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Evaluation scale for the use of adult diapers and absorbent products: methodological study

Escala de avaliação do uso de fraldas e absorventes: estudo metodológico

Escala de evaluación del uso de pañales y absorbentes: estudio metodológico

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ABSTRACT
Objective: To validate the content of the 'Evaluation Scale for the Use of Adult Diapers and Absorbent Products' (AUFA Scale) among elderly patients in primary care. **Method:** Methodological study for validation of contente with 23 specialists in gerontological nursing and/or wounds for evaluating the name and the items of the scale. The analysis of the data was done according to the Index of Validation of Content (IVC) and the Coefficient of Validation of Content (CVC), the 'Fully Agree" percentage and the compliance to 'Cronbach's Alpha', with a minimum score of 0,80 for each. **Results**: The general IVC and CVC were 0,91 and 0,89, respectively. However, the 'Fully Agree' and 'Cronbach's Alpha' percentages were 0,65 and 0,51, respectively. After three 3 submissions and modifications of the scale, the scores changed to 0,95 and 0,85. **Discussion**: Judges contributed to the content of the scale, especially regarding the number of absorbent product changes **Conclusion:** After taking into account the analyses and suggetions made by the judges, the content was refined and considered validated.
DESCRIPTORS: Elderly; Diapers, Adult; Diaper Dermatitis; Nursing Evaluation; Validation Studies.

RESUMO
Objetivo: Validar o conteúdo da escala de avaliação do uso de fraldas e produtos absorventes (Escala AUFA) por idosos na atenção primária. **Método:** Estudo metodológico de validação de conteúdo com 23 especialistas em enfermagem gerontológica ou feridas pela avaliação do nome e itens da escala. A análise dos dados ocorreu por meio de índice de validação de conteúdo (IVC) e coeficiente de validação de conteúdo (CVC), percentual de concordo totalmente e concordância pelo Alfa de Cronbach, com o mínimo de 0,80 cada. **Resultados**: Os IVC e CVC gerais foram de, respectivamente, 0,91 e 0,89. Entretanto, os percentuais de concordo completamente e Alfa de Cronbach foram de, respectivamente, 0,65 e 0,51. Após três envios e modificações da escala, a avaliação foi de 0,95 e 0,85. **Discussão**: Os juízes contribuíram para o conteúdo da escala, principalmente quanto ao número de trocas **Conclusão:** Após as análises e sugestões dos juízes, o conteúdo foi refinado e validado.
Descritores: Idoso; Fraldas para Adultos; Dermatite das Fraldas; Avaliação em Enfermagem; Estudos de Validação.

RESUMEN
Objetivo: **Objetivo:** Validar el contenido de la escala de evaluación para el uso de pañales y productos absorbentes (Escala AUFA) en ancianos en atención primaria. **Método**: Estudio metodológico de validación de contenido con 23 especialistas en enfermería gerontológica y/o heridas para la evaluación del nombre y de los ítems de la escala. El análisis de los datos se realizó mediante el Índice de Validación de Contenido (IVC) y el Coeficiente de Validación de Contenido (CVC), así como del porcentaje de la respuesta 'Totalmente de acuerdo' y del 'Alfa de Cronbach', con un puntaje mínimo de 0.80 para cada uno.**Resultados**: Los IVC y CVC generales fueron de 0.91 y 0.89, respectivamente. Sin embargo, el porcentaje de 'Totalmente de acuerdo' y del 'Alfa de Cronbach' fue de 0.65 y 0.51, respectivamente. Después de 3 presentaciones y modificaciones de la escala, la evaluación fue de 0.95 y 0.85. **Discusión**: Los jueces contribuyeron al contenido de la escala, principalmente en cuanto al número de cambios. **Conclusión**: Luego del análisis y de las sugerencias de los jueces, el contenido se refino el contenido hasta considerarlo validado.
Descriptores: Anciano; Pañales para adultos; Dermatitis de pañales; Evaluación de enfermería; Estudios de validación.

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INTRODUCTION

Aging of population is something observed worldwide, both due to technological advances leading to longer life expectancy and to the decrease in birth rates. In Brazil, the number of elderly people considered to be 60 years of age or older will be the 6th largest in the world in 2025 and will exceed the population aged 30 in 2055[1].

This scenario requires a need for taking a specific look at health practices, mainly due to the changes that this aging process brings about. Aging of skin, changes in urination, cognitive impairment, decreased motor capacity, for example, are aspects that require attention[2]. However, some nursing interventions for these conditions deserve caution regarding their prescription, as they can lead to even greater losses for this clientele.

The use of diapers and pads can be considered one of these interventions. About 42.3% of the elderly population uses diapers or pads. This can have an interference in living costs. A study in the home environment showed that absorbent materials represent 63% of the total costs of the elderly patient. It also relates to clinical complications, such as dermatitis associated with incontinence, pressure injuries, pain and discomfort, and a worsening of urinary incontinence. All this can lead to other costs related to treatments, in addition to a worsening quality of life[3].

On the other hand, the use of diapers and pads as an intervention may be necessary. In moderate or severe cases of motor, cognitive deficit or urinary and fecal incontinence, the elderly may need this resource for voiding restraint[2]. It is up to the nursing professional to decide on what product is best, what are the criteria for its clinical indication and what would be the most assertive moment for its use.

Some instruments are present in the literature and assist in the assessment of these motor, cognitive and continence capacities. However, this does not eliminate the need for evaluating separately each item that matters for deciding on the need for the elderly patient to wear diapers or pads. For this purpose, Evaluation Scale for the Use of Adult Diapers and Absorbent Products (AUFA Scale) was developed as a specific tool for the evaluation of diaper and pad use, presenting itself as a direct alternative to assist nurses in making the decision on whether diapers and pads should become a care strategy. It was elaborated through an integrative literature review that extracted the following as the necessary items for the evaluation: 'Product', 'Frequency of Change', 'Skin Condition', 'Skin Integrity', 'Cognitive Ability', 'Motor Capacity' and 'Incontinence'[4].

Thus, the literature supported the composition of the items on the AUFA Scale for prescribing the use of diapers and pads. However, it was necessary to validate this content in order to consider a specific group (the elderly) in a specific context (primary care). In view of the principle of longitudinal care, primary care accompanies and monitors the elderly person, even when this elderly person is referred to other levels of care. The nurse in these unit

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needs to have a trained eye to decide whether to continue or not the care practice according to defined needs. Based on this, this study aims to validate the content of the scale for evaluating the use of diapers and absorbent products among the elderly patients in primary care.

METHOD

It is a content validation methodological study, extracted from a doctoral thesis intitled "Validation of the Evaluation Scale for the Use of Adult Diapers and Absorbent Products"[5], which intends to define the domains of construction, generation, evaluation and correction of the content according to the perspective of judges, making use of analyses to refine the instrument[6]. To this end, nurses were considered judges based on the evaluation of their curriculum, available on the Lattes Platform (lattes.cnpq.br/) on the portal of the National Development and Technological Board (CNPq), if they met at least 2 of the following criteria: 1) minimum experience of three years in teaching or practice in the field of gerontological nursing, stomal therapy and/or dermatology; 2) postgraduate studies in gerontological nursing, stomal therapy and/or dermatology; 3) mastery of research methodology; 4) participation in nursing research in the construction and validation of scales and instruments. The sample size was calculated according to the formula: $n=Z\alpha 2.P(1-P)/e2$[7], where P represents the expected proportion of judges, indicating the adequacy of each item, and "e" represents the acceptable proportional difference compared to the expectation.

A 95% confidence level was considered, indicating that at least 70% of judges would classify the item as appropriate. Thus, the values used for the calculation were: $Z\alpha 2 = 1.96$; $P = 0.85$; $e = 0.15$, resulting in a total need for 22 judges in the sample.

For the recruitment of judges, from May to August 2018, there was a research of their e-mails based on the information available at the Lattes Platform (lattes.cnpq.br/) on the CNPq portal. For this purpose, keywords such as 'adult diapers', 'wounds' and 'gerontological nursing' were used. For those who did not provide contact information on the platform, a search was made in electronic scientific publications and in conference proceedings. In all, 287 invitations to participate in the study were sent, with the return of acceptance of participation by 23 judges, a number which remained without losses or replacements until the end of the research.

Upon acceptance of participation, the initial instrument with version 1 of the scale was sent. In this evaluation, a deadline of 15 days for feedback was established, a period in which the judges contributed with through the evaluation of the 'practical relevance' of the name chosen and of the items of the scale. What was considered 'Practical relevance' was the evaluation of the operational definition, that is, the way each item of interest measures a given population and how it actually evaluates the dimension proposed for the instrument[8].

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For such, an integrative review was carried out in order to establish which items and constitutive definitions of each variable of interest in the evaluation of version 1 AUFA scale should be considered[5]:

'Product': Intimate hygiene absorber with the function of retaining urine and feces or protecting the skin, being used by babies, children and adults who, for various reasons, had their control over physiological needs altered.

'Frequency of change': Refers to the number of diaper changes performed in 24 hours. Evaluation studies of hygienic products suggest that what is minimally acceptable is to change diapers every six hours.

'Skin integrity': It consists of assessing changes or breaks in the skin when in contact with the diaper or pad.

'Skin condition': Changes in the skin inherent to the aging process. Evaluation made according to the turgor, since, at the level of the epidermis, its layers become thinner and there is cellular atrophy as well as a decrease in the capacity for renewal, while its capacity to act as a semi-impermeable barrier is weakened.

'Cognitive capacity': Act or process of acquiring knowledge that occurs through perception, attention, association, memory, reasoning, judgment, imagination, thought and language.

'Motor capacity': Performing activities of daily living such as: bowel control, bladder control, personal hygiene, toilet transfers, bathtub transfer, food, clothing, wheelchair transportation to and from bed, walking and going up and down the stairs.

'Incontinence': Loss of urinary and fecal continence; in other words, the presence of involuntary loss of urine or feces due to uncontrolled bowel or bladder functions, respectively.

As for the operational definitions, or how each assessment was considered per item, they comprised the initial version of the scale that was submitted to the judges and the final one that was elaborated after their contributions had been given, as shown in Figure 1.

Figure 1 – Operational definitions of version 1 and end of the AUFA Scale submitted to judges (n=23). Niterói, RJ, Brasil, 2019

VERSION 1	**Operational defitinion**	**FINAL VERSION**	**Operational definition**
Product	1 Diapers with size1 according to anatomical shape and skin protector 2 Diapers with inadequate size and skin protector of choice 3 Product / adapted diapers and absence of skin protector	**Preferences of patient/caregiver**	1 External devices (toilet, bedpan, catheter with condom…) 2 Use of pads 3 Use of geriatric diapers
Frequency of change	1 Six daily changes or more	**Frequency of change**	1 Six daily changes or more 2 From four to five daily changes

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	2 From four to six daily changes 3Less than four daily changes		3Less than four daily changes
Integrity of skin	1 Entirety 2 Hyperemia 3 Ulcerated lesion	**Integrity of skin**	1 Entirety 2 Hyperemia on genitalia, gluteus, thighs and/or superior part of the abdomen 3 Ulcerated lesion on genitália, gluteus, thigh and/or superior parto f the abdomen
Skin condition	1 Preserved elasticity 2 Loss of turgor 3 Cutaneous frailty	**Skin aging**	1 Preserved elasticity 2 Turgor test from 2 to 5 segundos 3 Turgor test exceeding 5 seconds
Cognitive capacity	1 Preserved 2 Subjective memory complaint 3 MMSE[2] below 13	**Cognitive capacity**	1 Preserved 2 Subjective memory complaint 3 Objective memory complaint
Motor capacity	1 Independent for daily life activities[3] 2 Partially dependent for daily activities 3 Dependent for daily life activities	**Motor capacity**	1 Independent for daily life activities[33] 2 Partially dependent for daily activities 3 Dependent for daily life activities
Incontinence	1 Light urinary incontinence 2 Moderate urinary incontinence 3 Urinary and fecal incontinence	**Incontinence**	1 Light incontinence 2 Moderate incontinence 3 Severe incontinence

Source: The authors.

Explanations on the purposes of the research and on the content of the scale were sent to the judges attached to the instrument and it was requested that the nurses judged the content of each indicator of the modified scale as follows: 1) I fully disagree; 2) partially disagree; 3) partially agree; 4) fully agree. For each 1 or 2 score, a justification was requested in order to improve the item.

For data analysis, the following were considered: the Content Validation Index (CVI), with calculation based on the sum of agreement of items that received score "3" or "4" by the judges, divided by the total number of responses; Content Validation Coefficient (CVC) calculated by dividing the average of the ^{j}judges' judgment values ($^{\sum x/j}$) by the maximum value of the last category on the Likert scale ($^{V_{max}}$); agreement according to Cronbach's Alpha coefficient and percentage of 'fully agree' responses.

For the scale to be validated, a new version was sent to the judges with the suggestions made, until the global analysis and the analysis per item of the scale presented a minimum rate of 0.80[(10)].

RESULTS

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Figure 2 presents the characterization of judges responsible for analyzing the scale being studied.

Figure 2 – Characterization of judges (n=23). Niterói, RJ, Brazil, 2019

Variables	n	%
Sex		
Female	20	87
Male	3	13
Age		
24 |— 29	5	21,7
29|— 34	10	43,5
34|— 39	5	21,7
39|— 44	1	4,3
44|— 49	0	0,0
49|— 54	2	8,7
Academic degree		
PhD	7	30,4
Master's	23	100
Specialization	23	100
Area of Specialization		
Skin studies	13	56,5
Elderly studies	13	56,5
Area of expertise		
Research methodology	20	87,0
Validation studies	20	87,0
Teaching	23	100
Training time in nursing		
3 |— 7	8	34,8
7 |— 11	9	39,1
11 |— 15	3	13,0
15 |— 19	0	0,0
19 |— 23	1	4,3
23 |— 27	2	8,7
Experience time in teaching		
1 |— 5	14	60,9
5 |— 9	5	21,7
9 |— 13	2	8,7
13 |— 17	2	8,7

Source: The authors.

Most judges approached were female (87%), between 29 and 34 years of age (43.5%), with Master's degrees (100%), with a training time ranging from 7 to 11 years (39.1%), and with a teaching experience (100%) ranging from 1 to 5 years (60.9%). All judges had specialization in subjects related to skin or to the elderly, 56.5% in one or another, and one of the judges had the 2 specializations.

In the analysis per item, the judges' agreement was analyzed according to three approaches: Percentage of 'Fully Agree',

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'Content Validation Index' (IVC) and 'Content Validity Coefficient' (CVC). It took 3 submissions to meet the minimum condition of 0.80 for each approach, the first 2 of them being shown in Figure 3.

Figure 3 – Two first analyses of accord per item among judges for the three evaluations. Niterói, RJ, Brasil, 2019

Items in analysis	Percentage of "Fully Agree" replies		IVC		CVC	
	1	2	1	2	1	2
Product	52,2	78,3	87,0	91,3	0,84	0,90
Frequency of change	65,2	95,7	82,6	95,7	0,86	0,97
Skin condition	69,6	82,6	95,7	95,7	0,91	0,93
Skin integrity	47,8	78,3	91,3	95,7	0,85	0,93
Cognitive capacity	69,6	73,9	91,3	82,6	0,90	0,89
Motor capacity	69,6	100,0	95,7	100,0	0,91	1,00
Incontinence	65,2	78,3	91,3	91,3	0,91	0,93

Source: The authors.

According to the Percentage of "Fully Agree" replies, the lowest agreement between the judges in the first evaluation occurred in the evaluation of the items "Skin Integrity" and "Product". The improvement in "Skin condition" was obtained through the change to "Skin aging". In the "Product", the item 'External Devices' was added. However, even with these changes, the items had indexes below 0.80.

According to the IVC, the lowest agreement between the judges in the first evaluation occurred in the evaluation of items "Frequency of Change" and "Product". In "Frequency of Change", the order of the items to be evaluated was changed, following the order of the other ones. In other words, from the most to the least indicated conduct. Initially, it was shown as 'less than four changes', 'from four to five changes' and 'six or more changes'. After the adjustment, it was considered to change from 'six or more changes' to "four or less changes".

The second evaluation shows that the judges had better agreement when evaluating the item 'Motor Capacity' and the items with less agreement related to them in the second evaluation were the items 'Cognitive Capacity' and 'Product'.

In the third and last analysis by the judges, the needs for adjustments by replacing 'Product' for 'Preferences of the patient /caregiver' and 'Skin conditions' for 'Skin aging' were met, as shown in Figure 4.

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Figure 4 - Third and last analysis of accord per item among the judges (n = 23). Niterói, RJ, Brazil, 2019

Item	Percentage of "Fully Agree" replies	IVC	CVC
Patient's/caregiver's preferences	82,6	91,3	0,93
Number of changes	95,7	100,0	0,99
Skin aging	91,3	100,0	0,98
Skin integrity	95,7	95,7	0,98
Cognitive capacity	95,7	95,7	0,98
Motor capacity	100,0	100,0	1,00
Incontinence	100,0	100,0	1,00

Source: The authors.

Judges pointed out the need for considering the scale as guidance for the nurse's decision on adopting the external device products, either diapers or pads. Thus the 'product' item was removed from the scale and 'patient's/caregiver's preference' was included.

Figure 5 shows the analysis of the agreement among judges regarding the instrument in its fullness, without discriminating any item. Apart from the percentage of 'Fully Agree' replies, IVC and CVC. The table also shows the Alpha of Cronbach accord measurement, with its interval of confidence.

Figure 5 – Analysis of Global Accord among judges. Niterói, RJ, Brasil, 2019

Statystic	First Evaluation	Second Evaluation	Third Evaluation
Percentage of 'Fully Agree' replies	65,2%	85,3%	95,1%
IVC Global	91,8%	94,0%	97,8%
CVC Global	0,893	0,944	0,982
Cronbach's alpha	0,51	0,68	0,85
($IC_{95\%}$)	(0,24-0,79)	(0,42-0,84)	(0,77;0,93)

Source: The authors.

In the first of the 184 evaluations (23 judges x 8 items, including the 7 items and the name of the scale), 65.2% of them were in agreement with the answer 'Fully Agree'. In the second assessment, this percentage was of 85.3% and, in the third one, 95.1%. In the first of the 184 evaluations (23 judges x 8 items), 91.8% agreed with the answer 'Partially agree' or 'Fully agree'. In the second assessment, this percentage was of 94.0%, and, in the third one, 97.8%. Cronbach's Alpha reached, respectively, 0.51, 0.68 and 0.85 in the evaluations. The adjustments made to the instrument after each assessment were important to ensure consistency of the instrument. Thus, the conclusion is that the AUFA scale was validated per content.

DISCUSSION

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In the evaluation presented by the judges, after the three refinement steps, all the parameters evaluated for the percentage of 'I fully agree', 'IVC' and 'CVC' answers met the AUFA scale validation content both in global analysis and in scale items.

In this context, international studies stress the need to evaluate the type of product to be indicated, in addition to evaluating the material as reusable or disposable, to see what the product type is, whether it is with or without elastic, and observe the presence or absence of superabsorbent polymer. Absorbent products are available in different sizes and formats, with characteristics such as anatomical adaptation, odor tolerance and absorption capacity being described as the main factors for the analysis of their quality[9].

Thereafter, the prescription of the use of diapers and pads needs to be individualized, depending on the type of incontinence, the degree of mobility of the patient and the amount of diuresis. In addition, other important factors to be considered in the evaluation are the risk of developing pressure injuries, mixed incontinence (with association of urine and feces), acute states of polyuria, as well as the patient's cognitive status and the existence or not of family support[10]. However, in the literature there is not an instrument that all alone indicates the need for using these products[4].

The AUFA scale, therefore, started to be studied to assist in the indication of the use of diapers and pads as a care strategy according to its items. Therefore, it was suggested to remove the 'Product' item and to make this the focus of the scale through the indication of external devices (such as toilet bowls and bedpans), pads or diapers.

As for the frequency of changes, the request to improve organization in the first evaluation and the exclusion of it in two other evaluations was followed in order to avoid ambiguity. It became a shorter instrument, not requiring much time of practice to be filled out and capable of preserving satisfactory psychometric characteristics, avoiding ambiguity. With regards to the analysis of the scores, it is necessary to note that the higher scores on the scale reflect greater concerns with the indication. This permeates the entire instrument, following the analysis of the final score[11].

In skin condition, the request to change the nomenclature for skin integrity led to a better coverage when classifying items as "full", "hyperemia" and "ulcerated lesion". Most judges understood this classification as an important assessment when considering diaper prescription, in terms of a product to control incontinence, since the more vulnerable the skin is, the less indicated is the use of diapers due to the risk of worsening the condition[8].

In the item skin condition, the elderly person undergoes skin changes that reduce resistance to external aggressions, such as the presence of irritating substances, urine and feces. At the epidermis level, there is a thinning of its layers and cellular atrophy, decreasing even its capacity for renewal and the property of acting as a semipermeable barrier[11,12]. Thus, there is

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a need to assess these issues due to the vulnerability of the elderly individuals to skin disorders, being understood that the older the skin, the greater the risk implied in indicating the use of such devices. Therefore, the nomenclature of this item related to skin aging was changed.

As for the cognitive capacity variable, the request of the judges was to review the application of the 'Mini-Mental State Exam (MMSE) aiming to improve the applicability of the scale and reduce the use of multiple instruments for the evaluation of this item. Aiming at this facilitation and the use of practical expressions, the request for reviewing the use of MMSE scores in the assessment was adapted and items were changed to 'preserved', 'subjective memory complaint' and 'objective memory complaint'.

Cognitive ability is related to the process of acquiring knowledge (cognition). This involves several factors such as thinking, language, perception, memory and reasoning, which are part of intellectual development[13]. Such actions are self-organized, by means of assessing their suitability and efficiency in relation to the intended objective, in order to choose the most efficient strategies, thus solving immediate, and/or medium and long-term problems. The item 'cognitive capacity' fits into the evaluation of the use of diapers and pads as it involves, as an involuntary action, a process of thinking, reasoning, perceiving and memorizing, regarding the integration of behaviors.

Regarding motor skills, the request to change "activities of daily living" for only "hygiene" was not met. This is because the selection of the external urinary device, diaper or pads depends on the recognition of the need to urinate, to look for the right place where to do it and to be reached in a period good enough for retaining the urine until its voiding in the right place[14].

Elderly people who have acute and chronic health problems may experience a functional decline with a consequent loss of independence. One of the aspects of this functional competence is the ability to go to the bathroom independently. This ability is related to the motor capacity as there is a perception and decision-making to go to the bathroom, even in the presence of signs of urinary and/or fecal incontinence[15]. Therefore, it is more than merely personal hygiene and requires other strategies that depend on the motor capacity for their execution.

As for the 'Incontinence' variable, the request was reviewed and agreed upon. The individual evaluation of the fecal and urinary incontinence state was made in terms of it being 'absent', 'light', 'moderate' or 'severe', given that each of them represents different kinds of risk to patients wearing diapers.

There are different levels of prevalence of urinary and fecal incontinence, which leads to the needs of making individual evaluations. Besides, the bigger the loss of urine, the more adequate is the use of diapers, even in the absence of fecal incontinence. The same applies to fecal incontinence: even in the

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absence of urinary incontinence, if there is presence of fecal incontinence ranging from moderate to severe, the use of diapers is indicated[2]. Thus, a patient without urinary incontinence, yet with fecal incontinence, will be evaluated according to the scale and vice-versa.

This study was limited to validating the content applied to the elderly person and applying it to other clientele like adults, for example, will require further studies. Future research is expected to validate the criteria and construct, aiming to show the trustworthiness, consistence and reliability of the AUFA Scale and sustain its use in clinical practice.

CONCLUSION

By means of this study, it was possible to validate the content of the Evaluation Scale for the Use of Adult Diapers and Absorbent Products (AUFA SCALE), which is used for prescribing the use of these absorbent products for the elderly population. The "product" item was removed, as it was considered of interest to the final score of the scale. However, the items that were validated were "patient's/caregiver's preference", "number of changes", "skin integrity", "skin aging" "cognitive capacity", "motor capacity" and "incontinence".

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