

CONSTRUCTION AND VALIDATION OF AN EDUCATIONAL BOOKLET ON SUPPLEMENTARY INFANT FEEDING

CONSTRUCCIÓN Y VALIDACIÓN DE CARPETA EDUCATIVA SOBRE ALIMENTACIÓN INFANTIL SUPLEMENTARIA

CONSTRUÇÃO E VALIDAÇÃO DE UMA CARTILHA EDUCATIVA SOBRE A ALIMENTAÇÃO COMPLEMENTAR DE LACTENTES

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ABSTRACT

Objective: To develop an educational booklet on supplementary feeding for infants under one year of age. **Methods**: A methodological study was carried out from 2015 to 2017 in three stages: construction of the booklet based on manuals from the Ministry of Health, validation by experts, and clinical validation with pre- and post-tests in two groups (control and intervention) with 15 participants each. **Results**: Six manuals were selected to compose the booklet's content, which was built with eight sub-themes and entitled "How to feed your baby? Follow the tips of the health gang!". Following the validation by experts, improvements were made to the content and revision of concepts and images. In the clinical validation, the control group decreased, and the intervention group increased the mean of correct answers on the questionnaires. **Final considerations**: The booklet reached effectiveness and proved to be attractive and dynamic, with positive validation by experts and clinical validation.

Keywords: Infant; Infant Nutrition; Growth and Development; Technology; Nursing.

RESUMEN

Objetivo: elaborar una cartilla educativa sobre alimentación complementaria para lactantes menores de un año. **Métodos:** estudio metodológico realizado de 2015 a 2017 en tres etapas: construcción de la cartilla con base en manuales del Ministerio de Salud, validación por expertos y validación clínica con pre y post test en dos grupos (control e intervención) con 15 participantes cada uno. **Resultados:** se seleccionaron seis manuales para componer el contenido de la cartilla, que se construyó con ocho subtemas y se tituló "¿Cómo alimentar a tu bebé? ¡Sigue los consejos de la pandilla de la salud!". En la validación con jueces se realizaron mejoras en el contenido y revisión de conceptos e imágenes. En la validación clínica, el grupo de control tuvo una disminución en la media de respuestas correctas en los cuestionarios y el grupo de intervención tuvo un aumento. **Consideraciones finales:** el cuadernillo alcanzó efectividad, se mostró atractivo y dinámico con validación positiva por parte de jueces y clínica.

RESUMO

Objetivo: Desenvolver uma cartilha educativa sobre alimentação complementar de lactentes menores de um ano. **Métodos**: Estudo metodológico realizado de 2015 a 2017 em três etapas: construção da cartilha baseada em manuais do Ministério da Saúde, validação por especialistas e validação clínica com pré e pós-testes em dois grupos (controle e intervenção) com 15 participantes cada. **Resultados**: Foram selecionados seis manuais para compor o conteúdo da cartilha que foi construída com oito subtemas e intitulada "Como alimentar seu bebê? Siga as dicas da turminha da saúde!". Na validação com juízes realizaram-se aprimoramentos de conteúdo e revisão de conceitos e imagens. Na validação clínica, o grupo controle teve diminuição na média de acertos dos questionários e o grupo intervenção obteve um aumento. **Considerações finais**: A cartilha alcançou a efetividade, se mostrou atrativa e dinâmica com validação por juízes e clínica positivas.

Palavras-chave: Lactente; Nutrição Infantil; Crescimento e Desenvolvimento; Tecnologia; Enfermagem.



INTRODUCTION

Feeding in the first months of life is an extremely important factor, as it is at this stage that the greatest changes related to the growth and development of the infant occur, given that nutritional conditions influence the child's health status⁽¹⁻³⁾.

Thus, the World Health Organization (WHO) and the Brazilian Ministry of Health recommend exclusive breastfeeding (EBF) in the first six months of life. After this period, they suggest that the implementation of supplementary feeding (SF) together with breastfeeding (BF), which should last up to two years of life^(4,5).

Studies show that children alone cannot reach their full development, requiring stimulation and support from caregivers⁽⁶⁾. From this perspective, the figure of the family has an important impact on the construction and maintenance of infants' food quality. This is justified by the influence of the family's eating habits in the construction of preferences established by developing the child's taste⁽⁵⁾.

However, a negative factor is the lack of knowledge of guardians and family members about how to proceed with SF. In this sense, the doubts and difficulties presented in the face of the complexity of the various variables that involve SF are many. They range from the lack of information about the types/groups of food that should compose the vegetable baby food, passing through the limited financial access to these foods and the low level of education of the mother or the unpreparedness/disinterest of health professionals in the guidelines provided during consultations^(7,8).

According to the Brazilian Ministry of Health, it is estimated that 47 to 65% of children do not consume a diet that meets current recommendations for foods or nutrients^(4,8). Corroborating this, in a recent study carried out in two primary care units in Northeastern Brazil, it was found that about 37% of the monitored children had inadequate nutritional levels, were malnourished, overweight, or obese⁽⁹⁾.

Given the complexity of this issue, numerous strategies have been implemented to improve the quality of child nutritional healthcare⁽¹⁰⁾. In this aspect, the construction of technologies involving the use of instruments, norms, and equipment is configured as a preponderant factor in educating and guiding. Examples include materials used for feeding education: videos, posters, leaflets, pamphlets, folders, serial albums, and booklets^(11,12).

From this perspective, the booklet is an appropriate instrument to assist parents, family, students, and health professionals providing care and continuing educational activities on child care. This material constitutes an informative and scientific subsidy, which may be essential for the most efficient practice of possible nursing interventions, contributing to the adherence to adequate sumplementary feeding, becoming an important factor in preventing early obesity or malnutrition in this clientele⁽¹³⁾.

Given the above, the present research aimed to develop an educational booklet on



supplementary feeding for infants under one year of age.

METHODS

A methodological study was carried out in two primary health care units (PHCU) located in the urban area of Redenção, Ceará. The study involved three stages: construction of the booklet, validation by experts, and clinical validation.

First stage: Construction of the booklet

This stage took place between May and October 2015. First, a bibliographic survey was restricted to the analysis of manuals from the Brazilian Ministry of Health that addressed the topic under study.

Subsequently, a critical reading of the selected material was carried out, and summaries were prepared for the composition of the content. Thus, the content was structured in the following items: care and guidance about the breastfeeding period; determining factors in the transition period to supplementary feeding; characterization of supplementary feeding (choice of food, frequency of meals, and consistencies); care in the preparation and storage of food at all times of preparation (before, during, and after); and structuring and exemplification of menus with supplementary foods.

Finally, the illustrations were planned, chosen, and made. The researchers initially designed Figures and drawings and then sent them to a professional in manual drawings. After that, the drawings were scanned, edited, and attached to the booklet.

Second stage: Validation by experts

The educational booklet was submitted to the sieve of nurse experts, between November 2015 and February 2016, for judgment on appearance, clarity, content, language, and of the information objectivity and figures/drawings. The sample was established by convenience, and the following inclusion criteria were used: being a nurse with a masters' or doctor degree, having experience in nursing care, or having experience in teaching child healthcare courses. The search for experts was carried out using the Lattes platform and electronic addresses of several undergraduate nursing programs in Brazil.

It is noteworthy that, at this stage, it is necessary to recruit a minimum of three experts, with a number greater than ten being considered unnecessary⁽¹⁵⁾. Another important point is to select an odd number to avoid tied evaluations⁽¹⁶⁾. Fifteen nurses were recruited for the study considering possible sample losses and to enhance the research processes.

Invitation letters were sent through electronic e-mail, clarifying the research objectives. Then, after the nurse's acceptance, the following materials were sent: an informed consent form (ICF), a guide with instructions for completing and returning the material within 30 days, an instrument for the personal and professional characterization of the experts, and an instrument of evaluation regarding the



validation criteria of the booklet, adapted from another study⁽¹⁷⁾. The latter presented explanations on how the experts should proceed in the evaluation.

The experts' answers to the questions related to the eight sub-themes were listed at the following levels: very low level of agreement (grade 1), low level of agreement (grade 2), moderate level of agreement (grade 3), high level of agreement (grade 4), and very high level of agreement (grade 5). plus recommendations/suggestions, when applicable. Nevertheless, the experts were invited to give an overall score for the booklet, ranging from 0 to 10. For positive evaluation purposes, the booklet should have an average greater than or equal to 7.

Third stage: Clinical validation

This last stage, which took place from February to August 2017, was based on two evaluation groups: Control Group (CG) and Intervention Group (IG). A convenience sample was recruited, using the spontaneous demand at the PHCU. The following inclusion criteria were considered: being a mother or guardian of an infant under 12 months of age and having an infant under the follow up of Child Health services of one of the PHCUs investigated. As exclusion criteria, mothers/guardians who could not read or had visual impairments that prevented them from reading were excluded.

The establishment of each group was carried out randomly, whereby all participants had the same chance of being included in any group through simple random sampling⁽¹⁸⁾. Fifteen participants were recruited to each group, totaling 30 mothers/guardians.

The data collection was carried out in two moments. In the first, in both groups, an identification form was used that requested some socioeconomic and dietary information about the infant and his/her family and a pre-test questionnaire that contained 10 multiple-choice questions (A, B, C, and D) about SF was used, including information about food fractions, schedules. food insertion. consistencies. preparation, and conservation methods. After that, only the mothers/guardians in the IG received the booklets to read at their homes, and the researchers' telephone contact was provided to clarify any respondents' doubts during the reading procedure. The date and time for the call to be made in the second moment of the research were previously agreed upon with each participant of both groups so that their daily activities and tasks were not interrupted.

After one month, the post-test was applied using the same questionnaire as in the first moment in both groups to assess knowledge. At the end of it, each mother of the IG was invited to evaluate the booklet regarding the following items: appearance (drawings and layout), objective (quantity of objectives and learning motivation), and quantity of information (texts, quantity of information, and number of pages), according to the previously constructed instrument. The application of the post-test was carried out through telephone calls, a method that has been used in recent years with



satisfactory results⁽¹⁹⁾. The average duration of calls was 15 minutes and 30 seconds.

The knowledge of mothers/guardians was considered adequate if a minimum score of 7 points was achieved and inadequate if it was lower than 7, with a possible range from 0 to 10 points. For the validation of the booklet, it was expected that at least 75% of the mothers would score a minimum of 7 points in the post-test and agree on positive responses in the booklet's writing style, appearance, motivation, and importance, which is a standard established by the literature⁽¹⁸⁾.

Data were compiled in Excel 2013, analyzed using SPSS 20.0, and presented using descriptive statistics containing measures of central tendency (mean, mode, and median) and absolute frequencies.

The study was approved by the Research Ethics Committee of the University of International Integration of Afro-Brazilian Lusophony (UNILAB) with opinion number 1,183,892, respecting the ethical precepts of Resolution No. 466/12.

RESULTS

First stage: Construction of the booklet

Seventeen materials were analyzed, including technical manuals, guides, and booklets, exclusively from the Brazilian Ministry of Health, as they are validated materials with a complete and reliable theoretical framework. The above materials were screened by their titles. Then, after reading the sections and subthemes of each material, 11 were excluded, and the others subsidized the construction of the educational booklet's content.

The educational booklet was entitled "How to feed your baby? Follow the tips of the health gang!". To this end, texts and drawings were prepared to compose the booklet. The division by pages was made, and each page had illustrative drawings corresponding to the speeches of each character, which were identified by dialog balloons. In order to draw the attention of the target audience, three fictional characters were created. whose characteristics were the figure of a nurse, a cook, and fruits/vegetables, being a watermelon, a pineapple, and the last a carrot, characterizing the "health gang".

The development of the booklet took place through explanations given by the "health gang" to a mother of an infant. We tried to use language accessible to the target audience. During the explanations, schemes illustrating care related to all stages, from food preparation to menu suggestions according to the infant's age group, also emerged. In addition, two sections named "TIP!!!" were created, in which there were guidelines for the mothers and the other, as "IMPORTANT!", which contained the most relevant information to complement the dialogue of the page on which it was located.

The beginning of the construction of the booklet took place through the elaboration of informative and explanatory texts. From this, descriptions of images were prepared to illustrate each page, and a professional specialist in drawings was asked to create the images. Some



images were repeated as they sought to illustrate the same expressions. It is noteworthy that we sought to develop a colorful and dynamic pagination layout to enhance the adherence to the booklet by mothers/caregivers. Didactically, the booklet was divided into eight sub-themes (Table 1). There was a variation in the number of pages for each subtheme. The total number of pages was 25, except for the front and back cover.

Table 1 - Sub-themes of the booklet, its contents, and diagramming of the sub-themes, Redenção, Brazil,2016

SUBTHEMES	CONTENT / INFORMATION ADDRESSED	FIRST PAGE DIAGRAM OF EACH SUBTHEME
1 - Importance of breastfeeding	 Benefits of BF; Importance of exclusive breastfeeding for up to six months; Need to incorporate other foods after six months. 	HILD MERICE MERICE
2 - Characteristics of supplementary feeding	 Definition of SF; The BF must continue until at least two years; Initial refusal of supplementary foods as something common; Provision of colorful food for the child; Evolution of baby food consistencies; Use of salt only when necessary and in moderation; Importance of choosing foods from all food groups with portions according to the type of food in the group; Quantity of daily meals according to the infant's age; Importance of offering breast milk in free demand. 	PÁGINA 1
3 – Precautions before preparing meals	 Correct cleaning of hands, food, kitchen utensils, and food preparation surfaces; Healthy conditions of the food preparation environment (avoiding insects and animals). 	Image: A set of a

PÁGINA 9



4 - Care during meal preparation	 Cleanliness of the hands and nails of those who prepare the meals; Warning against wearing ornaments (rings, earrings, and bracelets), smoking, sneezing, or coughing near food, and the need to keep the hair tied. Fruit porridge: importance of varying types, not mixing fruits, and not replacing them with juices; Vegetable porridge (salted): importance of using all food groups, and replacing salt with natural seasonings; For both types of porridge, do not use the blender.
5 – Food storage	 Store food in properly sanitized warehouses and in the refrigerator; Avoid offering food that has been prepared for a long time.
6 – Care when serving meals	 Use spoons, plates, and cups instead of baby bottles; Encouraging the creation of a bond when giving meals; Encouraging the development of fine motor skills by encouraging autonomy in eating.
7 – After-meal care	 Correct hygiene and storage of utensils used to make and serve food; Proper cleaning of the child's oral cavity.
8 – Suggested menus for breastfed children	 Menu 1: breastfed children from 6 to 7 months. Menu 2: breastfed children aged 8 to 12 months, with suggestions of foods that can be prepared and the most appropriate times to serve them; Information and observations about the menus.



PÁGINA 13





Source: Authors' database.

It is worth mentioning that, during the construction of the booklet, we felt the need to address some guidelines for cases in which weaning from breast milk occurred before the period recommended by the Brazilian Ministry of Health.

Second stage: Validation by experts

Five experts participated in this stage. It was observed that all the evaluators were female, had PhD degrees in nursing, and were nursing professors. Of these, two had experience in



teaching subjects related to child health, had masters' and doctor degrees on child healthcare and research experience related to child health in different age groups. The others had experience and studies related to primary care, and the last one has research on systems of nursing diagnoses and taxonomies.

The average score of the experts was 8.7 points. The following general considerations were made: "Some parts of the booklet have much text. The more figures, the more attractive it will be [...]"; "It is very interesting and practical. I suggest a few changes to the images"; "some engravings and amount of text can be resized" and "in terms of appearance, [...] I think the figures could be more attractive [...]. I found the booklet a little long [...]".

In all sub-themes, changes were made that contributed to improving the educational material. In the final version, for printing, the booklet was composed of 26 pages, including the cover, the back cover, the references page, and the credits and support page. One page was eliminated, and two were summarized and gathered in one.

Third stage: Clinical validation

At this stage, the characteristics of infants in both groups were identified. In the CG, 53.3% (8) were male, and in the IG, 60% (9) were female.

Regarding the ages of the infants and the dietary profile in the pre-test, in the CG, 26.7% of the children were older than six months and were in SF; 73.3% were less than six months old.

Of these, only 36.3% were on EBF. In the posttest, 66.7% were older than six months and were in SF, 33.3% were younger than six months, and only 6.7% of the infants were on EBF.

In the pre-test in the IG, 26.7% of the children were older than six months; 73.3% were less than six months old. Of these, only 45.5% were on EBF. In the post-test, 32.3% were older than six months; 67.7% were less than six months old. Of these, 40% were on EBF.

All guardians were female in both groups, and mothers were the predominant family members selected, 86.7% in the CG and 80% in the IG. The remaining family members in the CG were grandparents (13.3%), and in the IG, aunts (13.3%) and grandmothers (6.7%).

Regarding the education level, in the CG, the mean was 10.73 years (\pm 1.67), ranging from 7 to 14 years. The mean education level in the IG was 11.77 years (\pm 2.7), ranging from 8 to 17 years.

Concerning marital status, in the CG, 73.3% were married or in a stable relationship, and 26.7% were single. In the IG, 53.3% were married or in a stable relationship, 40% were single, and 6.6% were widowed.

Concerning monthly income, the analysis by minimum wages was considered, referring to the value established in Brazil, which during the study period was BRL 937. In the CG, 53.3% had a monthly income of 1 minimum wage or less, the average income of the group was $1034.87 (\pm 613.71)$ reais, ranging between BRL 100 and 2000. In the IG, 66.7% had an income of 1 minimum wage, the average income was



BRL 1,667.73 (±1,322.34), ranging from BRL 624 to 5,000.

Concerning the assessment of the level of knowledge carried out in the pre-test, the CG had an average of 5.67 (\pm 1.95), ranging from 1 to 7 points, and in the IG, the average was 6 (\pm 2.04), ranging from 2 to 10.

The CG achieved a mean score of 5.6 (± 1.84) in the post-test, ranging from 2 to 8 points. Regarding the comparative analysis of the scores, there was an increase, support, and reduction of correct answers with equal distribution, corresponding to 33.3% in each

situation. The biggest decrease was 4 points, and the biggest increase was 3 points.

The IG had a mean of 7 points (± 1.81), ranging from 3 to 10. None of the participants had fewer correct answers in the post-test than in the pre-test, with 73.3% increasing their grades (the highest increase was 3 points), and 26.7% maintained the number of points. Still, 75% of the mothers scored 7 points or more in the posttest.

Table 2 - Assessment of	of mothers/guardians	regarding	writing	style,	appearance,	motivation,	and
importance of the booklet	by the IG, Redenção,	Brazil, 2017					

EVALUATED ITEM	FREQUENCY	%	95% CI ¹
WRITING STYLE			
Understanding of phrases			
Easy	15	100.0	100% - 100%
Difficult	0	0.0	-
Written content			
Clear	15	100.0	100% - 100%
Confuse	0	0.0	-
Is the text interesting?			
Yes	15	100.0	100% - 100%
No	0	0.0	-
APPEARANCE			
Illustrations			
Simple	15	100.0	100% - 100%
Complicated	0	0.0	-
Do the illustrations complement the			
text?	14	93.3	68.1% - 99.8%
Yes	0	0.0	-
No	1	6.7	0.2% - 31.9%
I don't know			
Organization of pages			
Well organized	15	100.0	100% - 100%



Poorly organized	0	0.0	-
MOTIVATION AND IMPORTANCE			
Would any mother who reads the			
booklet understand what it is about?			
Yes	15	100.0	100% - 100%
No	0	0.0	-
Did you feel motivated to read the			
booklet to the end?			
Yes	14	93.3	68.1% - 99.8%
No	0	0.0	-
I don't know	1	6.7	0.2% - 31.9%
Are the necessary issues related to			
infant feeding addressed? Yes			
No	14	93.3	68.1% - 99.8%
140	14	6.7	0.2% - 31.9%
Did the material make you reflect or	1	0.7	0.270 - 51.970
change the way you act about infant			
feeding?			
Yes			
No	14	93.3	68.1% - 99.8%
	1	6.7	0.2% - 31.9%
Could the booklet be used to assist the	_		
child healthcare consultation?			
Yes			
No	15	100.0	100% - 100%
	0	0.0	-

Source: Authors' database. ¹95% Confidence Interval.

For the booklet to achieve the objectives of promoting health education, it was necessary to go through some steps until reaching the efficient final product. This involved the elaboration through a selection of specific choice of illustrations, contents. content composition, appreciation by proficient professionals in the area, and clinical application, constituting the validation of the material in the proposed clinical care environment⁽¹³⁾.

Added to the above, the development of the booklet comprised a clear and accessible language for the intended public, an instrument aimed at understanding them. In this context, the implementation of textual and illustrative resources is valid to facilitate the transfer of material information to the reader⁽²⁰⁾.

Under the aegis of instrument validation, the purpose of adopting this practice is to give greater credibility to the material intended for investigations or clinical practice. Regarding the validation of this booklet on SF, it is intended to use in the nurse's consultation to implement changes in the child and their family's lifestyle during the transition from EBF to SF combined with $BF^{(21)}$.

A study on the validation of a booklet for the implementation of SF showed an agreement rate among experts of 92.29% on the booklet's proposed objective. Subsequently, the authors obtained 91.44% agreement on the structuring and presentation of the instrument created. Finally, the study showed that 95% of the experts found that the material was relevant⁽²²⁾.

The validation of the educational booklet in the clinical environment is important because it represents an evaluation of the material by the target audience (mothers or guardians of infants) interested in the content. Therefore, this clientele evaluated the material, including content organization, structure systematization, writing style (language) considering the understanding of sentences and the clarity of texts, appearance, and effectiveness of the images and the design of the pages⁽¹³⁻¹⁴⁾.

In general, in both groups, there was a predominance of infants who were not on EBF before 6 months and those who were not even on BF, regardless of age group. In this context, the Second Survey on Prevalence of Breastfeeding in the Brazilian Capitals and the Federal District highlights that 22% and 26% of children under six months already consume vegetable porridge (or salted) and fruit porridge, respectively^(23,24,1).

These data reinforce the importance of our research. It is known that breast milk for up to six months has all the nutrients necessary for the infant's development. However, when interrupted before what is recommended or in situations in which BF is not available, even if supplemented, there may be damage to the health of children expressed in greater vulnerability to co-morbidities, diseases, and developmental delays.

From this point of view, when starting the introduction of food after six months of the child's life, the family promotes the child's growth and development, since BF will not be able to provide all the nutritional support necessary to create healthy habits⁽²⁵⁾. In this sense, booklets such as the one developed in this study can help maintain healthy habits that are important for the infant's health.

The predominant caregivers were the mothers, and the mother-infant interaction was considered important for the construction of eating habits. Children, due to their biological immaturity, depend on others to feed themselves, and the lack of stimulation can impair the infant's adaptation to a new diet⁽²⁶⁾.

Despite the level of education of the IG being higher than that of the CG, it is observed that in both groups, the mean education level was greater than eight years, with little difference between the groups. This fact is seen as a protective factor, and none of the groups benefited as a higher level of knowledge was expected. Therefore, none of the groups had a low level of knowledge and instruction that could be factors leading to poor child nutrition and difficulties on the evaluation of the educational material^(24,27).

A slightly higher monthly income was observed in the IG. Income is a factor that can be protective of the child's nutrition or configure a socioeconomic vulnerability that can have



profound influences on the SF process⁽²⁸⁾. In addition, this difference between the groups, even if small, may have caused interferences in the assessment.

There was a greater number of single guardians in the IG, which is configured as a harmful factor that negatively interferes with SF⁽²⁹⁾. However, the results after the educational booklet intervention showed that this group stood out and that the evaluation may not have suffered interferences from the socioeconomic status.

In the pre-test, knowledge in both groups was considered inadequate. In the post-test, the CG remained with inadequate knowledge, and the IG achieved an adequate knowledge. These results show that the booklet may have contributed to improving knowledge. In addition, validation by the target audience was obtained considering that most items had an agreement equal to or greater than the cutoff expected.

A similar study showed improvements in the SF process of infants with the support of an educational material providing positive changes in habits and lifestyle when used by the target audience. In this study, the level of agreement was also higher than 75% concerning the organization, writing style, appearance, and motivation. However, despite obtaining an considered agreement rate good, some modifications were suggested to the authors to make the reading more $clear^{(30)}$, unlike this study implementations/changes where were not suggested after the validation by the target audience.

FINAL CONSIDERATIONS

It was possible to develop an educational booklet on supplementary feeding for infants with validation by experts and clinical validation by the target audience. In both validations, the educational material was considered an important contribution to better targeting care related to infant feeding, with attractive and dynamic potential on the subject.

The present study may contribute to health education activities aimed at mothers/guardians of infants, which may direct and systematize the actions carried out by health professionals, especially nurses in nursing/childcare consultations, teaching the target audience about infant feeding. It is also noteworthy that supplementary feeding is relevant for health promotion and adequate child development.

The main limitations of the study are the small sample size of children/parents/guardians in the clinical validation stage, and the nonapplication of inferential statistics.

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