

How Do Patients Prefer to Receive Patient Education Material about Treatment, Diagnosis and Procedures?

—A Survey Study of Patients Preferences Regarding Forms of Patient Education Materials; Leaflets, Podcasts, and Video

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Abstract

Aim: The aim of this study was to explore patients' preferences for forms of patient education material, including leaflets, podcasts, and videos; that is, to determine what forms of information, besides that provided verbally by healthcare personnel, do patients prefer following visits to hospital? **Methods:** The study was a mixed-methods study, using a survey design with primarily quantitative items but with a qualitative component. A survey was distributed to patients over 18 years between May and July 2020 and 480 patients chose to respond. **Results:** Text-based patient education materials (leaflets), is the form that patients have the most experience with and was preferred by 86.46% of respondents; however, 50.21% and 31.67% of respondents would also like to receive patient education material in video and podcast formats, respectively. Furthermore, several respondents wrote about the need for different forms of patient education material, depending on the subject of the supplementary information. **Conclusion:** This study provides an overview of patient preferences regarding forms of patient education material. The results show that the majority of respondents prefer to use combinations of written, audio, and video material, thus applying and co-constructing a multimodal communication system, from which they select and apply different modes of communication from different sources simultaneously.

Keywords

Audio Information, Audio-Visual Information, Text-Based Information, Health Literacy, Patient Education Material, Nursing

1. Introduction

Health literacy represents the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions [1]. A European Health Literacy Survey found that nearly half of all adults in the eight included European countries have inadequate health literacy [2]. Additionally, an estimated 80 - 90 million adults in the United States have limited health literacy. The consequences are that a significant number of people are struggling with reading, understanding, and applying health information. The struggles include understanding the wording on medication bottles, appointment slips, discharge instructions, health education material, and so on [3] [4]. According to the World Health Organization (WHO), patients with limited health literacy skills risk having a poorer health outcome and higher treatment costs. Improving health literacy skills can therefore have a positive effect on patient health outcomes, address health inequities, and reduce economic burden [4] [5] [6] [7] [8].

Health literacy can be targeted on different levels, including health environment, health services, and the systems levels. Intervention at these different levels aims to influence “health literacy responsiveness”, which refers to the way services make health information available to people with different literacy skills [5] [9].

One component that influences health literacy responsiveness is health education materials. Research has shown that more than 75% of patient education materials are written at a high school or college level [3], and healthcare personnel often overlook health literacy in routine patient care, overestimating patient’s health literacy skills and incorrectly assuming that the verbal information and the education materials that supplement the verbal information have been understood [3]. This assumption can have significant consequences for patients.

2. Background

The importance of supplementary patient education materials is well substantiated, as research has shown that 40% - 80% of medical information provided verbally by healthcare personnel is forgotten immediately, and there is an association between the amount of information given and the proportion that is forgotten [10]. This emphasizes the importance of examining/exploring how patient education materials can be constructed to target patients with different health literacy skills.

Text-based information (*i.e.*, leaflets) is the most common form of supplementary patient education material in healthcare; however, provision of supplementary information in leaflet form is not without challenges for patients and is a particular concern for patients with limited literacy skills [3] [4] [11] [12]. To improve the usability and impact of text-based information, visual material can be included in combination with text to increase understanding, an approach that has proven particularly successful for people with low literacy skills

[12] [13] [14] [15]. Nevertheless, research from the last 25 years has emphasized that, although text-based patient education materials have the advantages of supporting the patients' memory and helping them to communicate relevant information to family members and caretakers, the different and changing informational needs of patients represent a challenge to providers of text-based materials, and appropriately staged health education materials are evidently something patients require [1] [7] [8] [13] [16] [17] [18]. In recent years, technological solutions have been increasingly used in educating patients and achieving better health literacy [7]. Patient education materials are a significant element in the healthcare domain and should be considered in the light of technological advances. Patient education materials can be transformed from delivering simple static, text-based material to possibly including video information or other interactive solutions [7] [8]. Furthermore, technological solutions can be designed to simplify or expand on a concept and do not have a time constraint. Additionally, they can deliver multimedia education [1] [19]. Even though 10 years separate their research, both Jewitt [20] and Ector *et al.* [8] suggest that patient education material, to be of value for the patient, should be tailored to the unique circumstances and preferences of patients. Yet, to the best of our knowledge, and as acknowledged by others [16], no studies have addressed the issue of what forms of patient education material patients prefer or find most useful.

3. The Study

3.1. Aim

The aim of this study was to explore patients' preferences for different types of patient education material by asking the question, "Which forms of patient education material (PEM) are preferred beyond the information provided verbally from the healthcare personnel during your hospital visit?"

3.2. Method

The study was designed as a mixed-methods study, using a survey design with primarily quantitative items but with a qualitative component.

A survey design enables a large amount of data to be statistically analyzed, with the potential to identify tendencies in the study population and provide generalizable data. In addition to the quantitative items, open-ended responses are possible, allowing supplementation of the numerical responses with evaluation of narrative text using content analysis (the qualitative component). The Patient Education Material Survey (PEM survey) used in this study was created in REDCap (<https://redcap.regionh.dk/>) in April 2020 and consists of 11 items: five items about the respondents' experience, preferences, and earlier actions with regard to PEM (see **Table 1**), one item allowing inclusion of a text comment about the prioritization of PEM, four items regarding demographic characteristics, and one item asking whether we could contact respondents for further interviews.

Table 1. The translated danish patient education material survey and responses for items 1 - 3, 5, 6.

Response categories Items	Text-based information (<i>i.e.</i> , leaflets)	Audio information (<i>i.e.</i> , podcasts)	Audio-visual information (<i>i.e.</i> , videos)	Have never received patient education material	Don't know
	n (%)	n (%)	n (%)	n (%)	n (%)
1. Have you had previous experience with any of the mentioned patient education material with regard to obtaining knowledge about illness and or health related issues?	365 (76.04)	42 (8.75)	63 (13.13)	114 (23.8)	
2. What kinds of patient education material about diagnosis, treatment, and procedures would you like to be available from the hospital?	415 (86.46)	152 (31.67)	241 (50.21)		35 (7.3)
3. How do you prefer to receive patient education material about diagnosis, treatment and procedures? (prioritize your response)	1.38 (79.6) 2.43 (9.0) 3.55 (11.5)	1.39 (8.1) 2.88 (18.3) 3.35 (73.5)	1.59 (12.3) 2.35 (72.7) 3.72 (15.0)		
Response categories Items	I called the hospital and got the information I needed	I went to the hospital website and found the information I needed	I went online and looked for the needed information (not the hospital website)	I asked friends and family for advice	I don't remember
5. Think about the last time you needed information about diagnosis, treatment, or procedures. What was your first step to finding the information you needed?	102 (21.3)	88 (18.3)	211 (44.0)	26 (5.4)	53 (11.1)
Response categories Items	I was at home	I was at work	I was on transport	Something else	I don't remember
6. Think about the last time you needed information about diagnosis, treatment, and procedures. Where were you when the need for information occurred?	348 (72.5)	39 (8.1)	11 (2.3)	10 (2.1)	72 (15.0)

The Development of the PEM Survey

The PEM survey was created by the author using an item generation and de-generation process, based on the theoretical construct of value co-creation [21] [22], emphasizing how patients assessed that they could integrate the information provided into their value creation within the context of their everyday lives through discussions and co-creation with patients and scholars in the fields of allergy, dermatology, and venerology. The face and content validity of the PEM survey were tested using a pre-test that followed the guidelines of Fayers and Machin [23], to identify any major challenges with the survey and help solve these before the study was carried out.

The pre-test was carried out in the Allergy, Dermatology & Venerology Out-patient Clinic (ADVOC) and included five patients, selected as representative of the target population based on age, diagnosis, and whether they were new patients or had visited the outpatient clinic before. The participants in the pre-test were recruited by asking five patients in the waiting room of the ADVOC if they wanted to participate. All patients asked agreed to participate in the pre-test.

Participants were between 18 and 68 years old (median age, 45.4 years). Four participants had been to the outpatient clinic before and one participant was attending for the first time. All participants had different diagnoses.

Inclusion criteria were that participants could speak and write Danish and were over 18 years old. The chosen participants (three women and two men) were asked to complete the PEM survey and then debriefed in individual interviews, using a pre-structured interview guide. The purpose of the questions was to uncover how the survey was perceived and understood by the patients. The content of the interview guide is presented in **Table 2**.

Interviews for the pre-test were conducted by the author during April and May 2020 at the ADVOC. Participants in the pre-test were known only to the interviewer and were promised full anonymity. They could withdraw from the study at any point without giving a reason.

The results of the pre-test were discussed between the author and colleagues and alterations were made when deemed necessary to ensure the face and content validity of the survey. The analysis of the face and content validity of the survey showed that all participants understood the introduction and the immediate wording of each item and found the possible choices for answering appropriate. Three of the participants asked for more information briefly explaining what was meant by written, audio, and audio-visual information to avoid misunderstandings. This was implemented and considered helpful by the last two participants. The participants understood the meanings of each item, as intended by the author, and all participants said that the PEM survey was relatively easy to answer and did not take more than 5 minutes.

Table 2. Interview guide used for the pre-test.

Question No.	Wording
1	What was your overall impression of the survey?
2	Did you understand the introduction text and all the items?
3	Were any of the items difficult for you to answer?
4	How did you understand each item?
5	How did you understand the response categories?
6	Did you think the response categories were adequate?

3.3. Sample/Participants

The PEM survey was given to all patients who checked in at the ADVOC by in-

teracting with the secretary. The inclusion criteria were that the respondents were over 18 years and understood and could write Danish. A sample size calculation, with a confidence interval of 95% (margin of error 5%), was completed and showed that a sample size of minimum 385 respondents was needed to produce statistical confirmation [24].

3.4. Data Collection

Survey data were collected between May 20th and July 20th, 2020. The PEM survey was given to patients by a secretary, who welcomed the patients to the clinic upon arrival. If the patient chose to answer the survey using a tablet, the results were obtained directly in REDCap, while if patients answered on paper, the results were subsequently typed into REDCap by the author. Providing a choice of either using a tablet or paper was intentional. First, paper was used in an attempt not to lose respondents if the single tablet available was being used by another patient. Second, there was a concern that some respondents might be excluded from the study because they found the tablet difficult to use and therefore chose not to answer. It was also possible for patients to check in at the outpatient clinic on arrival without interacting with the secretary, and patients who did this did not receive a survey.

3.5. Ethical Considerations

The study was approved by the Danish Data Protection Agency (P-2020-199) and followed the principles of the Declaration of Helsinki [25].

Respondents who answered the PEM survey by tablet or paper were not obligated to provide any personal identifying data. At the end of the survey, respondents were asked if they could be contacted for further interviewing. They could choose to skip this question, or they could write their name and telephone number. Respondents could withdraw from the survey study at any point without giving a reason.

3.6. Data Analysis

Statistical analysis was conducted using SPSS 17.0. First, descriptive statistics were used to describe the demographic characteristics of the study population and the respondents' answers to the five items with checkboxes. Second, crosstab and Chi-square tests were used to determine if there were any statistically significant correlations between demographic data and any of the five items.

In Item 4, respondents were able (but not required in order to progress in the survey) to write an open-ended comment describing their reason for prioritizing written, audio, and audio-visual PEM in Item 3. All comments were read by the author and analyzed by content analysis. When more than one comment had the same meaning, with only minor insignificant differences in word choice, one comment was chosen to represent a group of comments expressing the same point of view. Representative comments are shown in **Table 3**.

Table 3. Representative comments for Item 4: “Why did you chose that specific order in Item 3?”

Themes	Representative comments about text-based PEM (leaflet)	Demographic
Safety	Text-based information (<i>i.e.</i> , a leaflet) seems more serious	1 male, age 42 years
Situational needs	I like text-based information best	9 females, aged 23 - 61 (median, 43) years and 4 males, aged 28 - 81 (median, 55) years
Safety	Text-based information is the most easily accessible	13 females, aged 18 - 69 (median, 44) years and 2 males, aged 57 - 68 (median, 62.5) years
Safety	It feels safer to have patient education material in a leaflet, you can hang it for example on your refrigerator and read it again and again	16 females, aged 21 - 72 (median 49) years and 4 males, aged 27 - 45 (median, 48.5) years
Earlier experience	I'm used to text-based information and don't know about video or podcast. I haven't tried them. Don't know the technique	18 females, aged 47 - 83 (median, 70) years and 4 males, aged 65 - 73 (median, 66.5) years
Situational needs	A leaflet is fast and easy to read, and good for short information, but sometimes more thorough information, like a video or podcast, would be a great additional help	41 females, aged 18 - 67 (median, 39) and 13 males, aged 10 - 59 (median, 39) years
Themes	Representative comments about audio-visual information (video)	Demographic
Challenged	I understand more when watching a video. Video is much easier to comprehend	14 females, aged 18 to 75 (median, 34.5) years and 5 males, aged 25 - 47 (median, 36) years
Situational needs	It would be easy to find thorough, scientific, and objective information if videos and podcasts about different subjects were accessible from the hospital website	2 females, aged 28 - 61 (median 44.5) years and 1 male, aged 45 years
Challenged	I often find leaflets to be lacking, so video would be a great supplement or alternative	1 female, aged 34 years and 5 males, aged 35 - 59 (median, 36.5) years
Challenged	Video gives you both audio and visual information. Twice as good	1 female, aged 50 years and 2 males, aged 50 - 60 (median, 55) years
Challenged	I'm dyslexic, so video or podcast would help me a great deal	2 females, aged 27 - 35 (median, 31) years
Situational needs	Videos would be great maybe as an addition to a leaflet. There could be a QR code on the leaflet	1 male, aged 22 years
Situational needs	Digital information (<i>i.e.</i> video and podcast) are the way forward	6 females, aged 20 - 41 (median, 31.5) years and 3 males, aged 38 - 76 (median, 49) years
Safety	Digital information (<i>i.e.</i> , video and podcast) are easier to access and don't get lost	3 females, aged 25 - 42 (median, 33) years and 7 males, aged 19 - 49, (median age, 39) years
Themes	Representative comments about audio information (podcast)	Demographic
Situational needs	I like to be able to listen to information when I'm on my way somewhere, when I'm doing house chores, when walking, etc.	5 females, aged 22 - 61 (median 50) years, and 3 males, aged 24 - 69 (median, 44) years
Safety	A podcast from the hospital can give you a lot of information that you can feel safe to trust. And then I don't have to try to find valid information online	2 females, aged 26 - 31 (median, 28.5) years
Situational needs	Easy and accessible everywhere, if you have a phone, a podcast can give you a lot of information	2 females, aged 50 - 53 (median, 51.5) years and 5 males, aged 24 - 79 (median, 26) years
Situational needs	Text-based information is good, but podcasts are a good supplement	2 females, aged 27 - 43 (median, 35) years and 1 male, aged 42 years
Safety	Podcasts are nice because my relatives can also get a lot of the information, I get	1 female, age 37 years
Situational needs	A podcast is a very easy and relaxing way of getting information	1 female, aged 22 years
Challenged	My experience tells me I learn a lot from podcasts	1 female, aged 56 years

4. Results

A total of 483 respondents answered the survey, three of whom provided incomplete responses that were removed from the analysis, resulting in a total of 480 included responses.

The majority of respondents were women (64.8%) and almost half (49.8%) had a medium-cycle higher education (MCHE), followed by respondents with a long-cycle higher education (LCHE) (22.7%). MCHE is equivalent to undergraduate education and LCHE is equivalent to graduate education. There was a small majority of respondents in the age group 18 - 30 years (22.1%); close to an equal distribution in the age groups 30 - 40 years (18.3%), 40 - 50 years (17.9%), and 50 - 60 years (17.9%) and smaller numbers of respondents in the age groups 60 - 70 years (12.9%), 70 - 80 years (9.2%), and 80 - 90 years (1.7%) (**Table 4**). The median age of the respondents was 45 years (SD \pm 17.5 years), which closely corresponded to the median age (45.5 years) of the participants in the pretest.

The 480 included respondents chose between one and four response categories that they found relevant for each of the five items with checkboxes regarding their experience, preferences, and earlier actions on the subject of PEM. In total there were 3830 answers in response to Items 1, 2, 3, 5, and 6. The distribution of the 3830 answers from all 480 respondents is presented in **Table 1**. For Item 4, 202 (42%) of the 480 respondents chose to write a comment. A selection of representative comments is presented in **Table 3**.

Table 4. Demographic characteristics of the 480 survey respondents.

Characteristic	n (%)
Sex	
Male	169 (35.2)
Female	311 (64.8)
Highest educational level	
Primary school	72 (15)
High school	60 (12.5)
Medium cycle higher education (MCHE) ¹	239 (49.8)
Long cycle higher education (LCHE) ²	109 (22.7)
Age (years)	
18 - 30	106 (22.1)
30 - 40	88 (18.3)
40 - 50	86 (17.9)
50 - 60	86 (17.9)
60 - 70	62 (12.9)
70 - 80	44 (9.2)
80 - 90	8 (1.7)
Total	480 (100)

¹MCHE is equivalent to undergraduate education. ²LCHE is equivalent to graduate education.

4.1. Responses to Items 1, 2 & 3

Responses to the first three items (1, 2, and 3) showed that the category used most often was text-based information (*i.e.*, leaflets); the majority of respondents (76.04%) had previous experience receiving PEM in text-based form. Markedly fewer respondents had previous experience receiving PEM in the form of audio information (*i.e.*, podcasts, 8.75%) or audio-visual information (*i.e.*, videos, 13.13%). Regarding respondent preferences for forms of PEM, the number expressing a preference for text-based PEM was 86.46%; however, half of respondents requested the availability of audio-visual PEM (50.21%), followed by approximately one-third of the respondents (31.67%) stating that audio PEM could also be helpful. When asked to prioritize the three forms of PEM according to their preferences, text-based PEM was the first priority for 79.6% of respondents, audio-visual PEM was the second priority for 72.7%, and audio PEM was chosen as the third priority by 73.7% of respondents (**Figure 1**).

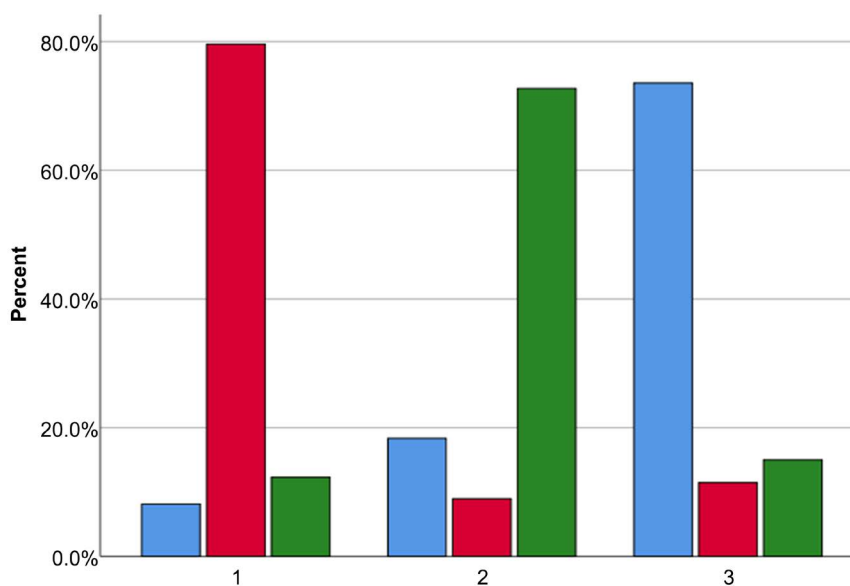


Figure 1. Distribution of answers when respondents were asked to prioritize forms of PEM from first priority (1), second priority (2) and third priority (3). Blue, podcast; Red, leaflets; Green, video.

4.2. Responses to Item 4

For item 4, 20 comments were chosen as representative of the 202 answers (**Table 3**). Each representative comment is constructed from between one and 54 respondents' answers. In the content analysis and construction of the representative comments, it was possible to identify certain themes as consistent throughout the answers. The themes identified were *safety*, *situational need*, *earlier experience*, and *challenged*. Although all the representative comments are important, a few have been chosen and used explicitly in the discussion because they highlight the themes and the important aspects of this study's focus (the chosen comments are highlighted in **Table 3**).

4.3. Responses to Items 5 & 6

When asked, in Item 5, “*Think about the last time you needed information about diagnosis, treatment or procedures. What was your first step in order to find the information you needed?*”, almost half of the respondents (44%) answered that they looked for information on the internet (not the hospital website). Subsequently, 21.3% called the hospital for information and 18.3% went to the hospital website to find the information needed. Finally, when asked in Item 6, “*Think about the last time you needed information about diagnosis, treatment and procedures. Where were you when the need for information occurred?*”, almost two-thirds of respondents (72.5%) replied that they were at home, with the remaining 27.5% distributed among at work (8.1%), on transport (2.3%), and other and don’t remember (17%).

4.4. Cross-Tabulations

There were no substantial differences between the choices of men and women or different age groups regarding the forms of PEM they had used previously; however, higher numbers of respondents with MCHE and LCHE educational levels had used audio and audio-visual forms to access information about health and illness.

There were no differences in the choices of men and women or different educational levels regarding their preferences for forms of PEM available from the hospital. Neither did the prioritization of the three forms of PEM differ substantially among respondents according to their sex or education. However, when looking at the age groups, it was possible to see a significant ($P \leq 0.001$) difference regarding preferences for forms of PEM available from the hospital. The preference for audio PEM (podcast) was highest (46.5%) among the 40 - 50 years old respondents and the preference for audio-visual PEM (video) was highest (67.0%) among the 30 - 40 years old respondents. All cross-tabulations are provided in **Appendix 1**.

5. Discussion

To the best of my knowledge, this is the first survey conducted to investigate patient experiences and preferences for different forms of PEM. The findings of this study constitute important knowledge that improves understanding of patient preferences for different forms of PEM.

The study found that majority of respondents (86.46%) would like text-based PEM to be available; however, half of the respondents (50.21%) also wished for audio-visual PEM, followed by approximately one-third (31.67%) expressing a desire for audio PEM. Analysis of respondent prioritization of the three forms (in Item 3) demonstrated the same outcome; that is, text-based PEM was their first priority, followed by audio-visual and lastly audio.

These findings were supported by the respondents’ written comments. It was found that 20 respondents wrote very similarly about the theme *safety* with re-

gard to PEM: “*It feels safer to have patient education material in a leaflet; you can hang it for example on your refrigerator and read it again and again.*” Nevertheless, 54 respondents who had chosen written PEM as their first priority wrote about the theme *situational needs* that comprehended how the need for information differed depending on the situation: “*A leaflet is fast and easy to read and good for short information, but sometimes more thorough information like video or podcast would be a great additional help.*” These findings suggest that, although written PEM remains the most common preference, there is also a need for other forms, depending on the subject of the PEM or how much detail is required. Additionally, 22 respondents who had chosen written PEM as their first priority wrote similarly about the theme *earlier experience* that related to their lack of experience with forms of PEM other than written: “*I’m used to text-based patient education materials and don’t know about video or podcast. I haven’t tried them. Don’t know the technique.*” This suggests that a considerable number of patients may change their preferences if they had the opportunity to use PEM in different formats.

Historically, there was agreement that written communication was the clearest form of communication and the most worthwhile, with the highest status. Text with pictures was deemed to be less serious and more entertaining than science [20] [26]. Today, the use of visual elements in text-based communication is a significant and well-substantiated choice. Graphics and pictures activate visual and verbal language centers in the brain and achieve more optimal learning [20] [26].

The need for audio and audio-visual elements was also evident in the answers to the open-ended item. The comments related to the theme *challenged* showed how several of the respondents mentioned having trouble with solely text-based PEM: “*I’m dyslexic, so Video or Podcast would help me a great deal,*” or, “*I understand more when watching a video. Video is much easier to comprehend.*” These points of view were shared by several respondents as shown in **Table 3**. The significance of the statements from the respondents is supported by research studies [1] [7] [11] [12] [27] that describe how non-text-based forms of media can serve to increase patient health literacy, specifically among those with low literacy skills. This is further substantiated by research demonstrating how people recognize, retain, and recall images better than text, and how a simultaneous presentation of images, writing, dynamic graphics, and sound increases comprehension [20].

In addition, the results show that respondents with a higher educational level (MCHE and LCHE) had more experience finding audio and audio-visual PEM about health- and illness-related topics. Of the respondents, 44% sought PEM on various websites. Only 18.3% of respondents looked for PEM from the hospital’s website (**Table 2**). The internet today is an easily accessible resource, with a vast amount of information in various forms; however, not all information online is credible. It is unsurprising that the respondents looked to the internet when they had questions that needed answering; however, as 44% choose not to use the

hospital website first, this suggests that the majority of respondents find the hospital website insufficient in providing the PEM they require. The reasons respondents with higher levels of education tended to be more experienced in finding audio and audio-visual information about health- and illness-related topics is unclear; however, this specific group of respondents may be more likely to seek additional information in various forms other than text-based, particularly if the information they have access to does not meet their expectations.

The results also show a significant difference between age groups in preferences for audio and audio-visual PEM. The preferences for the forms audio and audio-visual were highest with respondents younger than 50 years old. This could suggest that there is a digital divide between elderly and younger groups concerning the use of podcasts and video materials. The elderly are, on average, more reluctant or less able to integrate digital information material such as podcasts and videos from the internet in their value creation process. Thus, the digital divide may need more focus on the information providers' value facilitation and co-creation of value with patients.

The choice of form in a learning situation is didactic and the sender must be aware of the recipients and their different literacy skills [19] [28]; however, the majority of respondents appeared to prefer combinations of text-based, audio, and video PEM, thus applying and co-constructing a multimodal communication system, in which they pick and apply different modes of communication simultaneously from different sources. "*Mode is used to refer to a regularized organized set of resources for meaning-making, including, image, gesture, movement, music speech and sound-effect. Modes are broadly understood to be the effect of the work of culture in shaping material into resources for representation*" ([29]: pp. 1-2).

In recent years, there has been a significant change in our perception of which modes can be used in communication and how they are integrated with other modes. Each mode offers a different focus and a different aspect of meaning and, therefore, differently influences human cognition [20]. The computer, tablet, or smartphone is a tool for construction and dissemination of communication; therefore, digital technology opens up the possibility of using many different modes, and no specialized knowledge is required to activate additional modes [7] [8] [26]. It is also observed that modalities are co-constructed between patients and the clinic since patients use online resources to co-construct their own patchwork of communication bundles; however, this implies that the hospital, to improve communication and counteract potential inequalities between various groups of patients resulting from these wider semiotic practices, needs to know much more about how patients, in their social context, create value from various modes of communication.

This study gives an overall idea of patient preferences regarding PEM and the request for multimodal and co-created communication systems. According to Helkkula *et al.* [21], value can be considered a phenomenon that relates to the

experience and value-in-use for the user. They argue that the value as an experience is directly or indirectly linked to the phenomenological lifeworld context of the person using a certain product. Hence, to genuinely consider patient preferences and value creation, more research is needed to understand the value patients find in different communication bundles and how the value of communication can be co-created between patients and the hospital.

Limitations

One of the limitations of this study is that the survey was conducted at a single outpatient clinic. This could impact the generalizability and transferability of the findings to other outpatient and inpatient clinics; however, the outpatient clinic site treats a high number of patients who vary greatly in age, illness, and illness severity, which ranges from minor problems to conditions requiring lifesaving treatment, and is, therefore, comparable to many other outpatient clinics. However, the greatest impact on generalizability of our findings was the use of a nonprobability convenience sample.

Another limitation of this study is the potential for recall bias associated with respondents' answering questions about their behavior in the past in searching for answers regarding health- and illness-related topics. Nevertheless, the questions asked in the survey did not require the respondents to search far back in their memories, which may have mitigated this problem.

A third limitation is the lack of information about the demographics of those patients who did not check in with the secretary and therefore did not respond to the survey. Additionally, the ratio between patients who did and did not check in with the secretary is not known; however, with 480 respondents, a fair amount of data were collected and the analyses of demographics show that the distribution was relatively consistent with the clinical intake for all parameters.

6. Conclusions

In conclusion, the findings demonstrate that the majority of respondents would prefer the possibility of making their own patchwork of communication bundles with different forms of PEM. Earlier research substantiates this conclusion by reporting that information in different forms uses different modes and that each mode offers a different way of representing meaning, thus affecting human cognition differently, which can potentially result in higher health literacy. This notion is supported by the answers of our respondents to the survey.

This study can be considered a preliminary investigation of the process of understanding how different forms of PEM can be of value to patients. Additional interviews would be beneficial to gain in-depth understanding of how multi-modal communication systems of value for patients can be co-constructed. Nevertheless, this study constitutes important knowledge and indicates the need to do more to meet patient preferences for differentiated modes of PEM forms, for example, by creating written, visual, and audio-visual PEM.

Implication for Practice

In this paper, I have used the term healthcare personnel (HCP) when discussing who delivers PEM to patients. This is a conscious choice because every HCP delivers PEM. That said, it is very important to emphasize that I believe nurses have a major role to play in the development of good PEM that meets the patients' needs for different forms. Often nurses have the majority of interaction with the patients during the patients' time at the hospital and therefore have a great insight into patient perspectives. Nurses have a perception about what the patients struggle to understand or where they misinterpret given information. This perception should be further explored by nurses interviewing patients about what holds value for them in regard to PEM. The nurses' earlier experience and new knowledge obtained from interviews will give them a unique opportunity to create diverse PEM and help to improve patient health outcomes.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Appendix 1

1) Have you had previous experience with any of the patient education material mentioned to obtain knowledge about illness and/or health related issues? (Crosstabs with demographics)

Response categories Demographic ↓	Text-based information (leaflet)		Audio information (podcast)		Audio-visual information (video)	
	n (%)	P-value	n (%)	P-value	n (%)	P-value
Sex		0.033		0.200		0.143
Male	119 (70.4)		11 (6.5)		17 (10.1)	
Female	246 (79.1)		31 (9.9)		46 (14.8)	
Highest education		0.200		0.016		0.008
Primary school	48 (66.7)		1 (1.4)		3 (4.2)	
High school	42 (70.0)		4 (6.8)		3 (5.0)	
MCHE	189 (79.1)		30 (12.6)		39 (16.3)	
LCHE	86 (78.9)		7 (6.4)		18 (16.5)	
Age (years)		0.143		0.551		0.375
18 - 30	70 (66.0)		9 (8.5)		10 (9.4)	
30 - 40	68 (77.3)		11 (12.5)		15 (17.0)	
40 - 50	66 (76.7)		10 (11.6)		14 (16.3)	
50 - 60	68 (79.1)		6 (7.0)		11 (12.8)	
60 - 70	52 (83.9)		4 (6.5)		10 (16.1)	
70 - 80	37 (84.1)		2 (4.6)		3 (6.8)	
80 - 90	4 (50.0)		0 (0.0)		0 (0.0)	
Total	365 (76.0)		42 (8.7)		63 (13.1)	

2) What kinds of patient education material about diagnosis, treatment, and procedures would you like to be available from the department? (Crosstabs with demographic information)

Response categories Demographic ↓	Text-based information (leaflet)		Audio information (podcast)		Audio-visual information (video)		Don't know	
	n (%)	P-value	n (%)	P-value	n (%)	P-value	n (%)	P-value
Sex		0.047		0.610		0.826		0.538
Male	139 (82.2)		56 (33.1)		86 (50.9)		14 (8.3)	
Female	276 (88.8)		96 (30.9)		155 (49.8)		21 (6.7)	
Highest education		0.457		0.026		0.035		0.090
Primary school	62 (86.1)		15 (20.8)		25 (34.7)		6 (8.3)	

Continued

High school	49 (81.7)	14 (23.3)	31 (51.7)	8 (13.3)
MCHE	212 (88.7)	80 (33.5)	130 (54.4)	11 (4.6)
LCHE	92 (84.4)	43 (39.4)	55 (5.5)	10 (9.2)
Age (years)	0.410	0.001	0.001	0.176
18 - 30	87 (82.1)	30 (28.3)	65 (61.3)	14 (13.2)
30 - 40	79 (89.8)	31 (35.2)	59 (67.0)	5 (5.7)
40 - 50	70 (81.4)	40 (46.5)	46 (53.5)	7 (8.1)
50 - 60	77 (89.5)	28 (32.6)	38 (44.2)	3 (3.5)
60 - 70	56 (90.3)	18 (29.0)	23 (37.1)	3 (4.8)
70 - 80	39 (88.6)	4 (9.1)	10 (22.7)	3 (6.8)
80 - 90	7 (87.5)	1 (12.5)	0 (0.00)	0 (0.0)
Total	415 (86.5)	152 (31.7)	241 (50.2)	35 (7.3)

3) How do you prefer to receive patient education materials about procedures, diagnoses, and treatment? Prioritize your response. Crosstabs with demographic information and responses to items 5 and 6.

Response categories Demographic	1		2		3	
	Text-based information (leaflet)		Audio-visual information (video)		Audio information (podcast)	
	n (%)	P-value	n (%)	P-value	n (%)	P-value
Sex		0.015		0.187		0.075
Male	126 (74.6)		126 (74.6)		121 (71.6)	
Female	256 (82.3)		223 (71.7)		232 (74.6)	
Highest education		0.661		0.157		0.075
Primary school	61 (84.7)		61 (84.7)		62 (86.1)	
High school	49 (81.7)		46 (76.7)		46 (76.7)	
MCHE	184 (77.0)		168 (70.3)		170 (71.1)	
LCHE	88 (80.7)		74 (67.9)		75 (68.8)	
Age (years)		0.017		0.007		0.064
18 - 30	77 (72.6)		74 (69.8)		80 (75.5)	
30 - 40	71 (80.7)		64 (72.7)		62 (70.5)	
40 - 50	58 (67.5)		53 (61.6)		52 (60.5)	
50 - 60	74 (86.0)		59 (68.6)		63 (73.3)	
60 - 70	55 (88.7)		52 (83.9)		52 (83.9)	
70 - 80	40 (90.9)		39 (88.6)		37 (84.1)	
80 - 90	7 (87.5)		8 (100)		7 (87.5)	
What did you do the last time you needed information?		0.007		0.092		0.345

Continued

I called the hospital and got the information I needed	93 (91.2)	80 (78.4)	80 (78.4)
I looked at the patient information on the hospital website	65 (73.9)	62 (70.5)	64 (72.7)
I went online to search for information (not the hospital website)	159 (75.4)	141 (66.8)	150 (71.1)
I asked friends or family for advice	20 (76.9)	20 (76.9)	17 (65.4)
I did something else	16 (80.0)	18 (90.0)	16 (80.0)
I don't remember	29 (87.9)	28 (84.8)	26 (78.8)
Where were you when you last needed information?	0.004	0.007	0.013
At home	278 (79.9)	261 (75.0)	258 (74.1)
At work	27 (69.2)	26 (66.7)	30 (76.9)
On transport	7 (63.6)	6 (54.5)	10 (90.9)
Other	6 (60.0)	9 (90.0)	7 (70.0)
I don't remember	64 (88.9)	47 (65.3)	48 (66.7)
Total	382 (79.6)	349 (72.7)	353 (73.5)