

Construct validation of the Scale of Attitudes toward Alcohol, Alcoholism and Individuals with Alcohol Use Disorders

Validação de construto da Escala de Atitudes Frente ao Álcool, ao Alcoolismo e a Pessoas com Transtornos Relacionados ao Uso do Álcool

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Abstract

Background: The attitudes toward issues related to alcohol and alcoholism have been noted as important predictors of the quantity and quality of care provided to individuals who have problems related to alcohol use. The Scale of Attitudes toward Alcohol, Alcoholism and Alcoholics (EAFAAA) (*Escala de Atitudes Frente ao Álcool, ao Alcoolismo e à pessoa com transtornos relacionados ao uso do álcool – EAFAAA*) has been widely used among students in health-related fields. However, the psychometric properties of this instrument have not been tested among professionals. **Objective:** The goal of this study was to determine the construct validity of the EAFAAA for use among health professionals. **Methods:** A preliminary version of the EAFAAA was distributed to a sample of health care professionals (n = 1,025). For the construct validation of the scale, the data were subjected to a factorial analysis, and the internal consistency was examined; the cutoff score of the instrument was determined using a receiver operating characteristic (ROC) curve. **Results:** The exploratory factor analysis and the refinement of the EAFAAA items resulted in a final version consisting of 50 items divided into four factors: (1) Work and interpersonal relationships with patients with alcohol use disorders, (2) The individual with an alcohol use disorder, (3) Etiology of alcoholism and (4) Alcoholic beverages and their use. The internal consistency of the scale was considered adequate (Cronbach's $\alpha > 0.80$), and the instrument cutoff score was set at 3.15. **Discussion:** The results suggest that the instrument is valid for identifying attitudes towards alcohol, alcoholism and individuals with alcohol use disorders among health professionals.

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Keywords: Attitudes of health care professionals, alcohol, alcoholism, psychological tests.

Resumo

Contexto: As atitudes diante das questões relacionadas ao álcool e ao alcoolismo têm sido apontadas como importantes preditores da quantidade e da qualidade do cuidado prestado às pessoas com problemas relacionados ao uso dessa substância. A Escala de Atitudes Frente ao Álcool, ao Alcoolismo e à pessoa com transtornos relacionados ao uso do álcool (EAFAAA) tem sido bastante utilizada entre estudantes da área da saúde. Entretanto, as propriedades psicométricas desse instrumento ainda não foram testadas entre profissionais. **Objetivo:** Realizar a validade de construto da EAFAAA para uso entre profissionais da saúde. **Métodos:** A versão preliminar da EAFAAA foi aplicada em uma amostra de profissionais de saúde (n = 1.025). Para validação de construto da escala, os dados foram submetidos à análise fatorial e a consistência interna foi examinada; o ponto de corte do instrumento foi determinado por meio da curva ROC. **Resultados:** A análise fatorial exploratória e o refinamento dos itens da EAFAAA resultaram em uma versão final composta por 50 itens divididos em quatro fatores: (1) O trabalho e as relações interpessoais com pacientes com transtornos relacionados ao uso do álcool; (2) A pessoa com transtornos relacionados ao uso do álcool; (3) O alcoolismo (etiologia); e (4) As bebidas alcoólicas e seu uso. A consistência interna da escala foi considerada adequada (α de Cronbach $> .80$), e o ponto de corte do instrumento foi estabelecido em 3,15. **Conclusão:** Os resultados sugerem que o instrumento é válido para identificação das atitudes quanto ao álcool, ao alcoolismo e às pessoas com transtornos relacionados ao uso do álcool, entre profissionais de saúde.

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Palavras-chave: Atitudes do pessoal de saúde, álcool, alcoolismo, testes psicológicos.

Introduction

Alcohol consumption increases disease burden and has been identified as one of the main risk factors for premature mortality around the world, making it one of today's major public health concerns^{1,2}. It is estimated that alcohol consumption is directly responsible for the deaths of 2.5 million people annually¹. A survey of the patterns of alcohol consumption and associated problems in Brazil² showed that the prevalence of disorders related to alcohol consumption (abuse and dependency) was 19% in men and 4% in women. Data from the Global status report on alcohol and health 2014³ indicates that in 2012, the morbidity related to alcohol consumption in the Brazilian population was 8.2% among men and 3.2% among women. In the same report³, alcohol consumption also appears as an important cause of mortality in the country, especially among

the younger population. Associated with this mortality are costs to the government that are estimated to exceed US\$ 4 billion annually⁴. Despite the morbidity and mortality attributed to alcohol and the associated problems in Brazil, the Brazilian Ministry of Health⁵ recognizes that health care workers' attitudes and lack of training are among the main impediments to assess this problem. This is the case even though there are numerous variables that can influence the ability of health professionals to intervene in situations related to the use and abuse of alcohol, including specific knowledge, training, organizational policies and previous experiences (positive or negative). In a larger context, attitudes play a predominant role in the responses of health professionals to individuals with problematic alcohol use⁶ and can significantly affect the detection, referral and treatment of individuals with problems related to alcohol and alcoholism.

One way to address this phenomenon is to identify the predominant attitudes toward alcohol, alcoholism and individuals with alcohol use disorders, and it is necessary to provide reliable instruments for this purpose. The identification of health professionals' attitudes may also allow for the evaluation of changes in attitude after educational interventions and could trigger discussion and reflection that can provide health professionals insight into their own attitudes toward this type of patient, making it easier to identify strategies that result in more positive attitudes. In addition, specific instruments to assess attitudes toward alcohol use and associated problems may be used with professionals at the beginning of their careers or while they are still in training, which can identify current attitudes and assist in the recommendation of educational measures that positively influence the attitude of these future professionals.

Although it has been explored in other countries, there are few studies of health professionals' attitudes toward alcohol and associated problems in Brazil, and in general, there are few valid and reliable instruments for the identification of such attitudes. Of the instruments available in Brazil^{7,8}, none were developed in the country, and all have several limitations. The available instruments lack studies in the literature related to their psychometric properties, even in the original language, and some of these instruments were never fully published^{7,8}. The methods adopted for their translation, cultural adaptation and validation for use in Brazil are questionable.

Based on these findings, in 2005 the Scale of Attitudes toward Alcohol, Alcoholism and Alcoholics (*Escala de Atitudes Frente ao Álcool, ao Alcoolismo e ao Alcoolista* – EAFAAA)^{*} was developed and characterized as the first instrument developed in Brazil for this purpose. Its construction process and validation, along with the description of the construct it is designed to assess, can be found in previous publications^{9,10}. The EAFAAA was designed to encompass the primary types of attitudes (moral, disease, etiological, professional and human aspects) toward alcohol-related issues, and the studies of its psychometric properties have suggested good reliability indices, with variation between 0.86¹⁰ and 0.90⁹. However, despite its adequate psychometric parameters, the current version of the instrument is extensive. An instrument with fewer items that is able to retain the same psychometric qualities is desirable. Moreover, the current studies that have tested the psychometric properties of the EAFAAA are characterized as preliminary^{9,10}, and the results are limited to the instrument's application in student populations. Thus, it is necessary to ascertain whether the scale is also valid for use in other populations.

Objective

To determine the construct validity of the Scale of Attitudes toward Alcohol, Alcoholism and Alcoholics (EAFAAA) in a sample of health professionals.

Materials and method

Materials

Sample

The study sample consisted of 1,380 health professionals. Of these, 1,025 (74%) returned the completed instruments. To be included, individuals must be a health professional (social worker, nurse, physician, psychologist, occupational therapist, speech therapist, physiotherapist or pharmacist), be practicing at the time of collection and agree to participate. The sample was predominantly female (84%), single (56%) and in the nursing profession (53%). The mean

age was 35.4 years (SD = 10.7) and the length of profession was between 5 and 10 years. The majority of respondents were trained in private colleges/universities (51%). Of the total respondents, 50% reported having a graduate education; of these, the vast majority (90%) reported having a specialization.

Instruments

The EAFAAA is scored on a Likert-type 5-point scale (1 = strongly disagree, 2 = disagree, 3 = indifferent, 4 = agree and 5 = strongly agree). The preliminary version¹⁰ consists of 83 items divided into five factors: Factor 1 – The individual with an alcohol use disorder: work and interpersonal relationships; Factor 2 – Etiology; Factor 3 – Disease; Factor 4 – The repercussions of using/abusing alcohol; Factor 5 – Alcoholic beverages. Studies of this scale have demonstrated satisfactory reliability indices^{9,10}.

To obtain the demographic information of the participants, a questionnaire consisting of six questions related to gender, age, marital status, profession, training institution, length of profession and professional experience with individuals who have alcohol use disorders was included with the EAFAAA.

Data collection

Data collection occurred from January 2008 to December 2010 in health care facilities such as hospitals, psychosocial care centers and community primary health care units and at scientific meetings in health-related fields. This ensured the recruitment of a heterogeneous sample. For data collection, two different procedures were used, depending on the location of data collection. When data were collected in health facilities, health care professionals were approached in their workplace by trained interviewers and invited to participate. They received information regarding the purpose of the study as well as the voluntary and anonymous nature of participation. Those individuals who agreed to participate were given a sealed envelope containing the research instruments and were instructed to not write their names on the material. For these participants, we requested that the completed instrument be returned within 48 hours. In the case of data collection at scientific events, the organizing committee was contacted, and the envelopes containing the instruments and an additional page with information about the study and instructions for completing and returning the questionnaires were provided with the participants' meeting material. These participants were also instructed to not write their names in the responses. To collect the responses from these individuals, one interviewer remained in a specified place at the event to receive the questionnaires.

Ethical aspects of the research

The study was approved by the Research Ethics Committees (Comitês de Ética em Pesquisa – CEP) of the Nursing School, University of São Paulo (Universidade de São Paulo – USP), under protocols 709/2008 and 737/2008; of the São Paulo Municipal Health Secretariat, Protocol 150/08; and of the Teaching Hospital of the University of São Paulo, Protocol 946/09. All participants signed an informed consent form.

Methods

Considering the theoretical model that justified the construction of the EAFAAA¹¹, the construct validity of the instrument was tested by analyzing the behavioral representation of the construct, which enabled us to demonstrate the adequacy of its representation using factor analysis (FA) and internal consistency analysis.

Data analysis

For data analysis, a database was created in SPSS® v. 18.0 where all statistical analyses were performed.

* Vargas D. A construção de uma escala de atitudes frente ao álcool, ao alcoolismo e ao alcoolista: um estudo psicométrico. [The construction of a scale of attitudes toward alcohol, alcoholism and the alcoholic: a psychometric study]. Dissertation. Ribeirão Preto (São Paulo): Nursing School of Ribeirão Preto/University of São Paulo (Universidade de São Paulo – USP); 2005.

Procedures

To assess whether the data met the criteria for FA and if the EAFAAA items were correlated, Kaiser-Meyer-Olkin and Bartlett's sphericity tests were used. Next, the preliminary version of the EAFAAA, containing 83 items, was subjected to Exploratory Factor Analysis (EFA) with principal axis extraction and Oblimin rotation; the latter is determined by expecting that the factors extracted are correlated. To maintain the same factor composition as the initial scale, the setting of five and four factors was previously imposed, keeping items with a factor loading ≥ 0.4 in the model. The remaining data from this analysis underwent Oblimin rotation; after this, items that still presented factor loading in more than one factor were analyzed, taking into account their position in the conceptual map that defined the construct, and factors were excluded when they did not result in significant changes in this regard. The EAFAAA reliability was tested by analyzing the internal consistency coefficient, excluding items not associated with a reduction in Cronbach's alpha. Subsequently, the reliability index was individually checked for each of the four factors, using the same test. Under the assumption that, although distinct, the EAFAAA factors are not independent, the coefficients of correlation between the factors themselves and between the factors and the instrument as a whole were examined; the same procedure was carried out with the items that constitute the final version of the scale. In both cases, Pearson's correlation coefficient was used.

To determine the EAFAAA cutoff score, a receiver operating characteristic (ROC) curve was used. The ROC curve was generated by plotting sensitivity on the y axis, as a function of [1 - specificity] on the x axis. Sensitivity refers to the percentage of individuals who maintain a particular outcome (in the case of this study, a positive attitude) and were properly diagnosed by the indicator (i.e., a true positive), while specificity describes the percentage of individuals who did not maintain this outcome and were correctly diagnosed by the indicator (i.e., true negative). The cutoff was defined as the score that maximized the Youden index.

Results

The correlation matrix was considered adequate for performing the EFA, with a Kaiser-Meyer-Olkin coefficient of 0.937 and a significant Bartlett's sphericity test ($p < .0001$). A model consisting of four factors was the best solution for the final version of the scale. This model, made up of 83 items, was subjected to a refining process in which 21 items from the preliminary version of the instrument were excluded¹⁰ (I₀₃, I₀₆, I₀₇, I₁₀, I₅₉, I₇₄, I₉₃, I₁₂₂, I₁₃₅, I₁₃₇, I₁₀₉, I₁₄₆, I₁₄₈, I₁₄₉, I₁₅₀, I₁₅₃, I₁₅₄, I₁₅₉, I₁₆₂, I₁₆₃ and I₁₆₅). These items were excluded because they had a factor loading < 0.4 at the end of the EFA. Also in the refining process, 10 other items from the preliminary version¹⁰ (I₉₅, I₉₆, I₁₁₆, I₁₂₃, I₁₂₅, I₁₂₉, I₁₃₆, I₁₃₉, I₁₄₀, I₁₄₁) were excluded for maintaining a factor loading in more than one factor, even after data rotation. After completing the refining process, the reliability coefficient, measured by Cronbach's alpha, was determined when each of the remaining items was excluded one at a time. This resulted in the exclusion of two items (I₁₈, I₂₃)¹⁰ that were associated with a decrease in Cronbach's alpha. At the end of this process, 33 items had been excluded. The resulting instrument was a scale consisting of 50 items, divided into four factors: Factor 1: Work and interpersonal relationships with patients with alcohol use disorders; Factor 2: The individual with alcohol use disorders; Factor 3: Etiology of alcoholism; Factor 4 - Alcoholic beverages and their use (Table 1).

Subsequent analyses were performed with the final version consisting of 50 items; this version explained 53.7% of the total variance in the data, with 31.7% of the variance explained by the first factor, 9.2% by Factor 2, 6.9% by Factor 3 and 5.8% by Factor 4. The reliability analysis of the final version of the EAFAAA was tested with Cronbach's alpha and demonstrated sufficient internal consistency indices (Table 2). The alpha value calculated for the scale as a whole was 0.89. Among the factors, when individually analyzed, coefficients ranged from $\alpha = 0.87$ for Factor 2 and $\alpha = 0.66$ for Factor 4 (Table 2).

The hypothesis that the scale's factors are not independent was confirmed, indicating the existence of correlations between factors and correlations between the factors and the scale as a whole (Table 2). The same result was observed when the coefficients of correlation between each of the items and the instrument were analyzed. Correlations ranged from $r = 0.13$ (item 33 - "Individuals who develop alcoholism have low self-esteem") to $r = 0.70$ (item 7 - "Individuals with alcohol use disorders are impolite"). In all cases, correlations were statistically significant ($p = 0.01$, table 2).

After the recomposition of the EAFAAA factors, their operational definitions were revised and compared with the operational definitions of the previous versions^{9,10}, which required some adjustments because the number of factors was reduced from five in the previous version¹⁰ to four in the current version. The operational definitions of this version are as follows:

- **Factor 1: Work and interpersonal relationships with patients with alcohol use disorders** - This factor is composed of items related to perceptions, opinions, feelings and attitudes regarding providing health care to patients with alcohol use disorders (F1₀₁, F1₀₅, F1₀₉, F1₁₃, F1₂₁, F1₂₅, F1₃₇, F1₄₁, F1₄₆, F1₅₀), the relationship with patients who have alcohol use disorders (F1₂₉, F1₄₂, F1₄₄), the abilities or training needed to work with individuals who have alcohol use disorders (F1₄₉) and the participant's perception of their own professional capacity to work with these issues (F1₁₇, F1₄₈) (Table 1).
- **Factor 2: The individual with alcohol use disorders** - This factor covers items related to conceptions, perceptions, opinions and attitudes toward the patient with alcohol use disorders; its items express views about the personal characteristics of these patients (F2₀₂, F2₀₆, F2₁₀, F2₁₄, F2₁₈, F2₂₂, F2₃₀, F2₄₅, F2₄₇) and the expectations that the respondent has regarding working with this patient (F2₂₆, F2₃₃, F2₃₄, F2₃₈) (Table 1).
- **Factor 3: Etiology of alcoholism** - This factor groups items relating to the perceptions of the motivations behind and causes of alcohol use and alcoholism; it is based on the biopsychosocial explanation for alcohol use-related disorders and covers items related to the psychological (F3₀₇, F3₁₁, F3₂₇, F3₃₁, F3₃₅, F3₄₃), social (F3₀₃, F3₁₉, F3₃₉), biological (F3₃₃) and moral (F3₁₅) aspects behind alcohol use and related disorders (Table 1).
- **Factor 4: Alcoholic beverages and their use** - This factor encompasses items related to the opinions and attitudes towards alcohol (F4₀₈, F4₁₂, F4₁₆, F4₃₂), its use (F4₂₀, F4₂₄, F4₂₈, F4₃₆) and the right of people to drink (F4₀₄, F4₄₀) (Table 1).

The analysis for selecting the EAFAAA cutoff score, based on the ROC curve technique, indicated that 3.15 was the optimal cutoff score, with 80% sensitivity and 68% specificity.

Discussion

This study sought to determine the construct validity of the EAFAAA within a sample of health professionals. The results indicated that the scale assesses four factors: Factor 1 - *Work and interpersonal relationships with patients with alcohol use disorders*; Factor 2 - *The individual with alcohol use disorders*; Factor 3 - *Etiology of alcoholism*; and Factor 4 - *Alcoholic beverages and their use*. This result is consistent with and reinforces previous studies^{9,10} of the factor composition of the scale. A change that was made in the current version replaced the term "alcoholic" with "person with alcohol use disorders". In the present context, this is the most appropriate term, and it agrees with the definition found in the 10th edition of the International Classification of Diseases (ICD-10)¹² regarding issues related to alcohol and alcoholism, referred to as "mental and behavioral disorders due to alcohol use". Another change suggested for the final version of the scale was the elimination of the final letter A from its acronym, thus identifying the scale as the EAFAAA - *Scale of Attitudes toward Alcohol and Alcoholism and the Person with Alcohol Use Disorders*, with the words "Alcohol and Alcoholism" represented by the two letter As in the acronym. This change reduces the number of letters in the acronym and facilitates its recognition in national and international literature.

Table 1. Total explained variation of the number of items and factor loadings of items that make up Factor 1: Work and interpersonal relationships with patients with alcohol use disorders; Factor 2: The person with alcohol use disorders; Factor 3: Alcohol abuse/alcoholism disorders (etiology) and Factor 4: Alcoholic beverages and their use (São Paulo, SP, 2014)

		F1	F2	F3	F4
01	I am afraid to discussing alcohol problems with my patients	.547			
05	I am afraid that individuals with alcohol disorder might be aggressive toward me	.548			
09	Working with individuals with alcohol use disorders is frustrating	.407			
13	Compared with others patients I care for, I consider the patients with alcohol use disorder the patients that demand the most work	.602			
17	I feel an obligation to provide care for individuals with alcohol use disorders even if they resist that care	.573			
21	Even when not intoxicated, patients with alcohol use disorders are disrespectful to the team members	.532			
25	Caring for patients with alcohol use disorders makes me feel angry	.621			
29	Patients with alcohol use disorders never accept what health professionals say about their drinking problems	.537			
37	Providing care to patients with alcohol use disorders means less attention for other patients	.738			
41	I prefer caring for patients with alcohol use disorders more than caring of patients with other health problems	.460			
42	Patients with alcohol use disorders are difficult to relate to	.553			
44	I consider it difficult to establish a therapeutic relationship with patients with alcohol use disorders	.767			
46	Care must be taken to not be assaulted when working with patients with alcohol use disorders	.521			
48	When patients with alcohol use disorders do not accept that they have problems related to alcohol use, the best decision is to give up helping	.563			
49	I do not know how to lead the situation when I work with patients with alcohol use disorders	.496			
50	Caring for patients with alcohol use disorders is not rewarding to me	.551			
	Number of items 16				
	Variation explained 31.7%				
02	Individuals with alcohol use disorders do not have common sense		.604		
06	Those with an alcohol use disorders are more likely to be rude than other patients		.625		
10	Patients with alcohol use disorders not behave responsibly		.572		
14	Those with an alcohol use disorders are more likely to become angry than other patients		.531		
18	I think that individuals who develop alcoholism are weak		.549		
22	Patients with alcohol use disorders do not want to take care of themselves		.607		
26	I do not trust the information that patients with alcohol use disorders tell me		.578		
30	I believe that patients with alcohol use disorders have caused their health problems		.511		
33	I feel like giving up when patients with alcohol use disorders does not respond to assistance		.681		
34	I get frustrated when patients who continue to consume alcohol repeatedly return to health care service		.537		
38	Compared with other patients I care for, I consider patients with alcohol disorders to be more difficult		.466		
45	Patients with alcohol use disorders are patients who cooperate with their treatment		.565		
47	Alcoholics do not take treatment seriously		.522		
	Number of items 13				
	Variation explained 9.2%				
03	Living in a dysfunctional family leads to alcoholism			.535	
07	Shy or inhibited individuals are more likely to develop alcoholism			.617	
11	Depression leads to alcoholism			.474	
15	Patients with alcohol use disorders lack willpower			.450	
19	Social issues drive patients to drink			.402	
23	Heredity influences alcoholism			.440	
27	Dissatisfied individuals abuse alcohol			.502	
31	Alcoholic individuals have low self-esteem			.515	
35	Alcohol use disorders are caused by psychological disorders			.514	
39	People drink to feel more sociable			.454	
43	Patients with alcohol use disorders drink to escape from reality			.554	
	Number of items 11				
	Variation explained 6.9%				
04	I believe people have the right to drink if they want to				.415
08	Alcohol beverages are enjoyable and make people feel good				.646
12	The use of alcohol beverages is normal				.669
16	Alcohol beverages, in any amount, will make an individual dependent on alcohol				.483
20	Drinking moderately do not causes harm to health				.521
24	I am against using alcohol beverages at any time				.600
28	I am in favor of drinking moderately (7-14 drinks a week)				.568
32	Even small amounts of alcohol can cause dependence				.581
36	Alcohol beverages, in small amounts, are beneficial				.620
40	People can drink if they know how to control themselves				.573
	Number of items 10				
	Variation explained 5.8%				

Table 2. Descriptive statistics, internal consistency and correlation coefficients between factors and items of the EAFAAA (50 items)

Factor	Item	Mean	SD	Factor loadings		α	Correlation among items		Correlation among the factors and with the full scale				
				Min	Max		Min	Max	1	2	3	4	EAFAAA
1	16	2.58	0.65	0.40	0.76	0.86	r = .17*	r = .58*	1.00	r = .65**	r = .06*	r = .04 ^{NS}	r = .79**
2	13	2.55	0.79	0.46	0.62	0.87	r = .20*	r = .59*		1.00	r = .29 ^{NS}	r = .02 ^{NS}	r = .85**
3	11	3.34	0.64	0.40	0.62	0.75	r = .18*	r = .65*			1.00	r = .08*	r = .30**
4	10	3.00	0.51	0.42	0.67	0.66	r = .13*	r = .49*				1.00	r = .28**
Total	50	2.82	0.42	0.40	0.76	0.89	r = .13*	r = .70*					1.00

* Significant correlation $p < 0.01$; ** Significant correlation $p < 0.001$; NS: not significant.

The results of the EFA found that most of the items loaded on the same factors were predetermined in previous analyses^{9,10}. However, several changes were required to improve the factor structure of the instrument, such as the exclusion of 33 items from the initial version of the scale¹⁰ and the elimination of Factor 4 from the preliminary version (Repercussions of using/abusing alcohol).

Rearranging the items via EFA had little influence on the operational definitions of the factors and kept the initial characteristics of the instrument, despite the resulting reallocation of some items and the adjustment of the scale's factors. Thus, the EAFAAA items facilitate the assessment of the attitudes toward alcohol, alcoholism and individuals who have problems related to alcohol use, in many of their dimensions. Furthermore, the final scale (50 items) exhibited an appropriate structural validity, demonstrating that it is a unidimensional instrument. It explained more than 50% of the total variance in the data¹³⁻¹⁶, 31.7% of which was explained by the first factor¹⁷. The analysis of the sensitivity and specificity of the EAFAAA showed that this scale has an 80% ($p < 0.000$) probability of identifying individuals who score above 3.15 on the scale and do have a positive attitude toward alcohol, alcoholism and individuals with alcohol use disorders.

Although most of the items on the EAFAAA loaded on the same factors as they did in the initial version, the results necessitated changes in the order and composition of the factors from the initial version. Factor 1 retained its primary characteristics and was composed of items related to work (health care) and relationships with patients who have alcohol use disorders. However, 12 items that were included under this factor in the preliminary version¹⁰ (Item numbers 02, 07, 12, 16, 20, 24, 36, 40, 44, 47, 49 and 51) were reallocated after performing the EFA and are part of Factor 2: *The individual with alcohol use disorders* in the current version. Another significant change resulting from this analysis was the grouping of items from Factors 2 (9 items, numbers 03, 07, 11, 15, 19, 23, 27, 39 and 43) and 3 (2 items, 31 and 35) of the initial version, termed factor etiology and factor disease, respectively, into Factor 3 of the final version: *Etiology of alcoholism*. As a final point, with the elimination of Factor 4 from the preliminary version, Factor 5: *Alcoholic beverages* became the fourth Factor in the final version of the scale, termed *Alcohol and its use*. This factor changed the least; of the original 12 items, only 2 were not retained in the final version of the scale ("I think that drinking a shot of whiskey is considered social drinking" and "Alcohol relaxes the stresses of everyday life").

Although most experts^{11,16-19} postulate that items with a factor loading of at least 0.3 with the proposed factor are adequate for the assumption of unidimensionality of an instrument, a cutoff score of ≥ 0.4 was established for retention in this scale. After eliminating the items that have loadings below this value, the factor loadings ranged from 0.40 to 0.76, suggesting that the items retained in the final version of the EAFAAA are good representatives of the construct measured, demonstrating adequate correlation with its subscales and with the total scale.

As expected, the four measures of the final version of the scale are correlated, providing evidence for the attitudinal dimension of the model^{11,16-19}. This result suggests the possibility of using the subscales of the instrument separately as well as combined. It also

indicates that although the EAFAAA factors can measure different attitudes composing the construct, the factors may be shared in some proportion, be related to or be the opposite of each other. It can be expected, for example, that an increase in the mean score of subscale 1 (*Work and interpersonal relationships with patients with alcohol use disorders*) corresponds to an increase in the mean score of subscale 2, which measures the attitudes toward an individual with an alcohol use disorder, suggesting the predictive validity of the EAFAAA. However, this aspect should be investigated in future studies because this study is limited to describing the process of determining the construct validity of the instrument. In addition to the correlations observed between the factors of the scale, correlations between the items and factors and between the factors and the scale as a whole were also observed, indicating that the items are associated with the instrument.

Regarding the reliability of the scale, the values obtained are classified as good and adequate for both the scale as a whole and for each of the four factors²⁰. However, although Factor 4 had an acceptable level of internal consistency ($\alpha = 0.66$), its reliability warrants discussion because it had lower coefficients of internal consistency in previous studies^{9,10}. In addition, in this study, Factor 4 had the lowest degree of correlation with the scale as a whole.

It is speculated that Factor 4, although correlated with the EAFAAA as a whole, may be measuring an independent construct, namely, the attitudes toward alcohol. Moreover, it is possible that this subscale performs better when analyzed alone as a specific instrument. This result suggests that Factor 4 should be tested again in additional studies that can support the decision to create a new scale and exclude this factor from the EAFAAA.

The EAFAAA is characterized as a positively guided scale, i.e., the majority of its items (64%) measure negative attitudes towards alcohol, alcoholism and the individual with an alcohol use disorder⁹, which means that the greater the disagreement of the respondent in relation to these items, the more positive are their attitudes. However, as expected, the reduction in items resulted in a reduction in the number of negative items of the scale by approximately 15% when compared to the first (75% negative)⁹ and second (72% negative) versions¹⁰. In the current version, 18 items measure positive attitudes and 32 measure negative attitudes, which means that with the exception of items F1₁₇, F1₄₁, F3₀₃, F3₀₇, F3₁₁, F3₁₅, F3₁₉, F3₂₃, F3₂₇, F3₃₁, F3₃₉, F4₀₄, F4₀₈, F4₁₂, F4₁₆, F4₂₀, F4₂₈ and F4₃₆ (items assessing positive attitudes), the answers to all other items must be calculated with inverted values, and the scores must be computed using the following conversion: 1 = 5; 2 = 4; 3 = 3; 4 = 2 and 5 = 1. One way to minimize this characteristic is to change some items with an unfavorable position on the subject (negative attitude) to a favorable position (positive attitude). For example, an individual who disagrees with item 50 "Caring for patients with alcohol use disorders is not rewarding to me" (negative attitude) will receive the same score by agreeing with the item "Caring for patients with alcohol use disorders is rewarding to me" (positive attitude).

The contributions of the present study improve the field of chemical dependency. The availability of a reliable instrument that was designed in Brazil and the ability to measure the attitudes of health professionals with demonstrated reliability can advance research on this issue in Brazil. The present study also has several important advantages regarding the testing of this instrument, including the

quality of the sample. The sample in this study provided good power for analysis due to its size, was recruited from different health facilities, and consisted of professionals from different areas, which increases the generalizability and the possibility for widespread use of the scale.

Another breakthrough achieved in this study was the reduction in the number of items while retaining the psychometric qualities of the instrument, which was one purpose of this research. In addition, the EAFAAA has some advantages over existing instruments available for use. It measures attitudes regarding the professional relationship with patients who have alcohol use disorders, a dimension that is not considered in any of the instruments available. Additionally, it was constructed in the Portuguese language and should be the first choice for studies involving Brazilian populations. Finally, studies are being conducted to examine the cultural adaptation, translation and validation of the EAFAAA for the English and Spanish languages, which will enable it to be used among speakers of these languages.

Limitations

Although the present study provides additional support for the factor structure and reliability of the EAFAAA, suggesting that this scale has adequate psychometric properties to assess attitudes towards alcohol, alcoholism and individuals with alcohol use disorders in different populations, its limitations should be considered. The sample was recruited in the metropolitan region of São Paulo and consisted of primarily women and nurses; additional research with samples from other locations in the country and samples that are more balanced by gender and professional category must be performed to increase the external validity of these results.

Conclusions

Taken together, the results suggest that the EAFAAA demonstrates robust psychometric properties and is a valid and promising instrument to identify the attitudes of health professionals toward alcohol, alcoholism and individuals with alcohol use disorders.

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