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Nurses' attitudes towards alcoholism: factor analysis of three commonly used scales

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Objective: To investigate the psychometric properties of three scales commonly used to measure attitudes and beliefs about alcoholism. **Design**: Cross-sectional study using a systematic sample. **Setting:** Hospital São Paulo (a public general tertiary hospital) and the adjoining Federal University of São Paulo, Brazil. **Participants:** 310 nurses and nursing teachers. **Instruments:** The Marcus Alcoholism Questionnaire, The Seaman Mannello Nurses' Attitudes Towards Alcohol and Alcoholism Scale and The Tolor-Tamarin Attitudes Towards Alcoholism Scale, which were combined into one self-administered questionnaire. **Analysis:** The scales were re-grouped into their original formats and each underwent a principal components analysis with orthogonal rotation of factors. **Results:** Each scale was found to consist of three main factors. There was some degree of overlap in the nature of the factors that the scales measured but each scale also measured something unique. **Conclusion:** The results of this comparative analysis could be used as a basis for developing a new scale covering all the important attitudinal groups identified by this study.

UNITERMS: Nurse. Scale. Alcoholism. Attitude. Factor Analysis.

INTRODUCTION

In the last twenty years several scales have been developed to evaluate health care professionals' attitudes towards and beliefs about alcoholism. The three most commonly used scales are: The Marcus Alcoholism Questionnaire[1], The Seaman Mannello Nurses' Attitudes Towards Alcohol and Alcoholism Scale[2] and The Tolor-Tamerin Attitude Towards Alcoholism Scale[3]. These three instruments have certain similarities: in particular they contain items that cover various beliefs and perceptions about alcoholism and its causes, for example, moral factors (e.g. alcoholism as a character weakness), psychological factors (e.g. alcoholics having unresolved psychological conflicts), social factors (e.g. alcoholism caused by unhappy marriages) and biological factors (e.g. alcoholism as a disease).

The Marcus questionnaire was designed to measure both knowledge about alcoholism and attitudes towards alcoholics and consists of 40 statements which are responded to on a Likert scale that ranges from 1 (completely disagree) to 7 (completely agree). Ferneau[4] used the questionnaire to examine the attitudes of nurses and nursing assistants in a neuropsychiatric hospital, whilst Allen[5] used it to assess state registered nurses' attitudes towards alcoholic patients in a general hospital.

The Tolor[3] Instrument is a 24 item scale that was developed with the aim of investigating six attitudinal categories: psychological etiology, physical-genetic etiology, moral weakness, medical illness model, humanism and social rejection. It too is scored on a Likert scale with extreme scores of 1 and 4 (strong disagreement and strong

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agreement, respectively). Sullivan[6] used this scale to assess state registered nurses' beliefs about the etiology and treatment of alcohol abuse and related these to the subjects' biographical and professional characteristics.

The Seaman-Mannello Scale[2] consists of 30 items which are divided into five subscales: case disposition/therapy versus punishment, personal/professional satisfaction in working with alcoholics, inclination to identify/ability to help alcoholic patients, perceptions of personal characteristics of alcoholic persons and personal attitudes towards drinking. Like the other instruments, this uses a Likert scale for responding to questions and ranges from 1 (strongly disagree) to 5 (strongly agree).

As yet, there is no consensus as to which is the best scale to use to assess nurses' and other health care professionals' attitudes towards alcoholism. This deficiency is in part related to the fact that there are very few studies looking at the psychometric properties of the scales, so although the authors claim the scales measure various attitudinal groups, the validity of this claim is open to question. Furthermore, there are no comparative studies of the three scales, so one cannot say whether any one instrument has an advantage over the others. It is important to note that the original scales have never been published and only shortened versions were published. To try to answer these questions the present study was devised with the aim of evaluating the factor structure of each scale after applying them to a large number of nurses working at a teaching hospital.

METHODS

Setting. The study was undertaken among all nurses and nursing teachers working at the Hospital São Paulo and the adjoining university medical school, the Escola Paulista de Medicina, which forms part of the Federal University of São Paulo.

Instruments: The three questionnaires[1,2,3] were combined into one self-administered questionnaire; with the questions from each instrument being presented in a non-sequential order. We were unable to obtain the original 40 item Marcus scale, so a 15 item version was used, as appears in Allen[5]. Likewise, the full 24 item Tolor scale[3] was not used but a 14 item version which consists of those questions that the original authors had found to have the highest (>0.5) factor loading[3]. Six questions were eliminated because they appeared on more than one scale in a similar or near-identical format. Consequently, only 56% of all possible items were included in the final draft.

Although all the original instruments employ Likert scales for scoring responses, each one uses a different number of gradations, ranging from 4[3] to 7[2]. Therefore, a compromise was reached with a 5 point Likert scale (ranging from "strongly agree" to "strongly disagree") being used. In addition, nurses were asked to give some general sociodemographic information about themselves. The items were translated into Portuguese by the main author (S.P.) and checked by an English-speaking Brazilian specialist in alcohol dependence (R.L.). A pilot study was done with 10 nurses. In this study we asked them to identify possible difficulties with the items. Some small corrections to the translation of the items were made.

Procedure. Nurses were approached in their work place by the main investigator (S.P), given the questionnaire and invited to participate in the study. Questionnaires were completed anonymously and collected personally within 24 hours.

Analysis. A descriptive analysis of the sociodemographic information was undertaken. The items from the three instruments were re-grouped into their original format prior to analysis. A principal components analysis was performed which led to the identification of items with low Eigenvalues. Others forms of extraction were used which showed similar results[7]. In this study items that had a factor loading less than 0.3 were excluded (5 items). An orthogonal transformation of the principal factors was then undertaken using the SPSS statistical package. A further 11 items were excluded prior to the analysis because the translations were considered to be ambiguous or misleading when evaluated by the third author (J.D.), a Portuguese-speaking English specialist in alcohol dependence.

Table 1
Factor properties of the three scales (n = 264)

Scales	Factors	Variance (%)	Eigenvalue
Marcus	1	19.7	2.37
Questionnaire	2	15.6	1.87
	3	12.0	1.44
Tolor	1	21.3	1.91
Tamerin Scale	2	20.1	1.80
	3	12.2	1.09
Seaman	1	21.4	3.42
Mannello Scale	2	11.3	1.81
	3	8.7	1.39

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Table 2
Factor structure of The Tolor-Tamerin Attitudes Towards Alcoholism Scale.

Factor Content	Factor 1	Factor 2 (Correlations)	Factor 3
Moral Factor			
1. A good moral or religious upbringing is the thing that is lacking in the alcoholic.	.76		
2. Most alcoholics just want to live it up and are irresponsible.	.65		
3. All things being equal, the alcoholic has never learned to assume the responsibility of adulthood.	.66		
Disease Factor			
1. Alcoholics should be thought of and treated as sick people.		.59	
2. The best treatment for an alcoholic is early medical attention.		.64	
3. Some people have a physical makeup that doesn't permit them to tolerate even a couple of drinks without becoming drunk.		.77	
Nature of Alcoholism Factor			
1. Alcoholics are not essentially different from other human beings who have difficulty in adjusting to problems in living.		.81	
2. Most alcoholics really have sensitivities and needs similar to most people.			.53
3. Alcoholics will usually try to get other people to fall in with their bad drinking habits.			.54

RESULTS

The questionnaire was given to 310 nurses, of whom 264 (85%) returned it completed. A further 25 (8%) returned it incomplete. Twenty (6.5%) did not return the questionnaire, claiming to have lost it or to have not had time to fill it in, despite being given a second copy. One hundred and ninety (72%) of the questionnaires had been completed by nurses and 74 (28%) by nursing teachers. Ninety-four percent were female, mean age 34 (s.d. = 8.02; range 20 - 60), had been working professionally for a median of 8 years and 72% had graduated from public universities. Amongst the nursing teachers, 10% had either a PhD or were currently studying for one and 27% had a masters degree or were currently studying for one.

The results of the factor analysis are presented in Table 1, where the percentage variance of each factor and its Eigenvalue are shown. All three questionnaires were found to have a three factor solution with the amount of variance accounting for these factors being similar.

Table 2 shows the factor structure of the Tolor-Tamerin Scale. One item was excluded because it had a low factor loading of less than 0.3 ("Although others may feel differently, I personally would rather have as little as possible to do with an alcoholic"). The first factor, which accounted for most of the variance, reflected judgmental attitudes towards alcoholics and was named "Moral Factor". The second factor, called "Disease Factor", revealed a collection of statements related to alcoholism being a physical illness that warranted treatment. The third factor consisted of a series of statements which sought to characterize alcoholism and was a mixture of two positive and one negative statements and was named "Nature of Alcoholism Factor".

The Marcus Alcoholism Questionnaire also loaded into three factors, one of which ("Moral Factor") was similar to the factor of the same name found in the Tolor-Tamerin Scale (Table 3). Likewise, this questionnaire also had a "Nature of Alcoholism Factor", similarly consisting of relatively non-judgmental perceptions of what alcoholism is. A third factor was concerned with psychosocial explanations of alcoholism and was named "Etiological Factor." One item was excluded because it had a low factor loading (<0.3) ("Most alcoholics are either drunk or drinking everyday").

Although the Seaman-Mannello Scale also had a three factor solution, its factors were a little different to those of the other two questionnaires (Table 4). On this scale, beliefs about alcoholism being a disease and etiological explanations loaded together ("Disease/Etiological Factor"). The second factor was a mixed bag of statements about safe alcohol consumption and beliefs about alcoholics

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Table 3
Factor structure of The Marcus Questionnaire

Factor Content	Factor 1	Factor 2 (Correlations)	Factor 3
Etiological Factor			
1. Unhappy marriages and other unpleasant family situations often lead to alcoholism.	.75		
2. An alcoholic's basic troubles were with him long before he had a problem with alcohol.	.65		
3. An alcoholic usually has something in his past which is driving him to drink.	.73		
4. Alcoholics are usually in good physical health.	.50		
Nature of Alcoholism Factor			
1. Alcoholism is best described as a habit rather than an illness.		.74	
2. Alcoholism is not a disease.		.75	
3. With proper treatment, some alcoholics can learn to take the occasional social drink without getting into trouble.		.64	
4. A person who often drinks to the point of drunkenness is almost always an alcoholic.		.41	
Moral Factor			
1. Alcoholism is a sign of character weakness.			.74
2. The alcoholic is a morally weak person.			.64
3. The average alcoholic is usually unemployed.			.54
4. A person who frequently stays intoxicated for several days at a time is unquestionably alcoholic.			.47

Table 4
Factor structure of The Nurses' Attitudes Towards Alcohol and Alcoholism - The Seaman-Mannello Scale

Factor Content	Factor 1	Factor 2 (Correlations)	Factor 3
Disease/Etiological Factor			
1. Alcoholics usually have severe emotional difficulties.	.76		
2. The life of an alcoholic is not a very pleasant one.	.71		
3. Alcoholics suffer from feelings of inferiority.	.65		
4. Alcoholics were driven to drink by other problems.	.59		
5. Alcoholics are very sensitive people.	.60		
6. Alcoholism is an illness.	.61		
7. Alcoholics are usually in poor physical health.	.51		
8. Alcoholic patients need psychiatric consultation.	.45		
Safe Drinking/Alcoholism Factor			
1. Alcoholics feel they are bad people because of their drinking.		-.34	
2. Alcoholics want to stop drinking.		-.49	
3. When used wisely, alcoholic beverages are no more harmful to normal adults than nonalcoholic beverages.		.85	
4. Alcohol in moderate amounts can actually be beneficial to a healthy person.		.75	
Professional Attitude Factor			
1. Alcoholics deserve hospital space just like any other patient.			.53
2. I don't think that my patients would become angry if I discussed their excessive drinking with them.			.71
3. I prefer to work with alcoholic rather than other patients.			.46

("Safe Drinking/Alcoholism Factor"). The third factor was unique to this scale and was concerned with professional attitudes towards alcoholics and the place of these patients in the hospital setting. Three items were excluded because they had a low factor loading ("An alcoholic is lonely", "The consumption of alcoholic beverages cannot make normal people weak and silly" and "I can help an alcoholic even if he or she will not stop drinking").

DISCUSSION

This study analyzed the factor structure of three commonly used instruments designed to measure health professionals' attitudes towards alcoholism and alcoholics. It showed that each scale had a three factor solution and that these factors accounted for between 40-50% of the variance. This is the first time that the psychometric properties of all three instruments have been examined together.

The questionnaires shows some overlap in the attitudes and beliefs that they measure. For example, both the Marcus and Tolor-Tamarin scales have a "Moral Factor", representing judgmental and negative attitudes towards alcoholism, and a "Nature of Alcoholism Factor". Likewise, both the Seaman-Mannello and the Marcus questionnaires contain factors concerned with etiology whilst the Tolor-Tamarin and Seaman-Mannello scales possess a "Disease Factor."

At the same time, each scale measures at least one set of beliefs or attitudes that the others do not. This was most marked with the Seaman-Mannello scale which contained two unique factors, one measuring professional attitudes towards the treatment of alcoholics and the other measuring ideas about safe alcohol consumption.

If all possible items from all three instruments had been used, the final questionnaire would have consisted of 94 items instead of the 59 that we actually used. Exclusions were made for a variety of reasons: unavailability of the full version of the original scale (35 items), duplication of questions[6], low factor loading of individual items[5] and misleading or ambiguous translations into Portuguese[11]. These exclusions will have affected the results we obtained, in particular with a tendency towards factors with fewer items and factors that appear to be measuring more than one concept.

Since each scale measures something slightly different, or in the case of the Seaman-Mannello scale, something markedly different, any future study aiming to investigate nurses' or other health care professionals' attitudes towards alcoholism, would need to decide in advance exactly which attitudes were important. The questionnaires are not interchangeable. Should researchers wish to measure a wide range of attitudes and beliefs, it might be necessary to use more than one scale. The disadvantage of this is that the scales overlap with each other, leading to unnecessary repetition. Ideally a new scale should be developed that covers all the main attitudinal groups (moral, disease, etiological, professional and humane factors). This study presents a basis for undertaking such a task.

RESUMO

Objetivo: A investigação das propriedades psicométricas de três escalas mais usadas para medir atitudes e crenças sobre alcoolismo. **Desenho**: Estudo transversal numa amostra sistemática. **Local:** Hospital São Paulo (Hospital Geral Terciário) e na Universidade Federal de São Paulo, Brasil. **Participantes:** 310 Enfermeiras e Docentes de Enfermagem. **Instrumentos:** "The Marcus Alcoholism Questionnaire", "The Seaman Mannello Nurses' Attitudes Towards Alcohol and Alcoholism Scale" e "The Tolor-Tamarin Attitudes Towards Alcoholism Scale", as quais foram criadas um questionário. **Análises:** As escalas foram re-agrupadas em seu formato original e de cada escala sobresaiu uma análise do componente principal com rotação ortogonal dos fatores. **Resultados:** Cada escala consistia de três fatores principais. Houve algum grau de interseção na natureza dos fatores que a escala média, mas cada escala também mediu algo único. **Conclusão:** Os resultados desta análise comparativa poderá ser usada como base no desenvolvimento de novas escalas abrangendo toda a importância dos grupos de atitudes identificada neste estudo.

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