the validation and reliability of the decisional balance scale of Marcus et al. (1992) in 703 subjects (45.4% men and 54.6% women; $range = 18-65$; $M_{age} = 40.7$; $SD = 11.1$) from Ontario, Canada. Three measurements at intervals of six months between each measurement were performed. The final scale was composed of ten items, five pros and five cons. The factorial structure revealed an acceptable fit in the model ($\chi^2_{[102]} = 469.50$, $p < .05$, CFI = .94, RMSEA = .07, NNFI =

.92). Regarding internal consistency, the subscale of pros ($\alpha = .77-.83$) and cons ($\alpha = .69-.72$) reported good internal consistency.

Meanwhile Fallon, Hausenblas and Nigg (2005) examined which of the TTM constructs better distinguished the stages of action, maintenance and termination of change in a sample of 330 men ($M_{\text{age}} = 27.14$, $SD = 11.93$) and 380 women ($M_{\text{age}} = 24.80$, $SD = 9.30$) from North Central Florida. They used the decisional balance scale by Marcus et al. (1992) composed of sixteen items, ten of which belong to the subscale of pros and six that belong to the subscale of cons. The subscale of pros presented an alpha coefficient of .92 and the cons subscale an alpha of .75, indicating that both subscales had adequate internal consistency. In this study no confirmatory factor analysis of the scale was reported.

Another study by Eeckhout, Francaux, Heeren and Philippot (2013) with a sample of 406 individuals between 16 and 65 years of age ($M_{\text{age}} = 34.8$, $SD = 11.8$), was performed to validate the French version of the decisional balance scale for physical exercise and examine its psychometric properties with other components of TTM. The scale used, developed by Marcus et al. (1992), had sixteen items, ten for pros and six for cons. The result of the confirmatory factor analysis revealed a structure and fit of data slightly below recommended levels ($\chi^2/df = 3.93$; $GFI = .88$; $NNFI = .82$; $CFI = .85$; $RMSEA = .09$). The reliability of the two dimensions of the scale was acceptable with alpha values of .85 for pros and .73 for cons. Finally, the association between decisional balance and the stages of change was presented according to the principles of TTM, i.e., an increase of decisional balance was observed throughout the stages of change.

In Mexico, studies on decisional balance for physical exercise were performed with very specific populations such as high school students (Zamarripa, Hernandez-Soto, Lopez-Walle, Tristan, & Pérez-García, 2013), university students (Quiroz -Villanueva, 2002; Rojas-Russell, 2009), women with a first pregnancy (Luna-Rojas, 2002) and the elderly (Rodríguez-Garza, 2002). This has limited the use of instruments and generalization of the results. Also, none of these studies have focused on examining the factorial structure and psychometric properties of the decisional balance scale created by Marcus et al. (1992) in a general population.

Therefore, the objective of this study was to translate into Spanish, and adapt into the Mexican context, the decisional balance scale for exercise (DBS-E) by Marcus et al. (1992) and examine its psychometric properties and nomological validity with the stages of change in a sample of people living in the metropolitan area of Monterrey, Nuevo Leon, Mexico.

Methodology

This is a non-experimental, quantitative, cross-sectional study with a correlational design since this research is done without deliberately manipulating variables and it is intended to describe relationships between variables in a given time (Hernandez-Sampieri, Fernández-Collado, & Baptista-Lucio, 2014).

Participants

The sample consisted of 530 individuals (48.2% men and 51.8% women; $M_{\text{age}} = 33.22$ years, $SD = 15.27$, range = 11-76) who live in the metropolitan area of Monterrey, Nuevo Leon, Mexico. Most of the sample reported having less than 30 years (49.8%) of age, followed by those between 30 and 44 years (24.2%), 45 and 59 years (18.4%) and 60 years and over (7.6%).

Instrument

Decisional balance. The DBS-E developed by Marcus et al. (1992) was adapted to the context and language of Mexico to measure the perception of subjects on the advantages and disadvantages of physical exercise. The scale consisted of 16 items, 10 that reflect the advantages (pros) and 6 the disadvantages (cons) of physical activity. First, the participant was asked to read the following: «*La actividad física o*

ejercicio incluye actividades tales como caminar rápidamente, correr, rodar en bicicleta, nadar o cualquier otra actividad en la que el ejercicio es al menos tan intenso como estas actividades». «*Por favor, califica qué tan importante es para ti cada una de las siguientes afirmaciones en tu decisión para ser físicamente activo. En cada caso, piensa en cómo te sientes en este momento, no cómo te has sentido en el pasado o como te gustaría sentir*» (Physical activity or exercise includes activities such as brisk walking, running, cycling, swimming or any other activity in which the exercise is at least as intense as these activities.) Please rate how important each of the following statements are in your decision to be physically active. In each case, think about how you feel right now, not how you felt in the past or how you would like to feel). An example of an item of the pros subscale is «*El ejercicio regular me ayudaría a aliviar la tensión*» (regular exercise would help me ease tension) and an example of an item of the cons subscale is «*El ejercicio físico regular requiere mucho tiempo*» (regular physical exercise requires a lot of time.) The answers were collected using a Likert scale from 1 (not important) to 5 (very important).

Stages of change. The questionnaire of stages of change for physical activity by Marcus and Forsyth (2003) was used. First, the participant was asked to read the following: «*La actividad física o ejercicio incluye actividades tales como caminar rápidamente, correr, andar en bicicleta, nadar o cualquier otra actividad en la que el ejercicio es al menos tan intenso como estas actividades*» (physical activity or exercise includes activities such as brisk walking, running, biking, swimming or any other activity in which the exercise is at least as intense as these activities). Subsequently individuals were asked to answer «yes or no» with regard to the following statements: (1) *Actualmente soy físicamente activo (I am currently physically active)*. (2) *Tengo la intención de ser físicamente más activo en los próximos 6 meses (I intend to be more physically active in the next 6 months)*. Those who answered «No» answered question (2). Those who answered «Yes» to question (1) did not answer question (2) and continued reading the following: «*Para que la actividad sea regular, se debe sumar al día un total de 30 minutos o más, por lo menos 5 días a la semana. Por ejemplo, usted podría hacer una caminata de 30 minutos o hacer tres de 10 minutos para un total diario de 30 minutos*» (For activity to be regular, you should add a total of 30 minutes or more a day, at least 5 days a week. For example, you could walk for 30 minutes or walk on three occasions for 10 minutes for a total of 30 minutes a day); afterwards they were asked to answer «yes or no» with regard to the following statements: (3) «*Yo actualmente realizo una actividad física regular*» (I currently regularly exercise) and (4) «*Yo llevo realizando actividad física regular durante los últimos 6 meses*» (I have been regularly doing exercise for the last 6 months). Subjects were placed in one of five stages of change according to the algorithm in Table 1.

Procedure

The instrument was self-administered by personal interview, with the consensus and prior training of the interviewers. The interviewer took note of the responses given by the interviewee, with the questionnaire being applied in the home of the respondent, which was selected by random route. All participants were informed of the purpose of the study, of their autonomy, and of the absolute confidentiality of responses and data management; also they were told that there were no right or wrong answers and they were asked to respond with the utmost sincerity and honesty.

The DBS-E was translated into Spanish spoken in Mexico following the translation–retranslation procedure by Hambleton & Kanjee, 1995. The translation was done by a professional translation company hired by the investigators. A group of three specialists with doctorate degrees that work in the area of psychology in physical activity and sports was formed. Two with experience in the validation of psychological tools and a translator specialized in the area of physical activity and sport discussed the discrepancies in the translation to achieve the first version of the instrument in Spanish. This version of the questionnaire was translated back into English by a different professional translation

Table 1.

Categorization and distribution of subjects in the stages of change.					
Stage	Question number				%
	(1)	(2)	(3)	(4)	
Precontemplación	No	No	----	----	20.3
Contemplación	No	Si	----	----	22.5
Preparación	Si	----	No	----	12.9
Acción	Si	----	Si	No	12.8
Mantenimiento	Si	----	Si	Si	31

Table 2.

Descriptive statistics and factorial saturations of the items of the Decisional Balance Scale for Exercise (DBS-E).

No.	Pro Items	M	DT	Asymmetry	Curtosis	Factorial Saturations	
						EFA	CFA
06	Me sentiría bien conmigo mismo si mantengo mi compromiso de hacer ejercicio regularmente.	3.42	1.08	-.22	-.68	.75	.87
02	El ejercicio regular me ayudaría a aliviar la tensión.	3.60	1.05	-.31	-.72	.75	.87
05	Dormiría más profundamente si hago ejercicio regularmente.	2.74	1.12	.23	-.66	.73	.84
10	Me sentiría menos estresado si hago ejercicio regularmente.	3.57	1.07	-.33	-.69	.73	.82
14	El ejercicio regular me ayudaría a tener una perspectiva más positiva de la vida.	3.59	1.12	-.46	-.54	.72	.79
04	Me sentiría más seguro si hago ejercicio regularmente.	3.70	1.09	-.61	-.29	.69	.79
08	Me gustaría más mi cuerpo si me ejercitara regularmente.	2.90	1.14	.10	-.71	.69	.90
09	Sería más fácil para <input type="checkbox"/> llevar a cabo las tareas físicas cotidianas si me ejercito regularmente.	3.66	1.14	-.50	-.60	.69	.80
12	Me sentiría más a gusto con mi cuerpo.	3.54	1.13	-.51	-.53	.67	.81
01	Tendría más energía para mis familiares y amigos si me ejercito regularmente.	3.55	1.12	-.41	-.61	.66	.75
Contra Items							
16	Al final del día, estoy demasiado cansado como para hacer ejercicio.	2.63	1.21	.25	-.90	.67	.74
11	Me incomoda hacer actividad física porque me quedo sin aliento y mi corazón late muy rápido.	3.68	1.16	-.55	-.61	.65	.76
15	Tendría menos tiempo para mis familiares y amigos si me ejercito regularmente.	3.00	1.11	.04	-.63	.63	.79
13	El ejercicio físico regular requiere mucho tiempo.	3.46	1.11	-.36	-.56	.63	.72
03	Pienso que estaría muy cansado para hacer mi trabajo diario después de hacer ejercicio.	2.71	1.11	.08	-.82	.62	.73
07	Me resultaría difícil encontrar una actividad física que me guste y que no se vea afectado por el mal tiempo.	2.83	1.25	.17	-.95	.55	.62

Note. No. = Number; M = Mean; SD = Standard Deviation; EFA = Exploratory Factorial Analysis; CFA = Confirmatory Factorial Analysis

Table 3.

Means and standard deviation of pros, cons, and decisional balance by stages of change for physical exercise.

Variables	PC					F	Peer comparison
	M (SD)	C (SD)	P (SD)	A (SD)	M (SD)		
Pros ^a	41.89 (9.67)	51.50 (8.84)	50.42 (7.68)	50.27 (9.62)	54.03 (9.03)	30.708**	PC<A,P,C,M; PC,P,A<M
Cons ^a	50.92 (9.46)	51.76 (9.52)	50.74 (8.75)	49.53 (9.83)	47.92 (10.97)	3.101*	M<C
Decisional balance	-9.03 (9.12)	-.25 (13.01)	-.32 (11.86)	.74 (13.75)	6.10 (15.93)	21.156**	PC<P,C,A,M; PC,P,C,A<M

Note. * $p < .05$; ** $p < .01$. T-score mean of the Tukey HSD post hoc test. M = Mean; DT = Standard Deviation; PC = Precontemplation; C = Contemplation; P = Preparation; A = Action, M = Maintenance.

company and both versions of the instrument were contrasted, the original and the translation. Differences in the versions were again analyzed and the necessary changes made to facilitate understanding of the items to produce the final version of each of the scales. The items that make up each of the two subscales are presented in Table 2.

Statistical analysis of the data

The factor structure of the 16 items that compose the instrument was examined by exploratory factor analysis using principal axis factorization with an oblique Promax rotation ($Kappa = 4$). To confirm whether the two-factor structure fits the data of our population, a confirmatory factor analysis was conducted using the Weighted Least Squares (WLS) estimation method using as input matrix polychoric correlations and the asymptotic covariance matrix due to the ordinal nature of the variables.

In line with Garrido-Guzman, Zagalaz-Sanchez-Luque Torres and

Romero-Granados (2010), reliability expresses the degree of measurement accuracy that expresses the ability of the instrument to discriminate and differentiate subjects by their responses. In the present study, the reliability of each of the two subscales was analyzed by Cronbach's alpha (Cronbach 1951) to confirm if the removal of any item increases the alpha of the scale and analyzing the corrected item-total correlation.

On the other hand, validity refers to the meaning that we attribute to it; i.e., to be certain that the instrument measures what we say it measures (Garrido-Guzman et al., 2010). When the instrument behaves as expected with respect to other constructs with which it is theoretically related, we can affirm the existence of nomological validity (Malhotra, 2004). The nomological validity of the scale was determined by examining the scores of the pros, cons and decisional balance through the stages of change by analysis of variance (ANOVA) and the Tukey HSD post hoc test.

The exploratory factor analysis, the reliability analysis and ANOVA were performed with SPSS V.21. The confirmatory factor analysis was performed using the program LISREL 8.80 (Jöreskog & Sörbom, 2006).

Results

Distribution of participants by stages of change

Most of the study participants were placed in the last stage, i.e., maintenance (31%), followed by two inactive stages, contemplation (22.5%) and precontemplation (20.3%), respectively. The stages in which subjects were less prevalent were preparation (12.9%) and action (12.8%).

Exploratory Factor Analysis (EFA)

The Barlett sphericity test was significant ($\chi^2 = 3366.39$, $df = 120$; $p < .001$) and the Kaiser-Meyer-Olkin statistic was greater than .50 ($KMO = .92$) indicating adequacy of the data. The results revealed a structure formed by two factors (pros and cons) with eigenvalues greater than 1 and a total cumulative variance of 53.22%, where all items had a factor load higher than .40 (Table 2).

Confirmatory Factor Analysis (CFA)

The adequacy of the model was analyzed through different fit indexes: the chi-square value divided by the degrees of freedom (χ^2/df), the non-normed fit index (NNFI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). According to Carmines and McIver (1981), a χ^2/df ratio less than three indicates a good fit of the model. The CFI and NNFI values above .90 indicate an acceptable fit (Hu & Bentler, 1995). For the RMSEA, values between .05 and .10 are considered acceptable, and those less than .08 satisfactory (Cole & Maxwell, 1985).

Therefore, the goodness of fit indexes of the model were satisfactory ($\chi^2/df = 2.16$, $NNFI = .957$, $CFI = .963$ and $RMSEA = .046$). The estimated parameters are considered significant when the value associated with t is greater than 1.96 ($p < .05$). All factor loadings of the model were significant (t values from 19.73 to 56.41). Therefore, the existence of two independent latent variables, pros and cons, is confirmed (Table 2).

Internal consistency analysis

The reliability analysis showed high item-total correlations and that the removal of any item did not improve reliability coefficients; therefore, the sixteen items in the original version were maintained. The results showed good internal consistency for both subscales with alpha values of .91 for the subscale of the pros and .80 for the subscale of cons.

Nomological validity

As previously described, TTM postulates that in trying to modify a problem or addictive behavior people pass through five stages to achieve a behavioral change. Related studies have shown that scores on the perception of pros increase through the stages, from

precontemplation to maintenance, and on the other hand, scores of perceived cons decrease through them. Regarding decisional balance, studies have shown that people in early stages of change have a more negative decisional balance than those who are in the final stages, with a more positive decisional balance. All this has been proven in various studies with a number of health-related behaviors, including physical exercise (Eeckhout et al., 2013; Marshall & Biddle, 2001; Prochaska et al., 1994).

Following the recommendations made by previous studies (Marcus & Forsyth, 2003; Marcus et al., 1992; Prochaska et al., 1994; Velicer et al., 1985) and in order to present a standardized measure to improve the interpretation of results, the values of the pros ($M = 3.58, SD = .82$) and cons ($M = 2.80, SD = .81$) were converted to T-scores [$M = 50, SD = 10$]. Decisional balance was calculated by subtracting the score of the cons from the score of the pros.

The differences in pros through the stages were significant ($F_{[4,523]} = 30,708; p < .001$). The results of the Tukey HSD post hoc test revealed that the perception of the pros was significantly higher in subjects on maintenance compared with those in action, preparation and precontemplation. Furthermore, the perception of the pros was significantly lower in subjects in precontemplation than in other stages (Table 3).

The differences in cons through the stages were significant ($F_{[4,523]} = 3,101; p < .015$). The results of the Tukey HSD post hoc test revealed that the perception of the cons was significantly higher in subjects who were in contemplation than in those in maintenance (Table 3).

Finally, the decisional balance was also significant across the stages of change ($F_{[4,523]} = 21,156; p < .001$). The results of the Tukey HSD post hoc test indicated that the stages of precontemplation and maintenance were significantly different from the rest of the stages. Precontemplators had significantly more negative values in decisional balance, and those in maintenance showed significantly more positive scores in decisional balance than in the rest of the stages (Table 3). Figure 1 shows the progressive increase in decisional balance scores through the different stages of change for exercise. These results provide support for the nomological validity of the DBS-E.

Discussion

The purpose of this study was to translate into Spanish and adapt to the Mexican context the Decisional Balance Scale for physical exercise (DBS-E) by Marcus et al. (1992) and examine its psychometric properties and nomological validity with the stages of change in a sample of people living in the metropolitan area of Monterrey, Nuevo Leon, Mexico.

In line with the results of studies conducted in other populations such as the United States (Marcus et al., 1992; Fallon, et al., 2005), Canada (Plotnikoff et al., 2001) and France (Eeckhout et al., 2013), the results of the EFA of the Mexican version of the DBS-E revealed a structure composed of two factors that represent the pros (advantages) and cons (disadvantages) of performing physical exercise. None of the sixteen items of the scale were eliminated from our study since all had high factor loadings; therefore, the original version created by Marcus et

al (1992) was maintained; however, this was not presented in the same way in the study by Plotnikoff et al. (2001) since the final version of the scale was ten items, and in the study by Quiroz-Villanueva (2002) and Rojas-Russell (2009), the instrument was composed of eighteen items.

The CFA revealed a good fit of the data of the two-factor model tested (pros and cons). These results add empirical evidence about the structure of the instrument and are consistent with those obtained in the study in general population in Canada (Plotnikoff et al., 2001) and France (Eeckhout et al., 2013). The sixteen items reflected a suitable structure with high factor loadings in each of the two factors of the model. Both the results of the EFA as the CFA support the factorial validity of the Mexican version of the DBS-E.

The results of the internal consistency analysis revealed alpha values of .91 for the pros and of .80 for the cons. These values exceed the value of .70 recommended by Nunnally (1978), and adds empirical evidence and are consistent with the values obtained in other studies of workers in the United States (Fallon et al., 2005. Marcus et al., 1992), and general population in Canada (Plotnikoff et al., 2001), and French population (Eeckhout et al., 2013), and in studies performed in Mexico with more specific populations such as high school (Zamarripa et al., 2013) and college students (Quiroz-Villanueva., 2002; Rojas-Russell, 2009).

Overall, the results provide internal consistency to the Mexican version of the DBS-E, thus, now there is an instrument that is reliable and valid in both content and structure that can be used in future studies in this area in Mexico. Also, the wide age range of study participants (11-76 years), allows its generalization and use in the general population, which supports its external validity.

As expected, the perception of advantages (pros) increased progressively through the stages and the perception of disadvantages (cons) decreased from contemplation to maintenance.

The results regarding decisional balance were also in agreement with the TTM (Prochaska et al., 1992), since people in the early stages of change had a negative decisional balance, which progressively increased to maintenance, which had a more positive decisional balance. These results agree with those obtained in other studies that have examined a number of health-related behaviors, including physical exercise (Eeckhout et al., 2013; Marshall & Biddle, 2001; Prochaska et al., 1994). Thus, empirical evidence of the nomological validity of the Mexican version of the DBS-E is presented.

This study also has some limitations. In this research only the general population in the metropolitan area of Monterrey was included; therefore, in future research, the psychometric properties of the instrument considering population from other sectors should be analyzed. Second, this study presents psychometric support for the Spanish version of the instrument in the linguistic and cultural context of Mexico. Future research could focus on the evaluation of these properties in other Spanish-speaking countries. Finally, we believe that work on the study of the factorial invariance of the instrument by gender, age group, and populations from different Spanish-speaking countries should continue to determine its function and facilitate a comparison of results.

Conclusions

After examining the psychometric properties of the decisional balance scale for exercise (DBS-E), it can be concluded that the Spanish version adapted to the Mexican context is a reliable and valid instrument that can be used for future studies in order to increase the generation of knowledge and scientific production in this area in Mexico, since its factorial structure coincides with that used in previous studies and is consistent with the assumptions of the TTM (Prochaska et al., 1992).

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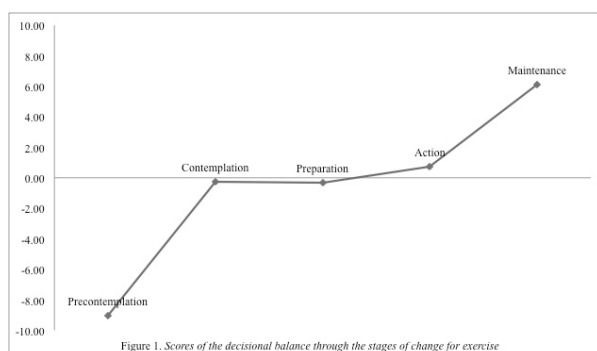


Figure 1. Scores of the decisional balance through the stages of change for exercise

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