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RESEARCH ARTICLE (ORIGINAL)

Development and validation of the Individual Empowerment Scale in the context of chronic disease

Construção e validação da Escala de Empowerment Individual no contexto da doença crónica

Construcción y validación de la Escala de Empoderamiento Individual en el contexto de la enfermedad crónica

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Abstract

Background: The assessment of empowerment can contribute to obtaining gains in health.
Objectives: To develop and validate a scale for assessing the individual empowerment of chronically ill people.
Methodology: The instrument was developed and applied to a convenience sample of 271 chronically ill people, between 18 and 65 years old, residing in Lisbon. The validation of the reliability of the instrument was carried out to assess the metric properties of the scale.
Results: A 25-item scale was developed with 7 dimensions: Self-perception, Participation in health-related decisions, Mastery, Determination, Identity, Autonomy and power, and Relationship with health professionals. The factor analysis (principal components analysis with Varimax rotation) revealed that the 25 items were organized into seven factors with a total variance explained of 65.28% and a total Cronbach's alpha of 0.803.
Conclusion: The creation of a valid and reliable measure of the empowerment of chronically ill people may assist health professionals in exploring the impact of this outcome on treatment regimen self-management.

Keywords: chronic disease; empowerment for health; scales

Resumo

Enquadramento: A avaliação do *empowerment* poderá ser um indicador determinante para a obtenção de ganhos em saúde.
Objetivos: Construir e validar uma escala de *empowerment* individual no contexto da pessoa com doença crónica.
Metodologia: O instrumento foi construído e aplicado a uma amostra de conveniência de 271 pessoas com doença crónica, com idades compreendidas entre os 18 e os 65 anos residentes em Lisboa. Para avaliar as propriedades métricas da escala recorreu-se à validação da fiabilidade do instrumento.
Resultados: Obteve-se uma escala de 25 itens com 7 dimensões: Autoperceção; Participação nas decisões em saúde; Mestria; Determinação; Identidade; Autonomia e poder; Relação com os profissionais de saúde. A análise fatorial (componentes principais-Varimax) revelou que os que os 25 itens se organizaram em 7 fatores com uma variância explicada total de 65,28% e alfa de Cronbach total de 0,803.
Conclusão: A criação de uma medida válida e fiável de *empowerment* no contexto da doença crónica poderá ajudará os profissionais de saúde a explorar o impacto deste resultado na autogestão dos regimes terapêuticos.

Palavras-chave: doença crónica; empoderamento para a saúde; escalas

Resumen

Marco contextual: La evaluación del empoderamiento puede ser un indicador determinante para obtener beneficios en la salud.
Objetivos: Construir y validar una escala de empoderamiento individual en el contexto de la persona con enfermedad crónica.
Metodología: El instrumento se construyó y se aplicó a una muestra de conveniencia de 271 personas con enfermedad crónica y con edades comprendidas entre los 18 y los 65 años que vivían en Lisboa. Para evaluar las propiedades métricas de la escala, se recurrió a la validación de la fiabilidad del instrumento.
Resultados: Se obtuvo una escala de 25 ítems con 7 dimensiones, Autopercepción; Participación en las decisiones de salud; Dominio; Determinación; Identidad; Autonomía y poder; Relación con los profesionales de la salud. El análisis factorial (componentes principales-Varimax) reveló que los 25 artículos se organizaron en 7 factores, con una varianza explicada total del 65,28% y un alfa de Cronbach total de 0,803.
Conclusión: La creación de una medida válida y fiable de empoderamiento en el contexto de la enfermedad crónica podrá ayudar a los profesionales de la salud a explorar el impacto de este resultado en la autogestión de los regímenes terapéuticos.

Palabras clave: enfermedad crónica; empoderamiento para la salud; escalas

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Introduction

Empowerment as an outcome in treatment regimen self-management seems to be a key factor for obtaining gains in health. Empowerment capacitates people to participate in decisions and interact with health professionals. An understanding of their health condition and the perception of remaining in control of their lives promote self-care and more effective treatment management. Empowered people may acquire more skills and become more involved in the management of their health, consequently being more effective. Investing in empowerment promotion can result in improved indicators such as fewer hospitalizations and decrease of associated complications or morbidities, thus contributing to lower consumption of health services and care.

No validated instrument was found in the context of chronic disease in general and in the context of primary healthcare in particular. A tool that measures empowerment as an outcome is important not only for research but also for clinical practice due to its usefulness in assessing goal achievement and improving the quality of care delivered. In this sense, the empowerment of chronically ill people means their qualification for decision-making relating to their treatment and self-care.

Therefore, it was necessary to develop an instrument for assessing empowerment and its dimensions, with a view to identifying its effect on chronic disease management in primary healthcare settings. This study aims to develop and validate a scale to assess the empowerment of chronically ill people.

Background

In 2012, the World Health Organization (WHO; World Health Organization Regional Office for Europe, 2012) presented the report with the main strategies for health policy implementation up to 2020, with one of its objectives being citizen empowerment in health.

The WHO report refers to empowerment as a key element for improving health outcomes, user satisfaction with health care, communication between patients and health professionals, increasing adherence to treatment, and ensuring the efficient use of primary health resources (Cerezo, Juvé-Udina, & Delgado-Hito, 2016). The concept of empowerment is used in various contexts, such as education and management. Empowerment in health was brought about in the area of health promotion and was used as a health promotion strategy. Today, it is used in chronic disease management. Empowerment is a process aimed at increasing one's ability to think critically and act autonomously (Santis, Hervas, Weinman, & Bottarelli, 2018). However, it can be perceived as a complex goal that involves three central concepts: well-being, health, and quality of life. In this respect, empowerment is an outcome (Santis et al., 2018). Although the complexity and multidimensionality of the concept are widely accepted, its dimensions and implementation generate controversy; that is, the development and application of scales are usually carried out in specific contexts (Barr et al., 2015; Fumagalli, Radaelli, Emanuele, Bertele, & Masella, 2015; Small, Bower, Chew-Graham, Whaley, & Protheroe, 2013; Wang et al., 2016), which implies the use of various instruments to assess the construct. The empowerment assessment instruments available in the literature have revealed weaknesses in terms of reliability and validity in the application and implementation of variables in different contexts (Barr et al., 2015; McAllister, Dunn, Payne, Davies, & Todd, 2012; Small et al., 2013; Cerezo et al., 2016). A secondary study identified 50 empowerment assessment scales. However, only two scales presented acceptable evidence of validity and reliability, while the rest lacked data to prove their robustness (Herbert, Gannon, & Rennick, 2009). Cerezo et al. (2016) also identified, in a literature review, 10 scales for empowerment assessment but only six scales proved to be robust: Anderson, Funnell, Fitzgerald, and Marrero (2000); Bulsara, Styles, Ward, and Bulsara (2006); Faulkner (2001); McAllister et al. (2012); Small et al. (2013). In Portugal, Almeida and Ribeiro (2010) published a preliminary study of the adaptation of the Empowerment Scale. However, the results revealed weaknesses in its applicability to the Portuguese population. The development of an empowerment assessment scale implies identifying the concept of empowerment, its dimensions, and the context in which they are applied and tested. The literature review, both national and international, allowed identifying empowerment scales developed for specific situations or diseases, such as diabetes, mental illness (schizophrenia), rare diseases, cardiovascular diseases, and rheumatic diseases. Still, none was designed for chronic disease in general. Small et al. (2013) presented a developed scale with dimensions for chronic diseases, though with some limitations in terms of psychometric properties. The development of the individual empowerment scale aimed at allowing the quantification of this construct as a dependent variable and identifying its predictive factors. This study also included the application of two other scales: the adapted illness intrusiveness ratings scale (Luz, Bastos, Vieira, & Mesquita, 2017) and the questionnaire on personality traits and attitudes towards the disease and the therapeutic regimen (Bastos, 2015; Mota, Bastos, & Brito, 2017).

Methodology

This study is a methodological research whose purpose is to develop an empowerment assessment scale as an outcome of health care delivery to chronically ill people. In this respect, a literature review was carried out to identify the various empowerment theories and the scales developed by their authors. The scales identified are incomparable because they do not measure or assess the same dimensions of the concept, and each was developed according to the purpose of their authors (Barr et al., 2015; Cerezo et al., 2016; McAllister et al., 2012; Köhler, Tingström, Jaarsma, & Nilsson 2018). Four scales were selected. Three of them were tested and validated in chronically ill people while the fourth assesses older people's perception of nursing interventions during hospital stay as empowering and

disempowering (Table 1).
The dimensions were selected as being necessary for assessing the empowerment outcome in chronically ill people. The selected dimensions were Self-determination, Autonomy and power, Feelings, Mastery, and Participation in health-related decisions.

Table 1
Summary of the characteristics and psychometric properties of the selected scales

Scales	Specific/generic conditions	Dimensions	Authors
The Empowerment Scale	Specific Conditions: Mental illness	Self-efficacy and self-esteem Power Autonomy and Community Activism Righteous anger Optimism and control over the future (patients) (*n* = 261; *Cronbach's alpha* – 0.86)	Rogers, Chamberlin, Ellison, & Crean (1997)
Diabetes Empowerment Scale	Specific Conditions: Diabetes	Self-efficacy (patients) *(n = 351; Cronbach's alpha* – 0.96).	Anderson et al. (2000)
Patient Empowerment Scale	Generic Conditions: Hospital settings	Promotion of autonomy Independence and mastery Limiting participation in care, dominance, and indifference (patients) (*n* = 101; *Cronbach's alpha* -0.84*)*	Faulkner (2001)
The Patient Empowerment Scale	Specific Conditions: Cancer	Coping mechanisms *(*patients*)* (*n* = 100; *Cronbach's alpha* - 0.92)	Bulsara et al. (2006)

Dimensions were selected according to the literature and with consensus among researchers, as they are nursing specialists and empowerment is their area of study. A pre-test was carried out in 30 chronically ill people who use functional units of the Health Center Cluster (ACES) where the study was conducted. The 28 questions were assessed as to their comprehensibility, clarity, and applicability. Minor syntactic changes were made, and two items raised questions regarding their comprehensibility. However, this difficulty was felt only by a few participants, so it was decided to keep them on the scale and assess them later.
The dimensions identified were Self-determination, Autonomy and Power, Feelings, Mastery, and Participation in health-related decisions. This process resulted in a 28-item list with single-answer format and 4-point Likert-type scale to indicate the level of agreement: *Strongly Disagree* (1); *Disagree* (2); *Agree* (3); and *Strongly Agree* (4; Table 2).

Table 2
Dimensions and items of the empowerment scale

Dimension	Items
Self-determination	*- I have the right to make my decisions, even if they do not benefit my health/illness.* *- I have the right to live my life the way I want to.* *- I can always overcome obstacles.*
Autonomy	*- I can do it all by myself.* *- When I need help managing my treatment regimen, I ask.*
Power	*- I see myself as a capable person.* *- People have no right to feel angry just because they don't like something.*
Mastery	*- I can identify signs and symptoms of my illness, and know what to do, I don't need to run to the doctor.* *- I know exactly what to do when my condition is worse.* *- I can inform and educate others with the same problem as me.* *- I'm capable of managing my treatment regimen calmly.* *- My treatment regimen is part of my life.*
Feelings	*- When I make plans regarding my health and treatment, I am often sure that I can comply with them.* *- I feel a person of value, just like the others, no more and no less.* *- I feel I can do things as well as most people.* *- I feel I have positive qualities.* *- I'm optimistic about the future.* *- Feeling angry about something is often the first step to change.* *- I'm happy with my life, despite everything.*
Participation in health-related decisions	*- The health professionals inform me about the necessary care.* *- The health professionals value my fears, doubts, and concerns about care, and explain what they will do to me and why.* *- The health professionals engage me in my care and establish with me the objectives of my treatment regimen.* *- The health professionals listen to my opinion and take it into account in my treatment regimen.* *- The health professionals believe in my capabilities.* *- I trust the health professional who provides me with the information.* *- I believe in the health professionals.* *- When the health professionals want to engage me in the management of my treatment regimen, I'm not capable.* *- The health professionals are best apt to decide what I need to do or learn.*

Sample
The scale was applied to a convenience sample of 271 participants who met the inclusion criteria and attended the Nursing and Family Medicine consultations in the ACES functional units. The participants were selected by the nurses according to the previously set criteria. The questionnaires were filled out in person at the functional unit of the participant's residence area. All questionnaires were completed by the researcher who ensured that the questions were fully understood by the participants. Each questionnaire took about 25 minutes to fill out.
Data were processed using IBM SPSS Statistics, version 22.0. The criteria for inclusion (eligibility) in the sample were as follows: adults between 18-65 years old; residing in the Lisbon metropolitan area; diagnosed with at least one of the following chronic diseases: diabetes, hypertension, heart failure, chronic obstructive pulmonary disease, lupus, rheumatoid arthritis, stroke, asthma; no manifestation of cognitive or communication problems; and independent in their activities of daily living.

Formal and ethical aspects
All ethical principles of voluntary participation were respected. Data anonymity was ensured. The study was approved with a favorable opinion by the Health Ethics Committee (Process 020/CES/INV/2014) of the Regional Health Administration of Lisbon and Tagus Valley, I.P.

Reliability
A factor analysis was performed using the orthogonal Varimax rotation with Kaiser normalization. A Kaiser-Meyer-Olkin (KMO) score of 0.803 was obtained, and Bartlett's test of sphericity was 2850.868 ($p < 0.001$), a good score, according to Marôco (2014). Then, a principal components analysis with Varimax rotation was performed to identify the underlying and interdependent dimensions. The results showed that the 28 items were divided into eight factors, with a total variance explained of 63.88% and a total Cronbach's alpha of 0.802. The selection of the number of factors was based on the recommended criteria (Marôco, 2014), eigenvalues > 1, the exclusion of factor loadings below 0.30, and the principle of discontinuity. The content of the 28 items was assessed, and item 28 was excluded ("People have no right to feel angry just because they don't like something") because its meaning was considered unclear, raising questions in the majority of the participants. The commonalities of all other items were observed. Items 26 ("When the health professionals want to engage me in the management of my treatment regimen, I'm not capable") and 27 ("The health professionals are best apt to decide what I need to do or learn") were excluded because their commonalities presented factorial loadings below 0.20. Also, these items did not present statistical affinity with the other factors.

Thus, a 25-item scale was obtained, whose internal consistency was considered *good* (Marôco, 2014), with a Cronbach's alpha of 0.803. The scale was submitted again to a factor analysis considering the criteria mentioned above.

The items were organized into seven factors, with a total variance explained of 65.28%. In this sense, the first factor consisted of six items, which explained 21.76% of the total variance. The second factor consisted of five items, which explained 14.34% of the variance; the third factor consisted of three items, representing 8.48% of the variance explained; the fourth factor consisted of two items, with variance explained of 6.27%; the fifth factor consisted of three items, with variance explained of 5.24%; the sixth factor consisted of three items, which explained 4.88% of the total variance; and, finally, the seventh factor consisted of two items, with variance explained of 4.31%.

The theoretical development of the scale was based on six dimensions, so an analysis was forced in this sense. However, the level of reliability was low, hence the seven-dimensional factor model.

Results

A 25-item scale was obtained, whose internal consistency was considered good (Marôco, 2014), with a Cronbach's alpha of 0.803. The scale was submitted again to a factor analysis according to the criteria mentioned above.

The factor analysis revealed some expected and unexpected dimensions, such as identity. The Feelings factor, considered in the theoretical development of the instrument, was named Self-perception after the analysis of the data matrix. The seven factors were Self-perception, Participation in health-related decisions, Mastery, Determination, Identity, Autonomy, and Relationship with health professionals. This division, resulting from the factor analysis, proposes a construct with rational significance (Table 3). All factors presented high factorial loadings.

Table 3
Principal components matrix after Varimax rotation of the 25 items of the Individual Empowerment Scale

Items	Factors							h^2
	1	2	3	4	5	6	7	
4. I feel a person of value, just like the others, no more and no less.	0.780							0.66
5. I see myself as a capable person.	0.862							0.79
6. I feel I can do things as well as most people.	0.843							0.73
7. I feel I have positive qualities.	0.725							0.65
8. I can always overcome obstacles.	0.718							0.53
9. I can do it all by myself.	0.655							0.51
18. I'm happy with my life, despite everything.	0.554							0.54
19. The health professionals inform me about the necessary care.		0.781						0.64
20. The health professionals value my fears, doubts, and concerns about care, and explain what they will do to me and why.		0.841						0.75
21. The health professionals engage me in my care and establish with me the objectives of my treatment regimen.		0.816						0.677
22. The health professionals listen to my opinion and take it into account in my treatment regime.		0.833						0.71
23. The health professionals believe in my capabilities.		0.679						0.56
13. I can identify signs and symptoms of my illness, and know what to do, I don't need to run to the doctor.			0.828					0.73
14. I know exactly what to do when my condition is worse.			0.859					0.76
15. I can inform and educate others with the same problem as me.			0.670					0.49
1. I have the right to make my decisions, even if they do not benefit my health/illness.				0.848				0.77
2. I have the right to live my life the way I want to.				0.805				0.74
3. When I make plans regarding my health and treatment, I am often sure that I can comply with them.					0.557			0.41
16. I'm capable of managing my treatment regimen calmly.					0.570			0.64
17. My treatment regimen is part of my life.					0.727			0.61
10. When I need help managing my treatment regimen, I ask.						0.774		0.70
11. I'm optimistic about the future.						0.357		0.59
12. Feeling angry about something is often the first step to change.						0.624		0.67
24. I trust the health professionals who provide me with the information.							0.583	0.78
25. I believe in the health professionals.							0.544	0.69
Variance by factor	*21.76*	*14.34*	*8.48*	*6.27*	*5.24*	*4.88*	*4.31*	
Cronbach's alpha	*0.860*	*0.871*	*0.735*	*0.711*	*0.436*	*0.294*	*0.845*	**0.803**

F1- Self-perception ; F2- Participation in Health-Related Decisions ; F3- Mastery ; F4- Determination ; F5- Identity; F6- Autonomy and Power; F7- Relationship with Health Professionals.

Note. IES = Individual Empowerment Scale; ** h^2 = *Commonality.*

The scale was analyzed as to its overall reliability by correlating each item with the total score of the scale, its effect on the α score, and the descriptive measures. A high correlation was obtained between practically all items and the total score of the scale, which means that its functioning is good as a whole, contributing to a moderate α score (0.845). The correlation between items obtained a score higher than 0.734. Table 4 shows correlations from *weak* (0.062) to *medium-high* (0.582), which are statistically significant for a $p < 0.05$, between the various dimensions, and between them and the total score of the scale (0.596; $p < 0.05$; Table 4).

Table 4
Interdimensional Correlation

Pearson correlation	Self-perception	Participation in health-related decisions	Mastery	Determination	Identity	Autonomy and power	Relationship with health professionals	Individual Empowerment
Self-perception	1	0.169**	0.166**	0.239**	0.225**	0.211**	0.171**	0.563**
Participation in health-related decisions		1	0.119	0.165**	0.145*	0.179**	0.582**	0.540**
Mastery			1	0.125*	0.172**	0.209**	0.121*	0.596**
Determination				1	0.232**	0.062	0.094	0.547**
Identity					1	0.089	0.121*	0.483**
Autonomy and power						1	0.191**	0.530**
Relationship with health professionals							1	0.515**
Individual Empowerment								1

Note. *$p < 0.01$; **$p < 0.05$

Paired means were compared between the overall empowerment and the empowerment by factor, obtaining a small difference in means (0.032-0.09) and a high and statistically significant correlation between both (= 0.977; $p < 0.001$). Thus, the global mean of all factors *(n* = 271*)* is 3.2575, with a standard deviation (*SD*) of 0.46489, a maximum value of 4.00 and a minimum of 0.84, and standard kurtosis (0.295) = 3.111. As to the overall empowerment, the mean is 3.2993, with *SD* = 0.46516, a maximum value of 4.00, a minimum value of 1, and standard kurtosis (0.295) = 2.677.

The categorization of the empowerment scale between the most empowered and the least empowered was carried out considering the quartiles of the distribution of the empowerment mean. The cut-off point of the scale would be 3.58, indicating that the participants belonging to the 4th quartile were the most empowered. In this sense, the 25% of the participants with higher values in the scale were considered to be more empowered than the remaining 75% (*n* = 203), who belonged to the group of the least empowered. Overall, the means by dimension were higher in dimensions such as the Relationship with health professionals and Participation in health-related decisions, and lower in Mastery and Autonomy and Power (Table 5).

Table 5
Characterization of the Individual Empowerment Scale

	Mean	***SD***	**Min**	**Max**
Overall Empowerment	3.2993	0.46516	1.00	4.00
Self-perception	3.4460	0.77093	0.14	4.00
Participation in Health-Related Decisions	3.5926	0.66929	0.40	4.00
Mastery	2.6285	1.21233	0.00	4.00
Determination	3.1863	1.06517	0.00	4.00
Identity	3.5166	0.66391	0.00	4.00
Autonomy and Power	2.7257	0.94401	0.00	4.00
Relationship with Health Professionals	3.7066	0.65101	0.50	4.00

Note. *SD* = Standard deviation; Min = Minimum value; Max = Maximum value.

The characterization of the level of empowerment allowed identifying the most empowered study subjects and thus establish the relation to other variables to confirm the discrimination level of the instrument and the factors that interfere with empowerment. Concerning the relation between the sociodemographic variables and the level of empowerment by age group, the results obtained in the ANOVA test showed statistically significant differences in Identity ($F_{(270.2)} = 4.82$; $p = 0.009$) and Autonomy and power ($F_{(270.2)} = 7.94$; $p < 0.001$), dimensions that assess the Individual Empowerment scale in the age groups 18-50 years and 61-65 years. Statistically significant results were also found between the household variable and the level of empowerment ($F_{(270.3)} = 4.08$; $p < 0.001$) in the

dimensions Self-perception ($F_{(270.3)}$ = 2.57; p = 0.027) and Identity ($F_{(270.3)}$ = 3.23; p = 0.007). Statistically significant differences were also found in the level of empowerment ($t_{(269)}$ = 2.10; p = 0.037), Self-perception ($t_{(269)}$ = 2.30; p = 0.023), and Identity ($t_{(269)}$ = 2.10; p = 0.038), with lower results in the study subjects with no partner compared to those with a partner. Statistically significant results were found between the different levels of education in the dimensions of Mastery ($F_{(270.3)}$ = 3.02; p = 0.030) and Autonomy and power ($F_{(270.3)}$ = 3.90; p = 0.009). The intrusiveness level of chronic disease was associated with empowerment ($X^2_{(1)}$ = 7.51; p = 0.006), with higher intrusiveness levels relating to lower empowerment (83.6%). Through multiple linear regression, the impact of chronic disease intrusiveness on empowerment was assessed, and statistically significant correlations were found in the three following dimensions: Instrumental activities (r = -0.374; p < 0.001), Intimacy (r = -0.357; p < 0.001) and Relationships and personal development (r = -0.298; p < 0.001). It was found that Instrumental activities (β = -0.11; P < 0.001; CI 95% = [-0.15; -0.06]) and Relationships and personal development (β = -0.11; p < 0.001; CI 95% = [-0.20; -0.03]) had a negative and statistically significant impact that could lead to decreased empowerment, which can be even lower as the intrusiveness of chronic disease in the aforementioned domains increases. These variables explained 16.1% of the total variation of empowerment. The linear model fitted the data well ($F_{(270.2)}$ = 25.70; p < 0.001), confirming their linear trend. Therefore, the adapted illness intrusiveness ratings scale allows assessing the relation between the illness and the level of empowerment (Luz et al., 2017). The empowerment scale is sensitive to this factor as well as to the treatment regimen self-management styles. The more complex the treatment regimen, the higher the intrusiveness of chronic disease in people's lives, the lower the level of empowerment, and the more predominant the formally guided and negligent management style. Chronic disease control and stabilization are linked with higher levels of empowerment and predominance of the responsible management style.

Discussion

The results presented in this study correspond to the first application of the scale to chronically ill people in the context of primary health care. It was found that the scale specifies levels of empowerment and that this variable is related to other variables. Although the primary goal of developing the scale was to use it in research and health care evaluation, the specification by levels of empowerment revealed itself useful for clinical practice in identifying the potential of individual empowerment and greater vulnerability.

As expected, the level of education is higher in the most empowered people, which is consistent with the study by Barr et al. (2015). Although this variable is not sensitive to nursing care, it determines the intent of nurses' actions. Patients with a low level of education tend to participate less in health-related decisions because they feel less capable of obtaining and interpreting information. Social and family support benefits the level of empowerment, and other forms of professional support should be provided to patients lacking this kind of support (Bastos, 2015). This instrument also allows observing that the level of empowerment is related to the severity of the chronic disease, meaning that the promotion of empowerment is not a goal for all patients. Bastos (2015) identified the style of responsible treatment regimen management as being the most favorable for developing empowerment, with better results if the treatment regimen is self-managed. This scale allows verifying the relation between the individual characteristics, including personality traits and behaviors, and the level of empowerment (Bastos, 2015; Mota et al., 2017).

Regarding the psychometric properties of the scale, reliability was assessed, revealing good internal consistency between the 25 items, with a Cronbach's alpha of 0.803. From the factor analysis with Varimax rotation, seven dimensions emerged: Self-perception, Participation in health-related decisions, Mastery, Determination, Identity, Autonomy, and Relationship with health professionals. These dimensions are organized differently from the scales found in the literature review (Cerezo et al., 2016; Barr et al., 2015; Köhler et al., 2018), which may be linked with the Portuguese context and its local application (Lisbon region). Nevertheless, they are similar conceptually. Small et al. (2013) and Barr et al. (2015) state that empowerment is a measurable concept, just like quality of life, and equally complex, given the various influencing factors and the individuality of the concept. The dimensions Identity and Autonomy and power have low α values. They were not excluded though, as they impact the evaluation of individual empowerment, are reported by some authors (Small et al., 2013; Barr et al., 2015), and contribute to the overall value of empowerment. However, its individual use for dimension assessment is not recommended as there are other instruments more suitable for individually assessing Identity and Autonomy and power. Yet, these dimensions are relevant when the purpose is the overall assessment of empowerment. Validity assessment was based on hypotheses of association between the new measure and the relations to other variables such as sociodemographic variables, chronic disease intrusiveness, and styles of treatment regimen self-management. Overall, the scale presented a Cronbach's alpha of 0.803, meaning a good level of validity, and allows identifying different levels of empowerment. Results' analysis cannot ignore some limitations of the study, particularly the use of a convenience sample. Therefore, caution is advised in the interpretation and generalization of results.

Conclusion

The measurement of the level of empowerment in chronically ill people allows assessing the impact of health care on treatment regimen self-management. It constitutes an indicator of the quality of health care and services. In

cases of chronic disease, gains in health are complex and difficult to measure because people's state of health tends to remain the same or even worsen.

The development of the scale was based on the literature review which identified common dimensions of empowerment assessment scales in the context of chronic disease. Despite the study limitations, this scale allows assessing empowerment in chronically ill people associated with the perception of the impact of chronic disease, the treatment regimen self-management, and its respective style. The result was a 25-item scale, divided into seven dimensions: Self-perception, Participation in health-related decisions, Mastery, Determination, Identity, Autonomy, and Relationship with health professionals. These seven dimensions were obtained through factor analysis. Overall, the scale presents good psychometric properties, with α values above 0.70 in total and in each dimension, except in dimensions Identity and Autonomy and power, which had lower values. A valid and reliable scale for chronically ill people's empowerment assessment in the context of primary health care may assist health professionals in exploring the impact of this outcome on treatment regimen self-management, indicators for disease control, and quality of life.

Author contributions

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