

Exploring Hypertensive Patients' Experiences and Preferences with Online Health Education

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Abstract

There is a lack of research on patients' experiences and preferences when using such websites among patients with hypertension. This study aimed to explore their experiences and preferences for health education websites. The study employed a qualitative approach using in-depth interviews with 14 participants in Selangor. Patients' experience and preferences of the website were categorised into two main themes, 1) quality of the content, and 2) design and appearance. Patients preferred that the website's content to be more practical and the design to be more user-friendly. In conclusion, website must be designed tailored to the needs of the target group.

Keywords: hypertension, health promotion, patient education, public health, website

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1.0 Introduction

Hypertension, or high blood pressure, is a major global health threat, contributing to millions of deaths each year from non-communicable diseases. If left undetected or poorly managed, hypertension can lead to devastating complications such as stroke, heart attack, kidney failure, and death (World Health Organization, 2024). In Malaysia, the National Health and Morbidity Survey (NHMS) 2023 highlighted that the overall prevalence of hypertension had reached 29.2% (Institute for Public Health, 2024). Based on the NHMS 2019, Among the major ethnic groups, Malays have the highest prevalence at 32.2%, followed by Indians at 30.6% and Chinese at 28.1% (Institute for Public Health, 2019).

In the current digital era, the Internet has evolved into an indispensable resource for health education, with an increasing number of individuals seeking credible information online. Patients are progressively turning to online health information as a valuable resource for self-education and decision-making about their health. The quality of online medical information serves as a critical factor for both

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health professionals and patient education. Online health platforms and the dissemination of physician information bear significant importance in patient education and the management of public health (Guo et al., 2022). Based on a previous study, more than half of the patients surveyed in Malaysia utilised websites to seek health-related information, with Google emerging as the most commonly used search engine (Lim et al., 2021). This trend highlights the pivotal role of online platforms in delivering readily available health education.

Despite the high prevalence of hypertension among Malays in Malaysia and the widespread use of online health information, there is a notable lack of research on the experiences and preferences of Malay patients regarding health education websites. This knowledge gap is particularly concerning given that Malays have the highest prevalence of hypertension in the country. Understanding their specific needs and preferences is essential for creating effective and engaging health education resources. This study aims to fill this gap by exploring Malay hypertensive patients' overall user experience with existing hypertension education websites and preferences for web elements of websites.

2.0 Literature Review

The global prevalence of hypertension is a significant concern as it affects a large portion of the population. According to the World Health Organization (WHO), an estimated 1.28 billion adults aged 30–79 years worldwide have hypertension, with a majority of them residing in low- and middle-income countries (World Health Organization, 2024). The percentage of hypertensive adults in Asian regions has increased, particularly in the WHO Western Pacific Region, rising from 24% to 28% in 2019. This increase includes countries such as China, Republic of Korea, Philippines, Malaysia, Vietnam, and Japan (Kario et al., 2024). Hypertension is often associated with an increased risk of cardiovascular diseases, making it a major risk factor for adverse health outcomes. Additionally, hypertension has been linked to conditions like obstructive sleep apnea, which can exacerbate blood pressure levels (Liu et al., 2023).

Health education websites are crucial for providing information to patients, especially those who are looking for online resources. Many people with high blood pressure rely on these websites for information. Internationally, governments provide comprehensive health education websites, such as Healthfinder.com in the US, Medline Plus in North America, and Healthdirect in Australia. On the other hand, in Malaysia, various government and non-government health education websites are available, including MyHealth Portal, LifeCare, AIA, Family.my, and Malaysian Family Physician. According to Ab Hamid et al. (2020), it is essential for these educational websites to be high in quality, accurate, trustworthy, and individually relevant health education. Misinformation can adversely impact critical health decisions by influencing beliefs and behaviours, threatening public health. Nonetheless, Ab Hamid and Mohd Isamudin (2020) found that half of the evaluated Malaysian hypertension websites were of fair quality, with only one rated as excellent (Ab Hamid et al., 2020). In addition, a study of 107 Malaysian hospital websites unveiled deficiency in accessibility, reliability, research and teaching, participation, and community interaction elements (Sarantis et al., 2024). These findings suggest that Malaysian health education websites are still developing and exploration of the preferred elements among the end-user could help to improve the websites quality.

Developing effective health education websites requires a user-centric approach. Factors such as patients' backgrounds, socio-demographic characteristics, and preferences for web elements are crucial (Noman et al., 2020). The Internet Intervention Model (IIM), developed by Ritterband in 2009, also emphasised the importance of considering user characteristics when designing educational websites (Ritterband et al., 2009). The complexity of lived mixed-race experiences among hypertensive patients in Malaysia, such as Malay, Chinese, and Indian, has posed a significant challenge in developing websites for patient education. The differences in socio-demographic background could impact the perception and preference of health education websites (Rocha & Fozdar, 2019). Therefore, this study aims to understand how Malay hypertensive patients perceive the information and design aspects of current hypertension education websites in Malaysia and identify their preferred web elements. Through in-depth qualitative research, the study seeks to determine specific elements that enhance the practicality and user-friendliness of these websites. The findings will contribute to better health outcomes and more personalised interventions for this high-risk group, aiding in the development of patient-centred recommendations for Malaysia's health education agenda.

3.0 Methodology

This study employed a qualitative case-study design as defined by Yin (2016): 'Case studies get as close to the subject of interest as they possibly can, partly through direct observation in natural settings, partly by their access to subjective factors such as thoughts, feelings, and desires' (Yin, 2014). This approach was chosen to deeply understand how hypertensive patients interact with health education websites and how these interactions influence their experiences and behaviours. By contextualising users' interactions with web elements, the researchers are able to gain insights into the factors shaping their responses and preferences. The study was approved by the Research Ethics Committee of Universiti Teknologi MARA (reference number 600-IRMI (5/1/6)), ensuring that all research activities adhered to ethical standards. Ethical considerations were paramount in this study, particularly given the sensitive nature of health-related research.

3.1 Data collection

Participants were recruited from a primary care specialist clinic in Selangor using purposive sampling. Eligible participants were Malay adults aged 30 to 50 who were computer literate, had Internet access, and were medically diagnosed with primary hypertension. To ensure eligibility, participants' medical information was reviewed. After obtaining full, written, informed consent, appointments for

interviews were scheduled. Data collection continued until saturation was reached. A total of 14 participants were recruited, in line with the recommendation of a minimum sample size of 10-15 interviews for qualitative research (Guest et al., 2016).

Data collection occurred in two stages. In the first stage, participants navigated a government health education website on hypertension for 30-45 minutes. This exposure ensured that participants had adequate experience with the website to provide informed feedback. In the second stage, the researcher conducted semi-structured interviews, each lasting approximately 30 minutes. These interviews gathered detailed insights into participants' experiences and preferences regarding the website. Figure 1 illustrates the flow of data collection.

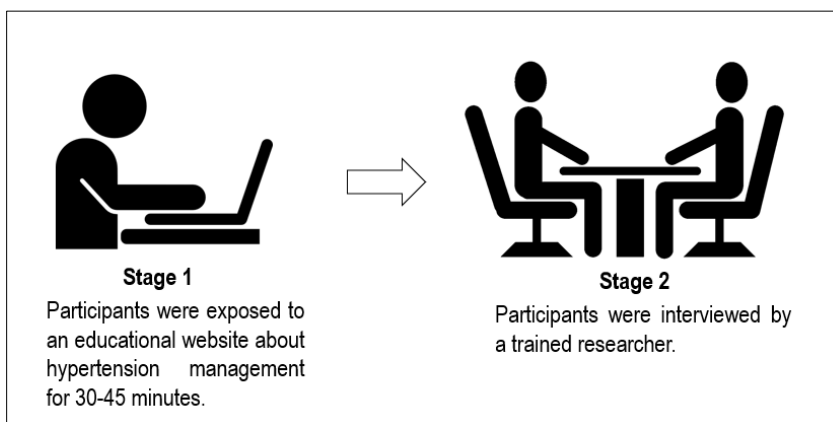


Figure 1. Flow of data collection

Semi-structured interviews were employed to collect qualitative data. The questionnaire was developed with reference to the Internet Intervention Model (IIM). This model offers a comprehensive theoretical framework for understanding the essential components of effective Internet health education and promoting behavioral changes (Ritterband et al., 2009). The interview questions were developed and face-validated by two experts in the field. Interviews were conducted in either Malay or English, based on participant preference, and lasted approximately 45 minutes. All interviews took place at the clinic and were recorded with participants' consent using a digital recording device. Recording the interviews ensured accurate data capture, allowing for thorough analysis and review. Written notes were also taken during each session to supplement the audio recordings. This step is a data triangulation process that ensures the validity and reliability of the data.

3.2 Data analysis

The data analysis in this study followed a thematic approach (Braun & Clarke, 2006). Interview transcripts were analysed, coded, and categorised. Emerging categories were structured into several themes related to web elements, addressing key research questions about essential components of health education websites. Content analysis was utilised to explore patients' perceptions and preferences regarding the website, ensuring the study's credibility, dependability, confirmability, and transferability from data collection to reporting results (Korstjens & Moser, 2018). The analysis combined both inductive and deductive approaches, considering the practical specifics of the research topic within its context (Gomm et al., 2009). To validate the data, two researchers independently participated in the analysis process. Atlas.ti software was used to analyse the data.

4.0 Findings

A total of 14 participants were interviewed in this study, consisting of 9 males (64%) and 5 females (36%). The majority of participants were aged between 40 and 49 years (57%), with the remaining 43% aged between 31 and 40 years. Thirteen participants were married, and all had received tertiary education. Table 1 provides participant demographics characteristics.

Table 1. Characteristics of the participants (n=14)

Participant	Age	Gender	Marital Status	Education level
1	39	Male	Married	Tertiary
2	38	Female	Married	Tertiary
3	39	Male	Single	Tertiary
4	38	Female	Married	Tertiary
5	39	Male	Married	Tertiary
6	43	Male	Married	Tertiary
7	43	Female	Married	Tertiary
8	45	Male	Married	Tertiary
9	46	Male	Married	Tertiary
10	46	Male	Married	Tertiary
11	47	Male	Married	Tertiary

12	48	Male	Married	Tertiary
13	48	Female	Married	Tertiary
14	37	Female	Married	Tertiary

Stage 1: Participants’ experiences and perceptions of the existing website

In the first stage of the study, participants were asked to provide their perceptions of an existing health education website. Two main themes emerged from the interviews: 1) content quality and 2) design and appearance.

Theme 1: Content quality

This theme reflects participants' evaluations of the website's quality, credibility, and efficiency. A high-quality and credible website was seen as essential for building trust and encouraging use. Most participants found the website to be clear, accurate, and credible. For instance, Participant 8 remarked, *“The website’s content is extremely precise, simple, concise, and condensed. Occasionally, if it is excessively long, you will feel as though it is too much to read.”* This sentiment was echoed by Participant 10, who noted a preference for disease-specific information: *“For someone like me who has hypertension solely, I want to read facts about my disease. I am not really interested in learning what diabetes is.”*

Participants emphasised that the website's content must be credible and sourced from trustworthy guidelines. Participant 5 stressed, *“I am comfortable reading the content due to the entity that produced this website. It is important to identify the individual profiles rather than allowing someone to prepare the content randomly.”* Participant 3 appreciated specific information: *“I appreciate that the website states that the knowledge is based on this or that research evidence. For instance, exercising for a specified time will help lower blood pressure. Even though it is not much, at the very least, it specifies the time. This type of fact lends credibility and trustworthiness to the source.”*

Theme 2: Design and Appearance

This theme captures how users perceive the website based on its layout, user interface, and typography. These elements are essential because they reflect the website’s quality and influence users’ attention. The simple website design with clear text can entice users to stay using the website. Participant 11 mentioned, *“The language and word usage are simple to comprehend. There is no issue with that. However, while reading on a mobile, it seems just too much to read on a single page.”* Similarly, Participant 14 found the website lengthy: *“I think it appears to be quite lengthy to read. It took some time to scroll from the beginning to the end.”*

Some participants felt that the design lacked engagement. Participant 5 commented, *“The information was sufficient. However, I believe it is too dull and gloomy. It is almost as if I am reading a textbook. I am afraid that people would lose interest in reading. Nevertheless, different people can have different perceptions, right?”*

Stage 2: Participants’ preferences for web elements

In the second stage, participants expressed their preferences for web elements, which were then classified into three themes. Two of these themes correspond to those identified in the first stage, while the third theme pertains to delivery strategies. Table 2 shows the theme and sub-theme of participants’ preferences for web elements.

Table 2. Participants’ preferences for web elements

Theme	Sub-theme
Content quality	- Comprehensive information
	- Theory and practical information
	- Culturally based
Design and appearance	- Simple layout
	- Easy navigation
Delivery strategies	- Use of multimedia
	- Use of Infographics
	- Segmentation
	- Communication

Theme 1: Content quality

Participants desired comprehensive information about hypertension, including its prevalence, complications, and lifestyle recommendations such as diet, physical activity, and sleep. Participant 6 emphasised, *“I believe the patient should consider maintaining a healthy blood pressure to prevent severe complications. They should have understood what would happen in another five to ten years if we did not take action to manage our hypertension.”* Participants requested that the website demonstrate 'how to' rather than explain the theory, ensuring the information is practical. Participant 9 suggested, *“Perhaps they can provide a reference link to view examples*

of exercises we should do, such as a short video.” The content should also suit the local culture, as highlighted by Participant 2: “For instance, when discussing diet as high sodium foods, you should consider examples that are very common in our country, such as salted fish or preserved fruits.”

Theme 2: Design and Appearance

Participants stated that a simple layout and easy navigation choices of the website can serve as additional positive characteristics for a greater number of users to utilize the site. Participant 1 suggested, “I believe that it may be possible if the website provider provides a tab on the header website. Thus, patients may click to learn about a certain intervention.” The importance of a visually appealing interface was underscored by Participant 3: “Perhaps, from my view, you could make it more graphical. If it is merely text, readers may become bored. I believe the website provider can improve the website’s layout and appearance.”

Theme 3: Delivery strategies

This theme pertains to how information is structured and presented to users. It is important for reducing cognitive load and improving information delivery effectiveness.

Segmenting the information into several sections and using bullet points could maintain the user’s attention. Participant 3 noted, “Perhaps the phrases may be separated into numerous sentences, or you might present them as points or bullet points, as some people dislike reading information that is too lengthy.” The use of infographics and multimedia was preferred for better clarity. Participant 7 suggested, “The delivery method for content could be converted to an image or an infographic. Additionally, it is simpler to post on social networking platforms such as Facebook.” Participant 13 emphasised the importance of videos: “How about providing a video explaining the factors that contribute to hypertension or what they should do if they develop additional complications? Perhaps they might also provide exercise videos, tutorials, and so forth. Create an easy-to-follow video for the elderly.” Participant 14 echoed the use of animation on the web: “Perhaps the website provider can incorporate animation. For instance, if you are talking about sleep hygiene, you can include an animation link there”.

Additionally, synchronous and asynchronous communication between users and physicians may boost users’ motivation to use the website. For example, Frequently Asked Questions (FAQ) section can help the users to get the information easier than scrolling to all pages of the websites. Participant 5 suggested, “I believe it is quite difficult to create a chat section where users can ask questions. Perhaps the website’s provider might compile a list of frequently asked questions (FAQ) and include them with the answers.”

5.0 Discussion

High-quality content is essential in web-based health promotion. The content must be comprehensive, understandable, and actionable to be effective (Furukawa et al., 2024). This study confirms that users are deeply concerned with the quality of online information. Hypertensive patients need clear guidance on what actions to take, why these actions are important, and how to implement them. Participants suggested including detailed dietary recommendations, such as meal planning, low-salt recipes, and cooking tutorials. Providing step-by-step recommendations, like a menu plan or cooking lessons, can help patients make informed decisions and take actionable steps (Ab Hamid et al., 2023). Participants’ preference for practical content over theoretical explanations aligns with the principles of adult learning theory, emphasizing the need for information to be relevant and applicable to real-life situations (Knowles, 1970). In addition, participants highlighted the importance of culturally relevant dietary advice. This suggests that incorporating culturally specific examples can enhance the relevance and effectiveness of health education websites.

Credibility, accuracy, and readability are the most critical sub-elements of content because they influence patients’ trust to use the website. Patients’ willingness to engage in online health consultation is influenced by their trust in the information provided on online platforms (Xu et al., 2022). The credibility and accuracy of the content are determined by several factors, such as comprehensiveness, level of detail, inclusion of articles with proper citations and references, visibility of the author’s qualifications, consistent links from reputable websites, currency, layout, content-related resources, and the clarity of information delivery (Noman et al., 2020). The presence of resources within the content plays a pivotal role in substantiating its quality, as the availability and clear presentation of these resources on the website can boost users’ confidence during their website navigation. Moreover, the content of the information must be tailored to the needs of the targeted population as it can either stress the positive consequences of performing a healthy behaviour or the negative consequences of not performing a healthy behaviour.

Multimedia elements are crucial for effectively communicating health information. Plain text can be uninteresting, whereas visuals help present complex information clearly. The use of visuals can aid in comprehending and presenting complex information (Centers for Disease Control and Prevention, 2021). Additionally, visuals serve as a reinforcement for written or spoken health messages. The use of visual aids in health education materials could also benefit people with low-literacy levels.

The design and appearance of health education websites are crucial for enhancing content quality. Participants highlighted web elements such as simple navigation, multimedia, interactivity, and typography. A web navigation system’s design significantly impacts the entire user experience of a website (Ab Hamid et al., 2024). Participants indicated a preference for simple navigation and visually appealing graphics. Therefore, it is recommended that health education websites incorporate intuitive navigation bars and vibrant infographics to maintain user engagement. Many tools are available to stimulate interactivity and empower user knowledge, such as chat rooms, forums, quizzes, self-assessments, and gaming options (Youhasan et al., 2022). Based on the

multimedia learning theory, chunking information into several segments may improve patients' understanding. It was proposed to split information according to their subtopic and present it on separate pages. The information can be simplified, and each subtopic can be explained and illustrated in greater detail. This strategy may assist readers in reducing the cognitive load and enabling them to concentrate on and comprehend each topic (Skulmowski & Xu, 2021).

6.0 Conclusion and Recommendation

The study is limited in its focus on Malay ethnicity, thereby overlooking the multicultural nature of Malaysia. Consequently, the outcomes may not be universally applicable due to the diverse backgrounds of the country's various races. Additionally, it is important to recognize that online health education is an evolving and dynamic process. The elements may extend and become more flexible when adding new website elements. On the other hand, this study uniquely examines the preferences of hypertensive patients in the Malay community regarding web elements on educational websites.

In conclusion, this study explored hypertensive patients' preferences for web elements on educational websites. Participants emphasised the need for practical, credible content and engaging design. Implementing these preferences could enhance the effectiveness of health education websites, ultimately improving patient engagement and health outcomes. Moving forward, future research should explore the preferences of other ethnic groups to ensure inclusivity.

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Paper Contribution to Related Field of Study

The findings offer valuable insights for healthcare providers, policymakers, and web developers in creating patient-centered online platforms for hypertension. Providers should consider these findings when developing and recommending online resources to patients, ensuring practical, credible, and culturally relevant content. Developers should prioritize user-friendly designs and multimedia elements to enhance engagement and comprehension. The exploration of users' preferred elements should not only be confined to websites but also to other health-related applications.

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