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The accessibility of general practice websites assessed by patients: a cross-sectional study



Rianne Beckers¹ and Birgitte Schoenmakers^{1*}

Abstract

Objectives This study aims to gather patients' perceptions regarding the accessibility of GP (general practitioner) practice websites in Flanders.

Methods This is a quantitative cross-section with perceived accessibility as dependent variable and age, readability, clarity, currentness, interactivity and cultural sensitivity as predicting variables. A patient questionnaire was designed for data collection. The study ran from August 2023 until February 2024.

Results Of the 643 individuals who completed the study, 486 were included for data analysis. 83% (n=417) found the website accessible; 96.4% (n=417) found the site readable and 91.1% (380) well-organized. Only 40.3% (n=417) found the site adapted to a multicultural society. Of those who rated the practice website as insufficiently accessible, there was a significantly larger proportion who found the site insufficiently adapted to a multicultural society (p=0.000293), insufficiently well-organized (p=<0.00001;) or insufficiently readable (p=0.00016).

Conclusion Most respondents found the website accessible, readable and well-organized. There are notable shortcomings in cultural sensitivity, currentness and interactivity. Areas for improvement include incorporating symbols, language options, displaying update date and the use of paragraphs, bold or colored words.

Lay summary In a study conducted in Flanders, most patients found healthcare websites easy to access, read, and navigate. However, the study highlighted significant gaps in cultural inclusivity, with only 40% of patients feeling the websites catered to a multicultural audience. Additionally, the websites lacked up-to-date content and interactive features. The study recommends improving user experience by incorporating multilingual options, clearly displaying update dates, and using visually distinct text elements such as symbols and colored words.

Keywords General practice, Websites, Communication, Accessibility, Patients

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Introduction

Technological advancement has firmly entrenched the Internet as an indispensable facet of contemporary society. Online platforms are assuming increasingly pivotal roles in our daily lives. Frequently, patients turn to the Internet as their primary resource before reaching out to their healthcare providers. Consequently, they seek medical information regarding their condition, symptoms, and grievances, alongside practical details such as the location of a general practice, contact information, appointment scheduling, and information about the attending practitioner [1]. Typically, patients visit practice websites with the aim of swiftly obtaining desired information. Therefore, it is imperative for these websites to be userfriendly, well-structured, and accessible to all [2].

In today's multicultural society, healthcare providers must cater to a diverse patient population with varying cultural backgrounds and languages. This diversity presents unique challenges in ensuring that medical information is accessible and understandable to everyone. Patients may face language barriers, cultural differences, and varying levels of health literacy, which can impact their ability to comprehend medical information and navigate healthcare systems effectively [3].

Challenges in this domain include the burgeoning multiculturalism, literacy issues (e.g., aging and dyslexia), and variations in health literacy levels. In 2018, 19% of Flemish 15-year-olds failed to attain the reference level for reading literacy, a figure which rose to 23.9% by 2022 [4]. Additionally, the rates of low (health) literacy among men and women in Flanders and in comparable European countries fluctuate between 15 and 30% dependent on the definition and approach [5, 6]. This indicates a deficiency in processing and comprehending information, impeding functionality in educational, occupational, and social spheres. At-risk demographics for low literacy encompass individuals with limited education, low socioeconomic status, the elderly, first-generation migrants, and non-native speakers [7]. The proportion of legal residents of foreign origin in Flanders as in the rest of Europe surged from on average 10% in 2000 to 25-30% in 2023 [8, 9].

Presently, there exists scant information regarding the perceived accessibility of general practice websites. Performant GP (general practitioner) websites offer several advantages for patients, enhancing their overall healthcare experience. Patients can access healthcare services anytime which implies an improved patient engagement. Accessible websites ensure inclusivity for all patients and can reduce waiting times [10, 11]. A notable advantage of an effective practice website is its potential to alleviate the burden on telephone and email communication channels, as patients can autonomously schedule appointments online. Limited research has been conducted on this subject, and patient feedback remains uncollected. However, a study conducted in Scotland in 2017 by Rughani et al. self-evaluated text and design elements of GP practice websites [2]. The findings revealed that the majority of websites contained content surpassing a reading age of 9–14 and were more complex than "simple English". Less than 10% of the websites examined adhered to accessibility and design recommendations. These recommendations imply clear language, easy navigation, readable fonts, patient feedback, security and privacy and regular updates [2, 3, 10, 11].

The objective of this study is to garner a comprehensive understanding of the readability, perceived accessibility, and coherence of GP practice websites in Flanders through patient assessments. This will be achieved via a questionnaire wherein patients assess the website of their general practice, focusing on textual, design, and accessibility aspects. The research question guiding this inquiry is as follows: "Do GP practice websites meet the criteria of being sufficiently readable, easily accessible, and wellorganized according to patient perspectives?"

Methods

Study design and data collection

To solicit patients' opinions, we designed a cross section study and offered both an online questionnaire via Qualtrics XM and an offline version. The questionnaire was particularly developed for this survey and comprised 26 questions derived from literature and supplemented with original inquiries delivered by communication experts (attachment 1) [2, 11, 12]. In a next step, the survey was proof read by patients after conception and adjusted to improve readability and understandability The survey questions were categorized into seven sections: respondent demographic patient information (Q1-3), general inquiries about the GP practice website (Q4-6), assessments of website readability (Q7-8), clarity (Q9-13), cultural sensitivity (Q14-17), currentness,, and interactivity (Q18-21), and summary queries (Q22-26). All questions were in a multiple-choice format, with two opportunities provided for respondents to furnish additional information or comments. No personal participant information was requested, ensuring consistent anonymity throughout the completion of the questionnaire.

The questionnaire was launched from August 2023 to February 2024 and disseminated through various channels, including social media platforms (Facebook, Reddit, and Instagram), survey platforms such as SurveySwap and SurveyCircle, and direct outreach to 52 out of 68 formal GP associations in Flanders. Seven associations were not contacted due to the absence of a website, six others due to the lack of displayed contact information, and three due to website malfunctions or unavailability. Of the contacted GP circles, 11 responded affirmatively, confirming the study's publication on their respective websites or newsletters. The questionnaire's distribution through GP practices intended to involve patients by presenting a poster in the waiting room, allowing them to scan a QR code or request a paper version from their GP.

Initially conducted in Dutch, the questionnaire was later translated into English and French to broaden participation.

Participants from Flanders aged 18 years or older were eligible for inclusion, with incomplete questionnaires or respondents below the age threshold being excluded. If a respondent's general practice lacked a website, the questionnaire was terminated prematurely, as it would render subsequent questions unanswerable. Participation in the study was voluntary.

Statistical analysis

This study employs a quantitative approach with perceived website accessibility as the dependent variable and age, currentness, readability, clarity, interactivity, and cultural sensitivity as predicting variables.

With approximately 6.7 million inhabitants in Flanders, a sample size of at least 385 respondents was deemed necessary to achieve a 95% confidence interval with a 5% margin of error.

Initially, a descriptive analysis of respondent characteristics and question responses was conducted. Subsequently, the relationship between accessibility factors and age was examined using a Chi-square test.

Finally, the correlation between website perceived accessibility and related factors (multiculturalism, clarity,

Table 1 Descriptive analysis of respondent's characteristics

Characteristic	n (%)		
Gender			
Man	85 (17.50)		
Woman	400 (82.30)		
Rather not say	1 (0.20)		
Age (years)			
18–24	100 (20.60)		
25–34	100 (20.60)		
35–44	88 (18.1)		
45–54	99 (20.4)		
55–64	55 (11.3)		
65–74	38 (7.8)		
≥75	6 (1.2)		
Province			
Limburg	106 (21.80)		
Antwerp	129 (26.50)		
East Flanders	69 (14.20)		
West Flanders	18 (3.70)		
Flemish Brabant	157 (32.20)		
Other	7 (1.40)		

Percentages are shown by the total number of respondents (n = 486). The numbering corresponds to the numbering of the questions in the questionnaire

and readability) was assessed using both Chi-square and Fisher's exact tests.

Ethical review

The Educational Guidance Committee on Medical Ethics of the Biomedical Sciences Group of KU Leuven (MP024004) approved the study. The study was performed in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants prior to the start of the survey and after reading and (digitally) signing the information letter. All data were collected and processed anonymously.

Results

Inclusion and exclusion

Six hundred forty-three individuals completed the questionnaire. After excluding uncompleted questionnaires or respondents who did not meet the inclusion criteria, 486 respondents were included in the data analysis.

Background data respondent

Table 1 presents the descriptive analysis of respondents' characteristics. 486 respondents fully completed the questionnaire, of which 85 were males and 400 were females. Most of the participants (79.70%, 387) were between 18 and 54 years old.

Practice websites

Table 2 illustrates the descriptive analysis of responses by question. Regarding the presence of practice websites, 14.2% (69) of respondents indicated that their GP did not have a practice website.

Regarding readability, 93.5% (390) of respondents found the font size to be sufficiently large and clear, and 98.80% (412) deemed the language used to be simple and common.

Assessing clarity, 90.60% (378) considered the website to be well-structured with an organized layout, and 91.10% (380) found it to have a logical structure. Only 70.5% (294) of websites utilized features such as paragraphs, bold or colored words, though 86.1% (359) of respondents found these features useful.

With respect to cultural sensitivity, merely 31.4% (131) of practice websites employed symbols for clarification, although 72.2% (301) of respondents perceived them to be beneficial. Similarly, only 12.9% (54) offered language change options, yet 67.9% (283) of respondents considered this feature useful.

Addressing currentness and interactivity a mere 31.4% (131) of respondents could discern whether the website was up-to-date, but 76.3% (318) expressed a desire for this feature.

In summary, 96.4% (402) of respondents found the website to be sufficiently readable, and 81.1% (380) found

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Question	Answer	n (%)
General		
4. Has a practice website?	Yes	417 (85.80)
5. Use of website?	Never	17 (4.10)
	For this study	15 (3.60)
	Sometimes	198 (47.50)
	Frequently	187 (44.80)
6. Easy to find?	Yes	413 (9.00)
Readability		
7. Font sufficiently large and clear?	Good	390 (93.50)
	Too small	27 (6.50)
8. Simple, everyday language?	Yes	412 (98.80)
Clarity		
9. Structured, well-organized lay-out?	Yes	378 (90.60)
10. Logical structure?	Yes	380 (91.10)
11. Finding the item?	Yes	385 (92.30)
12. Paragraphs, bold or colored words?	Yes	294 (70.50)
13. Useful?	Yes	359 (86.10)
Cultural sensitivity		
14. Symbols?	Yes	131 (31.40)
15. Useful?	Yes	301 (72.20)
16. Change language?	Yes	54 (12.90)
17. Useful?	Yes	283 (67.90)
Currentness and interactivity		
18. Up-to-date, actual?	Yes	131 (31.40)
	No	279 (66.90)
	Don't understand	7 (1.70)
19. Useful?	Yes	318 (76.30)
20. Adapted to smartphone?	Yes	310 (74.30)
	No	76 (18.20)
	No smartphone	31 (7.40)
21. Online appointment tool?	Yes	387 (92.80)
	No	4 (1.00)
	Don't know how	
Summary		
22. Sufficiently readable?	Yes	402 (96.40)
23. Sufficiently well-organized?	Yes	380 (91.10)
24. Sufficiently adapted to multi- cultural society?	Yes	168 (40.30)
25. Sufficiently accessible?	Yes	346 (83.00)

 Table 2
 Descriptive analysis of responses for each question

Percentages are shown by the total number of respondents (n = 486). Starting at question 5, respondents whose practice did not have a website no longer answered, making n = 417. The numbering corresponds to the numbering of the questions in the questionnaire

it to be sufficiently well-organized. Interestingly, only 40.3% (168) believed the website adequately addressed the needs of a multicultural society. Overall, 83% (346) of respondents found the website sufficiently accessible.

Table 3 Correlation between accessibility factors and age using a Chi-Squared test with n = 417

Accessibility factors	Age		
	χ²-test P	Effect size V	
General			
Frequency in use of website	0.00136	0.182	
Ease to find website	0.124	0.155	
Readability			
Font sufficiently large and clear	0.526	0.111	
Simple, everyday language	0.669	0.0986	
Clarity			
Structured, well-organized lay-out	0.17	0.147	
Logical structure	0.0875	0.163	
Ease to find an item	0.0339	0.181	
Usefulness of paragraphs, bold or colored words	0.302	0.132	
Cultural sensitivity			
Usefulness of symbols	0.875	0.0766	
Usefulness of ability to change language	0.0000184	0.276	
Currentness and interactivity			
Usefulness of displaying last update	0.444	0.118	
Summary			
Sufficiently readable	0.626	0.102	
Sufficiently well-organized	0.0844	0.163	
Sufficiently adapted to multicultural society	0.00162	0.226	
Sufficiently accessible	0.00425	0.213	

Correlation between perceived accessibility factors and age

Table 3 illustrates the correlation between accessibility factors and age. Individuals aged 18 to 24 consulted the practice website significantly less frequently compared to older age groups (p = 0.00136). Among respondents aged 25 to 34, a significantly higher proportion encountered difficulty in locating their desired topics compared to other age brackets (p = 0.0339).

Young adults aged 18 to 24 perceived the option to change language on the practice website as significantly more useful than other age cohorts, whereas individuals aged 45 to 54 found it notably less useful (p = 0.0000184).

The younger demographic (18 to 24 years) was significantly more inclined to believe that the practice website inadequately addressed multicultural needs, in contrast to individuals aged 45 to 64, where a significant portion felt the website was already sufficiently adapted (p = 0.00162).

A higher proportion of individuals aged 18 to 34 believed the website to be insufficiently accessible, while those aged 55 to 64 were significantly more likely to perceive the website as sufficiently accessible (p = 0.00425).

Table 4 Correlation between multiculturalism, clarity, readability and accessibility using Fisher's exact and Chi-Squared test and Cramer's V for effect size with *n*=417

		Accessible		FE-test P	χ²-test P	Effect size V
		Yes	No			
Multicultural	Yes	44.2%	21.1%	0.000293	0.000302	0.177
Well-organized	Yes	94.8%	73.2%	< 0.00001	< 0.00001	0.285
Readable	Yes	98.3%	87.3%	0.00016	< 0.00001	0.221



Fig. 1 Bar chart of responses to the question of what would improve the practice website or what the respondent would like to see changed on the website (n = 417). The x-axis shows the possible response options; the y-axis shows the percentage of respondents

Correlation between multiculturalism, clarity and readability and perceived accessibility

Table 4 presents the correlation between multiculturalism, clarity, readability and perceived accessibility. Among respondents who perceived the practice website as insufficiently accessible, a significantly larger proportion also found the site to be inadequately adapted to a multicultural society (p = 0.000293), poorly organized (p < 0.0001), or lacking in readability (p = 0.00016).

Remarkably, despite considering the practice website to be sufficiently accessible, a larger proportion (55.8%) of respondents still believed that the site was not adequately adapted to a multicultural society.

Qualitative analysis

Figure 1 provides a graphical depiction of respondents' preferences regarding desired alterations to the website. Among the responses:

39.1% (163) of respondents expressed a desire for multilingual options. Similarly, 32.1% (134) opted for the inclusion of a search function. An equal proportion of respondents, 32.1% (134), advocated for the incorporation of symbols to enhance clarity. A notable 21.3% (89) of respondents selected "other," citing concerns such as the lack of clarity and accessibility of the online appointment system. Additionally, respondents expressed a need for more comprehensive information on GPs' working hours and absences. Dissatisfaction with the adaptation of the website to smartphone screens was also highlighted.

Discussion and conclusion

Discussion

Websites play a crucial role in healthcare by providing accessible information, facilitating communication, and enhancing patient engagement [10-12]. They add to care quality through information access, patient engagement and service streamlining.

This study found that the vast majority of respondents considered the GP practice website sufficiently accessible, as well as sufficiently readable and well-organized. Less than half of the respondents thought that the site was sufficiently adapted to a multicultural society.

A contradictory result was observed, namely that only about slightly less than half of the participants found the site sufficiently adapted to a multicultural society. Nevertheless, most of the respondents still felt that the site was sufficiently accessible. These two issues contradict each other which might be explained by the assumption that most participants did not belong to a culturally or linguistically diverse group. Indeed, evaluating accessibility relies heavily on an individual's personal experiences rather than on hypothetical scenarios [3, 13–15].

A second remarkable finding is that in today's digitized society, a fair number of GP practice websites still do not have an online appointment system. Also, for almost 1 in 5, the website did not adapt properly to the screen of a smartphone. Almost everyone has a smartphone in their pocket al.l the time, presumably because of this people are more likely to access the GP practice website via smartphone than via computer, but this was not surveyed in this study [3].

Another striking result is that cultural sensitivity scored significantly lower than readability and clarity of GP practice websites. Only about 30% of respondents reported that the GP practice website used symbols for clarification and about 13% that there was the ability to change language. Both of these features appeared to the vast majority to be useful additions to the website. Some arguments why the lower result of cultural sensitivity should not be overlooked are the increasing immigration, the increase in number of students, whose home language is not Dutch, the increasing tourism, and the increase in the number of requests for the use of social interpreters and translators in the Flemish region [3, 16-18].

A final relevant result is that only about one third of the GP practice websites displayed whether the site was upto-date, yet more than three quarter found it relevant to see. For patients, it is pleasant to know that they can trust the information displayed and that there is no outdated information on the site [1, 16].

Only one other study was found to have relevant similarity to this study, namely the study by Rughani et al. [2] GP practice websites in Scotland were self-assessed by the author in terms of text and design factors and also whether the text was adapted to the presumed reading level of the population. The results were that 13.6% of practices had no website, 77.1% of websites were written for a higher reading level than recommended by the government, and 80.5% did not use simple, everyday language. Only 6.7% of the websites met the recommended design and accessibility criteria.

Similar to the current study, approximately 14% of practices did not have a website. In contrast to the current study, readability was scored significantly worse. Possibly this difference can be explained by the fact that in the study of Rughani et al. criteria were used to assess the site, whereas in the present study patients' opinions were effectively solicited, but possible the less literate patients were excluded because they, for example, did not properly comprehend the questionnaire [18, 19].

Implications for future research

Strikingly, most of the respondents who considered that the practice website was not sufficiently accessible also felt that the website was not sufficiently adapted to a multicultural society. This is a possible lead for further research.

In this study, origin was not questioned. Perhaps only few respondents of non-Belgian origin participated. Therefore, it might be of interest to conduct further research and question the opinion of patients of non-Belgian origin about the accessibility of their GP practice websites.

Limitations and strengths

Given the limited research on this topic to date, this study may contribute to the improvement of GP practice websites and provide a starting point for future studies.

There were several limitations associated with the study. The questionnaire did not ask the respondent's level of education or origin. This was potentially relevant, given that it questioned readability and perceived accessibility of the GP practice website, among other things, and these items may be influenced by both the respondent's level of education and origin. The study did not intend to thoroughly investigate the objective, norm-based accessibility of websites. Therefore, some questions might have been interpreted differently. The older population was underrepresented. Only six people over the age of 75 completed the questionnaire. However, the questionnaire was also provided in a paper version, this was mentioned on the poster that was distributed to the GPs. No offline questionnaire was submitted. Despite the paper questionnaire, it was inevitable that it remained necessary to access the website of the general practice to complete the questionnaire. This may have contributed to the fact that the offline questionnaire did not reach as many people, given that those who preferred to complete the questionnaire offline presumably use the Internet less or not at all. While the calculated sample size was met, the convenience sample exhibits participation bias, as evidenced by the gender imbalance.

Conclusion

This study aimed to assess the accessibility of GP practice websites from the perspective of patients. Overall, the findings indicate that the majority of respondents perceived the GP practice website as sufficiently accessible, with positive evaluations of readability and clarity. However, areas such as cultural sensitivity, currency, and interactivity scored notably lower.

Interestingly, while readability and clarity were generally perceived positively, cultural sensitivity emerged as a significant area for improvement. This suggests that enhancing cultural inclusivity may play a crucial role in further improving website accessibility for patients.

Moving forward, potential enhancements for future GP practice websites could include the incorporation of symbols for clarity, language customization options, visible date indicators for website updates, and the utilization of formatting elements such as paragraphs, bold text, or colored words.

By addressing these areas of improvement, GP practice websites can better meet the diverse needs of patients,

ultimately enhancing their overall accessibility and user experience in navigating healthcare information online.

Practice implications

This study highlighted the importance of accessible and structured GP practice websites for patients seeking quick information. GP practice websites often show shortcomings in cultural sensitivity, currentness, and interactivity. Areas for website improvement are: symbols, providing language options, displaying the date of the last update, and utilizing formatting features.

Abbreviations

GP General practitioner/general practice

Supplementary Information

The online version contains supplementary material available at https://doi.or g/10.1186/s12913-025-12629-5.

Supplementary Material 1.

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Authors' contributions

Idea and concept: RB, BS. Data processing: RB. Data Analysis: RB, BS. Writing of the manuscript: RB. Reviewing and commenting on drafts: RB, BS.

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Data availability

The full data set is available on simple request.

Declarations

Ethics approval and consent to participate

The study was approved by the Educational Guidance Committee on Medical Ethics of the Biomedical Sciences Group of KU Leuven (MP024004). Written informed consent for participation and data publication was obtained from all participants prior to the start of the survey and after reading and (digitally) signing the information letter. All data were collected and processed anonymously.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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