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Understandability and Actionability of Artificial Intelligence-Assisted Lymphedema Education Material in Patients Undergoing Breast Cancer Surgery: Expert Evaluation

Gülseren Maraş Baydoğan | Yeliz Sürme | Handan Topan

Faculty of Health Sciences, Surgery Nursing, Erciyes University, Kayseri, Türkiye

Correspondence: Handan Topan (handan_varol@hotmail.com)

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ABSTRACT

Aims: To evaluate the artificial intelligence-assisted lymphedema education material in patients undergoing breast cancer surgery.

Design: A comprehensive, successful methodological design was used to evaluate the portability of the expandable, AI-supported lymphedema education material for breast cancer. The study was reported in accordance with the STROBE statement (see Data S1 for the completed STROBE [Strengthening the Reporting of Observational Studies in Epidemiology] checklist). When preparing the AI-supported lymphedema education material managed with breast cancer treatment, it is first determined in the education of patients. Then, the commands of the Chat GBT-4 program are included in the scope of the transferred education content. For the created education content, readability was first evaluated and expert opinion was taken for the final version of the draft.

Methods: While preparing the AI-assisted lymphedema education material in the study, expert opinions were obtained, and the educational needs of the patients were determined by scanning the literature. Then, 12 commands were given in the ChatGPT-4 program to create the educational content. Formulas were used to evaluate the readability of the created educational content in Turkish and the readability of the health literature. The validity of the lymphedema education material was presented to 10 experts. The experts evaluated the understandability and actionability of the educational material using the Patient Education Materials Evaluation Tool and the Global Quality Scale, which evaluates the quality of the educational material.

Results: It was concluded that the readability index of the lymphedema education material for Turkish was 67.3, and the Turkish readability level was 'easily understandable'. The readability index of health literature was found to be 11.28, 9.68, 10.58, 39.0, and 11.26, respectively. When the internal consistency coefficient between the experts was examined, it was found to be 0.74. It was determined that the Patient Education Materials Evaluation Tool understandability score average was 92.10 ± 9.03, and the actionability score average was 81.60 ± 18.47. The Global Quality Scale score average, which evaluates the suitability and quality of the content of the AI-supported educational material, was found to be 4.10 ± 0.87.

Conclusion: At the end of the study, it was determined that the educational material was reasonable regarding understandability and actionability. The Turkish readability level was also reasonable and easily understandable.

Implication for the Profession: This study is one of the proactive attempts to use AI in preparing educational materials for nurses and healthcare professionals.

Patient or Public Contribution: No patient or public contribution.

Summary

- What does this paper contribute to the broader global clinical community?
  - The study provides a unique perspective on the understandability and actionability of AI-supported lymphedema educational material in patients, potentially inspiring new research and practices in the field.
  - The study reveals that the AI-supported lymphedema educational material has good understandability and actionability due to expert opinions.
  - This study plays a proactive role as it is the first to explore AI-supported lymphedema patient education. The findings of this study could potentially shape the future of patient education in the field of oncology, particularly in the context of breast cancer-related lymphedema.
  - It provides potential resources for nurses and healthcare professionals to integrate AI technologies and educational materials into their practices.

1 | Introduction

One of the most frequently diagnosed cancer types worldwide is breast cancer. Today, one in eight cancer diagnoses is breast cancer, and it accounts for 2.3 million new diagnoses in both sexes. In women, it accounts for one-fourth of all cancer diagnoses. It is estimated that the number of breast cancer diagnoses will increase by 40% by 2040, reaching an average of three million each year (Arnold et al. 2022). In Türkiye, the situation is similar; breast cancer is the first among the types of cancer seen in women and the second most common cancer (240,013), and the incidence rate is 10.3% (24,175) (Bray et al. 2024).

Breast cancer-related lymphedema (BCRL) is one of the unwanted and most feared complications of breast cancer. Lymphedema represents almost a lifelong risk after surgery (Donahue et al. 2023). One in every six people who survive cancer after surgery develops lymphedema, and therefore, lymphedema has become a significant clinical problem worldwide (Rafn et al. 2022). It is reported that breast cancer-related lymphedema (BCRL), which affects 3–5 million people worldwide, affects 20,000 people in the United States. It is also reported that 10%–30% of 3 million cancer survivors will develop breast cancer-related lymphedema (BCRL) (Ahmed et al. 2025; McEvoy et al. 2022). Lymphedema is a symptom and an essential condition that negatively affects the patient's long-term quality of life, psychosocial interaction, and emotional well-being, and has a severe financial burden on the patient, family, and healthcare services (Donahue et al. 2023).

It is emphasised that one of the leading causes of lymphedema is a lack of education and knowledge. Patient education facilitates early diagnosis of lymphedema and management of risk factors, early diagnosis of symptoms and signs, and increased awareness of treatment options (Perdomo et al. 2023). Risk-reducing behaviour and exercises aimed at providing lymphatic drainage are mostly recommended for the prevention of breast cancer-related lymphedema. In recent years, education plans for lymphedema have helped to reduce the incidence of surgery-related lymphedema (Martínez-Jaimez et al. 2022). However, health inequalities continue among patients in terms of equal access to interventions for the prevention of breast cancer-related lymphedema (Martínez-Jaimez et al. 2022). A systematic review emphasised that studies should create the most appropriate educational content to provide lifelong lymphedema education after surgery (Perdomo et al. 2023).

In 2022, ChatGPT, which emerged as a new generation of AI that can solve problems and answer questions with sophisticated software, was made available to the public. It reached 100 million users in just 64 days after its launch and became famous for its ability to produce text that resembles humans in various subjects and the health field (Munir et al. 2024). Virtual assistants have provided healthcare professionals and patients with remarkable communication opportunities. This access has also been made accessible to everyone in a way that eliminates inequalities. However, this fast access has also brought up the problem of not providing references; if it does provide references, their accuracy must be challenged. It can provide multiple answers to a question and, most importantly, confidently produce wrong answers (Hopkins et al. 2023). This technology, advancing at a dizzying pace, brings ethical problems, data security, and a futuristic approach that will facilitate the functioning of the healthcare system and personalise care (Civaner et al. 2022). ChatGPT has not only been accepted as an author in some journals (Flanagin et al. 2023) but has also been suggested to aid education, research, and clinical management (Yüce et al. 2024).

Considering that people frequently turn to online resources for information on health-related issues, there are doubts about the accuracy and quality of this online health content. The reliability of ChatGPT's ability to answer questions on topics such as the postoperative process of the surgical patient, management of complications, and care remains a question mark (Munir et al. 2024). Therefore, the study focuses on the evaluation of an AI-assisted lymphedema educational material by experts for understandability and actionability. The study's content evaluation design was based on expert opinions and did not involve direct patient participation. In this context, a methodological assessment was conducted to determine the quality of the educational material.

2 | Methods

2.1 | Aim and Objectives

This study was planned to expertly evaluate the understandability and actionability of the AI-supported lymphedema education material in patients who underwent breast cancer surgery.

- To evaluate the readability of AI-supported lymphedema education material for patients undergoing breast cancer surgery.
- To evaluate expert opinions on the understandability of AI-supported lymphedema education material for patients undergoing breast cancer surgery.
- To evaluate expert opinions on the actionability of AI-supported lymphedema education material for patients undergoing breast cancer surgery.

2.2 | Design

A comprehensive, successful methodological design was used to evaluate the portability of the expandable, AI-supported lymphedema education material for breast cancer. The study was reported in accordance with the STROBE statement (see Data S1 for the completed STROBE [Strengthening the Reporting of Observational Studies in Epidemiology] checklist). When preparing the AI-supported lymphedema education material managed with breast cancer treatment, it is first determined in the education of patients. Then, the commands of the Chat GBT-4 program are included in the scope of the transferred education content. For the created education content, readability was first evaluated and expert opinion was taken for the final version of the draft.

2.2.1 | Determining the Educational Needs of Patients

To determine the patients' education services, opinions and suggestions were received from a general surgeon, a general surgery clinic official, and a physician regarding the education services of patients who underwent breast cancer surgery. At the same time, the researchers determined information sources on lymphedema in children (Bakar 2025; Karahan et al. 2020; Gupta et al. 2020).

2.2.2 | Creation of Lymphedema Education Material Content in the ChatGPT-4 Program

The researchers scanned the literature on lymphedema care (Perdomo et al. 2023; Hasenoehrl et al. 2020; Liang et al. 2020; Jogerst et al. 2020) and reached systematic reviews, meta-analyses, and protocols. These resources were loaded into the ChatGPT-4, and a command was given to create educational content under the titles specified in Table 1. The booklet obtained from the commands consisted of 33 pages and 4116 words. An image of an arm with lymphedema is shown in Figure 1.

2.3 | Evaluation of Readability

The concept of readability is a tool frequently used to evaluate printed educational materials to determine whether readers can easily follow the content of a text. Ateşman developed the readability formula for Turkish by adapting the Flesch formula. Ateşman states, 'The average sentence length in Turkish is 9–10 words, and the average word length is 2.6 syllables.' According to the formula, the readability level is between 0 and 100. As the obtained score approaches 100, the readability of the text becomes easier, and as it approaches 0, the readability of the text becomes more difficult (Ateşman 1997). (http://okunabilirlikindeksi.com) It was evaluated using the 'Simple Measure of Gobbledygook (SMOG)',

TABLE 1 | Educational material topics on lymphedema management for patients who have undergone breast cancer surgery.

Commands
1. I am a surgical nurse. Can you create a visual for lymphedema in patients who have had breast cancer surgery?
2. I am a surgical nurse. Can you create educational material that explains the lymphatic system and lymphedema to patients who have had breast cancer surgery in a way that patients can understand?
3. I am a surgical nurse. Can you create educational material that explains what lymphedema is and why it is for patients who have had breast cancer surgery in a way that patients can understand?
4. I am a surgical nurse. Can you create educational material that patients can understand about the symptoms of lymphedema in patients who have had breast cancer surgery?
5. I am a surgical nurse. Can you create educational material that patients can understand about the risk factors for lymphedema in patients who have had breast cancer surgery?
6. I am a surgical nurse. Can you create educational material that patients can understand about lymphedema prevention methods in patients who have had breast cancer surgery?
7. I am a surgical nurse. Can you create educational materials that patients can understand about lymphedema management in daily life for patients who have had breast cancer surgery?
8. I am a surgical nurse. Can you create educational materials that patients can understand about nutrition for patients who have had breast cancer surgery?
9. I am a surgical nurse. Can you create educational materials that patients can understand about skincare for patients who have had breast cancer surgery?
10. I am a surgical nurse. Can you create educational materials that patients can understand about weight management for patients who have had breast cancer surgery?
11. I am a surgical nurse. Can you create educational materials that patients can understand about protection from trauma for patients who have had breast cancer surgery?
12. I am a surgical nurse. Can you create educational materials that patients can understand about self-exercise for patients who have had breast cancer surgery?

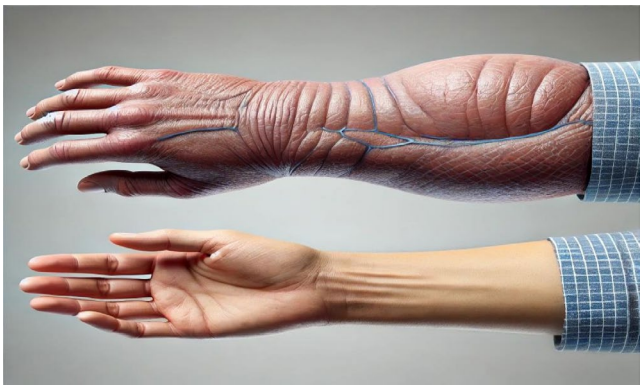

FIGURE 1 | Lymphedema image created by ChatGPT, which is used to visually explain the condition to patients. [Colour figure can be viewed at wileyonlinelibrary.com]

'Flesch-Kincaid Grade Level (FKGL)', 'Average Reading Level Consensus (ARLC)', and 'Flesch Reading Ease (FRE)' formulas frequently used in the health literature by Wang and his colleagues (Wang et al. 2013). Finally, it was evaluated using the 'Automatic Readability Index (ARI)' formula developed by Smith and Senter (Smith and Senter 1967) (https://readabilityformulas.com).

2.4 | Obtaining Expert Opinions for the Educational Material

Ten experts (Sürme et al. 2025) with doctoral degrees in surgical nursing and extensive experience in the field rigorously assessed the validity of the AI-supported lymphedema educational material for patients undergoing breast cancer surgery. These experts evaluated the educational material's understandability and actionability using the Patient Education Materials Assessment Tool (PEMAT-P) and its quality using the Global Quality Scale.

2.4.1 | Patient Education Materials Assessment Tool (PEMAT)

The Patient Education Material Assessment Tool (PEMAT) was developed by Shoemaker et al. 2014 to evaluate and compare the understandability and actionability of printable and audiovisual educational materials. Understandability: When individuals with different levels of education and health literacy can process and explain the essential messages intended to be given, the patient education material is understandable. Actionability: When individuals with different levels of education and health literacy can determine what they can do based on the information provided, the patient education material is applicable. The Turkish validity and reliability study of the Patient Education Material Assessment Tool was conducted by Akkoç and Orgun (2023). PEMAT has two versions: Patient Education Material Assessment Tool for Printable Materials (PEMAT-P) and Audiovisual Materials Patient Education Material Assessment Tool (PEMAT–A/V). The printable materials patient education material evaluation tool consists of 26 items, 17 evaluating understandability and seven evaluating actionability. The scale is scored as '0' (disagree), '1' (agree), and 'Not applicable'. Scoring is obtained by dividing the total score by the possible score and multiplying by 100. The final score is evaluated between 0 and 100 regarding understandability and actionability. The higher the score, the higher the understandability or actionability of the material. This study used the 'Patient Education Material Assessment Tool for Printable Materials (PEMAT-P)' to evaluate the understandability and actionability of the AI-supported lymphedema education material in patients undergoing breast cancer surgery.

2.4.2 | Quality Score of the Education Materials (GQS)

The appropriateness and quality of the content of the wound care education material were evaluated using the Global Quality Scale. The Global Quality Scale was developed by Bernard et al. (2007). Rating uses a five-point Likert scale (Bernard et al. 2007). The scores refer to the quality of the educational material and the extent to which the assessor is helpful to the patients. Accordingly, a score of '1' indicates poor quality, and a score of '5' indicates excellent quality. (Table 2) (Saatçi et al. 2024; Gunduz et al. 2024; Ozduran and Büyükçoban 2022).

2.5 | Statistical Analysis

Statistical analyses were performed using SPSS 25.0 (Statistical Package for Social Science). Descriptive statistics were presented as unit count (n), percentage (%), and mean ± standard deviation ($\bar{X} \pm SD$). Intraclass Correlation Coefficient analysis was used to calculate the internal consistency of agreement between experts. $p < 0.005$ was taken as the significance level.

2.6 | Ethical Statement

This study, conducted using the open-access ChatGPT application and not involving direct patient data or intervention, did not require ethics committee approval. Furthermore, all participating experts were informed about the study's purpose and procedures, and their voluntary informed consent was obtained before participation. The study was conducted by ethical standards applicable to research involving expert opinions, and confidentiality and data protection principles were strictly adhered to.

3 | Results

3.1 | Readability Evaluation

The readability index for Turkish, which was applied to evaluate the AI-supported lymphedema education material in patients undergoing breast cancer surgery, was determined to be 67.3. When the readability levels were examined, it was concluded that the readability level of Turkish was 'easily understandable'. In addition, the readability indexes of ARI, SMOG, FKGL, and FRE used for health literature's readability were 11.28, 9.68, 10.58, and 39.0, respectively. The ARLC was found to be 11.26. The readability levels of health literature were determined to be fairly difficult, somewhat difficult, fairly difficult, difficult, and fairly difficult, respectively (Table 3). This comprehensive evaluation process provides a reliable assessment of the readability of the educational material.

TABLE 2 | GQS criteria.

Criteria	Scores
Poor quality; poor flow of the site; most information missing; not at all useful for patients	1
Generally poor quality and poor flow; some information listed but many vital topics are missing; of minimal use to patients	2
Moderate quality; suboptimal flow; some critical information is adequately discussed, but others poorly discussed; somewhat helpful for patients	3
Good quality and generally has a good flow; most of the relevant information is listed, but some topics are not covered; beneficial for patients	4
Excellent quality and excellent flow; beneficial for patients	5

TABLE 3 | Evaluation of readability.

	Readability index	Readability level
Ateşman	67.3	9th or 10th grade students (easy to understand)
Automated readability index (ARI)	11.28	11th grade Fairly difficult
Simple measure of gobbledygook (SMOG)	9.68	10th grade Somewhat difficult
Flesch–Kincaid grade level (FKGL)	10.58	11th grade Fairly difficult
Flesch reading ease (FRE)	39.00	College Difficult
Average reading level consensus (ARLC)	11.26	11th grade Fairly difficult

TABLE 4 | Intraclass correlation coefficient.

		95% confidence interval		
	Intraclass correlation	Lower bound	Upper bound	*p*
Average measures	0.749	−0.012	0.938	**0.026**

Note: $p < 0.05$.

3.2 | Inter-Rater Reliability

When the internal consistency coefficient between experts was examined in our study, it was found to be 0.74 due to the analysis. (95% CI [0.187–0.950], $p < 0.05$) (Table 4).

3.3 | Patient Education Materials Assessment Tool (PEMAT)

In most of the PEMAT items (11 items), 90% or above of the experts agreed. The PEMAT understandability score average was 92.10 ± 9.03 (70–100), and the PEMAT actionability score average was 81.60 ± 18.47. The Global Quality Scale score average, which evaluates the suitability and quality of the content of the artificial intelligence-supported educational material prepared for patients who have undergone breast cancer surgery, was found to be 4.10 ± 0.87 (3–5) (Table 5 and Figure 2).

4 | Discussion

Lymphedema due to breast cancer surgery is one of the most common complications encountered by individuals who believe they have successfully treated a new problem (Shen et al. 2025). Lack of knowledge and awareness about lymphedema after surgery can lead to an increased risk of lymphedema. Therefore, multifaceted patient education is critical to prevent lymphedema, reduce the risk, and develop a healthy lifestyle (Cansız et al. 2022). Including AI applications in managing complicated symptoms in healthcare services has transformed the potential to improve patient care and quality of life. These rapid technological approaches create an opportunity for clinical applications and potentially revolutionise healthcare services (Alowais et al. 2023). This study was implemented to contribute to the understanding of the role of AI in healthcare services and to take a proactive role in clinical integration. It is thought to be the first study to evaluate the comprehensibility and actionability of AI-supported lymphedema education material in patients undergoing breast cancer surgery.

The study evaluated the readability of the AI-supported lymphedema education material and concluded that the Turkish readability index was 67.3 and the readability level was 'easily understandable'. The readability index of the health literature was determined to be 11.28, 9.68, 10.58, and 39.00 for the ARI, SMOG, FKGL, and FRE criteria, respectively. However, it was determined that the readability levels were generally 'difficult'. The readability of the ChatGPT-3.5-supported patient education material developed by Rouhi et al. for aortic stenosis was examined.

According to the study results, FRE, FKGL, SMOGI, and GFI scores were determined to be 76.9 ± 1.2, 5.9 ± 0.8, 8.8 ± 0.6, and 7.7 ± 0.9, respectively. At the same time, ChatGPT-3.5 was found to have readability at the 6th–7th grade reading level in all four criteria (Rouhi et al. 2024). In a study planned to examine the readability and quality of patient education material generated with artificial intelligence for endoscopic skull base surgery, the results of 66 articles were evaluated.

TABLE 5 | Patient education materials assessment tool (PEMAT) expert opinions.

Scale items	Agree *n* (%)	Disagree *n* (%)	Not applicable *n* (%)
Understandability			
1. The material makes its purpose completely evident	10 (100.0)		
2. The material does not include information or content that distracts from its purpose	10 (100.0)		
3. The material uses common, everyday language	10 (100.0)		
4. Medical terms are used only to familiarise the audience with the terms. When used, medical terms are defined	9 (90.0)		1 (10.0)
5. The material uses the active voice	8 (80.0)	1 (20.0)	
6. Numbers appearing in the material are easy to understand	8 (80.0)		2 (20.0)
7. The material does not expect the user to perform calculations	10 (100.0)		
8. The material breaks or 'chunks' information into short sections	10 (100.0)		
9. The material's sections have informative headers	10 (100.0)		
10. The material presents information in a logical sequence	10 (100.0)		
11. The material provides a summary	9 (90.0)	1 (10.0)	
12. The material uses visual cues (e.g., arrows, boxes, bullets, bold, larger font, highlighting) to draw attention to critical points	6 (60.0)	4 (40.0)	
13. The material uses visual aids whenever they can make content more easily understood (e.g., illustration of healthy portion size)	(70.0)	3 (30)	
16. The material's visual aids reinforce the content rather than distracting from it	7 (70.0)		3 (30.0)
17. The material's visual aids have clear titles or captions	6 (60.0)		4 (40.0)
18. The material uses illustrations and photographs that are clear and uncluttered	5 (50.0)	1 (10.0)	4 (40.0)
19. The material uses simple tables with short and clear row and column headings	1 (10.0)		9 (90.0)
Actionability			
20. The material identifies at least one action the user can take	10 (100.0)		
21. The material addresses the user directly when describing actions	10 (100.0)		
22. The material breaks down any action into manageable, explicit steps	8 (80.0)	2 (20.0)	
23. The material provides a tangible tool (e.g., menu planners, checklists) whenever it could help the user take action	6 (60.0)	3 (30.0)	1 (10.0)
24. The material provides simple instructions or examples of how to perform calculations	3 (30.0)		7 (70.0)
25. The material explains how to use the charts, graphs, tables, or diagrams to take action	1 (10.0)		9 (90.0)
26. The material uses visual aids whenever they can make it easier to act on the instructions	2 (20.0)	6 (60.0)	2 (20.0)
	Mean ± SD	**Min**	**Max**
PEMAT Understandability (0–100)	92.10 ± 9.03	70.0	100.0
PEMAT Actionability (0–100)	81.60 ± 18.47	50.0	100.0
GQS Criteria (1–5)	4.10 ± 0.87	3	5

Abbreviation: SD, standard deviation.

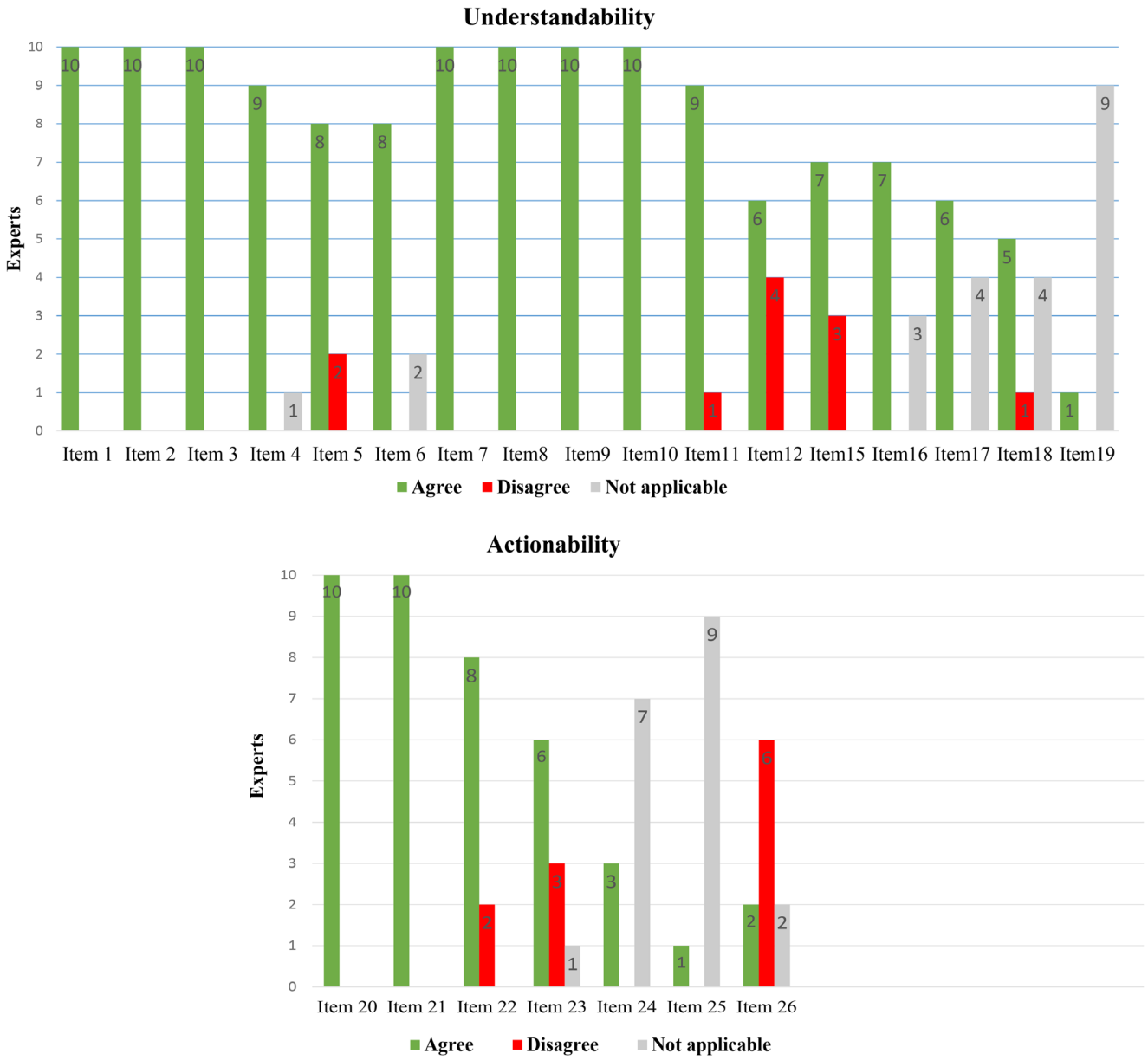

FIGURE 2 | PEMAT understandability and actionability expert opinions graph. [Colour figure can be viewed at wileyonlinelibrary.com]

The average FRE index of all articles examined was classified as 'difficult'. Most articles were 'difficult' and 'very difficult' to read. With ChatGPT, the 10 articles with the lowest FRE scores were revised with simple words and sentences at the sixth-grade reading level with the command. As a result of this revision, the FRE index of the texts generated by ChatGPT was classified as 'difficult' (38.6). However, it showed a better readability level than half of the original texts. The FKG, GFI, SMOGI, and ARI scores of the original articles were 11.5 ± 2.1, 13.8 ± 2.1, 13.6 ± 2.0, and 11.2 ± 2.3, respectively, while the ChatGPT results were 10.0, 12.1, 13.0, and 11.3, respectively (Warn et al. 2024). In another study, it was observed that patient education materials created using ChatGPT, DocsGPT, Google Bard, and Bing Chat artificial intelligence applications on cirrhosis were above the sixth-grade reading level required by the National Institutes of Health and the American Medical Association for patient education materials (Pradhan et al. 2024). As a result, it can be said that ChatGPT performed well in increasing the readability of the created and adapted texts, both in this study and in the literature examples. However, in order to evaluate whether the created content is evidence-based, health professionals must evaluate it.

At the end of the study, experts gave 90% or above 'I agree' responses for most of the PEMAT items (11 items). These items, which include the use of plain language, the organisation of the material, and visual aids, are crucial for ensuring the understandability and actionability of patient education materials. The PEMAT understandability score average was 92.10 ± 9.03 (70–100), indicating a high level of comprehension. The PEMAT actionability score average was 81.60 ± 18.47, suggesting that the material was generally applicable to the target audience. The Global Quality Scale score average, which evaluates the suitability and quality of the content of the AI-supported educational

material prepared for patients who have undergone breast cancer surgery, was found to be 4.10 ± 0.87 (3–5), indicating a high level of quality. Musheyev et al. evaluated the responses given by the ChatGPT used by patients about urological malignancies. The PEMAT understandability score was 66.7% (44.4–83.3), and the PEMAT actionability score was 40% (0–40). In addition, the DISCERN health consumer information quality score, which was evaluated between 1 and 5 (1 = low, 5 = high), was evaluated as 3. The Flesch–Kincaid Grade (FKG) score was determined to be 11.7 (5th grade = very easy, 12th grade = university graduate level, most difficult to read) (Musheyev et al. 2024). In another study, the accuracy and readability of patient education material obtained from the Interventional Radiology Association Patient Center website and created with ChatGPT were compared.

At the end of the study, it was found that the readability of the patient education content obtained from the association website and Chat-CPT was above the fifth or sixth-grade level. The Flesch–Kincaid Grade (FKG) score was determined to be 11.1 (±1.3) for the website and 11.9 (±1.6) for the ChatGPT content. Finally, comparing the PEMAT-P scores, it was stated that the ChatGPT content received a lower score than the website material (McCarthy et al. 2023). In a study examining the responses given by ChatGPT to the five most frequently searched questions about the five most common cancers, it was determined that the DISCERN score was 5 (2–5), and no incorrect information was detected. The PEMAT understandability score was moderate (66.7% (33.3%–90.1%)), and the PEMAT actionability score was weak (20% (0%–40.0%)). It was stated that the Flesch–Kincaid Grade (FKG) score was between 11.3 and 12.7 at the university level (Pan et al. 2023). Scerri and Morrin's study suggested that nurses should perceive and become familiar with chatbots such as ChatGPT as having advantages over other applications and that their use is simple and testable. Although there are limitations in the current use, it was emphasised that there is a need for further work and development in nursing planning and practices. Nurses must participate in the decision-making processes of using such technologies independently, effectively, and reliably in their fields (Scerri and Morin 2023).

As can be seen, the readability, understandability, and actionability of AI-supported educational materials vary. These results show that information and materials produced by AI, which have become an essential source of medical information for readers, must be used with the opinion and evaluation of health professionals. The educational material was developed in Turkish and evaluated by a small, nationally homogeneous group of experts. Therefore, the generalizability of the findings is limited. Future studies conducted in different languages and with a more diverse group of experts will enhance the material's international validity and applicability. More studies are needed to evaluate the reliability and accuracy of the information obtained.

4.1 | Strengths and Limitations

This study, which examines the understandability and actionability of the lymphedema patient education material created by artificial intelligence, has several limitations. The first of these is the limitation of the commands directed to ChatGPT. Since lymphedema after breast cancer surgery is a comprehensive and multifaceted subject, it was difficult to create appropriate titles and commands. Another limitation is that sometimes short answers were received for the given commands, and different explanations had to be provided for a more comprehensive explanation of the subject. The booklet obtained from the commands consisted of 33 pages and 4116 words, which took time for experts to evaluate and read. However, it is limited due to the lack of visual content. The fact that the lymphedema education booklet does not visualise the application steps for the exercise, which is one of the critical parameters that should be included in the booklet, will create problems for patients to understand and apply. In this study, the ICC calculated for interrater reliability was 0.749, while the 95% confidence interval showed a wide range, ranging from −0.012 to 0.938. The negative lower bound of the confidence interval indicates high uncertainty regarding interrater consistency. This is particularly due to the limited sample size, which limits the generalizability of the findings. Therefore, the reliability results should be interpreted with caution and should be supported by more comprehensive future studies. Another limitation is that the educational material was prepared in Turkish and evaluated by a small group of national experts. The study's strength is that experts evaluated the educational material obtained to verify whether it contained incorrect information. Another strength is that the readability of the educational material created is easily understandable for the Turkish society in which it will be used.

5 | Relevance to Clinical Practice

With the digitalization of healthcare services and the integration of artificial intelligence technologies into these areas, healthcare professionals and patients have found easy access to information in the healthcare field. These rapidly developing artificial intelligence technologies will continue to significantly impact cancer surgery, symptom management, and the prevention of complications, as in many other areas. Patient education materials created by artificial intelligence technologies need to be developed with more precise commands that are more understandable, applicable, and supported by visual content. As a result of this development, healthcare professionals and patients will have access to reliable, evidence-based information in the modern technology age. Educational materials containing reliable, evidence-based information will contribute to achieving universal health goals such as individualised care, sustainable patient education, prevention of complications, equal access to healthcare resources, and reducing healthcare costs in the long term. It is also essential for policymakers and decision-makers to provide artificial intelligence technologies and ensure that they are seamlessly integrated into clinical routines. As a result, more studies are needed to evaluate the reliability of the information provided by artificial intelligence technologies to patients and healthcare professionals and their real-world impact on general health.

Author Contributions

G.M.B.: conceptualization, data curation, formal analysis, investigation, methodology, project administration, supervision, writing – original draft preparation, writing – review and editing. H.T.: project

administration, writing – original draft preparation, writing – review and editing. Y.S.: conceptualization, data curation, formal analysis, investigation, methodology, project administration, supervision, writing – original draft preparation, writing – review and editing.

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Disclosure

Declaration of generative AI and AI-assisted technologies in the writing process: The authors declare that they used ChatGPT-4-assisted material to create patient education content during the study's preparation. However, it was not used to prepare other parts of the article. After preparing the patient education material, the authors reviewed the content, performed the analyses described in the article, and took full responsibility for the publication's content.

Ethics Statement

This study, conducted using the open-access ChatGPT application and not involving direct patient data or intervention, did not require ethics committee approval. Furthermore, all participating experts were informed about the study's purpose and procedures, and their voluntary informed consent was obtained before participation. The study was conducted by ethical standards applicable to research involving expert opinions, and confidentiality and data protection principles were strictly adhered to.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1:** jocn70123-sup-0001-supinfo.docx.