

Development and validation of an elimination ostomy adjustment scale

Construção e validação de uma escala de adaptação a ostomia de eliminação
Construcción y validación de una escala de adaptación a la ostomía de eliminación

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Abstract

Theoretical framework: An ostomy represents a potential threat to people's lives and is translated into physical, emotional and social maladjustments. The specific Nursing intervention may positively affect the adjustment to changes, helping people integrate them in their daily lives.

Objectives: Development and validation of a psychometric instrument designated as *Escala de Adaptação a Ostomia de Eliminação* (EAOE) (Elimination Ostomy Adjustment Scale) in ostomy patients.

Methodology: The scale was developed based on the Nursing literature, as well as other measuring instruments, with the participation of a panel of experts. The sample was composed of 256 patients with intestinal or urinary elimination ostomies, who were followed up in a stoma therapy Nursing consultation. Construct validity was assessed using the principal components analysis, with varimax rotation.

Results: The analysis showed good item quality ($KMO=0.812$). Six factors were retained, which explained 52,38% of the total scale variance. Reliability was assessed using Cronbach's alpha (global scale=0.87; subscales= 0.85 - 0.61).

Conclusion: The scale showed good validity and reliability. Further studies should be developed, thus complementing its psychometric analysis.

Keywords: ostomy; adjustment; validation studies; Nursing care.

Resumo

Enquadramento: Uma ostomia representa uma potencial ameaça na vida das pessoas que se manifesta por desajustes físicos, emocionais e sociais, podendo a intervenção específica de Enfermagem influenciar positivamente a adaptação às mudanças, ajudando-as a incorporá-las no seu dia-a-dia.

Objetivos: Construção e validação de um instrumento psicométrico denominado *Escala de Adaptação a Ostomia de Eliminação* (EAOE), pelas pessoas portadoras.

Metodologia: A escala gerou-se a partir da literatura de Enfermagem e de outros instrumentos de medida, com a participação de um painel de peritos. Constituíram a amostra, 256 pessoas com ostomia de eliminação digestiva ou urinária, seguidas em consulta de Enfermagem de estomaterapia. A validade de construto estudou-se pela análise fatorial de componentes principais, com rotação *varimax*.

Resultados: A análise revelou boa qualidade dos itens ($KMO=0,812$), extraindo-se seis fatores que explicam 52,38% da variância total da escala. A fiabilidade estimou-se pelo coeficiente alfa de *Cronbach*, (escala global=0,87; subescalas entre 0,85 e 0,61).

Conclusão: A escala revela boa validade e fidelidade, esperando-se que outros estudos se desenvolvam, complementando a sua análise psicométrica.

Palavras-chave: ostomia; adaptação; estudos de validação; cuidados de Enfermagem.

Resumen

Marco contextual: Una ostomía representa una posible amenaza para la vida de las personas, que se manifiesta por desajustes físicos, emocionales y sociales, de manera que la intervención específica de enfermería puede influir positivamente en la adaptación a los cambios, ayudando a las personas a incorporarlos en su día a día.

Objetivos: Construcción y validación de un instrumento psicométrico denominado *Escala de Adaptação a Ostomia de Eliminação* (EAOE) (*Escala de Adaptación a la Ostomía de Eliminación*) por las personas portadoras.

Metodología: La escala se creó a partir de la literatura de enfermería y de otros instrumentos de medición, y contó con la participación de un grupo de expertos. La muestra consistió en 256 personas con ostomía de eliminación digestiva o urinaria, a las cuales se realizó un seguimiento en la consulta de enfermería de estomaterapia. La validez de constructo se estudió mediante el análisis factorial de los componentes principales, con rotación *varimax*.

Resultados: El análisis mostró buena calidad de los ítems ($KMO=0,812$), extrayéndose seis factores que explican el 52,38 % de la varianza total de la escala. La fiabilidad se estimó mediante el alfa de *Cronbach* (escala global=0,87; subescalas entre 0,85 y 0,61).

Conclusión: La escala muestra una buena validez y fidelidad. De este modo, se espera que se realicen otros estudios que complementen su análisis psicométrico.

Palabras clave: ostomía; adaptación; estudios de validación; atención de Enfermería.

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Introduction

An ostomy results from a surgical procedure that may alleviate the symptoms of a disease or also limit or slow down its progression, but entails a change in biological functions, with physical and often emotional, social and family consequences. The adjustment to the changed body, which involves apprehension and suffering, causes ostomy patients to find a wide range of responses to this new circumstance of life, which cannot be altered. When patients are confronted with those changes, they either try to cope with the situation, by accepting it as a challenge and experiencing feelings of self-control, or adopt behaviours of denial, by avoiding or minimising the problem as a way of protection, or feel helpless in the face of such a devastating event (Sousa, Brito, & Castelo Branco, 2012; Poppek et al., 2010; Lobão, Gaspar, Marques, & Sousa, 2009).

The diagnosis of a severe illness (*e.g.*, cancer), that may simultaneously imply an ostomy, forces people to deal with a sudden threat to their life projects and realities, and may make them emotionally vulnerable, at a great risk of breakdown or rupture with their identity. In this mix of feelings and emotions that patients have difficulties in managing and organising, they go into a process of life transformation from *before* to *after* the ostomy surgery (Meleis, 2010). According to the same author, for the transition to be successful, it is essential to reconstruct one's sense of identity and break with the *before*.

In the adaptive transition, patients gradually learn how to incorporate the changes in their lives, through the mobilisation of personal resources and/or the support of relatives, friends and health care professionals (Sun et al., 2013; Sousa et al., 2012; Cotrim, 2009; Albuquerque, Agostinho, Freitas, Machado, & Silva, 2009; Lobão et al., 2009).

Different authors argue that the specific and systematic Nursing intervention has a positive influence on the adjustment to the circumstance of living with an ostomy and, therefore, we searched for valid tools to assess this concept.

Although valid, the instruments found did not fully meet the analysis of the construct under study. For this reason, this study aimed to develop and validate a scale that allowed assessing patients' adjustment to elimination ostomies.

Theoretical Background

The impact of having a colostomy, an ileostomy or a urostomy may give rise to complex disturbances in people's health and quality of life, which are translated into physical, emotional and social maladjustments. Support to cope with insecurity and fears should be intensified precisely in these moments of greater vulnerability to facilitate a more satisfactory transition. As a Nursing concept, transition has been widely studied by Meleis (2010), who argues that there are transitions in people's lives that require Nursing interventions at different stages and critical points. Meleis defines transition as the passage from one stage of life, condition or state to another, triggered by a specific change and characterised by different dynamic stages and critical or turning points. It implies an inner reorganisation of transformation and adjustment, involving intrapsychic processes of reconstruction of identity, self-confidence and integration of change in people's own lives. The central focus of the Nursing clinical practice is to facilitate the transition, which prepares people for change, by helping patients during turning points from one stage to another (*e.g.* ostomy surgery) and monitoring the course of adjustment and autonomy. The successful transition to life with an ostomy comprises an effective acceptance of the new health circumstances, through the reorganisation and reorientation of daily life, with feelings of anguish and destructive behaviours being replaced by feelings of well-being and control over the situation (International Council of Nurses, 2000). However, an initial process of mourning is required for the new health status to be accepted, which implies an awareness of the losses experienced (Poppek et al., 2010) and time to help smooth out the suffering (Lobão et al., 2009; Simmons, Smith, & Mackawa, 2009).

In addition to the nature of the diagnosis, an elimination ostomy threatens the high social value assigned to a healthy body, beauty, cleanness, physiological control and, on the contrary, to disability. Although it may not be a visible change, there is still the possibility of it being revealed through noises, gases and leakage of the collecting bag. Perceiving the meaning of such physical change and physiological functions, with more or less impact on self-concept, may lead to feelings of rejection, loss of social status, inability to

manage the situation and social isolation (Sousa et al., 2012; Albuquerque et al., 2009; Cotrim, 2009).

Overall, self-concept is defined as the representation or perception that each person makes of himself/herself by reflecting on his/her relationship with others. A positive self-concept facilitates rewarding social interactions, such as the establishment or maintenance of healthy contacts promoting self-esteem and self-image. Since self-esteem and body image are dimensions of the same construct (self-concept), the former allows for the evaluation of personal merit and the verbalisation of self-acceptance, while the latter allows for a description of the mental image that each person has of his/her body and physical appearance (Santos, 2005).

The dimension of sexuality that implies "behavioural expressions of sexual desires, values, attitudes and activities among individuals" (ICN, 2000, p. 68) may also be affected. The presence of an ostomy, being visible not only to the patient but also his/her companion, may disturb the psycho-affective relationship between them, as suggested by several studies (Danielsen, Burcharth, & Rosenberg, 2013a; Popek et al., 2010).

Due to the physiological change in the elimination function(s), people also have to learn and acquire body care-related specific skills to maintain their autonomy and well-being. Taking as a reference the ICN (2000) that defines self-care as an action performed by patients themselves to manage their activities in daily life and their basic individual and intimate necessities, an ostomy significantly changes the cultural representation of personal care in terms of elimination needs. This type of care involves touching and looking at a hole, where once there was healthy skin, by which faeces or urine are eliminated, and is now a demanding physical, social and psycho-affective activity. Undertaking self-care with the stoma implies physical and cognitive skills and believing in the successful performance of this activity (Bandura, 1993). This author introduced and elaborated on the concept of perceived self-efficacy, defining it as people's beliefs about their capabilities to achieve certain levels of performance that impact on events affecting their lives. In that respect, a strong sense of efficacy is associated with optimism, thus increasing both the skills to perform the action and personal revaluation.

Popek et al. (2010) found significant associations between optimism and self-efficacy in stoma care, arguing that optimists believe that they can successfully overcome the situation, seek information and are confident and persistent, even if the path is slow and difficult. On the contrary, low expectations of self-efficacy, associated with pessimism, may predict great inability, feelings of insecurity, low self-esteem, isolation, anxiety and depression.

To sum up, given the changes that may occur in people's lives, adjusting to an ostomy requires time and individual effort, and may be maximised in the interaction with relatives and friends as well as through the systematised intervention of health care professionals, namely nurses (Danielsen et al., 2013a; Sun et al., 2013; Sousa et al., 2012; Albuquerque et al., 2009; Lobão et al., 2009).

Systematic review studies show that, even though an extensive literature highlights the Nursing intervention as promoting the adjustment and positively influencing the quality of life of ostomy patients, research studies confirming such effectiveness are still scarce (Danielsen, Burcharth, & Rosenberg, 2013b; Recalla et al., 2013). On the other hand, there is a lack of instruments to facilitate the nurses' assessment of their interventions (Pittman, Kozell, & Gray, 2009). Guided by these findings, our search aimed at identifying validated scales that measured the concept of adjustment to ostomy. We found that there are several specific scales, most of them aiming at assessing dimensions of quality of life related to, but distinct from, this construct. Pittman et al. (2009) analysed the characteristics and potential clinical use of some of those instruments, such as the Stoma Quality of Life Index, developed by Padilla and adapted by Marquis, Marrel, & Jambon, which includes areas such as physical and psychological well-being, body image, pain, sexual activity, nutrition, social concerns, self-efficacy, help and advice, satisfaction with medical care and adjustment to the situation; the City of Hope Quality of Life-Ostomy Questionnaire of Grant and her collaborators, composed of the domains: physical well-being, psychological well-being, social well-being, and spiritual well-being; the Stoma Quality of Life Questionnaire of Prieto, Thorsen, & Juul, which integrates the domains of sleep, sexual activity, relations to family and close friends, and social relations to people other than family

and close friends; and the Stoma Quality of Life Scale of Baxter and collaborators, which consists of the domains of work/social function, sexuality/body image, stoma function, financial concerns and skin irritation.

Concepts close to that of the adjustment to an ostomy are assessed by other instruments such as the Ostomy Adjustment Scale (Olbrisch, 1983), which assesses the psychological adjustment to life with an ostomy and establishes associations between the preoperative preparation and the time elapsed since surgery or the return to work; and the Ostomy Adjustment Inventory-23 of Simmons et al. (2009), which assesses the psychosocial adjustment in the domains of acceptance, anxious-preoccupation, social engagement and anger. However, although valid, these instruments did not fully explain the conceptual framework that we intended to analyse, the reason why this study was conducted.

Methodology

Based on the established objectives, a quantitative study was developed in two phases: the development of the scale and study of its psychometric properties. The scale was developed based on theoretical Nursing approaches, namely the ICNP® (ICN, 2000), the NIC® (McCloskey & Bulechek, 2004) and the NOC® (Johnson, Maas, & Moorhead, 2004). First, we analysed the areas relevant to the specific Nursing care provided to individuals with elimination ostomy so as to define the domains of the scale. Six foci of Nursing care were selected: Self-concept, Self-care, Acceptance, Hope, Sexual Interaction and Social Interaction (ICN, 2000), where we included 47 initial items resulting from the Nursing Outcomes Classification (Johnson et al., 2004) and the previously mentioned specific instruments.

The initial version of the scale was analysed by a panel of 25 experts for content validation. This group was composed of nurses with education and/or experience in stomal therapy; nurses of general surgery and urology services, with five or more years of practice in the area; faculty researchers in Nursing and a psychologist.

Following the analysis of the experts' answers and suggestions, a pilot version was developed and, subsequently, validated by 10 members of the

previous panel, with education and experience in stomal therapy and faculty researchers in Nursing. The consensus version, designated as *Escala de Adaptação a Ostomia de Eliminação* (EAOE), was composed of 39 items.

The response options for 37 items were measured on a 7-point Likert scale, ranging from 1=strongly disagree to 7=strongly agree. Two items were assessed on a 6-point Likert-type scale, ranging from 1=never to 6=always, taking into account the construct to be assessed (performance of stoma care). To avoid response bias, both positively and negatively worded items were used.

In order to validate the clarity and understanding of the items and identify possible difficulties in completion, a pre-test was conducted with 20 individuals not included in the study. Some difficulties in answering questions related to the intimate domain were identified, especially when individuals had no affective or marital relationship, the reason why the option *does not apply* was introduced.

The analysis of the psychometric properties of the scale was performed after the assent of the Ethics Committees was obtained as well as the authorisation of the administration boards of the hospitals in the northern region of Portugal where data were collected.

A non-probabilistic accidental sample was used. Participants had to meet the following inclusion criteria: individuals with (intestinal or/and urinary) elimination ostomies, aged 18 years or over and having preserved cognitive and communication skills. A total of 256 users attending the nursing stomal therapy consultation and volunteering to participate in the study at the time of data collection were included. Both data confidentiality and the participants' anonymity were ensured. Sample size took into account the recommendations proposed by Hill and Hill (*apud* Pestana & Gageiro, 2008) for the performance of Principal Components Analysis (PCA).

Results

The sample was composed of people aged between 18 and 80 years, with a mean age of 62.4 ± 13.13 years and a median of 65 years. The most represented age group was 61 or more years (59.0%) and least represented group was less than 40 years of age

(7.5%). Most participants were male (52.0%) and married or living with a partner (65.2%), followed by widowed participants (23.8%). As for the level of education, most of them had studied up to the 4th grade of primary school (55.5%), while 10.5% had a higher education degree. As regards cohabitation, most of them lived with their spouse (45.5%) and with their spouse and other family members (38.6%), while 12.8% lived alone and 3.1% lived in collective accommodations. Most participants were

retired (64.8%), followed by around 29% who had a professional activity. The majority of them had an intestinal ostomy (78.1%), while 19.1% had a urinary ostomy. They were mostly permanent ostomies (68.7%). Regarding the time of surgery, 50% of participants had undergone the surgery between one month and one year prior to data collection, 28.9% had undergone it around one month before and the other participants had had it over a year ago (Table 1).

Table 1
Socio-demographic and clinical characteristics of participants

	n	%
Age (years)		
18-30	5	2.0
31-40	14	5.5
41-50	31	12.0
51-60	55	21.5
61-70	74	28.9
71-80	77	30.1
Marital Status		
Single	13	5.1
Married/cohabiting	167	65.2
Separated/divorced	15	5.9
Widowed	61	23.8
Education		
Up to 4 th grade	142	55.5
Between 5 th – 10 th grade	59	23.0
Between 11 th and 12 th grade	28	10.9
Higher Education	27	10.5
Cohabitation		
Husband/wife	99	45.5
Family (spouse, children, grandchildren, siblings, parents, etc.)	117	38.6
Home	8	3.1
Alone	32	12.8
Professional Situation		
Employee	74	28.9
Unemployed	16	6.3
Retired	166	64.8
Type of Stoma		
Colostomy	160	62.5
Ileostomy	40	15.6
Urostomy	49	19.1
Double (ileostomy and colostomy or colostomy and urostomy)	7	2.8
Type of ostomy		
Permanent	176	68.7
Temporary	80	31.3
Time elapsed since ostomy		
1 month	74	28.9
Up to a year	128	50.0
> 1 year	54	21.1

In a first analysis, the construct validity of the 39 item-scale was performed using the PCA with varimax rotation. The criteria for factor extraction

were eigenvalues above 1.0 and the criteria for item retention were item loadings above 0.30.

The *Kaiser-Meyer-Olkin* (KMO) and the Bartlett's test of sphericity were used to assess sample adequacy. A KMO of 0.686 and a Bartlett's test of sphericity of approx. χ^2 of 2010.903; 780; $p=0.000$ were found, thus allowing for the factor analysis to be proceeded (Pestana & Gageiro, 2008).

Initially, the extraction of factors through the varimax rotation revealed 12 factors, which together explained 70.78% of the total variance. Given the large number of components and even though it was statistically valid, this factor solution was poorly correlated with content validity. Subsequently, forced factor solutions were performed based on the *scree plot*, namely the location where the most significant leaps were observed and the explained variance was higher than 50%. This method also resulted in valid solutions, in particular, seven- and five-factor solutions that were more consistent with the areas originally identified. However, the final option was a 6-factor solution, with factors proving to be more consistent with the foci of attention sustaining the development of the scale. This solution was also statistically satisfactory.

Four items were eliminated by these procedures, and

the final version of the EAOE had 35 statements. The KMO of 0.812 and the Bartlett's test of sphericity of approx. χ^2 of 1857.205; 595; $p=0.000$ allowed us to proceed to a new factor analysis, forcing a six-factor solution that explained 52.38% of the total variance of the scale. Retained items obtained factor loadings ranging between 0.89 and 0.34 (Table 2). In addition, reasonable levels of communality were obtained, indicating that the six retained factors adequately described the inter-item correlation.

With regard to the global score of the scale, good indicators of internal consistency were found, with a Cronbach's Alpha coefficient of 0.87 and a Spearman-Brown split-half of 0.82. In each factor, Alpha values ranged between 0.85 and 0.61 and the split-half values ranged between 0.83 and 0.60, thus indicating good internal consistency in factor I (Self-concept), reasonable internal consistency in factors II (Positive Acceptance), III (Social/Religious Support), IV (Sexual Interaction) and V (Self-care), and low internal consistency in factor VI (Negative Acceptance). If deleted, none of the items would increase the internal consistency of the EAOE or its subscale.

Table 2

Matrix of the PCA, eigenvalues and explained variance of the EAOE

FACTORS / ITEMS	I	II	III	IV	V	VI
I. Self-concept (9 items)						
18. Participar nos divertimentos que aprecio (convívios, festas, atividades sociais) é para mim doloroso	0.690	0.315				
21. Preocupa-me viajar devido ao meu estoma	0.682					
6. Procuo esconder que tenho uma ostomia	0.639					
5. O meu estoma impede-me usar a roupa de que gosto	0.605					
20. Tenho medo dos gases, cheiros ou que o saco descole, quando estou em público	0.600					
3. Estar ou sair com os meus vizinhos, amigos e/ou colegas de trabalho é para mim difícil	0.595	0.331				
36. Olhar para a minha ostomia é doloroso	0.592					
16. Sinto-me diminuído devido ao meu estoma	0.539					
23. O meu estoma interfere com o meu trabalho, a minha profissão ou a escola	0.510					
II. Positive Acceptance (8 items)						
30. Acredito que vou realizar os meus sonhos		0.674				
26. Tenho prazer de viver		0.669				
24. Estou otimista em relação ao futuro		0.628				
28. Aceito a minha ostomia		0.567				
1. Estou satisfeito com aparência do meu corpo	0.345	0.551				
27. A ostomia aumentou o meu bem-estar		0.517				-0.319
14. Sinto orgulho em mim		0.502				
7. Tento não pensar na minha situação		0.384				-0.330

II. Social/Religious Support (5 items)

11. Faz-me bem falar dos meus sentimentos e preocupações com familiares e amigos	0.688	
17. Procuro ajuda de familiares, amigos e profissionais, quando necessito	0.684	
25. Acredito que as minhas orações vão-me ajudar	0.682	
10. Acreditar em alguém divino dá-me forças e ajuda-me a viver	0.634	
33. O apoio da minha família e amigos é para mim importante	0.521	0.464

IV. Sexual Interaction (5 items)

29. O meu relacionamento sexual piorou com a ostomia	0.358	0.722	
12. Estou satisfeito(a) com a minha vida sexual		0.688	
35. Sinto-me sexualmente atraente		0.645	
34. Evito intimidade sexual por causa do meu estoma	0.503	0.556	
19. O meu cônjuge/companheiro(a) interessa-se sexualmente por mim		0.447	0.342

V. Self-Care (4 items)

39. Mudo o saco da minha ostomia sozinho(a)		0.893	
38. Cuido da higiene da minha ostomia sozinho(a)		0.883	
37. Tocar na minha ostomia é para mim difícil	0.511	0.531	
15. Identifico alterações do estoma, pele em redor, fezes e urina		0.480	

VI. Negative Acceptance (4 items)

31. Sinto-me culpado(a) pela minha situação				0.654	
32. Acho que os outros me olham como uma pessoa diminuída	0.386	0.354		0.559	
9. Descarrego nas outras pessoas a minha revolta		0.458		0.418	
22. Perdi o meu interesse sexual por causa da minha ostomia	0.339			0.338	

Eigenvalues	7.46	3.29	2.33	1.84	1.68	1.48
% Explained Variance (Total EAOE=52.38)	21.33	9.39	6.65	5.25	4.80	4.23

Pearson's correlations were also calculated. Positive moderate to strong correlations were found between all subscales and the total scale, with the exception of the Self-care subscale ($r=0.368$), which showed a weak correlation (Pestana & Gageiro, 2008). The subscales which were more related to the total scale were Self-concept ($r=0.809$), Positive Acceptance ($r=0.776$), Negative Acceptance ($r=0.738$) and Sexual Interaction ($r=0.629$). There were also correlations between almost all subscales, with the exception of the correlation between the Social/Religious Support

and Self-concept subscales; the Sexual Interaction and Social/Religious Support subscales; and the Self-care subscale and the Positive Acceptance, Social/Religious Support and Sexual Interaction subscales.

On the other hand, we found that the association between the subscales was not very high. This indicates that the concepts under study were different from each other, although, as a whole, they contributed to the overall concept of adjustment to the elimination ostomy (Table 3).

Table 3

Pearson's Correlation between the subscales and the total EAOE

	Self-concept	Positive Acceptance	Social/Religious Support	Sexual Interaction	Self-Care	Negative Acceptance
Positive Acceptance	0.514**					
Social/Religious Support	0.044	0.263**				
Sexual Interaction	0.453**	0.491**	0.027			
Self-care	0.196**	0.066	0.004	0.132		
Negative Acceptance	0.496**	0.407**	0.172*	0.417**	0.233**	
Total EAOE	0.809**	0.776**	0.422**	0.629**	0.368**	0.738**

**($p<0.01$) *($p<0.05$)

Discussion

This study aimed to develop and validate a scale to measure the adjustment to the elimination ostomy, which may be used in both Nursing research and clinical practice.

The process of development of the scale, which we designated as EAOE, was initially based on the Nursing literature and other specific instruments that contributed to the selection of the domains and compilation of the items. Subsequently, the participation of a panel of experts in the areas of Nursing, research and psychology ensured its content validation.

In the next phase, following the application of the scale to a sample of 256 individuals with intestinal and urinary stomas, the psychometric properties of the EAOE were tested.

Construct validity was analysed using the principal components analysis with varimax rotation. Four items were eliminated, with the final version of the EAOE being composed of 35 statements. Psychometric analyses and studies were used once again and a final forced six-factor solution was chosen, which explained 52.38% of the total variance. This choice was based on the fact that this solution was more consistent with the theoretical constructs at the basis of this scale.

The factor loading matrix of the EAOE presented content validity, as the items composing each factor/subscale could easily be identified as belonging to that factor/subscale. The final version also showed good internal consistency values for the total scale and the subscales. Only one of the subscales (Negative Acceptance, $\alpha=0.61$) had a Cronbach's alpha lower than 0.70, which had been established as the ideal minimum value (Pestana & Gageiro, 2008). Any inference of the results related to this domain should, therefore, be carefully analysed. However, the values obtained for the other subscales and, above all, the total scale should be highlighted.

The correlations between the subscales and the total scale were significant, ranging between 0.81 and 0.37, which is also a good indicator of their content validity. The Self-concept, Positive Acceptance, Negative Acceptance and Sexual Interaction subscales were those that contributed the most to assessing the concept under study (Adjustment), thus indicating that the EAOE is sensitive to measure the impact of an ostomy on psycho-emotional variables. On the

other hand, the correlation between Self-care and Adjustment was not very significant, which seems to demonstrate that, as time progresses, ostomy patients find it easier to integrate the changes related to stoma care (instrumental performance) than to manage their psycho-affective and emotional aspects.

The associations between the Self-concept, Sexual Interaction and Acceptance subscales suggest that a positive self-concept facilitates the acceptance of the ostomy and enhances sexuality. However, even if there is no surgically induced injury that influences the sexual function on a permanent basis, the impact of an ostomy on self-esteem and body image affects sexuality and may hinder the adjustment process (Popek et al., 2010; Albuquerque et al., 2009; Cotrim, 2009; Lobão et al., 2009; Pittman et al., 2009).

It should be noted that the associations between the subscales were not very high, which means that the concepts, although linked to a global structure (adjustment), measured different parts of the construct, thus contributing to their overall assessment.

In addition, the organisation of the items and the designation of the factors were somehow distinct from the previously established ones. Five subscales (Self-concept, Self-care, Sexual Interaction, Positive Acceptance and Negative Acceptance) were oriented towards the previously selected domains. A new subscale emerged, which was designated as Social/Religious support. This construct was not considered *a priori*, but integrated resources and support networks promoting social interaction and hope.

These analytical results showed that the EAOE meets the minimum validity and reliability criteria needed to be used in studies on the complexity of psychosocial adjustment to intestinal or urinary stomas. The scale items are intended to cover situations that aim at studying the subjective responses of individuals with ostomies, such as feelings, emotions and more or less active strategies in dealing with such specific trauma and its implications.

However, we believe that the results of this study, as well as the use of the scale and the planning of further research, should be interpreted in the light of some limitations. Although the sample comprised individuals from both rural and urban areas, it was limited to a region in northern Portugal. Therefore, extending the area of research is desirable. Another

limitation relates to the low educational level of most participants, which may lead to difficulties in understanding some items. Although the influence of socio-demographic and clinical variables in adjusting to the ostomy has not been considered, it is important that it be included in future studies, given its specific interest for the study of both the sensitivity of the scale and its application in the Nursing practice. Finally, other limitations in the analysis of the scale properties relate to the fact that temporal stability was not assessed, through the test-retest reliability, nor was the concurrent and discriminative validity by correlating it with other instruments assessing similar or disparate concepts.

However, most participants had their elimination ostomies for up to one year, thus the results seem to demonstrate the usefulness of the scale in assessing the adjustment process during the first year after surgery. Some studies suggest this year to be the most difficult period to manage the changes associated with the new situation (Simmons et al., 2009; Pittman et al., 2009). However, it is also described that an ostomy continues to affect survivors for several years after the surgery, thus longitudinal studies may help to enhance the characteristics of the EAOE.

The development of this scale may bridge existing gaps, considering that its isolated use or in association with other instruments may be useful for research on the adjustment to an ostomy and to Nursing clinical practice in stomal therapy.

Despite the limitations of the EAOE, it is expected to be used in future broader studies so as to contribute to improve its applicability to Nursing practice.

Conclusion

An ostomy represents a potential threat to all aspects of the lives of people who have to learn not only to manage stoma care, but also to incorporate it into their day-to-day.

Guided by these principles, we developed and validated an elimination ostomy adjustment scale (EAOE), based on the most affected psychosocial dimensions, including issues related to stoma self-care.

Although other consistent and applicable instruments existed, they aimed at assessing aspects of quality of life or only some of the dimensions that we intended

to measure with the EAOE. For these reasons, this study was developed.

The final version of the EAOE is composed of 35 statements organised into six subscales that fit to the meaning of their items and the construct to be measured, which represents an added value from the point of view of the validity of the scale. It shows reasonable psychometric properties to measure the adjustment of patients with elimination ostomies, being more sensitive to measure the implications of ostomies at the levels of self-concept, acceptance and sexuality.

Despite the good psychometric properties of the EAOE, future applications will be needed, particularly to study its concurrent and discriminative validity and temporal stability.

The development of further research studies is, therefore, suggested in order to make the scale more robust. This scale may be a useful tool in clinical practice with ostomised patients and in further research on stoma adjustment.

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