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Evaluation of Turkish Websites Providing Information on Mastalgia According to the JAMA Benchmark Criteria

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ABSTRACT

Objective: Mastalgia is a common complaint in primary care and can lead individuals to seek health information online before consulting a physician. This study aimed to evaluate Turkish-language websites providing information on mastalgia according to the Journal of the American Medical Association (JAMA) benchmark criteria.

Methods: This descriptive cross-sectional study was conducted on March 28, 2025, using the Google Türkiye search engine. The Turkish keywords “mastalji” (mastalgia), “mastodini” (mastodynia), and “meme ağrısı” (breast pain) were searched separately, and the first 60 results for each keyword were screened. After applying the predefined inclusion and exclusion criteria, 54 websites providing written information for the public were included. Websites were independently evaluated according to the four JAMA benchmark criteria: authorship, currency, attribution, and disclosure. Each criterion was scored as present (1) or absent (0), resulting in a total score ranging from 0 to 4. Descriptive statistics are presented as frequencies and percentages, and Fisher's exact test was used for categorical comparisons.

Results: Among the 54 websites analyzed, none fulfilled all four JAMA benchmark criteria. Most websites received a total score of 2 points (62.96%). Authorship and currency were present in 74.07% of the websites, whereas disclosure was present in 38.89% and attribution was present in only 12.96%. Attribution was the only criterion that differed significantly according to institution/organization type (P = .007).

Conclusion: Turkish-language websites providing information on mastalgia frequently include authorship and update details; however, substantial deficiencies exist in terms of source citations and transparency. These findings suggest that patients may encounter online information that lacks adequate references when they are searching for mastalgia-related content. Improving the transparency and evidence base of web-based health information may support digital health literacy and help healthcare professionals guide patients toward reliable online resources.

Keywords: Mastodynia, public health information, health literacy, patient education

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INTRODUCTION

With the widespread use of digital technologies, access to health-related information has become increasingly independent of time and place. Although health information is traditionally obtained from physicians and other healthcare professionals, the internet has become a primary source for individuals seeking information on diseases, symptoms, and treatment options.[1–3] However, the accuracy, reliability, transparency, and scientific basis of online health information remain variable.[3] This variability may negatively influence health-related decisions, particularly among individuals with limited health literacy.[4]

Mastalgia is a common complaint among women and is one of the reasons for seeking medical consultation in primary care and breast clinics.[5,6] Although breast pain alone is not considered a reliable indicator of breast cancer, it may cause anxiety because the public often perceives it as a possible symptom of malignancy.[7,8] This concern may lead individuals to seek information online before consulting a healthcare professional.[9,10]

The quality of online health information is especially important for symptoms such as mastalgia, where inaccurate, outdated, or unsupported information may contribute to unnecessary anxiety, false reassurance, or inappropriate health behaviors.[11] Therefore, evaluating whether online patient information is transparent, up to date, and supported by references is important from the perspectives of health literacy and patient education.[12]

The Journal of the American Medical Association (JAMA) benchmark criteria provide a structured method for evaluating key transparency indicators of online health information, including authorship, currency, attribution, and disclosure.[13] Although online health information has been evaluated in various medical fields, data concerning Turkish-language websites providing information on mastalgia are limited. The lack of transparent, referenced, and up-to-date online information may affect patient anxiety, health literacy, and consultation behavior, particularly for symptoms such as mastalgia, which are commonly associated with cancer fear. Therefore, this study aimed to evaluate Turkish-language websites that provide written information on mastalgia according to the JAMA benchmark criteria.

METHODS

Study Design and Search Strategy

This study was designed as a cross-sectional descriptive analysis of online health information services. All searches were performed on the same day (28 March 2025) using Google™ Türkiye (www.google.com.tr), which is the most widely used search engine in Türkiye, in incognito mode after the browser history, caches, and cookies were clear.[14] No user account was logged in during the searches. Sponsored advertisements, if present, were not included. Because Google results may vary according to location, time, and algorithmic personalization, the findings represent the search environment at the time of data collection.

Turkish-language keywords were used to reflect the search behavior of Turkish-speaking users. The keywords “mastalji” (mastalgia), “mastodini” (mastodynia), and “meme ağrısı” (breast pain) were searched separately without the use of combinations.

For each keyword, the first 60 results were screened to capture the websites most likely to be encountered by lay users while maintaining a manageable and reproducible sampling frame. This approach was based on previous evidence showing that health information seekers often use search engines quickly and selectively and on similar online health information quality studies that evaluated top-ranked search results.[15,16] Since this was a descriptive evaluation of publicly available websites rather than a participant-based study, no formal sample size calculation was performed.

Website Selection

A total of 180 websites were initially identified. Websites were screened according to predefined inclusion and exclusion criteria.

Websites consisting solely of video or visual content were excluded. Academic publications intended for healthcare professionals, books, news/media websites, social media platforms, digital dictionaries, blogs, forums, inaccessible pages, duplicate results, membership-restricted content, and websites in languages other than Turkish were also excluded.

Websites providing text-based information intended for the general public were included in the study. Institutional websites (public and private hospitals, governmental organizations, and medical associations) and clinic-based informational pages were considered eligible.

After the selection criteria were applied, 54 websites were included in the final analysis (Figure 1).

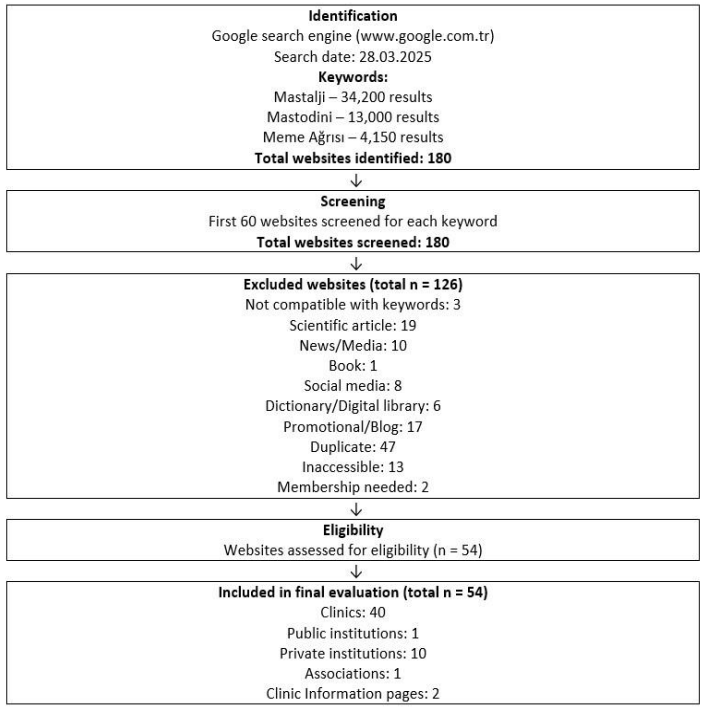

Figure 1. Flow Diagram of the Study Selection Process

Evaluation process

All included websites were independently evaluated by two researchers using the Journal of the American Medical Association (JAMA) benchmark criteria.[13]

The JAMA benchmark criteria consist of four components: authorship, currency, attribution, and disclosure. Each criterion was scored as 0 (absent) or 1 (present), resulting in a total score ranging from 0 to 4.

Discrepancies between reviewers were resolved through discussion and consensus.

Interrater agreement between the two independent reviewers was assessed using Cohen's kappa coefficient. The agreement was found to be substantial to almost perfect across all the evaluated criteria (κ range: .70–.85), indicating a high level of consistency between the reviewers.

Statistical Analysis

Data were recorded using Microsoft Excel and analyzed using SPSS version 25.0 (IBM SPSS Corp., Armonk, NY, USA). Descriptive statistics are expressed as frequencies (n) and percentages (%).

Owing to the small sample sizes in some subgroups, associations between categorical variables were analyzed using Fisher's exact test. A *P* value < .05 was considered to indicate statistical significance.

Ethical Considerations

This study did not involve human participants, identifiable personal data, clinical interventions, or patient records. It was based solely on publicly available website content; therefore, ethics committee approval was not needed.

RESULTS

A total of 180 search results were initially identified using the three keywords. After removing duplicates and applying the exclusion criteria, 54 websites were included in the final analysis. The website selection process is shown in Figure 1.

Table 1 presents the distribution of websites that fulfilled each JAMA benchmark criterion according to institution/organization type. Accordingly, only websites scoring 1 for the relevant criterion are shown. Among the 54 included websites, authorship and currency criteria were each fulfilled by 40 websites (74.07%). Attribution was the least frequently fulfilled criterion, being present on only 7 websites (12.96%). Disclosures were identified on 21 websites (38.89%). The distribution of total JAMA benchmark scores is shown in Table 2. No website fulfilled all four JAMA benchmark criteria.

When the JAMA benchmark criteria were compared according to institution type, attribution differed significantly between groups (*P* = .007) (Table 1). No significant differences were observed for authorship, currency, or disclosure (*P* > .05). (Table 1). However, these findings should be interpreted with caution because some institution/organization categories included only one or two websites.

Table 1. Distribution of fulfilled JAMA benchmark criteria by institution/organization type

JAMA criterion	Clinics* n/N (%)	Public institutions** n/N (%)	Private institutions*** n/N (%)	Associations+ n/N (%)	Clinic information++ pages n/N (%)	Total n/N (%)	*P* value
Authorship	27/40 (67.50)	1/1 (100.00)	9/10 (90.00)	1/1 (100.00)	2/2 (100.00)	40/54 (74.07)	.460
Currency	27/40 (67.50)	1/1 (100.00)	9/10 (90.00)	1/1 (100.00)	2/2 (100.00)	40/54 (74.07)	.460
Attribution	4/40 (10.00)	1/1 (100.00)	1/10 (10.00)	1/1 (100.00)	0/2 (.00)	7/54 (12.96)	.007
Disclosure	18/40 (45.00)	0/1 (.00)	3/10 (30.00)	0/1 (.00)	0/2 (.00)	21/54 (38.89)	.477

Notes: Data are presented as n/N (%). Only websites scoring 1 for each JAMA benchmark criterion are shown in the table. The percentages represent the proportion of websites fulfilling each JAMA criterion within each institution/organization type. *P* values were calculated using Fisher's exact test. A *P* value < .05 was considered to indicate statistical significance. *Clinics included websites of private outpatient clinics and individual physicians. **Public institutions included websites affiliated with public healthcare or governmental organizations. ***Private institutions included private hospitals or private healthcare organisations. +Associations included professional or patient-related associations. ++Clinical information pages included general informational pages related to clinics or health platforms.

Table 2. Distribution of Institution/Organization Types According to Total JAMA Benchmark Scores

JAMA Benchmark Criteria	Institution/Organization Types					
Scores	**Clinics***	**Public institutions****	**Private institutions*****	**Associations+**	**Clinic Information pages++**	**Total Pages**
1 Point	10	0	0	0	0	10
2 Points	24	0	8	0	2	34
3 Points	6	1	2	1	0	10
4 Points	0	0	0	0	0	0
Total Pages	40	1	10	1	2	54

Notes: *Clinics included websites of private outpatient clinics and individual physicians. **Public institutions included websites affiliated with public healthcare or governmental organizations. ***Private institutions included private hospitals or private healthcare organisations. +Associations included professional or patient-related associations. ++Clinical information pages included general informational pages related to clinics or health platforms. Scoring interpretation: 1 point: one criterion met; 2 points: two criteria met; 3 points: three criteria met; 4 points: all criteria met

DISCUSSION

In this study, Turkish-language websites providing information on mastalgia were evaluated in accordance with the JAMA benchmark criteria. The main finding was that none of the websites fulfilled all four JAMA benchmark criteria. Although authorship and currency were present in approximately three-quarters of the websites, attribution was identified in only 12.96% of the websites. These findings suggest that Turkish online sources on mastalgia frequently provide authors and update information but often lack adequate citations of sources and transparency regarding the evidence base of the information.

The low frequency of attribution is particularly important because references allow readers and healthcare professionals to verify whether online information is evidence-based. The JAMA benchmark criteria define attribution as one of the core indicators of transparency in online medical information.[13] Previous research has emphasized that online health information may be incomplete, inconsistent, or insufficiently supported by scientific evidence.[3] Therefore, the absence of references may make it difficult for users to distinguish evidence-based information from unsupported claims.

Our findings are consistent with those of previous studies evaluating online health information using the JAMA benchmark criteria and complementary quality assessment tools. Staemmler et al.[16] reported that online information on multiple myeloma intended for laypersons was of variable quality despite being readily accessible through search engines. Similarly, Nghiem et al.[17] evaluated breast cancer websites and reported that only a limited number fulfilled all four JAMA benchmark criteria. Kloosterboer et al.[18] reported that none of the evaluated diabetic retinopathy websites achieved all four JAMA benchmarks, highlighting that insufficient transparency and variable quality are common problems across different areas of online patient information.

In the context of mastalgia, inadequate referencing may have additional implications. Mastalgia is a common complaint, and although breast pain alone is not considered a reliable indicator of breast cancer, it may cause anxiety because patients may interpret it as a possible sign of malignancy.[5–8] Health anxiety and cyberchondria may further increase online health information seeking, particularly when symptoms are perceived as threatening.[9,10] Eysenbach and Köhler also reported that consumers may search for and appraise health information on the internet rapidly and selectively, which may increase the importance of transparent and easily verifiable online content.[15] Therefore, unsupported online information on mastalgia may contribute either to unnecessary anxiety or to false reassurance.

Online health information may influence patient–provider communication, as patients may discuss or act upon information obtained from the internet before consulting healthcare professionals.[11] Although this study did not directly evaluate family medicine practices, the findings are relevant to primary care because patients with mastalgia may initially consult family physicians or may search online before presenting to healthcare services. Family physicians can help patients interpret online health information, recognize unreliable sources, and access evidence-based patient education materials. This role is consistent with the broader importance of health literacy, patient empowerment, and patient education in shaping health-related decisions.[4,12]

In the present study, attribution differed significantly according to institution/organization type. This difference may be partly explained by variations in editorial responsibility, institutional accountability, and content production processes

across website types. Public institutions and professional or patient-related associations may be more likely to follow formal information governance practices and to provide references for patient-facing educational materials. In contrast, clinic-based or commercially oriented websites may prioritize accessibility, visibility, and patient engagement over formal citation practices. Previous studies using the JAMA benchmark criteria have similarly shown that transparency indicators, particularly attribution and disclosure, are inconsistently fulfilled across online health information sources.[13,16–18] Nevertheless, these findings should be interpreted cautiously because some institution/organization categories include only one or two websites. Therefore, the observed difference should be considered exploratory rather than definitive, and future studies with larger and more balanced website categories are needed to clarify whether institutional characteristics are associated with transparency indicators.

To the best of our knowledge, this is one of the first studies evaluating Turkish-language websites providing information on mastalgia according to the JAMA benchmark criteria. The use of predefined inclusion and exclusion criteria, independent assessment by two reviewers, reporting of interrater agreement, and application of a recognized benchmark tool are strengths of the study.

Limitations

This study has several limitations. First, only Google Türkiye was used as the search engine, and searches were performed on a single date. Therefore, the findings may not reflect results obtained through other search engines or at different time points. Second, Google search results may vary according to location, time, and algorithmic personalization despite efforts to minimize personalization by using the incognito mode and clearing browser history, caches, and cookies. Third, only the first 60 results for each keyword were screened, which may have excluded less visible websites. Fourth, only Turkish-language websites were included; therefore, the findings may not be generalizable to online information in other languages. Fifth, websites are dynamic and may be updated, removed, or reorganized over time; therefore, the findings reflect the content available at the time of data collection. Sixth, some institution/organization categories included very small numbers of websites; therefore, comparisons between institution types should be interpreted as exploratory. Seventh, although the interrater agreement was substantial to almost perfect, the scoring of some of the JAMA criteria may still involve a degree of subjective judgment. Finally, the JAMA benchmark criteria evaluate transparency indicators such as authorship, currency, attribution, and disclosure, but they do not directly assess clinical accuracy, readability, completeness, or patient comprehension. Future studies should combine JAMA benchmark criteria with tools such as DISCERN, readability indices, HONcode principles, and expert-based content accuracy assessments.

CONCLUSION

In this cross-sectional evaluation of 54 Turkish-language websites providing information on mastalgia, no website fulfilled all four JAMA benchmark criteria. Authorship and currency were present in approximately three-quarters of the websites, whereas attribution was present in only 12.96%. These findings indicate that Turkish online information on mastalgia often lacks adequate reference and transparency. Although this study did not directly assess clinical accuracy, readability, completeness, or patient comprehension, the results suggest that patients may encounter access to mastalgia-related online information with limited evidence transparency. Healthcare professionals, including family physicians, should be aware of these limitations when discussing online health information with patients. Future studies should assess the clinical accuracy, readability, completeness, and patient comprehension of mastalgia-related online content using complementary evaluation tools.

Ethics Committee Approval: Ethics committee approval was not required for this study because it did not involve human participants, patient data, clinical intervention, or identifiable personal information. The study was conducted using publicly accessible web-based content.
Informed Consent: Informed consent was not required because the study did not involve human participants or personal data. The research was based solely on publicly available website information.
Peer-review: Externally peer-reviewed.
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