ARTIGO ORIGINAL

Convergent validation study of the Contemplation Ladder for application via telephone in tobacco users

Estudo da validação convergente da Escala de Contemplação Ladder aplicada por telefone em tabagistas

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ABSTRACT

Objective: This work was designed to validate the Portuguese version of the Contemplation Ladder, whose purpose is to assess the motivational phase to quit smoking among tobacco users using a telephone service. **Method:** A cross-sectional study was conducted in a nationwide drug use information hotline. In order to assess the convergent validation, the correlation between the Contemplation Ladder and the URICA Scale was calculated, which was previously validated. **Results:** The study included 271 tobacco users. Statistically significant correlations were found between the Contemplation Ladder scores and the scores of the URICA precontemplation (r=-0.16; p<0.01), action (r=0.15; p<0.01) and maintenance (r=0.18; p<0.01) subscales. The correlation between the URICA Scale compound score and the Contemplation Ladder was also significant (r=0.31; p<0.01). **Conclusion:** The results of our study suggest that the Contemplation Ladder can be an efficient substitute for the URICA scale (whose application lasts at least 20 minutes), without submitting the interviewee to a heavy load of questions. The study presented evidences of convergent validity for the Contemplation Ladder when applied via telephone in tobacco users.

Keywords
Telemedicine, tobacco use, URICA Scale, Contemplation Ladder.

RESUMO

Objetivo: *Este estudo teve como objetivo validar a versão em português da Escala de Contemplação Ladder, que visa verificar o estágio motivacional para parar de fumar em tabagistas, em um serviço de atendimento telefônico.* ***Método:*** *Um estudo transversal foi conduzido em um serviço de âmbito nacional de informação sobre uso de drogas por telefone. Para avaliação da validação convergente foi calculada a correlação entre a Escala de Contemplação Ladder e a Escala URICA, a qual já foi validada anteriormente.* ***Resultados:*** *O estudo incluiu 271 tabagistas. Foram encontradas correlações estatisticamente significativas entre os escores da Escala de Contemplação Ladder e os escores das subescalas de pré-contemplação (r=-0,16; p<0,01), ação (r=0,15; p<0,01) e manutenção (r=0,18; p<0,01) da URICA. A correlação entre o escore composto da Escala URICA e a Escala de Contemplação Ladder também foi significativa (r=0,31; p<0,01).* ***Conclusão:*** *Os resultados do nosso estudo sugerem que a Escala de Contemplação Ladder pode ser uma alternativa para a Escala URICA (cuja aplicação dura no máximo 20 minutos), sem se impor uma carga maior de perguntas ao entrevistado. O estudo mostrou evidências de validade convergente da Escala de Contemplação Ladder, quando aplicada por telefone, em usuários de tabaco.*

Palavras-chave
Telemedicina, tabagismo, Escala URICA, Escala de Contemplação Ladder.

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INTRODUCTION

Several studies show that smoking cessation brings considerable benefits to health, because individuals that stop smoking avoid most of the tobacco-associated diseases[1,2]. However, when trying to stop smoking, tobacco users find several difficulties, and many of them relapse. Success rates for tobacco abstinence are rather low[3]. A wide range of interventions may help smokers to reach and keep the abstinence. The telephone counseling is a method that offers advantages, not only for the fact that it comprises a large number of individuals, but because it is more accessible to those tobacco users who do not have access to or interest in other treatments, such as individuals who live in distant rural areas or those with physical disabilities, those who are reluctant to participate in face-to-face interventions or pharmacological interventions, or those that do not participate for lack of time or financial difficulties[4,5].

Both proactive[6] and reactive[6,7] telephone counseling, have been shown to be effective ways to promote smoking cessation in developed countries**.** Smoking quitlines are associated with increased 12-month smoking quit rates by approximately 30%[8,9]. In an Australian study, the effectiveness of a telephone callback counseling intervention was examined. At the 3-month follow-up, significantly more participants in the callback group (24%) reported that they had quit smoking, compared to those in the usual care comparison group (13%). Using sustained abstinence there was a significant benefit of callback counseling at 12-month follow-up. The benefit of callbacks was to increase quit attempts and to significantly reduce relapse[8]. In a Scottish study, at one year, 23.6% of callers reported that they had stopped smoking and 88% reported having made some change. About 19.500 adult smokers, equivalent to 1.4% of the mean adult smoking population in Scotland, stopped smoking with direct help from telephone helpline[9]. In a wide-range of northern-hemisphere countries, telephone counseling improve smoking quit chance in comparison with self-help material (OR = 1.56) [10].

Among substance-abusing individuals, motivation and intentions related to the modification of the addictive behavior play an important role in the recovery process[11]. However there is still a tremendous lack of assessment instruments to systematically describe the diversity of problems associated with psychoactive substance abuse or dependence, the results of appropriate treatments and the effectiveness of interventions. The lack of diagnostic instruments is especially true when establishment of degree of motivation to engage in drug abuse/dependence treatment is aimed. Also, when choosing assessment scales, it is necessary to consider the objective and clinical use, the target population, type of administration, level of necessary training and cost[12]. Two scales for motivation to change behaviors assessment are frequently used, the University of Rhode Island Change Assessment (URICA) and Contemplation Ladder.

The URICA Scale is a self-application scale and aims at investigating the motivational stages of individuals and how much they are available for a change in their problem-behavior, which can be applied to both alcohol addicts and other substances dependents[13,14]. Standardization and factorial analysis studies have already been performed in Brazil and showed the instrument's reliability[15]. The URICA Scale psychometric properties have been evaluated in groups of individuals who abuse a variety of substances such as alcohol, tobacco, heroin and cocaine. Most studies point to a factorial structure with 4 factors for the scale[14,16,17]. Two studies found a good internal consistency, with the alpha coefficient ranging between 0.82 and 0.89[14,18]. Another study indicated a strong concurrent validity for the scale when used on individuals with alcohol problems[19]. Its only counterproductive characteristics is that it is composed of many questions, each with complex answers possible, and takes more than 20 to 30 min to be answered. This characteristic is a drawback for its use in quitlines.

The Contemplation Ladder also assesses an individual's motivational stages for change and presents the advantage to be shorter and, consequently, easier to apply in a telephone service[20,21]. The psychometric properties of the Contemplation Ladder are well established[22]. To our knowledge, one study supported the concurrent validity and the predictive validity of the Marijuana Ladder, a modified version of the Contemplation Ladder, in a sample of incarcerated adolescents[23].

For a better development of the brief telephone interventions, it is necessary to use short, brief scales that answer to the questions in the shortest time as possible. The purpose of this study was to provide evidence for the convergent validity of the Portuguese versions of the Contemplation Ladder and the URICA when used with tobacco users who call a telephone quitline. Use of brief but valid measure of readiness to change may facilitate the telephone counseling process in Brazil.

METHOD

Design and population

The research was a cross-section study to assess the convergent validity of the Contemplation Ladder. The population was composed of clients that call a telephone drug information and counseling service. The phone line is a nationwide toll-free telephone counseling service for the Brazilian population providing advice to the community, based on evidence, scientific concepts and epidemiological data

on all licit and illicit psychoactive substances. This service attends the general population, psychoactive substance users, relatives, students and professionals from various areas. The protocols of tobacco users who called the 0 800 line and agreed to participate in the study and fully answered both scales for readiness to change, the URICA Scale and the Contemplation Ladder, between June 2005 and June 2006 were included in the study. A consecutive sampling was used, comprising all the tobacco users attended within the determined study period (296 individuals). Considering $p<0.05$ and a power of 80%, the sample size calculated was of 150 individuals to establish a correlation. Because it was expected that at least half of the individuals would have to be excluded due to partial information there was an initial doubling of the sample numbers taken for this study.

The excluded protocols were from not tobacco users or were also alcohol or illicit drug users; only contained requests for information about psychoactive substances; were not complete in respect to both stages of motivation scales information or did not give the informed consent.

Instruments

The study used the instruments that are part of the call center service: general protocol with socio-demographic data, the Contemplation Ladder[21], the URICA Scale[14] and a question about the individual's intention to stop smoking[24].

The URICA Scale aims at investigating the individuals' motivational stages and how much they are available for a change in their problem behavior. The questionnaire contains 32 assertions for which the following answers must be selected: 1=totally disagree; 2=disagree; 3=undecided; 4=agree; 5=totally agree. From the data survey, the distribution among the motivational stages is assessed (precontemplation, contemplation, action and maintenance) for each individual, provided that each phase is related to 8 items. The final result shows the number of points scored at each of the phases, as well as if there is a significant prevalence of any of them[13,14]. Its compound score can also be calculated by summing the contemplation, action and maintenance subscales and subtracting by the precontemplation subscale[25].

The Contemplation Ladder also assesses an individual's motivational stages for change and presents the advantage to be shorter and, consequently, easier to apply to the use in telephone service[21]. It is an instrument used to identify the readiness of the alcohol, tobacco or other drugs user to stop using it[17]. The Contemplation Ladder is a brief measure of motivation or redness to change, allowing individuals to indicate their motivation to change their smoking from 1 to 10, in which 1 is least motivated and 10 is most motivated[21]. The first step corresponds to the statement "I enjoy smoking and have decided not to quit smoking for my life" (score=1, precontemplation stage), followed by "I never think about quite smoking, and I have no plans to quit" (score=2, precontemplation stage), "I rarely think about quiting smoking, and I have no plans to quit" (score=3, precontemplation stage), "I sometimes think about quiting smoking, but I have no plans to quit" (score=4, contemplation stage), "I often think about quitting smoking, but I have no plans to quit" (score=5, contemplation stage), "I definitely plan to quit smoking in the next 6 months" (score=6, preparation stage), "I definitely plan to quit smoking in the next 30 days" (score=7, preparation stage), "I still smoke, but I have begun to change, like cutting back on the number of cigarettes I smoke" (score=8, preparation stage), "I have quit smoking, but I still worry about slipping back, so I need to keep working on living smoke free" (score=9, action stage) and "I have quit smoking and I will never smoke again" (score=10, action stage).

The original scale was translated to Portuguese by a bilingual psychiatrist. Another bilingual psychiatrist who was unfamiliar with the original version back-translated this initial Portuguese version into English. Then, a third bilingual psychiatrist checked the comparability of item meanings between the retranslated and the original version to verify content equivalence. All three professionals involved in the procedure worked in the elaboration of the final Brazilian version of the Contemplation Ladder to ensure cross-cultural equivalence both in terms of semantic content and linguistic structure. This Portuguese version of the Contemplation Ladder has not been published yet.

Data collection and outcome variables

The telephone service and the application of the scales were performed by 30 previously selected and trained undergraduate students in the health area. The training model used was adapted from the Medical Education Model for the Prevention and Treatment of Alcohol Use Disorders[26]. The interdisciplinary training model was based on the following educational principles: a) repetition and reinforcement of major ideas, themes, and skills; b) group integration and linking of ideas throughout the course; c) continuous supervision; d) learner-centered teaching strategies; e) initial skills-based small-group practice sessions utilizing role-play and simulated or real cases; f) additional practice sessions in the call-center under close supervision; and g) periodic testing and feedback[27]. The students were trained for around 3 months and were submitted to a written test, in which they should obtain average score of 7.0. All interviews were conducted under supervision by health professionals[28].

The user was invited to take part in the study after having his/her questions answered or being counseled. If the client was a tobacco user and agreed to answer to the questionnaires, the consultant started filling up the questionnaires. The consent for participation was recorded. The person answering the call was the same as the one who

filled up the instruments, which were submitted always in the same order. Before the application, the respondent was told about the number of questions of each scale and that the URICA Scale would take about 20 minutes to be completed. The Contemplation Ladder was applied, where each step of the ladder was checked with the user in order to verify the readiness to stop smoking. The questionnaire with the social-demographic variables was structured and in electronic form.

When applying the URICA Scale, the customer was asked questions making sure that these answers were not given based on past feelings or on how they would like to feel. As it is a very long questionnaire (32 questions), it was made available in tabs of a software that opened as the questions were answered. If any question was not answered, it was impossible to open the next tab, in order to ensure that all the questions were presented to the clients. After being opened, there was nothing to prevent the client to return and modify the previous tabs. Each patient was rated in the 4 factors of the URICA Scale, the highest score prevailing to characterize the motivational state of each subject. In cases of ties, the individual was included in both stages for which he had the highest scores.

Finally, there was also the question about if the individual would like to stop smoking. Each respondent answered in a standardized manner one and the same question: "During the past 12 months, did you want to try to stop or cut down on your use of that drug but found you couldn't?"

The Contemplation Ladder's convergent validity was determined through the comparison of its results to the other scale's results, the URICA Scale, provided that both assess the clients' level of preparation for behavioral changes, in the specific case of this study, changes of habits related to the tobacco use. The scales' results regarding the study participants' sex and age were also compared. Besides, the study compared the scales' average scores between the patients who wanted and those who did not want to stop smoking.

Data analysis

A descriptive analysis was presented with regard to social-demographic variables. Means ± standard deviation or median (semi-interquartile range) were used for quantitative variables, and percents were used for category variables. For evaluation of the convergent validity, the correlation between the Contemplation Ladder and the URICA Scale was calculated using Spearman's rank correlation coefficient. The Mann-Whitney test was used to compare average scores in the two scales of those who declared they wanted to quit drug use and those who did not.

Ethic aspects

The service provided by this telephone line is free of charge (0800) and anonymous. All the telephone line's clients were informed that the information provided by the service could be used as research data, without the disclosure of personal data. Even after the informed consent, the client could interrupt the interview at any time. Secrecy was assured by anonymity. The study was approved by the Ethics Committee of the Federal University of Health Sciences of Porto Alegre (UFCSPA) (proceedings nº 019/05).

RESULTS

In an initial sample of 296 tobacco users, 25 were excluded from the study for incomplete answers of the URICA Scale. Most of the individuals were females, married, had a family income of only 1 to 5 times the minimum wages in most of the times, and had only complete or incomplete elementary school. The social-demographic characteristics of the sample are shown in Table 1. Some variables are not complete due to recording errors, or because some individuals chose not to answer certain questions.

Table 1. Socio-demographic characteristics of the sample (N=271)

Variables	n	(%)
Sex		
Male	90	(33.2)
Female	181	(66.8)
Total	271	(100.0)
Marital status		
Married	125	(46.1)
Separated	29	(10.7)
Single	88	(32.5)
Widower	3	(1.1)
Non-respondents	26	(9.6)
Total	271	(100.0)
Family income		
1 to 5 minimum wages	189	(69.7)
5 to 10 minimum wages	31	(11.4)
More than 10 minimum wages	5	(1.8)
Non-respondents	46	(17.0)
Total	271	(100.0)
Education		
Illiterate	2	(0.7)
Incomplete elementary school	69	(25.5)
Complete elementary school	36	(13.3)
Incomplete secondary school	28	(10.3)
Complete secondary school	56	(20.6)
Incomplete higher education	11	(4.1)
Complete higher education	0	(0.0)
Non-respondents	69	(25.5)
Total	202	(100.0)
Age (years, mean ± sd)	35.01	± 15.8

The data was presented in n (percentage) or mean ± sd

In the total sample, the Contemplation Ladder median was 10 (5 to 10), the compound score median of the URICA Scale was 59 (52 to 63), the URICA precontemplation subscale was 12 (9 to 15), the contemplation subscale was 24 (24

to 26), the action subscale was 24 (23 to 26) and the maintenance subscale was 22 (19 to 25).

Statistically significant correlations were found between the scores of the Contemplation Ladder and the scores of the URICA's precontemplation, action and maintenance subscales. The correlation between the compound score of the URICA Scale and the Contemplation Ladder was also relevant. No significant correlation was found between the Contemplation Ladder's scores and the URICA's contemplation subscale score (p=0.07). As may be seen in Table 2, the URICA subscales correlated rather with its compound score than with the Contemplation Ladder.

Table 2. Intercorrelations of the Contemplation Ladder and the URICA subscales and the URICA compound score

Measure	1	2	3	4	5	6
1 Ladder	1					
2 URICA–Precontemplation	-0.16**	1				
3 URICA – Contemplation	0.1	0.006	1			
4 URICA – Action	0.15**	-0.1	0.26**	1		
5 URICA – Maintenance	0.18**	0.02	0.05	0.12*	1	
6 URICA – Compound Score	0.31**	-0.59**	0.32**	0.51**	0.60**	1

* p< 0.05 ** p< 0.01

Regarding the Contemplation Ladder, the most frequent stage was the action (53.1%) and after the preparation (21.8%), the contemplation (16.2%) and the precontemplation (8.8%). The subscales with higher scores of the URICA Scale of the smokers who call the phone line were contemplation (56.1%) and action (48.7%). Only 15.1% of the individuals had higher scores in the maintenance subscale and 1.8% in the precontemplation subscale. Because the Contemplation Ladder does not present evaluation for maintenance and URICA lacks evaluation for preparation, a comparison could only be made after grouping responses for preparation and contemplation and for action and maintenance (Table 3).

Men presented more frequently than the women the action stage (p=0.04) in the Contemplation Ladder and women were more frequently at the precontemplation stage (p=0.05). Considering the URICA scale, men presented more frequently the action/maintenance subscale, with higher scores than women (p<0.05) (Table 3). Individuals above 35 years of age, were at the contemplation/preparation stages of the Contemplation Ladder more frequently than those younger than 35 years old (p<0.05) and the URICA contemplation subscale (p=0.03). However, one needs to be cautions with these results since many individuals did not disclose their age.

Among men, a statistically relevant correlation was found only between the Contemplation Ladder and the URICA scale's compound score. However, among the women, statistically relevant correlations were found between the scores of the Contemplation Ladder and the scores of the URICA's precontemplation, action and maintenance subscales and the URICA scale's compound score. No statistically relevant correlation was found between the URICA's contemplation subscale score and the Contemplation Ladder's score neither for men nor women (Table 4).

Table 4. Intercorrelations of the Contemplation Ladder and the URICA subscales and the URICA compound score by sex and age

Measures	Ladder Men (n=90)	Ladder Women (n=181)	Ladder ≤35 years old (n=116)	Ladder >35 years old (n=140)
URICA – Precontemplation	-0.17	-0.15*	-0.26**	-0.04
URICA – Contemplation	0.05	0.13	0.25**	-0.008
URICA – Action	-0.02	0.20**	0.10	0.20*
URICA – Maintenance	0.16	0.21**	0.16	0.17*
URICA – Compound Score	0.26*	0.33**	0.36**	0.22**

* p< 0.05 ** p< 0.01

In respect to age, statistically relevant correlations between the scores of the Contemplation Ladder and the scores of the URICA's precontemplation, contemplation subscales and the URICA Scale's compound score were found among individuals younger than 35 years. However,

Table 3. Frequencies of the Contemplation Ladder's and the URICA subscales' stages of the total sample and in relation to sex and age

	Total n=271(%)		Men n=90(%)		Women n=181(%)		≤ 35 years n=116(%)		> 35 years n=140(%)	
	Ladder	URICA	Ladder	URICA	Ladder	URICA	Ladder	URICA	Ladder	URICA
Precontemplation	24(8.8)	5(1.8)	4(4.4)	4(4.4)	20(11.0)	1(0.6)	14(12.1)	3(2.6)	10(7.1)	2(1.4)
Contemplation and Preparation	103(38.0)	152(56.1)	31(34.4)	51(56.7)	72(39.7)	101(55.8)	37(31.9)	57(49.1)	58(41.4)	86(61.4)
Action and Maintenance	144(53.1)	173(63.8)	55(61.1)	70(77.8)	89(49.2)	118(65.2)	65(56.0)	90(77.6)	72(51.4)	86(61.4)

Stages of changes frequency of individuals according to URICA show a higher number than respondents due to consideration of scores of more than one subscale, when ties in subscales were detected.

for those above 35 years old, statistically relevant correlations were found between the scores of the Contemplation Ladder and the scores of the URICA's action, maintenance subscales and the URICA Scale's compound score (Table 4).

Among those who answered the direct question about their wish to stop smoking, those who wanted to stop corresponded to 89.1% of the sample. No differences with statistical significance were found in relation to the medians of the Contemplation Ladder's scores and the medians of the URICA's compound score and also regarding the medians of the URICA's subscales scores, among those that intended to stop smoking and those that intended to keep using tobacco.

DISCUSSION

The study presented evidences of convergent validity for the Contemplation Ladder when applied via telephone in tobacco users. The most significant correlation occurred between the URICA Scale's compound score and the Contemplation Ladder's score (r=0.31), where the correlations between the URICA's precontemplation, action and maintenance subscales and the Contemplation Ladder were also significant, although not strong (r between 0.15 and 0.18). The correlation between the Contemplation Ladder and the URICA's contemplation subscale was not significant. This last correlation was only significant for the individuals aged 35 years or younger. In other study, the Contemplation Ladder demonstrated convergent validity when applied to smokers identified to be in the contemplation stage as well as in the precontemplation stage through URICA[29]. The instrument has demonstrated to predict subsequent participation in programs to quit smoking and in educational events promoted to increase tobacco risk awareness[21,30].

A previous study also showed the convergent validity of the Contemplation Ladder, when compared to the URICA scale, in a sample of tobacco users, during face-to-face interviews, suggesting that it may be an alternative practice[17]. Contemplation Ladder scores for the entire sample (n=183) correlated positively with the URICA contemplation (r=0.33), action (r=0.30), and maintenance (r=0.22) subscales scores but negatively with precontemplation subscale scores (r=-0.39). The Contemplation Ladder also correlated positively with the URICA composite score (r=0.41). Additionally, participants seeking to quit within the next 6 months had significantly higher Contemplation Ladder and URICA contemplation, action, and composite scores, but lower precontemplation scores than participants not seeking to quit[17].

When we subdivided the sample according to gender and age, we found rather correlations among the women than among the men, maybe because women were more represented in this sample. This observation prompts planning of future research to determine biological and cultural differences that may be inducing slight differences between genders and ages in future studies.

The fact that the differences between the medians for the scales' average scores have not been statistically significant between those people who intended to stop smoking and those who didn't, is probably due to the small number of individuals who had no intend to stop smoking (10.8%). This occurred because the individuals who sought the telephone service intend to stop or reduce the use, in most of times, which has upset a bigger sampling among those people who did not intend to stop smoking. This fact would also justify the small number of individuals found in the precontemplation stage, in both scales. The study presents limitations because the findings cannot be generalized to other contexts outside a telephone service, the sample was relativelly small and the correlations were significant but rather low. In a previous study, already cited, also the correlations that were found were moderate to low, between 0.22 and 0.41[17].

The validation of the Contemplation Ladder will permit, through an easily applied scale, the determination of the motivational stage to quit smoking in tobacco users using a telephone line service. Future studies could be more valuable if they were able to report the scales' capacity to predict results of treatments to increase the tobacco users' motivation for changes. In addiction, future research should continue to empirically compare different classification methods, e.g., the URICA Scale and Contemplation Ladder with various staging, in order to assess their interchangeability as well as to determine whether the development of new measures may be warranted.

CONCLUSIONS

Our study's results suggest that the Contemplation Ladder, by defining an only score, may be a practical substitute for the URICA Scale's compound score, in telephone-based interventions. The Contemplation Ladder is easy to complete, which might make it more palatable than longer rating scales for some clinicians and clients[31]. Thus, the Contemplation Ladder may work as an efficient measure when the researcher or physician does not intend to submit the interviewee to a heavier load of questions, allowing the use of a fast and easy application in order to determine the motivational state for changes in tobacco users during telephone services.

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