ORIGINAL PAPERS

The photographic atlas of Spanish food consistency: a new tool for the treatment of dysphagia

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ABSTRACT

Introduction: dysphagia requires texture-modified foods and thickened liquids, which is difficult to explain to patients and caregivers.

Methods: an atlas has been developed and validated to explain the consistencies using the Likert scale questionnaire and the Delphi survey. The agreement and reliability of the tool were evaluated, with a minimum of 80%. The atlas was developed in Spanish.

Results: an agreement of 93.3% (95% CI: 63.7-100%) was obtained during the evaluation and a value of 97.5% and a Kappa index of 0.96 (95% CI: 0.93-0.99; p = 0.016] were obtained during the validation processes.

Conclusion: the atlas is a new valid tool that can be used by health professionals.

Key words: Atlas. Dysphagia. Deglutition disorders. Viscosity.

INTRODUCTION

Swallowing dysfunctions have a detrimental impact on the quality of life and may be responsible for severe complications (1,2). The treatment of dysphagia requires an assessment of the swallowing function and an evaluation of the type and consistency of the food to ensure adequate nutrition (3-6).

There are numerous international classifications for texture-modified foods and thickened fluids. However, there are currently no agreements with respect to the common terminology to enable the communication of treatment indications to patients and caregivers (7-9). Studies reveal that the same indications produce food consistencies that may differ from one hospital to another (10,11).

The purpose of this study was to develop a photographic atlas of food consistency using pictures and descriptions to perform nutritional interventions.

METHODS

A qualitative and quantitative, cross-sectional, two-phase observational study was performed. The first phase was an evaluation of the atlas design (Fig. 1) that was performed by 15 health professional. This was based on the international classifications of texture-modified foods and thickened liquids (7,8,12) using the Likert scale questionnaire and the Delphi survey. An agreement was reached regarding the subject matter (13) and a preliminary version of the atlas was developed. The atlas was validated by 22 caregivers and patients with dysphagia in a second phase. Subjects who had to alter the characteristics of food during their treatment were also included. Those with difficulties in comprehension were excluded. An understanding of the classifications and their concordance with the pictures in the atlas was sought.

Continuous variables were described as the mean with the SD and discrete variables are shown as percentages with the 95% CI. The percentage agreement of the answers was analyzed in order to evaluate the photographic tool, establishing an agreement of 80% as the minimum. For the external validation, each answer was compared to the gold standard established by the health professionals, using the full agreement and Cohen's kappa.

Ethical approval was obtained from the local board of health research ethical committee (REPIS N° 3262/3236). Participants and caregivers gave their assent and informed consent.

RESULTS

The atlas uses the names according to the international classifications (7,8,12) and pictures were taken by our research

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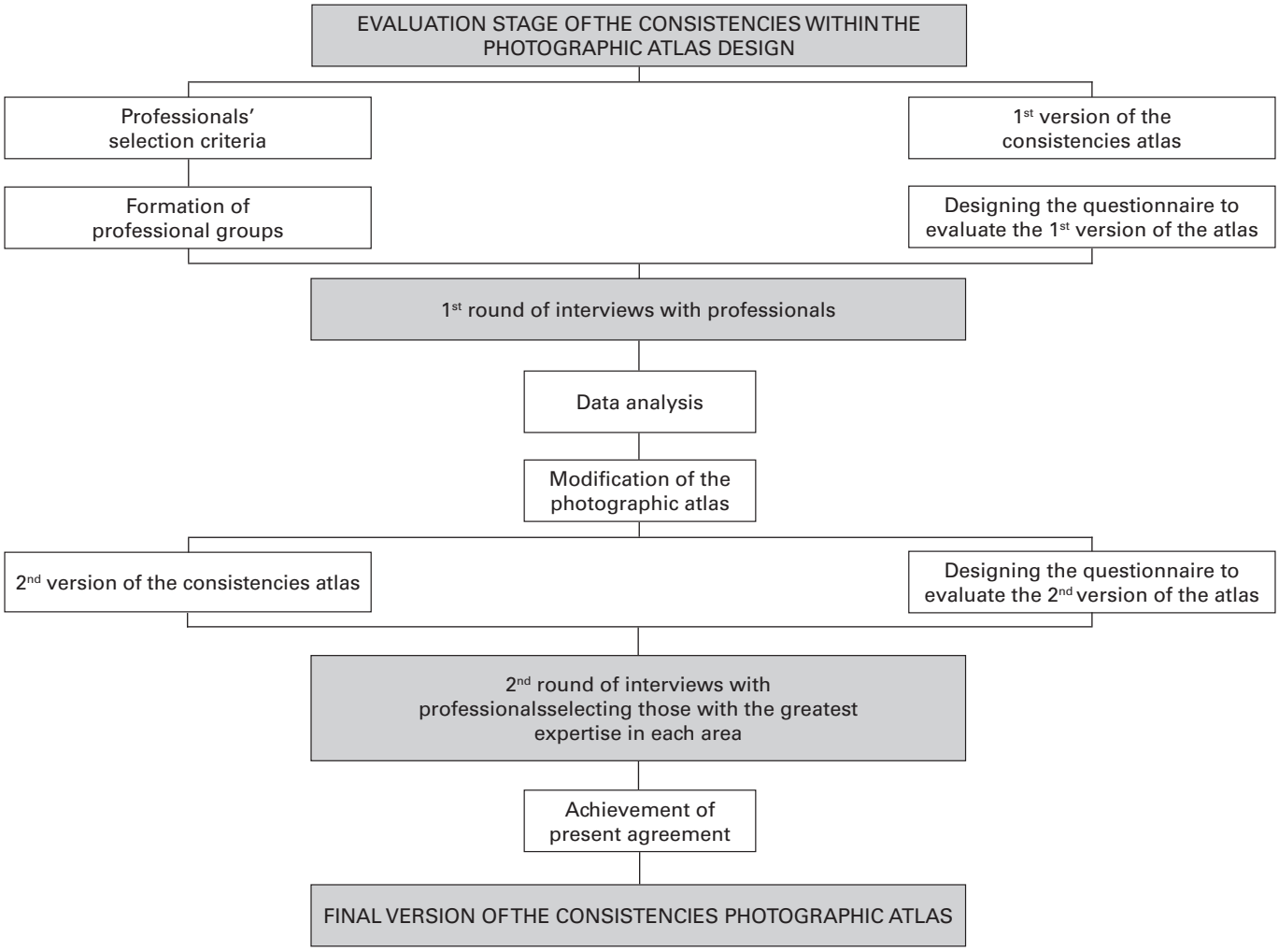

Fig. 1. *Design stage diagram of the food consistency atlas. Source: own design.*

group that represent each food texture and thickened liquid. These were supplemented by a short description of the consistencies, with examples (Fig. 2). The full photographic atlas is available at https://rdu.unc.edu.ar/handle/11086/11398.

Fifteen health professionals took part in the evaluation of the design of the atlas, including speech therapists, occupational therapists, dietitians, physiotherapists, gastroenterologists and physicians. They were aged from 30 to 69 years and all were renowned for their expertise in the treatment of dysphagia. Scores were allocated on the Likert scale based on the interviews held by the health professionals. Based on these, summary measures of the score and agreement percentages were calculated for each consistency (Table 1). After the two rounds, the final version of the atlas obtained agreement percentages greater than 90% for each consistency and the design stage was finalized. Twenty-two participants were surveyed in order to validate the atlas, this included nine patients and 13 caregivers. The responses from both rounds were analyzed against the gold standard established by the professionals. A concordance percentage of 97.52% was obtained and a Kappa index of 0.96 (95% CI: 0.93-0.99), which was considered as an almost perfect agreement.

DISCUSSION

To the best of our knowledge, this is the first tool based on the international classifications of food consistencies (7,8,12) in Spanish. This tool illustrates the modifications of texture-modified foods and thickened liquids required for the treatment of dysphagia, with clinical and research purposes. Our study made reference to the procedures for the design and validation that were used in the development of other classification systems related to swallowing difficulties (7,8). This was also based on international classifications such as the National Dysphagia Diet NDD (12). A broad range of terminology from this classification has been included as professionals regularly use this, in particular those related to thickened liquids. Nevertheless, terms more closely related to Spanish usage were also included, as well as the CentiPoise measurements in order to give more objectivity to the terms.

Fig. 2. *Pictures extracted from the photographic atlas of food consistency.*

Table 1. *Summary of the evaluation stage of the consistencies within the photographic atlas design*

Consistencies	n	Mean	95% CI	SD	Min	Max	% of agreement	95% CI
1st round								
Solid-firm	15	4.08	3.84-4.32	1.04	1	5	*81.66*	71.04-89.66
Minced	15	4.48	4.31-4.66	0.68	2	5	*89.66*	79.07-96.03
Mixed textures	15	4.13	3.91-4.36	0.98	1	5	*82.66*	72.18-90.43
Slippery textures	15	3.73	3.42-4.04	1.35	1	5	*74.66*	63.30-84.00
Sticky foods	15	3.92	3.63-4.20	1.09	1	5	*78.33*	65.80-87.93
Blended food	15	4.62	4.49-4.74	0.49	4	5	*92.33*	82.47-97.61
Soft	15	4.08	3.85-4.32	0.91	1	5	*83*	71.09-91.46
Pureed	15	4.44	4.25-4.63	0.81	1	5	*88.88*	79.50-94.97
Nectar like	15	4.55	4.36-4.74	0.75	1	5	*91*	80.76-96.85
Honey like	15	4.20	3.93-4.47	1.04	1	5	*84*	72.25-92.19
Pudding like	15	4.07	3.74-4.39	1.26	1	5	*81.33*	69.18-90.22
2nd round								
Solid-firm	3	4.87	4.67-5.06	0.35	4	5	*97.30*	73.79-99.99
Option of solid-firm: minced	3	5.00	5.00-5.00	0.00	5	5	*100*	73.54-100
Blended food	3	4.83	4.47-5.20	0.58	3	5	*96.67*	68.36-99.99
Soft	3	4.83	4.47-5.20	0.58	3	5	*96.67*	68.36-99.99
Pureed	3	5.00	5.00-5.00	0.00	5	5	*100*	78.2-100
Sticky foods	3	4.67	4.35-4.98	0.49	4	5	*93.3*	63.66-99.92
Slippery textures	3	5.00	5.00-5.00	0.00	5	5	*100*	78.2-100
Mixed textures	3	5.00	5.00 - 5.00	0.00	5	5	*100*	78.2-100
Nectar or syrup (slightly thick)	3	5.00	5.00-5.00	0.00	5	5	*100*	73.54-100
Honey or creamy (moderately thick)	3	4.67	4.35-4.98	0.49	4	5	*93.3*	63.66-99.92
Pudding (extremely thick)	3	5.00	5.00-5.00	0.00	5	5	*100*	73.54-100

As the NDD classification does not offer a broad variety of food texture, this was supplemented with more recent classification systems, such as the Sistema de Clasificación de las Habilidades para Comer y Beber (EDACS) and the International Dysphagia Diet Standardisation Initiative (IDDSI) (7,8).

The main advantage of our atlas is that it incorporates pictures, examples and brief explanations of the texture-modified food and thickened liquids. This is presented in an understandable language for both professionals and patients, making it a useful tool for the clinical practice and research.

Even though the photographic atlas registered good validation results, some cases of disagreement were found between professionals and participants. Similar findings were reported in the development of EDACS (8). Thus, this atlas is only intended to be used by professionals and should not be considered as a food self-prescription instrument for patients.

The modified texture of food in terms of size, viscosity and consistency is one of the most frequent approaches used to treat dysphagia. However, the fulfillment of the indications by patients and caregivers appears to be affected, as they are no clearly understood. Furthermore, it has been shown that an exclusively oral explication makes it harder to adhere to guidelines (14). Given these difficulties, the most widely used strategies to improve adherence to the indications of texture-modified food and thickened liquids by patients and caregivers are education and participation (6). Lund et al. suggest that the use of simple visualization tools is important for training people with dysphagia and caregivers (15). The use of a photographic atlas as a tool to complement verbal indications will help to promote safer oral ingestion for patients with dysphagia and also to reduce stress.

One potential limitation of this study could be the fact that is was based in only one country. To avoid the possible use of local terminology, the tool has attempted to focus on the texture-modified foods and their pictures and not on cultural aspects. The photographic atlas is a useful tool for health professionals, allowing them to indicate culturally appropriate food for each context.

On the other hand, one of the main strengths of our study was the rigorous methodology implemented for the construction and validation of the tool, which was based on the guidelines used in multiple international research projects.

In conclusion, this study has made the design, review, reformulation and validation possible of a photographic atlas as a new tool in the treatment of dysphagia. Thus, patients and caregivers can better and more clearly understand the indications of health professionals related to food.

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