

Elaboration and validation of printed educational material on the use of insulin pens

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Abstract

Objectives: To develop and validate printed educational material (PEM) on the use of fast-acting and long-acting insulin analogue pens with users who have Diabetes Mellitus (DM) and professionals with expertise in care. **Methods:** We carried out a study descriptive, from June to November 2021, in three stages: exploratory research and material construction, validation with professionals and users. The exploratory research was carried out with users through a questionnaire, the validation with professionals was carried out using the Suitability Assessment of Materials – SAM tool and in the validation with users a tool based on the Doak method was used. Research approved by the Ethics Committee under opinion nº 44126821.2.0000.5312. **Results:** The exploratory research was carried out with 15 users to understand expectations regarding the PEM. Aspects related to the use of pens (application, storage, handling, needles) were reported. Most users wanted the prepared material to be in folder/leaflet format (n=9), followed by video (n=6) and with illustrations (n=13). From this analysis, the PEM was elaborated. Thirteen pharmacists performed the validation and the average training time was 11.6 years, with 46.1% working in public pharmacy. The SAM tool obtained 92.0% agreement. Ten people validated the PEM, being 80.0% women and with an average age of 40.5 years and having completed high school education (40.0%). As for the time and type of diagnosis, the mean value in years was 18.3, with DM1 being the most prevalent (70%). The average time of use of insulin pens was 9.8 years. The Doak questionnaire was applied and the result of users' agreement in each method domain was high, except for the comprehension domain. **Conclusions:** The acceptance of the PEM was high and proved to be an adequate tool for the practice of health education.

Keywords: Validation study; Diabetes mellitus; Teaching Materials.

Elaboração e validação de material educativo impresso sobre a utilização das canetas de insulina

Resumo

Objetivos: Elaborar e validar um material educativo impresso (MEI) sobre o uso das canetas de insulina análogas de ação rápida e de ação prolongada com usuários que possuam Diabetes Mellito (DM) e profissionais com expertise na área. **Métodos:** Foi realizado um estudo entre junho e novembro de 2021 em três etapas: (i) pesquisa exploratória, (ii) construção do material, (ii) validação com profissionais e usuários. A pesquisa exploratória foi realizada com usuários através de um questionário contendo perguntas abertas para compreensão das expectativas em relação ao MEI. O MEI foi construído com base nas orientações da literatura especializada e documentos de sociedades científicas. A validação com profissionais foi realizada através do instrumento *Suitability Assessment of Materials* – SAM. Na validação com usuários foi utilizado o instrumento baseado no método Doak. A pesquisa foi aprovada por Comitê de Ética sob parecer nº 44126821.2.0000.5312. **Resultados:** Quinze usuários participaram da pesquisa exploratória. Aspectos relacionados ao uso das canetas (aplicação, armazenamento, manuseio, agulhas) foram relatados. A maioria dos usuários desejava que o material elaborado fosse em formato de folder/panfleto (n=9), seguido de vídeo (n=6) e com ilustrações (n=13). A partir dessa análise, o MEI foi elaborado. Treze farmacêuticos realizaram a validação do MEI, obtendo-se 92,0% de concordância. Dez usuários validaram o MEI. O resultado de concordância dos usuários em cada domínio do método foi alto, com exceção do domínio de compreensão. **Conclusões:** A aceitação do MEI foi alta e se mostrou um recurso adequado e com potencial positivo para a prática da educação em saúde.

Palavras-chave: Estudo de Validação; Diabetes Mellitus; Materiais de Ensino.



Introduction

Diabetes Mellitus (DM) is a chronic condition considered a serious Public Health problem. It is defined as a heterogeneous group of metabolic disorders, mainly characterized by persistent hyperglycemia due to defects in insulin action and/or secretion¹. In the long term, if not controlled, DM can cause serious complications such as retinopathy, nephropathy or neuropathy, among other clinical conditions². In 2019, it was estimated that 9.3% of the world population (Confidence Interval – 95% CI: 7.4-12.1) aged between 20 and 79 years old lived with DM. In Brazil, the scenario is also worrying, affecting 16.5 million Brazilians and ranking first among Latin American countries in incidence of the disease².

There are countless DM classifications defined by clinical guidelines. The most common and prevalent ones are as follows: Type 1 DM, Type 2 DM and Gestational DM^{1,3}. Type 1 DM is more common in children and adolescents, with abrupt clinical presentation and requiring full insulin therapy immediately after diagnosis, unlike type 2 DM, which is more common in the adult population and is oftentimes associated with obesity and aging, with insidious onset¹.

For being a chronic condition, there is a need for non-pharmacological interventions, such as adapting eating habits and regular physical exercise, as well as of pharmacological interventions consisting in using oral or injectable hypoglycemic agents and insulin therapy¹. Such approaches should be carried out continuously and will help control the disease, reduce morbidity and mortality and improve people's quality of life⁴.

Despite the patients' resistance to accepting insulin therapy, it is one of the pillars in controlling the disease⁵. Pens for administering insulin have become very popular nowadays, having some advantages over syringes. The availability of shorter needles, practical handling and transport, added to the ability to record even and odd doses and also the administration possibility every half insulin unit, provide better social acceptance and adherence to the treatment and generate greater glycemic control¹. A systematic review with meta-analysis compared self-administration using an insulin pen and vial with a syringe and identified discrete benefits in clinical variables such as glycated hemoglobin (HbA1c) and hypoglycemia. Adherence to the treatment and each patient's preference were positively correlated with using pen devices⁶.

Among the types of insulin widely used, long-acting insulin analogues (glargine, detemir and degludec) and rapid-acting analogues (lispro, aspart and glulisine) were recently incorporated for free distribution by the Unified Health System (*Sistema Único de Saúde*, SUS) through the Specialized Pharmaceutical Assistance Component⁷. As any treatment involving insulin therapy is complex, health education strategies such as Printed Educational Materials (PEMs) have been widely used with the aim of improving adherence to the treatment and providing greater protagonism for people in relation to their health condition. PEMs can be presented in the form of posters, leaflets, booklets and folders⁸.

An integrative review carried out with the objective of identifying technologies developed to promote health education for older adults showed that several technologies were developed and that most of them were effective in individual use. PEMs are

the ones used with highest prevalence⁹. To date, no studies have been identified in the literature validating PEMs for people who use insulin pens to treat DM. Therefore, the objective of this research was to create and validate the PEM on the use of rapid-acting and long-acting analogue insulin pens for people with DM.

Methods

The study was carried out in three stages, from June to November 2021 and with multiple approaches, at the Special Medications Pharmacy (*Farmácia de Medicamentos Especiais*, FME) premises in the municipality of Porto Alegre, state of Rio Grande do Sul. The FME was located in the central area of the city, with easy access to fetch the medications. It currently serves nearly 20,000 users, of which 3,293 receive medications for DM.

Study Phases

Phase 1 – PEM exploratory research and creation

In this stage, adults aged at least 18 years old who were using at least one of the insulin pens and were actively registered at the Special Medications Pharmacy were selected through a convenience sample. A questionnaire formulated with four open questions was used to collect diverse information about the main difficulties and demands identified in using insulin applicator pens (Supplementary Appendix 1). This analysis preceded elaboration of the PEM. The literature indicates that people want to be actively included in their care process and feel stimulated to participate when encouraged by health professionals¹¹⁻¹⁴. In addition to that, it should be noted that involving the users and/or their caregivers in the process of elaborating and synthesizing the content of the informative material that will be prepared for them, will enable optimizing management of the medications in use and ensure that each user receives adequate and relevant to their reality and needs¹⁴.

Data collection for this stage was carried out in person at the waiting room in the FME and comprised the following variables: name, age, gender, schooling, treatment time with the insulin pen and DM diagnosis time.

Phase 2 – Elaboration of the PEM

Preparation of the PEM considered the topics indicated by the users in the exploratory analysis. The recommendations described in the PEM were based on a bibliographical research carried out on the Brazilian Ministry of Health website and in Scientific Societies, in addition to consulting the Clinical Protocol and Therapeutic Guidelines for Type 1 Diabetes⁷ and Type 2 Diabetes¹⁵ and clinical guidelines of the Brazilian Diabetes Society¹ and from the International Diabetes Federation².

The technical information about the insulin pens was consulted in the electronic leaflet available on the National Health Surveillance Agency (*Agência Nacional de Vigilância Sanitária*, ANVISA) website¹⁶.



Phase 3 – Validation of the PEM

Pharmaceutical professionals, in a convenience sample, who provided clinical care directly to the patients, proven by work experience or specialization, were invited to participate in the research and filled out the Informed Consent Form (FICF).

The PEM was validated using the Suitability Assessment of Materials (SAM) instrument, adapted, validated and translated into Portuguese¹⁷. This tool is used to evaluate and devise educational materials. It was decided to employ it due to its ease of comprehension, applicability, analysis and interpretation of the results, showing efficiency and effectiveness in studies for the construction and evaluation of materials¹⁸. The instrument consists of a checklist with 22 items divided into six categories that evaluate content, illustrations, literacy requirements, layout and presentation, learning stimulation and cultural adequacy. Each item can be scored with 0, 1 or 2, totaling up to 44 points (100%). At the end of its application, a percentage is calculated that indicates whether the material is not adequate (0% – 39%), adequate (40% – 69%) or of superior quality (70% – 100%).¹⁷

The *Google Forms* resource was used to transcribe the SAM questionnaire and the link generated was sent via email and *WhatsApp* to the professionals that presented the profile required by the study. The form was available for completion for a 14-day period.

Comments and suggestions made by professionals were used to modify the PEM, before validation with users.

Subsequently, in the validation by the users, a convenience sample was assembled consisting of adult users over the age of 18, who used or applied at least one of the insulin pens evaluated in this study. Participants with total visual impairment or another type of disability that would make it impossible to view and understand the material to be validated according to the interviewing researcher's perception were not included, as well as people with a non-literate schooling levels. It was considered that the sample size depends on the confidence level desired, and for local distribution. Thus, a sample of 10 interviewees would be sufficient to validate the material¹⁰.

The instrument used was based on a method created by Doak and Root (1996). This method consists in evaluating the following PEM elements: appeal, comprehension, self-efficacy, cultural acceptability and persuasion¹⁰. The eligible users were invited to participate in the research while waiting in line for assistance at the FME. After filling out the FICF, the PEM was handed in to the users for them to view and read it. The time used to view the PEM was approximately four minutes, although no maximum time was stipulated. Subsequently, each question of the method was asked and users responded.

The questionnaire consisted of 11 descriptive questions that encompass the five elements proposed (appeal, comprehension, self-efficacy, cultural acceptability and persuasion) (Supplementary Appendix 2)¹⁰. In addition to the answers to the questionnaire, information such as age, gender, schooling, treatment time with an insulin pen and time since the DM diagnosis were also collected.

The answers were transcribed by one of the researchers into a specific printed form for subsequent individual analysis in *Microsoft Excel*[®] spreadsheets and description using tables. The sociodemographic variables were presented as percentage, mean and Standard Deviation (SD).

Ethical aspects

This study was developed based on the research project entitled "Impact of Pharmaceutical Telecare on people with Diabetes *Mellitus* treated at the Special Medications Pharmacy of the State of Rio Grande do Sul: A randomized clinical trial (*TelePharmaceutical Care Diabetes Trial*)", approved by the Research Ethics Committee at ESP/SES/RS under opinion No. 44126821.2.0000.5312.

Results

Stage 1 – Exploratory research

Fifteen users agreed to participate in the exploratory phase. Of these, 60.0% were female (n=9). Their mean age was 44.3 years old (with a standard deviation [SD] of 15.1). Regarding schooling, 40.0% reported having Completed Higher Education (n=6), 26.6% had High School level (n=3), and 13.4% were attending Higher Education courses (n=2). Technical, elementary and graduate education had only one respondent in each level. The mean time using the insulin pen was 10.2 (4.7) years. It was also identified that 40.0% were caregivers of people who used insulin pens and were responsible for handling them.

To better clarify the results, four categories were created to fit the answers. The first category mentions the most cited information related to use. The second category refers to the communication means via which the user intends to receive such information (audiovisual, graphic, audio and others). The third category refers to the application stages, as shown in the leaflet. The last category identifies the PEM presentation desired by the users. From these categories and depending on the type of answer, subcategories were also created (Table 1).

Stage 2 – Creation of the PEM

The PEM prepared, based on the data collected in Table 1, considered the need to convey information about the use modality, application locations, storage and disposal in a complete, but not exhaustive, way to the target audience (Table 2).

The final PEM version can be viewed in Supplementary Appendix 3. The Canva[®]Pro online design creation platform (<https://www.canva.com/>) was used for its creation.

Stage 3 – Validation of the PEM

Thirteen professionals with expertise in the area participated in this stage. Eleven (84.6%) were female. Their mean training time was 11.6 (7.3) years. In relation to the performance area, 46.1% work in public pharmacy (n=6), 30.7% in the hospital area (n=4), and the remaining professionals reported working in the pharmaceutical assistance (n=1), state management (n=1) and clinical pharmacy and management (n=1) areas. The professionals' agreement in each content category addressed in the PEM prepared can be seen in Table 3.

The mean percentage obtained from the data collected through the SAM instrument was 92.0%. For the material to be considered adequate, the result of calculating the scores percentage obtained should be equal to or greater than 70.0%.



Table 1. Categories and subcategories created to analyze the answers, as well as reporting frequency (n=15). Porto Alegre, Rio Grande do Sul, Brazil, 2021.

Categories/ Subcategory	Answers	Reporting frequency (n)
Use-related		
Application	Application locations	3
	Technique	5
	Rotation	5
Glycemic control	Control	4
	Storage	5
Pen	Proper storage	5
	Safety test	2
	Dosage selector	4
Needles	Care with the needles	1
	Size	2
	Exchange	1
Others	Food control	1
	Hygiene	1
Communication type		
Audiovisual	Video	6
Graphic	Folder/Pamphlet	9
	Telephone contact/Podcast	2
Audio	Oral	4
	WhatsApp/Home visit	2
Others	Digital channel	1
	Social networks	1
Application stage (according to the leaflet shown)		
	All	10
	Discard	1
	Needle fit	1
	Storage	2
	Expiration date	2
	Plunger pressure for 10 seconds	1
	Skin fold	1
	Indication of the units	2
	Hypoglycemia management	1
	Insulin types	2
	Glucometer use	1
PEM presentation		
	Illustrations	13
	Summarized	2
	Descriptive	8
	Large letters	2
	Colors	1
	Grouped presentation	1
	Comic book	1

Table 2. List of scientific documents/guidelines and articles used to create the PEM.

Reference	Year of publication	Authors
Clinical Practice Recommendations for Managing Type 2 Diabetes in Primary Care ²	2018	International Diabetes Federation
Protocolo Clínico e Diretrizes Terapêuticas do Diabetes Mellito Tipo 1 ⁷	2019	Ministry of Health, Brazil
Protocolo Clínico e Diretrizes Terapêuticas do Diabetes Mellito Tipo 2 ¹⁵	2020	Ministry of Health, Brazil
SBD Guideline (only available on the website) ¹	2021	Brazilian Diabetes Society

At the end of all the categories presented in the SAM instrument sent to the professionals through the form, a space was reserved for them to leave suggestions. Four professionals made the following notes, which were used in reviewing the document.

"It was not clear what to do when the ambient temperature is above 30°C."

"I just thought that it was unclear to write "posterior" in the application part on the arm. The term may not be within the person's domain."

"Verify with the user their understanding of the figure with the sun and the refrigerator"

"As for question A, I was just in doubt about the function of the images referring to the letter A in the material. The illustration referring to lispro insulin has the writing out of focus. There are three types of long-acting insulin and two images."

"I found it very clear, it is richly illustrated without being cluttered. Congratulations!"

"Excellent work, I just leave one suggestion. When I saw the material quickly for the first time, I found it to be visually busy. When I started reading, I noticed that the thick lines separating the letters of the alphabet on the side were a little distracting for my vision. I think that there would be no need to place the letters on the left side, as the lines that separate the subject matters could be thinner."

"In item C, when you say "directly until it is firm", I did not understand this "DIRECT"/"reuse it", the acute accent is MISSING/the word "imprecise" can be modified for better understanding."

"One suggestion would be using a thermal case for storage and transportation."

Stage 3 results – Validation of the PEM with users

A total of 10 users were interviewed, 80.0% of whom were female and with a mean age of 40.5 (standard deviation of 16.2) years old. As for schooling, 40.0% reported having attended High School, 30.0% have Complete Higher Education, 20.0% Incomplete Higher Education and only 10.0% had completed up to 5th grade of Elementary School. In relation to time and diagnosis type, the mean number of years was 18.3 (12.1), with DM1 as the most prevalent diagnosis at 70% (n=7). In relation to the treatment, the mean time using insulin pens was 9.8 (6.1) years.

In general, all domains (appeal, comprehension, self-efficacy, cultural acceptability and persuasion) of the Doak and Root method (1996) were positively evaluated by the users. The self-efficacy, cultural acceptability and persuasion domains obtained agreement from all participants. The comprehension domain showed agreement variation between 70% and 100%, depending on the content that was addressed within the domain. The appeal was also well accepted, with 90% agreement among the users.

Table 3. Description corresponding to the professionals' assessment of the printed educational material in each content category addressed in the PEM, (n=13). Porto Alegre, Rio Grande do Sul, Brazil, 2021.

Categories	Excellent, n (%)	Adequate, n (%)	Not adequate, n (%)	Not assessed (N/A), n (%)
Content				
The purpose is evident	12 (92.3)	1 (7.7)	-	-
The content is about behaviors	10 (76.9)	3 (23.1)	-	-
The content is focused on the purpose	11 (84.6)	2 (15.4)	-	-
The content highlights the key points	12 (92.3)	1 (7.7)	-	-
Literacy requirement				
Reading level	8 (61.5)	5 (38.5)	-	-
It uses active voice writing	11 (84.6)	2 (15.4)	-	-
It uses vocabulary with common words in the text	10 (76.9)	3 (23.1)	-	-
The context comes before new information	10 (76.9)	3 (23.1)	-	-
The topics ease learning	12 (92.3)	1 (7.7)	-	-
Illustrations				
The purpose of the illustrations referring to the text is clear	11 (84.6)	2 (15.4)	-	-
Illustration types	12 (92.3)	1 (7.7)	-	-
The figures/illustrations are relevant	13 (100)	-	-	-
There is an explanation for the lists, tables, etc.	8 (61.5)	1 (7.7)	-	4 (30,8)
The illustrations have keys	9 (69.2)	3 (23.1)	-	1 (7,7)
Layout and presentation				
Layout feature	9 (69.2)	4 (30.8)	-	-
Font size and type	10 (76.9)	3 (23.1)	-	-
Subtitles are used	10 (76.9)	3 (23.1)	-	-
Learning stimulation/motivation				
It uses interaction	10 (76.9)	3 (23.1)	-	-
The guidelines are specific and give examples	12 (92.3)	1 (7.7)	-	-
Motivation and self-efficacy	12 (92.3)	1 (7.7)	-	-
Cultural adequacy				
It is similar to your logic, language and experience	12 (92.3)	1 (7.7)	-	-
Cultural image and examples	12 (92.3)	1 (7.7)	-	-

NR: Not Reported. N: Number.

Table 4. Description of the users' assessment in each domain addressed in the printed educational material (n=10). Porto Alegre, Rio Grande do Sul, Brazil, 2021.

Domains	Domain comprehension n (%)	Domain non-comprehension n (%)
Appeal		
Do you want to read the material when you look at the cover? If not, say why.	9 (90)	1 (10)
Comprehension		
Tell us in your own words what the material is. Anything else?	10 (100)	-
What does this figure (FIGURE G) tell you?	7 (70)	3 (30)
On page 1, what should be done before applying insulin?	8 (80)	2 (20)
What does the picture (fire with x and pen) tell you?	8 (80)	2 (20)
Which are the injection locations for insulin?	10 (100)	-
At which angle should you inject (position) the needle?	10 (100)	-
Where should you store an insulin pen that you have not used yet? And after it is already open?	7 (70)	3 (30)
Self-efficacy		
Do you think that you could do what the figure (FIGURE F) suggests?	10 (100)	-
Cultural acceptability		
Is there any item in this folder that makes you uncomfortable or that would not be well-accepted by you and your friends?	10 (100)	-
Persuasion		
Do you think that it is possible to apply insulin better after reading this folder?	10 (100)	-

NR: Not Reported. N: Number.



Discussion

This study allowed preparing a PEM on the use of rapid-acting and long-acting analogue insulin pens for people with DM. The mean percentage obtained through the SAM instrument for validation with the professionals was 92.0%, indicating that the PEM is superior, and the users' agreement in each domain of the Doak method was high, with the exception of the comprehension domain.

Whenever possible, the process of preparing a PEM should be carried out with the active participation of professionals who work in services that use this type of resource as a complement to the care process¹⁹; in addition to that, including the users in the construction process is a fundamental point, as it encourages care autonomy and self-management²⁰. In this sense, through the exploratory stage, this research allowed understanding the PEM requirements and adequacy to its target audience, considering that the users' subjectivity is also part of the process of creating this material²¹.

The exploratory stage with the users' participation is extremely important to ensure that the materials developed for care can achieve the objectives proposed in order to meet their expectations²². From this, the users mentioned employing folders/pamphlets as the main communication means used to receive health education information (n=9). A previous study already highlighted PEM preference over other communication means, as it is a more accessible, practical and less expensive resource²³.

In relation to the diverse information that the users wanted contained in the PEM, the details related to insulin pen use, application technique and handling were the most cited. In fact, the application technique with the insulin pen can be complex, mainly for older adults and/or those with low schooling levels²⁴. Added to this, the difficulty understanding technical knowledge and the therapeutic protocol is seen as a barrier to adhering to the DM treatment²⁵. In this sense, while preparing the PEM, it was decided to use photographs of all the components that govern the application technique, in order to illustrate the procedure and make it more familiar, intuitive and easy to understand - which corroborated with the users' expectations.

The professionals' agreement in each content category addressed in the PEM was high (92.0%). Other studies that evaluated PEMs for different clinical conditions also found similar results²⁶⁻²⁸. Most of the suggestions for adapting the PEM mentioned by the professionals were aimed at clarifying images and words. All the adjustments were made, using literature publications as support and theoretical basis^{10,29}. An important point to highlight is in relation to the PEMs' limitations related to their use³⁰. Even though materials are widely used as a way of transmitting and raising awareness among the population through health education³¹, issues such as difficulty reading due to their inadequacy, characteristics and schooling level of the readers can negatively influence the teaching-learning process, thus highlighting the importance of the suitability and flexibility of the material to properly reach its target audience³²⁻³³.

Also noteworthy is the aim of providing educational materials with diverse information based on scientific evidence and evaluated through the clinical guidelines that made up the content addressed in this PEM, which represents a difficult task in its construction, as it requires that every aspect related to layout, color, letter sizes,

images and words are transmitted in a clear and intuitive way. This is a purposeful way of helping care for people with DM, mainly due to the possibility of encompassing lay people and those with low health literacy levels³²⁻³³.

The sociodemographic characteristics of the users who validated this PEM showed a profile of people with a time since diagnosis similar to that of other research studies^{25,34}. The insulin pen use time, which was 9.8 years in this research, can be associated with more people diagnosed with type 1 DM, something that has also been identified in other studies³⁴⁻³⁶. These two variables can also be associated with the users' level of understanding and perception about DM since, in a way, these people already have prior knowledge based on their personal experience using insulin pens, which makes them question or not understand the information transmitted through the material as correct. In another study³⁵, the authors detailed the influence of beliefs and perceptions of patients with DM in understanding their health condition, mainly highlighting this influence on adherence to the treatment process.

However, it is noticed that the characteristics related to the schooling level of the sample under study cannot be generalized, as the majority of people who access this type of pen are younger individuals with higher education levels - as pointed out in this research -, whereas older adults have more access to NPH and regular insulin pens, due to their health condition requiring this type of therapeutic management.

Doak's "Comprehension" domain was the one that obtained the most convergences. Within the hypotheses, it can be inferred that this can be related to the fact that this domain has been more explored due to the number of questions when compared to the others. It is also observed that this domain has detailed questions, such as where to store unused pens and what should be done before applying insulin. In two studies³⁶⁻³⁷, it was found that there is a tendency for patients to make some errors related to the application technique, mainly in storage, reusing needles and not waiting for the injection time.

It is estimated that approximately half of the patients worldwide reuse their needles more than once, with pen users tending to reuse them more frequently than syringe users. Most reuse is for five or fewer times; however, up to 30% of the people who use the device do so six times or more due to convenience and cost³⁷. Such data suggest that there is a need for full understanding on the part of the users, mainly in terms of handling, correct application technique, storage and disposal. In this context, it is believed that the material prepared might contribute to the processes involving insulin pens use and their management, as it considered the needs reported by users undergoing treatment.

This research had some limitations. Initially, data collection was conducted in the FME waiting line. Due to the pandemic, the health service was reorganized so that there were no crowds inside the pharmacy, justifying that it was the only place available for collection. It is understood that the location does not provide privacy and that some users may have omitted information as a result of this or because of their own rush to fetch their medications. Also regarding data collection, as it was carried out in a descriptive way, some information reported by the users may not have been transcribed. In relation to the statistical analysis, due to time-related impediments, it was not possible to carry out validation rotation among the judges - common in methodological studies, which enables a robust statistical analysis to be carried out, with reliability and agreement indices, for example. As perspectives,



it is suggested that the PEM be validated by professionals from other areas and institutions, as a way of complementing and sharing other relevant aspects that may not have been addressed and allowing external validity of the study.

Conclusion

In general, the PEM was well-accepted by most of the research participants and proved to be suitable for its target audience. It is believed that it can be used as a complementary resource in the clinical practice, in order to contribute to and ease the learning process in the users' health education. As future perspectives, validation of the PEM and other communication sources (podcasts or videos) is suggested, with the aim of making the information more inclusive, encompassing different audiences.

Collaborators

H.B.L.O was responsible for study design, collection, data analysis and interpretation, writing of the article and critical review relevant to the intellectual content. A.N.G collaborated in study design, data analysis and interpretation, writing of the article and critical review relevant to the intellectual content. D.G collaborated in study design, writing of the article and critical review relevant to the intellectual content. All authors approved the final version to be published.

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Declaration of conflict of interests

The authors declare that there are no conflicts of interest in relation to this article.

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