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ORIGINAL ARTICLE

PSYCHOMETRIC STUDY OF THE SOCIAL SUPPORT SATISFACTION SCALE IN PEOPLE WITH PULMONARY TUBERCULOSIS

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ABSTRACT

Objective: to evaluate the psychometric properties of the Satisfaction with Social Support Scale in people with pulmonary tuberculosis. Method: methodological study developed in two stages: content validation of the items; and assessment of the psychometric properties of the Scale. Data were collected between October 2020 and January 2021 in a sample of 204 individuals with pulmonary tuberculosis in Pulmonary Diagnostic Centers in Northern Portugal. Results: The validated scale has α-Cronbach's coefficient of 0.91, keeping the 15 items. There was a different distribution of items within the subscales, designated as: "Satisfaction with family" (α-Cronbach=0.94) now includes seven items; "Satisfaction with friends" α-Cronbach =0.85) includes only four items; "Social activities" (α-Cronbach=0.86) and "Intimacy" (α-Cronbach =0.77) go from three and four items of the original scale to two items each. Conclusion: the version of the Satisfaction with Social Support Scale can be a resource for planning nursing care for people with pulmonary tuberculosis.

DESCRIPTORS: Nursing; Tuberculosis; Social Support; Patient Satisfaction; Validation Study.

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INTRODUCTION

Social Support is a concept usually described as complex and dynamic. Perceived according to the circumstances and its actors, it has been the target of several research works in the last decades, both in its conceptualization and in its application to research. Despite the heterogeneity of conceptions, its degree of abstraction, its definitions, as well as the instruments available for its assessment are considerably differentiated[1-4].

Tuberculosis, an infectious disease whose pulmonary form is contagious, persists today as a health problem on a global scale[5]. Because it requires a treatment considered long for its completion, the measures recommended for its follow-up and the identification of social and economic variables are fundamental for its success[6-8]. Studies that aim to analyze the relationship between psychosocial factors and health should be supported by reliable, valid, and adapted to the populations they intend to study[9].

The literature review allowed the identification of the Social Support Satisfaction Scale (ESSS) developed by Pais-Ribeiro[10] and validated in young people without disease. Later, the scale was cross-culturally adapted Brazil-Portugal for higher education students[11], evaluating each item, satisfaction with social support from various sources and with social activities. This instrument enables the collection of basic information and the evaluation regarding satisfaction with support.

The ESSS (Social Support Satisfaction Scale), developed and validated by Pais-Ribeiro10, is an instrument that enables the collection of basic information regarding social support satisfaction. It consists of a self-completion scale and is composed of 15 items and four subscales: "Satisfaction with friends"; "Intimacy"; "Satisfaction with family"; and "Social activities". It allows the participant to mark his or her degree of agreement with each of them, presented on a Likert-type scale with five response options ("totally agree", "mostly agree", "neither agree nor disagree", "mostly disagree", and "totally disagree").

The constructs created based on the items intend to assess the following aspects of social support: (i) the first one assesses satisfaction with the friendships/friends they have (SF); (ii) the second one assesses the perceived existence of intimate social support (IN); (iii) the third one assesses satisfaction with existing family social support (FS); and (iv) the fourth one assesses satisfaction with the social activities (SA) they do.

The original version of the ESSS (Social Support Satisfaction Scale) has an internal consistency, assessed with a -Cronbach's score of 0.85. This scale has already been used in other patient populations, showing psychometric properties identical to those of the original scale[12-14]. Therefore, it may also help identify key areas for improving the quality of care for patients with pulmonary tuberculosis, since social support is described as an extremely important pillar in the entire process of pulmonary tuberculosis treatment[8].

The application of this scale to the context of pulmonary tuberculosis is therefore justified by the potential to obtain knowledge about the view of the person with the disease, their network and satisfaction with their social support. In this context, and based on the literature review, this study aimed to assess the psychometric properties of the Satisfaction with Social Support Scale of Pais-Ribeiro[10] in a sample of Portuguese patients with pulmonary tuberculosis.

METHOD

For the process of adaptation and validation of the ESSS, a methodological study of transversal nature was carried out using qualitative and quantitative analysis of the

items[15-19]. To validate the content of the items, a pre-test was conducted in a sample of 30 people already undergoing tuberculosis treatment, followed by a spoken reflection.

This study used a non-probability sample of 204 individuals with pulmonary tuberculosis being treated in Centers for Pulmonary Diagnosis (CDP) in Northern Portugal. Inclusion criteria were being over 18 years of age; being affected by pulmonary tuberculosis; and having been under treatment or in follow-up for at least one month.

Data collection took place between October 2020 and January 2021. All participants of legal age who agreed to participate in the study signed the informed consent form and were guaranteed anonymity and data confidentiality. The questionnaires were provided in a sealed envelope, accompanied by an explanatory note and contact details of the principal investigator.

The psychometric properties of the ESSS were assessed through the determination of reliability or internal consistency of the scale by calculating Cronbach's coefficient; and validity of the results, using the Exploratory Factor Analysis (EFA) of the items in principal components and with orthogonal rotation by the Varimax method to verify construct validity. The Varimax method is used to obtain a factor structure where one, and only one, of the original variables is strongly related to a single factor and slightly related to the remaining factors[15].

The Cronbach coefficient is the most used measure to evaluate reliability, ranging on a scale from zero to one, with values above 0.7 considered acceptable. Marôco & Garcia Marques[16] consider that values of this index above 0.9 translate to high reliability and values between 0.8 and 0.9, moderate to high reliability.

To extract the factors, it was used the principal components method, since it was intended to remove the maximum variance of the data with the minimum of orthogonal components. To perform the factor analysis, it is necessary that there is correlation between the variables, and, for such, the measurement is made through the KMO (Kaiser-Meyer-Olkin)[1] statistical test and Bartlett's test of Sphericity. The KMO varies between zero and one. Values between one and 0.9 indicate a very good correlation; between 0.8 and 0.9, a good correlation; between 0.7 and 0.8, an average correlation; between 0.6 and 0.7, a reasonable correlation; between 0.5 and 0.6, a bad correlation; and less than 0.5, unacceptable. In turn, it is important that the Bartlett's test of sphericity registers a $p \leq 0,05$ value.

For the factor analysis to be smooth and reliable, it was assumed not to accept any saturation below 40% (that is, 0.40), since factor loadings of latent variables higher than 40% indicate significant relevance.[18] Data were analyzed using the Statistical Package for Social Sciences (SPSS) program for Windows, version 26.0. A 95% confidence interval was defined with a margin of error of 0.05.

The study was approved by the Health Ethics Committee of the Regional Health Administration of the North, I. P., Porto, under number 021/2019.

RESULTS

In this study, 204 patients[2] treated for pulmonary tuberculosis in Portuguese PDCs participated, mostly males (n=126; 61.7%), aged between 18 and 87 years (x=49.5 years; s=14.7 years). Mean age was 46.8 years for males and 51.2 years for females. Most of the sample participants were married (n=99; 48.5%), the professional situation with employment prevailed (n=148; 72.5%), followed by the unemployed situation (n=30; 14.7%). As for education, about 45.1% (n=92) of the participants had completed elementary school, 26.5% (n=54) had completed high school, and 26.9% (n=55) had completed high school or

college. The total sample started treatment for the disease approximately one month ago or was in follow-up.

Table 1 presents the results of the factor analysis of the ESSS, including the factor loadings, the communalities (h^2) after extraction, the percentage of variance explained by each factor and the total variance explained, the eigenvalues, and the measures of sample adequacy through the KMO Test and Bartlett's test of sphericity.

The factorial analysis of the scale showed a factor structure that allowed explaining the correlations between the observable variables, allowing the construction of a measurement scale with the purpose of assessing a construct and/or a variable.[17-19] All items have a saturation higher than or equal to 0.50. Item six has the lowest saturation of 0.52, and the remaining items have a saturation ranging from 0.74 to 0.91. Item six has the lowest saturation, 0.52, and the remaining items have a saturation ranging from 0.74 to 0.91.

Factorial analysis in main components followed by orthogonal Varimax rotation gave rise to four principal components with eigenvalues greater than one. The totality of the items in this study explains 77.58% of the total variance of the ESSS, clearly higher than the minimum percentage of 50% of acceptable variance[17-19]. The first component, that is, the subscale "Family Satisfaction", explains 47.87% of the total value of the scale with a saturation ranging from 0.74 to 0.89 of the seven items that represent it, presenting an eigenvalue of 7.18; the second component, that is, the subscale "Satisfaction with friends", explains 14.17% of the total value of the scale, with a saturation ranging between 0.52 and 0.88 of the four items that represent it, presenting an eigenvalue of 2.13; the third component, that is, the subscale "Social Activity", explains 8.24% of the total value of the scale with a saturation ranging between 0.84 and 0.91 in the two items that represent it, presenting an eigenvalue of 1.24; the fourth component, i.e., the subscale "Intimacy", explains 7.30% of the total value of the scale with a saturation ranging between 0.82 and 0.91 in the two items that represent it, presenting an eigenvalue of 1.10.

The percentage of common variance of the variables in the extracted factors is greater than 70% for all items (except for item six, where $h^2=45\%$ is found), which is suggestive of the operative capacity of certain factors to express variability. That is, we can state that, except for item six, all items have a strong relationship with the retained factors (greater than 50%). This data is important to the extent that the greater number of factors retained corresponds to a lower loss of information.

The results of applying the Kaiser-Meyer-Olkin test, with KMO=0.863 and Bartlett's Test of Sphericity, with $X^2=2501.541$; $p<0.001$ (H_0 rejection) allow confirming the factorability of the correlation matrix to assess the adequacy of the sample to perform factor analysis[17-19].

Table 1 - Results of factor analysis of the Satisfaction with Social Support Scale. Porto, Portugal, 2021

	Factors				
	FSac_____ os da análise facda facSFSF	SF	SA	IN	h²
Satisfaction with family					
10- I am satisfied with the amount of time I spend with my family	0.89				0.84
11- I am satisfied with what my family and I do together	0.88				0.86

	FS	SF	SA	IN	
9- I am satisfied with the way I relate to my family	0.81				0.71
12- I am satisfied with the number of friends that I have	0.77				0.73
14- I am satisfied with the activities and things that I do with my group of friends	0.77				0.80
13- I am satisfied with the amount of time I spend with my friends	0.76				0.75
15- I am satisfied with the kind of friends that I have	0.74				0.74
Satisfaction with friends					
2- I do not go out with friends as often as I would like		0.88			0.84
3- Friends don't come up to me as often as I would like		0.81			0.80
1- Sometimes I feel alone in the world and without support		0.80			0.74
6- Sometimes I miss someone really close who understands me and with whom I can vent about intimate things		0.52			0.45
Social Activities					
8- I would like to participate more in organization activities			0.91		0.87
7- I miss social activities that satisfy me			0.84		0.87
Intimacy					
4- When I need to vent with someone, I can easily find friends to do it with				0.91	0.86
5- Even in the most embarrassing situations, if I need emergency support, I have several people to turn to				0.82	0.81
Total variance explained: 77,58%	47.87%	14.17%	8.24%	7.30%	
Eigenvalue	7.18	2.13	1.24	1.10	
Kaiser-Meyer-Olkin measure of sample adequacy: KMO=0.863					
Bartlett's test of sphericity: χ^2=2501.541; p<0.001					

FS - Family satisfaction; SF - Satisfaction with friends; SA - Social activities; IN - Intimacy
Source: The authors

Considering the factors presented by Pais-Ribeiro[10] and Marôco[11] corroborated in the sample of the present study, the internal consistency or homogeneity of the ESSS was analyzed by determining the α-Cronbach coefficient.[16] Therefore, the internal consistency calculated the α-Cronbach coefficient, both for the items as a whole and for the elimination of each item.

Table 2 presents the analysis of the internal consistency or homogeneity of the ESSS items. Along with the mean and standard deviation, we describe the respective correlation of the items with the total of their belonging scale (corrected coefficient) and the value of if that same item is eliminated, considering the total sample (n=204). From the values entered, we observe that the α-Cronbach coefficients for each item with the total scale (α=0.91) range between α=0.90 and α=0.92, obtaining an "Excellent" internal consistency[17]. In parallel, these values indicate a very strong correlation between all items and a good homogeneity of the items.

By analyzing the corrected item-total correlation of each item with the total scale, we found that the values ranged between r=0.25 and r=0.80. It should be noted that, in the correlation of the item with the total, the value found refers to the correlation of the item with the sum of the other items, that is, it itself was excluded from the sum of the scale.

Table 2 - Analysis of the internal consistency or homogeneity of the scale items. Porto, Portugal, 2021

Items	Average	Standard Deviation	Correlation of total items Correlation of total items corrigida	α- Cronbach if item eliminated
1. Sometimes I feel alone in the world and without support	2.45	1.22	0.63	0.91
2. I don't go out with friends as often as I would like	2.95	1.10	0.58	0.91
3. Friends don't seek me out as often as I would like	2.90	1.07	0.68	0.91
4. When I need to get something off my chest, I can easily find friends to do it with	2.89	1.08	0.25	0.92
5. Even in the most embarrassing situations, if I need emergency support, I have several people to turn to	2.74	1.02	0.51	0.91
6. Sometimes I miss someone truly close who understands me and with whom I can vent about intimate things	3.01	1.07	0.54	0.91
7. I miss social activities that I find satisfying	3.04	0.92	0.49	0.91
8. I would like to participate more in organizational activities	3.07	0.88	0.38	0.91
9. I am satisfied with the way I relate to my family	2.26	1.02	0.66	0.91
10. I am satisfied with the amount of time I spend with my family	2.39	1.05	0.71	0.90
11. I am satisfied with what I and my family do together	2.34	1.02	0.79	0.90
12. I am satisfied with the number of friends I have	2.48	0.95	0.76	0.90
13. I am satisfied with the amount of time I spend with my friends	2.62	0.89	0.78	0.90
14. I am satisfied with the activities and things I do with my group of friends	2.68	0.95	0.80	0.90
15. I am satisfied with the kind of friends I have	2.55	0.94	0.72	0.90
α- Cronbach's scale = 0.91				

FS – Family Satisfaction; SF Satisfaction with Friends; SA Social Activities; IN – Intimacy

Source: Authors

Table 3 summarizes the statistical analysis, namely the weighted mean (x_w) of the different ESSS subscales, the standard deviation (s) and the variance (Var). Of all the subscales, the subscale "Family Satisfaction", which includes seven items, stands out with a weighted mean of 17.31, a standard deviation of 5.88 and a variance of 34.56. We also observed the importance given to friends whose subscale includes four items, with a weighted mean of 11.30, standard deviation of 3.72, and variance of 13.83.

Table 3 - Analysis of the weighted mean by the different ESSS subscales. Porto, Portugal, 2021

Subscales	No. Items	x_w	s	Var
Family Satisfaction	7	17.31	5.88	34.56

Satisfaction with Friends	4	11.30	3.72	13.83
Social Activities	2	6.11	1.69	2.85
Intimacy	2	5.63	1.89	3.58

Source: Authors (2021).

Regarding the comparison of the ESSS internal consistency in the study sample and the one presented by Pais-Ribeiro [10]; the results are shown in Table 4. From the results obtained, it can be observed that the subscale "Family Satisfaction" increases from three items, in its original version, to seven items in the version obtained in our study with α-Cronbach value of 0.94; the subscale "Satisfaction with friends" increases from five items, in its original version, to four items in the version obtained in our study with α-Cronbach value of 0.85; the subscales "Social activities" and "Intimacy" increase from three and four items, respectively, in the original version to two items each in the version of the present study with α-Cronbach value of 0.86 and 0.77, respectively.

The version of the total Scale in the present study has a very good internal consistency with a total α-Cronbach value of 0.91 higher than the original version ($\alpha=0.85$).

Table 4 - Internal consistency of the ESSS in the study sample and of the original Scale. Porto, Portugal, 2021

	Original study ($n=609$)		Current study ($n=204$)	
Subscales	No. of Items	α-Cronbach	No. of Items	α-Cronbach
Family satisfaction	3	0.74	7	0.94
Satisfaction with friends	5	0.83	4	0.85
Social activities	3	0.64	2	0.86
Intimacy	4	0.74	2	0.77
Total Scale	15	0.85	15	0.91

Source: Authors (2021).

The statistical relationship between the ESSS subscales and the total scale was performed using Pearson's correlation coefficient, considering the overall sample under study (n=204). Based on the classification criteria presented by Marôco[17], the magnitude of the correlations varies from moderate to very strong ($0,51 \leq r \leq 0,91$). It should be noted that the two subscales with the highest magnitude of correlation with the total Scale are "Family Satisfaction" (r=0.91; p≤0.01) and "Satisfaction with friends" (r=0.81; p≤0.01). In turn, the subscales "Social Activities" (r=0.51; p≤0.01) and "Intimacy" (r=0.54; p≤0.01) register moderate correlation with the total Scale.

Regarding the discriminant validity of an item, it is evidenced by the difference between the correlation of the item with the subscale to which it belongs, compared to the correlation of the item with the subscales to which it does not belong. In this sense, Table 5 shows the Pearson's correlation matrix between the subscales and the ESSS items.

The correlation between the items, individually, with each of the subscales of the scale, shows that the highest correlation value is associated with the subscale to which it belongs; therefore, we confirm the discriminant validity of the ESSS items, and the results obtained indicate that it is a reliable and robust instrument to study satisfaction with Social Support in patients with pulmonary tuberculosis.

Table 5 - Correlation matrix between the subscales and the items of the ESSS. Porto, Portugal, 2021

Items	FSac_____ os da análise facda facSFSF	SF	SA	IN
9. I am satisfied with the way I relate to my family	0.81**	0.40**	0.21**	0.38**
10. I am satisfied with the amount of time I spend with my family	0.87**	0.41**	0.33**	0.30**
11. I am satisfied with what my family and I do together	0.91**	0.50**	0.32**	0.34**
12. I am satisfied with the number of friends I have	0.85**	0.49**	0.32**	0.40**
13. I am satisfied with the amount of time I spend with my friends	0.86**	0.53**	0.33**	0.37**
14. I am satisfied with the activities and things I do with my group of friends	0.88**	0.57**	0.31**	0.35**
15. I am satisfied with the kind of friends I have	0.84**	0.49**	0.20**	0.40**
1. Sometimes I feel alone in the world and without support	0.52**	0.86**	0.31**	0.21**
2. I don't go out with friends as often as I would like	0.40**	0.88**	0.44**	0.11
3. Friends don't seek me out as often as I would like	0.51**	0.88**	0.49**	0.20 **
6. Sometimes I miss someone really close who understands me and with whom I can vent about intimate things	0.43**	0.71**	0.40**	0.19**
7. I miss social activities that I find satisfying	0.35**	0.54**	0.94**	0.02
8. I would like to participate more in organizational activities	028**	0.37**	0.94**	0.03
4. When I need to get something off my chest, I can easily find friends to do it with	0.28**	0.06	0.04	0.91**
5. Even in the most embarrassing situations, if I need emergency support, I have several people to turn to	0.49**	0.33**	0.09	0.90**

** Correlation is significant at 0.01 significance level
FS- Family Satisfaction; SF- Satisfaction with friends; SA- Social Activities ; IN - Intimacy
Source: Authors (2021).

DISCUSSION

Social Support, also called social support, has been a variable that the literature mirrors as a determinant of physical, social, and psychological well-being[2, 9, 12, 14, 20]. It encompasses policies and support networks such as family, friends, and community, which are intended to contribute to the well-being of people, including those in situations of exclusion[9, 12, 14, 21-23].In the context of illness, the importance of Social Support in the psychological well-being of people affected and its influence on their treatment has been well documented[2, 6-8, 13, 20-25].

Family support and social support are central factors in the success of treatment for tuberculosis, as scientific evidence describes it as a key factor for treatment adherence[21-25]. Therefore, it is important to develop instruments to measure social support satisfaction, properly adapted to the population where it is appropriate to assess this variable.

In this study, we adapted Pais-Ribeiro's ESSS[10] for a sample of people with pulmonary tuberculosis. In relation to its original version, we observed a migration of items within the different subscales. Thus, the subscale: "Family Satisfaction", with a total of seven items, now includes, in addition to the three items of the original subscale, four more items belonging to the subscale "Satisfaction with friends"; "Satisfaction with friends", with a total of four items, kept one item of the original scale, adding one item of the "Social activities" subscale, and two items of the "Intimacy" subscale; "Social activities" kept only two items, keeping those of the original subscale; and "Intimacy" kept only two items, keeping those of the original subscale.

The valorization attributed to satisfaction with family was higher than expected, suggesting a possible explanatory junction between friends/family. This valorization may be related to the perception that individuals have that family and friends are people they can trust, feeling valued and integrated in a communication network and supported in this phase of crisis.

The Cronbach's coefficients α for each item with the total scale (α =0.91) range from α =0.90 to α =0.92, giving a "very good" internal consistency[17].

As limitations of this study, it is considered that the fact that this is a study of people with pulmonary tuberculosis does not cover other variants of the disease. Thus, it is recommended that further research be carried out with people with other types of TB and from other regions of the country. However, the results of this study show that the Satisfaction with Social Support Scale is an instrument with adequate reliability and validity, available to nurses, when planning their interventions, to diagnose the social support needs of people with pulmonary tuberculosis and their families.

CONCLUSION

In the version of the ESSS adapted for a sample of people with pulmonary tuberculosis, four subscales were also identified, as in the original scale, but with variation in the distribution of items among the different subscales. It is believed that this fact is due to the particularities of people with this contagious pathology, with the need for prolonged and controlled treatment and the risk of social isolation.

This scale allows assessing the satisfaction with perceived social support (from family, friends, intimacy, and social activities), recognizing that this subjective dimension is essential for quality of life and well-being, both in healthy and ill populations. This knowledge may contribute to improve the quality of care for people with pulmonary tuberculosis, since social support is recognized as a significant pillar in the whole process of pulmonary tuberculosis treatment.

Based on the psychometric characteristics of the ESSS, it can be concluded that it is a reliable and valid measuring instrument, which can be used by nurses in the treatment of people with pulmonary tuberculosis. Its results may provide substantial information for better decision making when planning care. Social support and satisfaction with social support are now referred to and recognized within the scientific community as one of the factors that enhance treatment adherence and the well-being of the sick person.

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