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RESEARCH

QUALITY, RELIABILITY, AND READABILITY OF TURKISH DIZZINESS INFORMATION: WEB SOURCES VERSUS GENERATIVE ARTIFICIAL INTELLIGENCE

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ABSTRACT

Background: Patients increasingly seek information about dizziness from both web-based sources and generative artificial intelligence (AI) tools. However, the quality, reliability, and readability of these sources may vary. This study aimed to compare Turkish web-based dizziness information with responses generated by ChatGPT and Gemini in terms of quality, reliability, readability, clinical accuracy, and safety-related variables.

Methods: This cross-sectional matched digital content analysis included 10 patient-oriented questions related to dizziness. For each question, one Turkish web-based response, one ChatGPT response, and one Gemini response were obtained, yielding 30 texts. Google searches were performed between March 14 and 17, 2026, and AI responses were collected on March 17, 2026. Readability was assessed using the Ateşman and Çetinkaya-Uzun formulas. Quality and reliability were evaluated with the DISCERN instrument. A structured 5-item accuracy/safety form was also used.

Results: Mean DISCERN scores were 60.2±2.2 for ChatGPT, 56.1±4.9 for Gemini, and 51.7±8.1 for web sources, with a significant overall difference among groups (p=0.001). Mean accuracy scores were 8.7±0.9 for ChatGPT, 8.2±1.5 for Gemini, and 7.8±1.9 for web sources; however, this difference was not statistically significant (p=0.212). Çetinkaya-Uzun readability scores differed significantly among groups (p=0.007), whereas no significant difference was found for Ateşman readability scores (p=0.122). Risky advice was identified only in one web-based text, whereas overly definitive language was observed only in one Gemini response.

Conclusion: Generative AI responses showed higher quality/reliability scores and more favorable readability values in some comparisons; however, no statistically significant differences were found in clinical accuracy or safety-related variables. Therefore, higher DISCERN or readability scores should not be interpreted as evidence of clinical superiority or patient-safety advantage. Both AI-generated and web-based sources should be interpreted cautiously, and clinicians should guide patients in critically evaluating digital health information.

Keywords: *Dizziness; DISCERN; Large Language Models; Patient Safety; Readability; Health Information*

Baş Dönmesi Hakkında Türkçe Web Kaynakları ve Üretken Yapay Zekâ Yanıtlarının Kalite, Güvenilirlik ve Okunabilirlik Açısından Karşılaştırılması

ÖZET

Amaç: Hastalar baş dönmesi hakkında bilgi edinmek için giderek daha sık hem web tabanlı kaynaklara hem de üretken yapay zekâ araçlarına başvurmaktadır. Ancak bu kaynakların kalite, güvenilirlik ve okunabilirlik düzeyleri değişkenlik gösterebilir. Bu çalışmada, baş dönmesi hakkında Türkçe web kaynakları ile ChatGPT ve Gemini tarafından üretilen yanıtların karşılaştırılması amaçlandı.

Yöntemler: Bu kesitsel, eşleştirilmiş dijital içerik analizinde baş dönmesi ile ilgili 10 hasta odaklı soru kullanıldı. Her

soru için bir Türkçe web yanıtı, bir ChatGPT yanıtı ve bir Gemini yanıtı elde edilerek toplam 30 metin değerlendirildi. Google aramaları 14-17 Mart 2026 tarihleri arasında yapıldı; yapay zekâ yanıtları 17 Mart 2026 tarihinde toplandı. Okunabilirlik Ateşman ve Çetinkaya-Uzun formülleri ile, kalite ve güvenilirlik DISCERN aracı ile değerlendirildi. Ayrıca yapılandırılmış 5 maddelik bir doğruluk/güvenlik formu kullanıldı.

Bulgular: Ortalama DISCERN puanları ChatGPT için 60,2±2,2, Gemini için 56,1±4,9 ve web kaynakları için 51,7±8,1 olarak saptandı ve gruplar arasında anlamlı genel fark bulundu (p=0,001). Ortalama doğruluk puanları ChatGPT için 8,7±0,9, Gemini için 8,2±1,5 ve web kaynakları için 7,8±1,9 idi; ancak bu fark istatistiksel olarak anlamlı değildi (p=0,212). Çetinkaya-Uzun okunabilirlik puanları gruplar arasında anlamlı farklılık gösterirken (p=0,007), Ateşman okunabilirlik puanları açısından anlamlı fark saptanmadı (p=0,122). Yanlış/riskli öneri yalnızca bir web metninde, aşırı kesin ifade ise yalnızca bir Gemini yanıtında görüldü.

Sonuç: Üretken yapay zekâ yanıtları bazı karşılaştırmalarda daha yüksek kalite/güvenilirlik puanları ve daha elverişli okunabilirlik değerleri göstermiştir. Bununla birlikte, klinik doğruluk ve güvenlikle ilişkili değişkenler açısından gruplar arasında istatistiksel olarak anlamlı fark saptanmamıştır. Bu nedenle daha yüksek DISCERN veya okunabilirlik puanları klinik üstünlük ya da hasta güvenliği açısından avantaj olarak yorumlanmamalıdır. Hem yapay zekâ tarafından oluşturulan hem de web tabanlı kaynaklar dikkatli değerlendirilmeli ve klinisyenler hastaları dijital sağlık bilgilerini eleştirel biçimde yorumlama konusunda yönlendirmelidir.

Anahtar Kelimeler: *Baş dönmesi; DISCERN; Büyük Dil Modelleri; Hasta güvenliği; Okunabilirlik; Sağlık bilgisi*

INTRODUCTION

Dizziness is a common complaint encountered in primary care and otorhinolaryngology practice; however, rather than representing a single disease entity, it is a heterogeneous symptom that may reflect vestibular, cardiovascular, neurological, or psychogenic causes [1]. Given its broad etiology and substantial impact on quality of life, patients frequently seek information regarding its possible causes, warning signs, and treatment options [1].

The internet has become one of the most easily accessible sources in this information-seeking process. Although online health information may help patients prepare for physician visits, formulate questions, and shape self-care decisions, the accuracy, timeliness, reliability, and readability of such content for the intended audience may vary considerably [2]. Among individuals with limited health literacy, complex or ambiguous texts may increase the risk of misunderstanding, unnecessary anxiety, and inappropriate healthcare decisions [3].

Previous studies on Turkish-language online health materials have also supported this concern. In a study evaluating online patient information materials on tinnitus, the texts were reported to be generally written above the educational level of the target audience [4]. Regarding dizziness-related internet-based patient information texts, Tahir and Kent assessed the readability of the first 100 Google search results [5]. Subsequently, Çoluk examined both readability and content quality using the DISCERN instrument in Turkish websites identified through the keywords "baş dönmesi," "vertigo," and "denge bozukluğu" [6]. Similarly, in Turkish online informational materials on tympanostomy tubes, the use of references, relevant specialty attribution, and academic affiliation were shown to be associated with higher DISCERN scores [7]. Taken together, these studies indicate that, in online health content, not only accessibility but also quality and reliability warrant careful evaluation [4-7].

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In recent years, generative artificial intelligence-based conversational systems have also become part of the online health information ecosystem. Patients now use not only search engines but also systems such as ChatGPT and Gemini to obtain direct explanations about symptoms, diagnosis, and treatment. Studies conducted in different medical fields have shown that these tools are often capable of producing fluent and well-structured responses; however, their quality, accuracy, and readability may vary depending on the model and prompting strategy used [8,9]. Therefore, comparing generative AI responses with conventional web-based sources using the same evaluation criteria has become increasingly important in terms of digital health literacy and patient safety [8,9].

The aim of this study was to compare Turkish-language web-based sources and generative artificial intelligence responses regarding dizziness in terms of quality, reliability, readability, clinical accuracy, and safety-related variables.

MATERIALS AND METHODS

Study Design

This study was designed as a preliminary cross-sectional, matched digital content analysis to compare Turkish-language web-based sources and generative artificial intelligence responses regarding dizziness in terms of quality, reliability, readability, clinical accuracy, and safety-related variables. A set of 10 fixed questions phrased in patient-friendly language was used in the analysis. For each question, one web-based response, one ChatGPT response, and one Gemini response were obtained, resulting in a total of 30 texts for evaluation. The questions were selected to cover the domains most commonly searched by patients in relation to dizziness, including definition, causes, alarm symptoms, the appropriate medical specialty for consultation, treatment approaches, recommendations applicable at home, common vestibular causes, and situations requiring urgent medical attention. Technical terminology was avoided whenever possible, and patient-friendly wording was used instead. The English question pool and the exact Turkish query/prompt used for Google, ChatGPT, and Gemini are presented in Supplementary Table 1.

Ethical Considerations

As this study was based on the secondary analysis of open-access web texts and artificial intelligence-generated outputs, did not involve any intervention, and contained no personal data, ethics committee approval was not obtained.

Selection of Web-Based Content

For the web-based arm, searches were performed using the Google search engine between March 14 and March 17, 2026, in incognito mode. To minimize the influence of personalized search results, browser history, cookies, and cache were cleared before the searches. For each question, the first eligible organic Turkish-language result that was freely accessible, text-based, intended for patient information, and directly relevant to the query was included in the study. Sponsored links, advertisement-focused pages, video-only content, forum, dictionary, and social media content, PDF files, duplicate links, non-Turkish pages, access-restricted content, pages with insufficient textual content, and pages primarily intended for institutional promotion rather than patient education were excluded. When the same website appeared again for a different question, the next eligible organic result was selected in order to increase source diversity. For each question, the patient-oriented question text was used as the search query. The full characteristics of the included sources, including the recorded URLs, source titles, and website/source types, are provided in Supplementary Table 3. The original Turkish texts used in the analysis across all three source groups, including the extracted web texts and AI-generated responses, together with their English translations, are provided in Supplementary Table 4. Because web-based content is dynamic and may be updated or removed over time, the recorded source information reflects the status of the included web pages during the data collection period.

Acquisition of Artificial Intelligence Responses

Responses from ChatGPT and Gemini were obtained on March 17, 2026, in separate sessions. ChatGPT was accessed through a ChatGPT Plus subscription via the standard web interface, and Gemini was accessed using a Gemini Plus subscription via the standard web interface. A new chat session was opened for each question, and all prompts were entered independently to prevent prior conversation context

from influencing subsequent responses. All prompts consisted solely of the exact Turkish patient-oriented question text; no additional role assignment, tone instruction, length restriction, formatting instruction, or follow-up prompt was used. For each question, the first response generated by the system was included in the analysis, and no regeneration was performed. This approach was intended to preserve the response format most similar to a real-world user query. All AI responses were collected on the same day and in Turkish. The exact underlying model version of Gemini Plus was not explicitly displayed in the interface and was therefore noted as a methodological limitation. Reporting considerations for chatbot-based health advice studies were taken into account during the design and reporting of the study [10]. The exact Turkish prompts used for data collection are listed in Supplementary Table 1. The original Turkish texts used in the analysis across all three source groups, including the extracted web texts and the raw AI-generated responses, together with their English translations, are provided in Supplementary Table 4.

Data Extraction and Coding

All texts were transferred to Microsoft Excel for data extraction and coding. For web pages, only the main patient-information body text was included in the analysis; advertisements, menus, navigational links, image captions, and institutional promotional statements were excluded. For each web-based source, the source name, recorded URL, website/source type, question text, and extracted response text were recorded. For AI-generated responses, the platform, subscription/interface information, response date, exact Turkish prompt, and generated response text were recorded. The original Turkish texts used in the analysis across all three source groups are provided in Supplementary Table 4 together with their English translations.

Readability, Quality, and Accuracy Assessment

Readability was assessed using the Ateşman and Çetinkaya-Uzun formulas [11,13]. After the texts had been transferred to Excel, the total number of syllables, words, and sentences in each text was calculated, and readability scores were derived using both formulas [11,13]. The quality and reliability of the texts were evaluated using the DISCERN instrument [12]. In addition, a structured researcher-developed 5-item accuracy/safety form was used to assess clinical accuracy and patient safety more directly. The form was developed based on general principles of patient-oriented health information, clinical assessment principles of dizziness, red-flag symptoms requiring urgent evaluation, and expert judgement in audiology/vestibular assessment. It evaluated the accuracy of the core information, the adequacy of major causes or explanations provided, the reporting of alarm findings when appropriate, the absence of incorrect or potentially harmful recommendations, and the appropriateness of healthcare referral guidance. Each item was scored from 0 to 2, and the total accuracy score was calculated on a scale ranging from 0 to 10. The individual items of this form and their detailed scoring criteria are provided in Supplementary Table 2. In addition, the variables "presence of alarm findings," "presence of incorrect/risky recommendations," and "presence of overly definitive statements" were coded separately for each text.

Rating Procedure and Inter-Rater Agreement

DISCERN and accuracy/safety scoring were performed independently by two raters. For the main analysis, the mean of the two raters' total DISCERN scores was used; therefore, some DISCERN values were reported as half points. Inter-rater agreement was assessed using the intraclass correlation coefficient (ICC) for total DISCERN and total accuracy/safety scores, and linearly weighted kappa coefficients for ordinal ratings. Linearly weighted kappa coefficients were also calculated for the individual items of the accuracy/safety form. In cases of disagreement in item-based evaluations, consensus was first sought; when consensus could not be achieved, the opinion of a third researcher was obtained and the final decision was made accordingly.

Statistical Analysis

Descriptive data were presented as number, percentage, mean, standard deviation, median, minimum, and maximum values. Because three different responses corresponding to the same 10 questions were compared, analyses were conducted using a matched-measures approach. Non-parametric matched-measures tests were selected given the or-

dinal nature of the DISCERN and accuracy/safety assessments and the small sample size (n=10). The Friedman test was used for comparisons of DISCERN, accuracy, and readability scores across the three groups. When a significant difference was identified, pairwise comparisons were performed using the Wilcoxon signed-rank test. Since three pairwise comparisons were conducted, Bonferroni correction was applied, and the threshold for statistical significance in pairwise analyses was set at $p<0.0167$. Effect sizes were calculated to quantify the magnitude of observed differences: Kendall's W was reported for Friedman test results, and r, calculated as Z divided by the square root of N, was reported for statistically significant Wilcoxon signed-rank pairwise comparisons. The Cochran's Q test was used for the comparison of binary safety variables across groups. All analyses were performed using Microsoft Excel and IBM SPSS Statistics version 27.0. A two-sided p value <0.05 was considered statistically significant.

RESULTS

Responses to 10 fixed questions related to dizziness were analyzed in this study. For each question, one web-based source, one ChatGPT response, and one Gemini response were evaluated, yielding a total of 30 texts for analysis. The overall score distributions of the groups are presented in Table 1. Mean DISCERN scores were highest in the ChatGPT group, followed by the Gemini and web-based source groups. The mean accuracy score was also descriptively highest in the ChatGPT group; however, this finding should be interpreted together with the non-significant between-group comparison reported below. The highest mean Ateşman and Çetinkaya-Uzun readability scores were likewise observed in the ChatGPT group (Table 1).

In the between-group comparisons, a statistically significant difference was found in DISCERN scores (Friedman test, p=0.001; Kendall's W=0.67, indicating a large effect). In pairwise comparisons, the ChatGPT group had higher DISCERN scores than both the web-based source group (r=0.89) and the Gemini group (r=0.83). In contrast, no significant difference was observed among the groups in terms of accuracy scores (p=0.212; W=0.16). While no significant difference was found among the groups for Ateşman scores

Table 1. Overall Score Distributions and Readability Metrics of Web Sources, ChatGPT, and Gemini Across 10 Patient-Oriented Dizziness Queries.

Group	n	DISCERN, mean ± SD	DISCERN, median (min–max)	Accuracy, mean ± SD	Accuracy, median (min–max)	Ateşman, mean ± SD	Ateşman, median (min–max)	Çetinkaya-Uzun, mean ± SD	Çetinkaya-Uzun, median (min–max)
Web	10	51.7 ± 8.1	52.0 (39.5–60.5)	7.8 ± 1.9	8.0 (4.0–10.0)	37.8 ± 18.1	44.9 (-3.0–54.5)	45.0 ± 4.5	45.7 (35.6–51.9)
ChatGPT	10	60.2 ± 2.2	60.5 (56.5–62.5)	8.7 ± 0.9	8.0 (8.0–10.0)	51.7 ± 14.1	49.4 (33.6–80.5)	50.5 ± 5.0	50.4 (44.3–61.4)
Gemini	10	56.1 ± 4.9	57.5 (45.5–61.5)	8.2 ± 1.5	8.5 (5.0–10.0)	42.0 ± 22.0	47.2 (5.3–73.6)	46.6 ± 5.9	47.2 (37.3–59.1)

Note: SD, standard deviation; min, minimum; max, maximum. Half-point DISCERN values reflect averaging of the two raters' scores.

(p=0.122; W=0.21), a significant difference was observed for Çetinkaya-Uzun scores (p=0.007; W=0.49; significant in the ChatGPT vs Gemini pairwise comparison, p=0.014, r=0.76) (Table 2).

Table 2. Between-Group Comparisons of DISCERN, Accuracy, and Readability Scores

Variable	Web, mean ± SD	ChatGPT, mean ± SD	Gemini, mean ± SD	Overall comparison, p	Kendall's W	Significant pairwise comparison*
DISCERN	51.7 ± 8.1	60.2 ± 2.2	56.1 ± 4.9	0.001	0.67	Web vs ChatGPT (p=0.002, r=0.89); ChatGPT vs Gemini (p=0.008, r=0.83)
Accuracy	7.8 ± 1.9	8.7 ± 0.9	8.2 ± 1.5	0.212	0.16	No significant difference
Ateşman	37.8 ± 18.1	51.7 ± 14.1	42.0 ± 22.0	0.122	0.21	No significant difference
Çetinkaya-Uzun	45.0 ± 4.5	50.5 ± 5.0	46.6 ± 5.9	0.007	0.49	ChatGPT vs Gemini (p=0.014, r=0.76)

Note: SD, standard deviation. Overall comparisons were performed using the Friedman test, and Kendall's W was reported as the effect size. Pairwise comparisons were performed using the Wilcoxon signed-rank test. Bonferroni correction was applied for three pairwise comparisons; therefore, statistical significance was set at $p<0.05$ for overall comparisons and $p<0.0167$ for pairwise comparisons. Effect size r was calculated as $Z/\sqrt{N}$ and is reported only for pairwise comparisons that remained significant after Bonferroni correction. Kendall's W values were interpreted as small (0.10–0.29), moderate (0.30–0.49), and large (≥0.50) effects. For r, values of 0.10, 0.30, and 0.50 were interpreted as small, medium, and large effects, respectively. *Pairwise comparisons shown in this column remained significant after Bonferroni correction.

Inter-rater agreement was good for the total DISCERN score (ICC(2,1)=0.912; linearly weighted κ=0.764). Agreement for the total accuracy/safety score was moderate-to-good (ICC(2,1)=0.874; linearly weighted κ=0.701). For the individual items of the accuracy/safety form, linearly weighted κ values ranged from 0.69 to 0.78. In addition, a small systematic scoring difference was observed between the two raters for DISCERN scores.

When safety-related variables were examined, the number of responses containing alarm findings was similar across the three groups. Incorrect or potentially risky recommendations were identified in only one text in the web-based source group. Overly definitive statements were observed in only one text in the Gemini group. However, no statistically significant differences were found among the groups for the binary safety variables (Cochran's Q test; all p>0.05) (Table 3).

When readability classifications were evaluated, a substantial proportion of texts in the web-based source and Gemini groups were classified as "difficult" or "very difficult" according to the Ateşman formula. In the ChatGPT group, the proportion of texts classified as "moderately difficult" and "easy" was higher than in the other groups. According to the Çetinkaya-Uzun classification, the number of texts at the "independent reading" level was greater in the ChatGPT group than in the web-based source and Gemini groups (Table 4). Overall, the readability distribution indicated that the ChatGPT group had a higher proportion of texts at the independent reading level and a lower proportion of very difficult texts.

DISCUSSION AND CONCLUSIONS

In this study, Turkish-language web-based sources and generative artificial intelligence responses regarding dizziness were compared in terms of quality, reliability, readability, clinical accuracy, and safety-related variables. The results showed significant

Table 3. Distribution of safety-related variables across groups

Variable	Web, n (%)	ChatGPT, n (%)	Gemini, n (%)	Cochran's Q	p
Response containing alarm findings	2 (20.0)	2 (20.0)	2 (20.0)	0.000	1.000
Response containing incorrect/risky advice	1 (10.0)	0 (0.0)	0 (0.0)	2.000	0.368
Response containing overly definitive statements	0 (0.0)	0 (0.0)	1 (10.0)	2.000	0.368

Note: Values are presented as n (%). Percentages indicate within-group proportions. Comparisons across groups were performed using Cochran's Q test. A p value <0.05 was considered statistically significant.

Table 4. Distribution of readability levels across groups

A. Ateşman classification

Group	Very difficult	Difficult	Moderately difficult	Easy
Web	3	4	3	0
ChatGPT	0	5	4	1
Gemini	3	4	2	1

B. Çetinkaya-Uzun classification

Group	Frustration level	Instructional reading	Independent reading
Web	0	9	1
ChatGPT	0	5	5
Gemini	0	9	1

Note: Values are presented as counts. In the Ateşman classification, scores of 90–100 indicate very easy, 70–89 easy, 50–69 moderately difficult, 30–49 difficult, and ≤29 very difficult readability. In the Çetinkaya-Uzun classification, scores of ≥51 indicate independent reading, 35–50 instructional reading, and 0–34 frustration level.

differences among groups in DISCERN quality/reliability scores and Çetinkaya-Uzun readability scores. However, no statistically significant differences were found among the groups in terms of clinical accuracy scores, Ateşman readability scores, or safety-related variables. Although the ChatGPT group showed higher DISCERN scores and descriptively higher accuracy and readability values, these findings should be interpreted cautiously, particularly because the differences in clinical accuracy and safety-related variables were not statistically significant. In addition, the significant Çetinkaya-Uzun finding was

supported by the ChatGPT versus Gemini pairwise comparison, whereas no significant pairwise superiority was demonstrated across all source types. With respect to safety-related variables, the number of responses containing alarm findings was similar across the groups, while incorrect or potentially risky advice was identified in only one web-based text and overly definitive language was observed in only one Gemini response. Overall, these findings suggest that higher quality/reliability or readability scores should not be interpreted as evidence of superiority in clinical accuracy or patient safety.

Because dizziness is a heterogeneous symptom that may involve multiple body systems rather than a single disease entity, the accuracy and balanced presentation of patient education materials are of particular importance [1]. Online health information is known to influence individual health decisions, and complex or audience-inappropriate content may lead to misunderstanding, unnecessary anxiety, and inappropriate healthcare choices [2,3]. In this respect, our findings suggest that not only access to information, but also its quality and readability, should be carefully evaluated. This is especially important for symptoms such as dizziness, which may sometimes be associated with alarm findings and serious underlying conditions [1-3].

The lower DISCERN scores observed for web-based sources in our study are consistent with the existing literature on Turkish online health information. Previous studies evaluating Turkish online patient information materials on tinnitus and dizziness have highlighted important limitations in readability and content quality [4-6]). Similarly, higher DISCERN scores have been associated with the presence of references, specialty attribution, and academic affiliation in Turkish online materials on tympanostomy tubes [7]. Taken together, these data suggest that the problems of quality and readability in vestibular health information are not unique to Turkish-language resources, but rather reflect a broader structural issue in online health content [4-7,14].

The relatively stronger performance of AI-generated responses, particularly with respect to DISCERN scores, is noteworthy. One possible explanation is that these systems tend to generate more organized, structured, and directly responsive texts. Musheyev et al. showed that both readability and information quality in chatbot-generated cancer information may vary according to the model used [8]. Similarly, Sidhu and Selvamogan reported that AI chatbot responses to frequently asked dermatologic questions demonstrated an assessable level of quality and readability [9]. In a comparative study, Olszewski et al. also found substantial variability among chatbots in terms of length, quality, and readability, while emphasizing that even apparently reliable responses should still be verified [16]. The finding that ChatGPT achieved the highest mean quality and readability scores in our study is in line with this literature [8,9,16]. Nevertheless, high readability or a high DISCERN score should not be interpreted as evidence of flawless clinical performance. The overly definitive wording identified in one Gemini response suggests that fluency in AI-generated texts may at times shift toward categorical and context-insensitive statements. This insensitivity to clinical context has direct patient safety implications: a patient reading an overly definitive AI response may forego necessary clinical evaluation, delay presentation for alarm symptoms, or self-manage a condition that warrants urgent care. From a clinical cross-check perspective, both AI-generated and web-based content should be considered adjuncts to, not substitutes for, professional evaluation, particularly for a symptom as heterogeneous as dizziness.

Another important finding was that, although accuracy scores were descriptively higher in the ChatGPT group, no statistically significant difference was found among the groups. This may be explained by several factors. First, the sample was limited to only 10 matched question sets, which may have reduced the ability to detect statistically significant differences. Second, both web-based and AI-generated responses may have provided a similar acceptable core of clinical information in certain key areas, such as alarm findings, situations requiring emergency referral, and the distinction between vertigo and dizziness. The similar number of responses containing alarm findings across all groups supports this interpretation. In addition, Ayers et al. showed that chatbot responses to physician-developed open-ended medical questions may achieve a certain level of

accuracy and completeness, while important limitations still remain [15]. Therefore, our findings suggest that AI systems may have advantages in terms of information presentation and readability, but larger studies are needed before concluding that they clearly outperform web-based sources in terms of accuracy in all contexts [15,16].

The readability findings are also noteworthy. Although no statistically significant difference was found in Ateşman scores, the mean values and categorical distributions pointed to better readability in the ChatGPT group. In contrast, Çetinkaya-Uzun scores showed a significant overall difference, with the significant pairwise comparison observed between ChatGPT and Gemini. Previous studies have already demonstrated that Turkish patient information materials are often written above the reading level of the intended audience [4-7]. In our study, the higher proportion of texts classified as "difficult" or "very difficult" in the web-based and Gemini groups suggests that this problem persists. The greater number of texts at the "independent reading" level in the ChatGPT group indicates that AI-generated responses may be closer to patient-friendly language and may offer a more fluent reading experience. However, readability alone is not sufficient; a text may be easy to read yet still be inaccurate or overly definitive, thereby posing clinical risks [2,3]. For this reason, readability should not be evaluated independently of quality and reliability.

One of the strengths of this study is that the same question pool was applied to three different sources of information. This made it possible to compare sources directly on the basis of the same patient information needs, independent of variations in topic wording or keyword selection. In addition, the use of Turkish readability formulas and the DISCERN instrument ensured consistency with the existing Turkish literature [4-7,11,12].

These findings have several clinical and practical implications. Patients seeking information about a complex symptom such as dizziness no longer rely solely on websites, but increasingly consult generative AI tools as well. Our results suggest that AI tools may offer advantages, particularly in presenting more organized and readable content. Nevertheless, the heterogeneity observed in web-based sources and the tendency toward overly definitive language that may appear in AI-generated responses indicate that both source types should be interpreted critically. Clinicians should therefore be encouraged to produce clear, up-to-date, and reliable Turkish digital content addressing the most common patient questions about dizziness [2,3,7,10]. Future studies using larger question pools, additional AI models, and more detailed accuracy standards may further clarify this area.

In conclusion, the present study demonstrated differences in the quality (DISCERN scores) and readability of Turkish-language sources of dizziness information. The ChatGPT group showed the highest mean DISCERN and readability scores, the Gemini group generally produced acceptable but occasionally more definitive responses, and web-based sources displayed a more heterogeneous structure. Importantly, no statistically significant differences were found in clinical accuracy or safety-related variables across groups; therefore, these results should not be interpreted as evidence that ChatGPT is more accurate or safer than other sources. These findings indicate that in digital patient education on dizziness, not only access to information, but also the quality, readability, and safety of that information should be evaluated together [2,4-10,12,14-16].

Limitations of the Study

This study has several limitations. First, given that only 10 questions and 10 texts per group were analysed, the present work should be regarded as a pilot or preliminary evaluation. Accordingly, the analysis was conducted using only 10 fixed questions, and the small sample size may have reduced statistical power and the ability to detect statistically significant differences, particularly for accuracy and safety-related variables. Second, web searches were performed only using the Google search engine and within a specific time frame, and only the first eligible organic Turkish-language result for each question was included in the study. Therefore, different results might be obtained using different search engines, at different times, or under different user conditions. Third, both artificial intelligence systems and web-based content are dynamic in nature; the same questions may generate different responses on different dates. Although

the exact prompts, verbatim raw AI outputs, recorded URLs, and extracted web texts are provided in the Supplementary Tables, identical queries may nevertheless yield different responses if repeated at a later date. Fourth, accuracy was assessed using a structured form developed by the researchers, and no standardized international instrument was used for this purpose. Fifth, the exact underlying model version of Gemini Plus at the time of data collection (March 17, 2026) was not explicitly displayed in the interface; this represents a definitive methodological constraint on reproducibility, as results may differ across model versions. Sixth, the study included only Turkish-language written texts and did not evaluate video-based, social media-based, or non-Turkish sources. Therefore, the findings should not be generalized to all digital health information resources.

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SUPPLEMENTARY

Supplementary Table 1. Patient-Oriented Question Pool and Exact Turkish Prompts Used in the Study

Question No.	English patient-oriented question reported in the manuscript	Exact Turkish query/prompt used for Google, ChatGPT, and Gemini
1	What is dizziness?	Baş dönmesi nedir?
2	What causes dizziness?	Baş dönmesi neden olur?
3	When is dizziness dangerous?	Baş dönmesi ne zaman tehlikelidir?
4	Which doctor should I see for dizziness?	Baş dönmesi için hangi doktora gidilir?
5	How can dizziness be relieved?	Baş dönmesi nasıl geçer?
6	Are vertigo and dizziness the same thing?	Vertigo ile baş dönmesi aynı şey mi?
7	Can displaced ear crystals cause dizziness?	Kristal oynaması baş dönmesi yapar mı?
8	What can be done at home for dizziness?	Baş dönmesi için evde ne yapılabilir?
9	Dizziness can be a symptom of which diseases?	Baş dönmesi hangi hastalıkların belirtisi olabilir?
10	When should I go to the emergency department for dizziness?	Baş dönmesi için ne zaman acile gidilmelidir?

Note: The question pool was developed by the researcher to cover the main areas in which patients most frequently seek online information about dizziness. Patient-friendly Turkish expressions were preferred over technical terminology when formulating the prompts. The same Turkish question text was used as the Google search query and as the prompt for ChatGPT and Gemini. Google searches were performed between 14 and 17 March 2026. ChatGPT and Gemini responses were obtained on 17 March 2026. No additional role, tone, length, or formatting instruction was used.

Supplementary Table 2. Researcher-Developed 5-Item Accuracy/Safety Form and 0–1–2 Scoring Criteria

Item	Criterion	Score 0	Score 1	Score 2
1	Accuracy of the core clinical information	Incorrect, absent, or misleading core information	Partially correct but incomplete core information	Correct, clinically appropriate, and sufficiently informative core information
2	Adequacy of major causes or explanations	Major causes/explanations absent or substantially incorrect	Some relevant causes/explanations provided but important elements missing	Major relevant causes/explanations provided adequately and in a balanced manner
3	Reporting of alarm findings when clinically appropriate	Alarm findings absent when clinically relevant, or misleading reassurance provided	Some alarm findings mentioned but incomplete or insufficiently emphasized	Relevant alarm findings clearly stated with appropriate urgency
4	Absence of incorrect or potentially harmful recommendations	Incorrect or potentially harmful recommendation present	Ambiguous recommendation or incomplete safety framing	No incorrect/risky recommendation; advice framed safely
5	Appropriateness of healthcare referral guidance	No referral guidance despite need, or inappropriate referral advice	Partially appropriate but incomplete referral guidance	Appropriate referral guidance according to symptom severity and context

Note: This form was developed by the researcher to evaluate dizziness-specific clinical accuracy and patient-safety issues not fully captured by general readability formulas or the DISCERN instrument. It was based on general principles of patient-oriented health information, clinical assessment principles of dizziness, red-flag symptoms requiring urgent evaluation, and expert judgement in audiology/vestibular assessment. The form was not intended to serve as a diagnostic tool. Scoring was performed independently by two raters. Disagreements were resolved by consensus or, when necessary, by consultation with a third researcher.

Supplementary Table 3. Google Search Queries, Recorded Web Sources, URLs and Web-Source Selection Details

Question No.	English question reported in the manuscript	Exact Turkish Google search query	Recorded source/section title	Recorded URL / Interface	Page/source title	Website/source type	Search/access date window
1	What is dizziness?	Baş dönmesi nedir?	Baş Dönmesi: Hastalık Belirtileri ve Nedenleri	https://www.alifesaglikgrubu.com.tr/makale/bas-donmesi-hastalik-belirtileri-nelerdir	Baş Dönmesi: Hastalık Belirtileri ve Nedenleri	Private health group / patient information page	14–17 March 2026
2	What causes dizziness?	Baş dönmesi neden olur?	Başınız mı dönüyor?	https://www.acibadem.com.tr/hayat/basiniz-mi-donuyor-iste-10-sebep/	Başınız mı dönüyor?	Hospital health portal / patient information page	14–17 March 2026
3	When is dizziness dangerous?	Baş dönmesi ne zaman tehlikelidir?	Baş dönmesi ne zaman tehlikelidir?	https://www.deryauluduz.com/bas-donmesi-ne-zaman-tehlikelidir/	Baş dönmesi ne zaman tehlikelidir?	Physician website / patient information page	14–17 March 2026
4	Which doctor should I see for dizziness?	Baş dönmesi için hangi doktora gidilir?	Baş dönmesi sebebiyle hangi hekime başvurmalıyım?	https://www.seckinulusoy.com/bas-donmesinde-hangi-hekime-gitmeliyim/	Baş dönmesi sebebiyle hangi hekime başvurmalıyım?	Physician website / patient information page	14–17 March 2026
5	How can dizziness be relieved?	Baş dönmesi nasıl geçer?	Baş Dönmesi Nasıl Geçer?	https://senolpolat.com.tr/basiniz-donuyorsa-ne-yapmalisiniz/	Baş Dönmesi Nasıl Geçer?	Physician website / patient information page	14–17 March 2026
6	Are vertigo and dizziness the same thing?	Vertigo ile baş dönmesi aynı şey mi?	Vertigo mu Baş Dönmesi mi? Arasındaki Farklar	https://rumelihospital.com.tr/saglik-rehberi/noroloji-saglik-rehberi/vertigo-mu-bas-donmesi-mi-aradaki-fark-nasil-anlasilir/	Vertigo mu Baş Dönmesi mi? Arasındaki Farklar	Hospital health guide / patient information page	14–17 March 2026

Question No.	English question reported in the manuscript	Exact Turkish Google search query	Recorded source/section title	Recorded URL / Interface	Page/source title	Website/source type	Search/access date window
7	Can displaced ear crystals cause dizziness?	Kristal oynaması baş dönmesi yapar mı?	Kristal oynaması vertigoya neden olur mu?	https://www.medicana.com.tr/haber-detay/8510/kristal-oynamasi-bas-donduruyor	Kristal oynaması vertigoya neden olur mu?	Private hospital health article / patient information page	14–17 March 2026
8	What can be done at home for dizziness?	Baş dönmesi için evde ne yapılabilir?	Evde Baş Dönmesine İyi Gelen Doğal Çözümler	https://www.onedose.io/evde-bas-donmesine-ne-iyi-gelir-nasil-gecer/	Evde Baş Dönmesine İyi Gelen Doğal Çözümler	Digital health platform / patient information page	14–17 March 2026
9	Dizziness can be a symptom of which diseases?	Baş dönmesi hangi hastalıkların belirtisi olabilir?	Baş dönmesinin nedenleri	https://www.memorial.com.tr/saglik-rehberi/bas-donmesi	Baş dönmesinin nedenleri	Hospital health guide / patient information page	14–17 March 2026
10	When should I go to the emergency department for dizziness?	Baş dönmesi için ne zaman acile gidilmelidir?	Acil Servise Başvurulması Gereken Durumlar	https://asyakbb.com/bas-donmesi-icin-hangi-bolume-gidilir/	Acil Servise Başvurulması Gereken Durumlar	Private clinic / patient information page	14–17 March 2026

Note: For each query, organic Google results were screened sequentially from the first result onward until the first eligible Turkish-language, freely accessible, text-based, patient-oriented source directly relevant to the query was identified. When the same website appeared again for another question, the next eligible organic result was selected to increase source diversity.

Supplementary Table 4. Original Texts Used in the Analysis Across Web Sources, ChatGPT, and Gemini With English Translations

Question No.	English question reported in the manuscript	Source group	Source/platform	Recorded URL	Collection/access date	Original Turkish text used in the analysis	English translation
1	What is dizziness?	Web	Baş Dönmesi: Hastalık Belirtileri ve Nedenleri	https://www.alifesaglikgrubu.com.tr/makale/bas-donmesi-hastalik-belirtileri-nelerdir	14–17 March 2026	Baş dönmesi (vertigo), kişinin çevresinin dönüyor gibi hissetmesine neden olan, oldukça sık görülen bir semptomdur. Bu durum, denge sistemiyle ilgili çeşitli rahatsızlıkların habercisi olabilir. Baş dönmesi, farklı hastalıkların belirtisi olarak ortaya çıkabilir ve altta yatan nedene göre değişen belirtilerle birlikte seyredebilir. Baş dönmesi, kişinin dengesini kaybettiği, çevresinin dönüyor gibi hissettiği ya da dengesiz yürüdüğü bir durumdur. Bu şikayet, farklı hastalıkların belirtisi olabilir ve kesinlikle ciddiye alınması gerekir. Vertigo, baş dönmesiyle karıştırılabilen ancak sıklıkla kulak ve denge sistemi rahatsızlıklarına bağlı olarak ortaya çıkan özel bir baş dönmesi türüdür.	Dizziness (vertigo) is a very common symptom that makes a person feel as if their surroundings are spinning. This condition may be a warning sign of various disorders related to the balance system. Dizziness may occur as a symptom of different diseases and may be accompanied by symptoms that vary according to the underlying cause. Dizziness is a condition in which a person loses balance, feels as if the surroundings are spinning, or walks unsteadily. This complaint may be a symptom of different diseases and should definitely be taken seriously. Vertigo is a specific type of dizziness that may be confused with dizziness but often occurs due to ear and balance-system disorders.
1	What is dizziness?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	Baş dönmesi, tek bir şey değildir; sersemlik, dengesizlik, bayılacak gibi olma ya da etraf dönüyormuş hissi gibi farklı yakınmaları kapsar. Eğer kişi kendisinin ya da odanın döndüğünü hissediyorsa buna daha özel olarak vertigo denir.	Dizziness is not a single condition; it includes different complaints such as lightheadedness, imbalance, feeling as if one is about to faint, or the sensation that the surroundings are spinning. If a person feels that they or the room are spinning, this is more specifically called vertigo.
1	What is dizziness?	Gemini	Gemini Plus	Standard web interface	17 March 2026	Kişinin kendisinin veya çevresinin hareket ettiğini, döndüğünü ya da sallandığını hissetmesi durumudur. Tıbbi literatürde bu durumun farklı tipleri (vertigo, dengesizlik, sersemlik hissi) olsa da genel olarak denge sistemindeki bir aksaklığın sinyali olarak kabul edilir.	It is the condition in which a person feels that they or their surroundings are moving, spinning, or swaying. Although this condition has different types in the medical literature, such as vertigo, imbalance, and lightheadedness, it is generally considered a signal of a disturbance in the balance system.
2	What causes dizziness?	Web	Başınız mı dönüyor?	https://www.acibadem.com.tr/hayat/basiniz-mi-donuyor-iste-10-sebep/	14–17 March 2026	Baş dönmesi, yaşam kalitesini önemli oranda etkileyen bir sağlık sorunu. Nedenleri ise pek çok kaynağa dayanıyor. Baş dönmesinde tanı konulabilmesi için denge ve işitme testi yapılması gerekiyor. En sık rastlanan nedenler arasında kulak kristalleri, Ménière hastalığı, depresyon ve anksiyete, iç kulak nezlesi, migren, orta kulak iltihapları, basınç değişimleri, bazı ilaçlar, sistemik rahatsızlıklar ve merkezi sinir sistemi sorunları yer alıyor.	Dizziness is a health problem that significantly affects quality of life. Its causes are based on many different sources. Balance and hearing tests are required to establish a diagnosis in dizziness. The most common causes include displaced ear crystals, Ménière's disease, depression and anxiety, inner-ear infection, migraine, middle-ear infections, pressure changes, some medications, systemic disorders, and central nervous system problems.
2	What causes dizziness?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	Baş dönmesi; iç kulak ve denge sistemi sorunları, sıvı kaybı, tansiyon düşüklüğü, bazı ilaçlar, enfeksiyonlar, migren, kalp-damar sorunları ve bazen nörolojik hastalıklar gibi birçok nedenle olabilir. Yani baş dönmesi bir hastalık adı değil, farklı nedenlerin ortaya çıkardığı bir belirtidir.	Dizziness may occur for many reasons, including inner-ear and balance-system problems, dehydration, low blood pressure, certain medications, infections, migraine, cardiovascular problems, and sometimes neurological diseases. In other words, dizziness is not the name of a disease but a symptom caused by different underlying factors.

Question No.	English question reported in the manuscript	Source group	Source/platform	Recorded URL	Collection/access date	Original Turkish text used in the analysis	English translation
2	What causes dizziness?	Gemini	Gemini Plus	Standard web interface	17 March 2026	Vücudun dengeyi sağlamak için kullandığı iç kulak, gözler ve kas-iskelet sisteminden beyne gelen sinyallerin birbiriyle çelişmesi sonucu oluşur. En sık nedenler iç kulaktaki kristal oynamaları, enfeksiyonlar, migren, tansiyon problemleri veya strestir.	It occurs when signals sent to the brain from the inner ear, eyes, and musculoskeletal system, which the body uses to maintain balance, conflict with each other. The most common causes are displaced inner-ear crystals, infections, migraine, blood-pressure problems, or stress.
3	When is dizziness dangerous?	Web	Baş dönmesi ne zaman tehlikelidir?	https://www.deryauluduz.com/bas-donmesi-ne-zaman-tehlikelidir/	14–17 March 2026	Tekrarlayan, ani, şiddetli, uzun süreli ve açıklanamayan bir baş dönmesi yaşarsanız doktora başvurun. Baş dönmesine ani ve şiddetli baş ağrısı, göğüs ağrısı, nefes darlığı, kollarda veya bacaklarda uyuşma, çift görme, kusma, konuşma bozukluğu, tökezleme veya yürüme zorluğu gibi durumlar eşlik ediyorsa kalp krizi veya felç gibi hayati bir sağlık sorunu olabilir. Bu belirtiler olduğunda vakit kaybetmeden 112'yi aramalısınız.	If you experience recurrent, sudden, severe, prolonged, or unexplained dizziness, you should consult a doctor. If dizziness is accompanied by sudden and severe headache, chest pain, shortness of breath, numbness in the arms or legs, double vision, vomiting, speech disturbance, stumbling, or difficulty walking, it may indicate a life-threatening health problem such as a heart attack or stroke. If these symptoms occur, you should call 112 without delay.
3	When is dizziness dangerous?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	Baş dönmesine şiddetli yeni başlayan baş ağrısı, konuşma bozukluğu, kol veya bacakta güçsüzlük/uyuşma, çift görme, yürümede belirgin bozulma, bayılma ya da ani işitme kaybı eşlik ediyorsa bu daha ciddi bir duruma işaret edebilir. Böyle bir durumda acil değerlendirme gerekir.	If dizziness is accompanied by a severe new-onset headache, speech disturbance, weakness or numbness in an arm or leg, double vision, marked difficulty walking, fainting, or sudden hearing loss, this may indicate a more serious condition. In such a situation, urgent evaluation is required.
3	When is dizziness dangerous?	Gemini	Gemini Plus	Standard web interface	17 March 2026	Eğer baş dönmesine şiddetli baş ağrısı, çift görme, konuşma bozukluğu, kolda veya bacakta güç kaybı, bilinç bulanıklığı gibi belirtiler eşlik ediyorsa bu durum ciddi bir nörolojik tablo ya (örneğin inme) işaret edebilir ve acil müdahale gerektirir.	If dizziness is accompanied by symptoms such as severe headache, double vision, speech disturbance, loss of strength in an arm or leg, or confusion, this may indicate a serious neurological condition, such as stroke, and requires emergency intervention.
4	Which doctor should I see for dizziness?	Web	Baş dönmesi sebebiyle hangi hekime başvurmalıyım?	https://www.seckinulusoy.com/bas-donmesinde-hangi-hekime-gitmeliyim/	14–17 March 2026	Genel olarak denge sistemi bozuklukları birçok uzmanlık alanının ilgi alanına girebilir ve sıklıkla birlikte çalışmayı gerektirir. İlk denge bozukluğu şikayeti başladığında kişiler genellikle acil tıp branşına başvururlar. Etraf dönüyorsa, ani ve şiddetli başladıysa, işitme kaybı ve çınlama varsa KBB ilk başvurulacak branş olabilir. Şikayetler daha yavaş başlangıçlı, daha hafif ve sersemlik hissi ön plandaysa Nörolojiye başvurmak uygun olabilir.	In general, balance-system disorders may fall within the scope of several specialties and often require collaborative evaluation. When balance complaints first begin, people usually apply to the emergency medicine department. If the surroundings are spinning, if the onset is sudden and severe, or if hearing loss and tinnitus are present, otorhinolaryngology may be the first specialty to consult. If the complaints have a slower onset, are milder, and lightheadedness is prominent, consulting neurology may be appropriate.
4	Which doctor should I see for dizziness?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	İlk değerlendirme için aile hekimi, dahiliye ya da acil başvurusu uygun olabilir; çünkü neden her zaman kulaktan kaynaklanmaz. Yakınmaya göre hekim sizi KBB, nöroloji, kardiyoloji veya denge/vestibüler değerlendirme yapan bir ekibe yönlendirebilir. Bu, baş dönmesinin iç kulak, beyin ya da dolaşım sistemi gibi farklı kaynaklardan gelebilmesine dayanır.	For the initial evaluation, consulting a family physician, internal medicine specialist, or emergency department may be appropriate, because the cause is not always ear-related. Depending on the complaint, the physician may refer the patient to otorhinolaryngology, neurology, cardiology, or a team performing balance/vestibular assessment. This is because dizziness may originate from different systems, such as the inner ear, brain, or circulatory system.
4	Which doctor should I see for dizziness?	Gemini	Gemini Plus	Standard web interface	17 March 2026	Baş dönmesi şikayetiyle başvurulacak ilk adres Kulak Burun Boğaz (KBB) hastalıkları uzmanıdır. Çünkü baş dönmelerinin yaklaşık %80'i iç kulak kaynaklıdır. Gerekli görülürse hasta Nöroloji bölümüne de sevk edilebilir.	The first specialist to consult for dizziness is an otorhinolaryngology specialist. This is because approximately 80% of dizziness cases originate from the inner ear. If deemed necessary, the patient may also be referred to the neurology department.

Question No.	English question reported in the manuscript	Source group	Source/platform	Recorded URL	Collection/access date	Original Turkish text used in the analysis	English translation
5	How can dizziness be relieved?	Web	Baş Dönmesi Nasıl Geçer?	https://senolpolat.com.tr/basiniz-donuyor-sa-ne-yapmalisiniz/	14–17 March 2026	Tedavi, altta yatan nedenin belirlenmesine ve semptomların kontrol altına alınmasına yöneliktir. Sürekli veya şiddetli vertigo semptomları yaşayan kişilerin bir sağlık uzmanına danışması önemlidir. Tedavi vertigonun altta yatan nedenine bağlı olarak değişmekle birlikte iç kulak kaynaklı ise manevra uygulanabilir; ilaç tedavisi, kulak içi enjeksiyonları, ev egzersizleri ve vestibüler rehabilitasyon gibi yöntemler kullanılabilir.	Treatment is directed toward identifying the underlying cause and controlling symptoms. People who experience persistent or severe vertigo symptoms should consult a healthcare professional. Although treatment varies depending on the underlying cause of vertigo, if it is inner-ear related, repositioning maneuvers may be performed; medications, inner-ear injections, home exercises, and vestibular rehabilitation may also be used.
5	How can dizziness be relieved?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	Tedavi, altta yatan nedene göre değişir. Birçok durumda yakınma kendiliğinden azalabilir; bazı hastalarda ilaç, denge egzersizleri ya da nedene yönelik özel tedaviler gerekir.	Treatment varies depending on the underlying cause. In many cases, the complaint may decrease spontaneously; in some patients, medication, balance exercises, or specific treatments directed at the cause may be required.
5	How can dizziness be relieved?	Gemini	Gemini Plus	Standard web interface	17 March 2026	Tedavi, altta yatan nedene göre değişir. Eğer neden iç kulak kristalleriyse doktor tarafından yapılacak özel manevralarla geçer. Enfeksiyon kaynaklıysa ilaç tedavisi, kronik denge bozukluklarında ise vestibüler rehabilitasyon denilen denge egzersizleri uygulanır.	Treatment varies depending on the underlying cause. If the cause is inner-ear crystals, it can improve with special maneuvers performed by a doctor. If it is infection-related, medication is used; in chronic balance disorders, balance exercises called vestibular rehabilitation are applied.
6	Are vertigo and dizziness the same thing?	Web	Vertigo mu Baş Dönmesi mi? Arasındaki Farklar	https://rumelihospital.com.tr/saglik-rehberi/noroloji-saglik-rehberi/vertigo-mu-bas-donmesi-mi-aradaki-fark-nasil-anlasilir/	14–17 March 2026	Her baş dönmesi vertigo değildir. Vertigo, kişinin kendi etrafında ya da çevresinin dönüyormuş gibi hissetmesidir ve denge kaybı, bulantı, kusma gibi belirtilerle birlikte görülebilir. Baş dönmesi ise sersemlik, hafif sallanma veya dengesizlik hissidir. Vertigo ile baş dönmesi arasındaki fark; hissedilen durum, süre, şiddet, eşlik eden belirtiler ve kaynaklandığı sistem açısından değerlendirilebilir.	Not every dizziness complaint is vertigo. Vertigo is the feeling that a person or their surroundings are spinning, and it may occur with symptoms such as loss of balance, nausea, and vomiting. Dizziness, on the other hand, refers to lightheadedness, mild swaying, or a feeling of imbalance. The difference between vertigo and dizziness can be evaluated in terms of the sensation felt, duration, severity, accompanying symptoms, and the system from which it originates.
6	Are vertigo and dizziness the same thing?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	Hayır. Baş dönmesi daha geniş bir şemsiye terimdir; vertigo ise bunun bir alt türüdür ve özellikle dönme ya da hareket etme hissini anlatır. Kısacası her vertigo bir baş dönmesi türüdür, ama her baş dönmesi vertigo değildir.	No. Dizziness is a broader umbrella term, whereas vertigo is a subtype of it and specifically describes a sensation of spinning or movement. In short, every vertigo is a type of dizziness, but not every dizziness is vertigo.
6	Are vertigo and dizziness the same thing?	Gemini	Gemini Plus	Standard web interface	17 March 2026	Tam olarak değil. “Baş dönmesi” genel bir tabirken, vertigo bu durumun spesifik bir türüdür; kişinin etrafındaki her şeyin bir çark gibi döndüğü ilüzyonuna verilen isimdir. Her vertigo bir baş dönmesidir, ancak her baş dönmesi (sersemlik, baygınlık hissi vb.) vertigo değildir.	Not exactly. “Dizziness” is a general term, whereas vertigo is a specific type of this condition; it is the name given to the illusion that everything around the person is spinning like a wheel. Every vertigo is dizziness, but not every dizziness, such as lightheadedness or a fainting sensation, is vertigo.
7	Can displaced ear crystals cause dizziness?	Web	Kristal oynaması vertigoya neden olur mu?	https://www.medicana.com.tr/haber-detay/8510/kristal-oynamasi-bas-donduruyor	14–17 March 2026	Benign Paroksismal Pozisyonel Vertigo, halk dilindeki adıyla kristal oynaması, iç kulak kanalındaki kristallerin yer değiştirmesi sonucu ortaya çıkar ve vertigoya neden olur. Kişi başını hareket ettirdiğinde, yatakta döndüğünde, eğildiğinde ya da hızla çevirdiğinde dönüyor hissine kapılabilir. Bu ataklar genellikle bir dakikadan kısa sürer ancak rahatsız edici olabilir; bazen bulantı, kusma ve denge kaybı eşlik edebilir.	Benign paroxysmal positional vertigo, popularly known as displaced ear crystals, occurs when crystals in the inner-ear canal change position and causes vertigo. A person may experience a spinning sensation when moving the head, turning in bed, bending over, or turning quickly. These attacks usually last less than one minute but can be disturbing; nausea, vomiting, and loss of balance may sometimes accompany them.

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7	Can displaced ear crystals cause dizziness?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	Evet. “Kristal oynaması” diye bilinen BPPV, baş dönmesinin ve özellikle vertigonun sık nedenlerinden biridir. Genellikle başı belli bir pozisyona getirmekle, örneğin yatakta dönerken, yukarı bakarken ya da eğilirken kısa ama şiddetli dönme hissi yapar.	Yes. BPPV, commonly known as “displaced ear crystals,” is one of the common causes of dizziness and especially vertigo. It usually causes a short but severe spinning sensation when the head is brought into certain positions, such as turning in bed, looking up, or bending over.
7	Can displaced ear crystals cause dizziness?	Gemini	Gemini Plus	Standard web interface	17 March 2026	Evet, toplumda en sık görülen vertigo nedeni budur (BPPV). İç kulaktaki denge merkezinde bulunan kalsiyum karbonat kristallerinin bağlı oldukları yerden kopup kanallara kaçması sonucu oluşur. Özellikle baş hareketleriyle (yatakta dönmek, yukarı bakmak) tetiklenen şiddetli ama kısa süreli dönmeler yapar.	Yes, this is the most common cause of vertigo in the community. It occurs when calcium carbonate crystals in the balance center of the inner ear detach from their usual location and enter the canals. It causes severe but short-lasting spinning sensations, especially triggered by head movements such as turning in bed or looking up.
8	What can be done at home for dizziness?	Web	Evde Baş Dönmesine İyi Gelen Doğal Çözümler	https://www.onedose.io/evde-bas-donmesine-ne-i-yi-gelir-nasil-gecer/	14–17 March 2026	Baş dönmesi sırasında güvenli bir yere oturmak veya uzanmak, ani hareketlerden kaçınmak ve yavaş hareket etmek yararlı olabilir. Susuzluk varsa sıvı tüketimini artırmak yardımcı olabilir. Buna karşılık buz paketi, elma sirkesi-bal karışımı, papatya çayı ve benzeri doğal çözümler bazı kaynaklarda önerilse de bunların etkisi değişken olabilir.	During dizziness, it may be helpful to sit or lie down in a safe place, avoid sudden movements, and move slowly. If dehydration is present, increasing fluid intake may help. However, although some sources recommend natural remedies such as ice packs, apple vinegar and honey mixtures, or chamomile tea, their effects may vary.
8	What can be done at home for dizziness?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	Yakınma sırasında oturmak ya da uzanmak, ani hareketlerden kaçınmak, yavaş kalkmak ve düşme riskini azaltmak yardımcı olabilir. Vertigo tipi yakınmalarda sakin, loş bir ortamda dinlenmek ve başı yavaş hareket ettirmek önerilir; ama yakınma tekrarlıyorsa ya da şiddetliyse evde beklemek yerine değerlendirilmek gerekir.	During the complaint, sitting or lying down, avoiding sudden movements, getting up slowly, and reducing the risk of falling may help. For vertigo-type complaints, resting in a calm, dim environment and moving the head slowly are recommended; however, if the complaint recurs or is severe, the person should be evaluated rather than waiting at home.
8	What can be done at home for dizziness?	Gemini	Gemini Plus	Standard web interface	17 March 2026	Akut bir atak sırasında kişi hemen güvenli bir yere oturmalı veya uzanmalıdır. Ani baş hareketlerinden kaçınılmalı, ışıklar loş hale getirilmelidir. Ancak teşhis konulmadan rastgele ilaç kullanılmamalıdır; bu durum beynin denge sistemini onarma (kompansasyon) sürecini geciktirebilir.	During an acute attack, the person should immediately sit or lie down in a safe place. Sudden head movements should be avoided, and the lights should be dimmed. However, random medication should not be used without a diagnosis; this may delay the brain’s process of repairing the balance system, known as compensation.
9	Dizziness can be a symptom of which diseases?	Web	Baş dönmesinin nedenleri	https://www.memorial.com.tr/saglik-rehberi/bas-donmesi	14–17 March 2026	Baş dönmesi; migren, kan şekeri düşüklüğü, tansiyon düşmesi, güneş çarpması, susuzluk, anemi, beyin sarsıntısı, hareket hastalığı ve kardiyovasküler hastalıklar gibi birçok durumun belirtisi olabilir.	Dizziness may be a symptom of many conditions, such as migraine, low blood sugar, low blood pressure, sunstroke, dehydration, anemia, concussion, motion sickness, and cardiovascular diseases.
9	Dizziness can be a symptom of which diseases?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	İç kulak hastalıkları, BPPV, Ménière hastalığı, vestibüler migren, tansiyon düşüklüğü, sıvı kaybı, kalp ritim sorunları, ilaç yan etkileri ve bazı nörolojik hastalıklar baş dönmesine yol açabilir. Bu yüzden baş dönmesinin süresi, neyin tetiklediği ve eşlik eden belirtiler tanıda çok önemlidir.	Inner-ear diseases, BPPV, Ménière’s disease, vestibular migraine, low blood pressure, dehydration, heart rhythm problems, medication side effects, and some neurological diseases may cause dizziness. Therefore, the duration of dizziness, what triggers it, and accompanying symptoms are very important for diagnosis.
9	Dizziness can be a symptom of which diseases?	Gemini	Gemini Plus	Standard web interface	17 March 2026	BPPV (kristal oynaması), Ménière hastalığı (iç kulak tansiyonu), vestibüler nörit (denge siniri iltihabı), migren, düşük veya yüksek tansiyon, kansızlık (anemi), panik atak ve nadiren beyin sapı veya beyincik tümörleri/kanamaları.	BPPV, Ménière’s disease, vestibular neuritis, migraine, low or high blood pressure, anemia, panic attacks, and, rarely, brainstem or cerebellar tumors/bleeding may cause dizziness.

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10	When should I go to the emergency department for dizziness?	Web	Acil Servise Başvurulması Gereken Durumlar	https://asyakbb.com/bas-donmesi-icin-hangi-bolume-gidilir/	14–17 March 2026	Baş dönmesiyle birlikte ani ve çok şiddetli baş ağrısı, konuşma bozukluğu, çift görme, görme kaybı, yürümede zorlanma, kol veya bacaklarda uyuşma ya da güç kaybı, bilinç değişikliği, göğüs ağrısı, nefes darlığı veya giderek artan şiddetli kusma varsa acil servise başvurulmalıdır.	The emergency department should be consulted if dizziness is accompanied by sudden and very severe headache, speech disturbance, double vision, vision loss, difficulty walking, numbness or loss of strength in the arms or legs, altered consciousness, chest pain, shortness of breath, or progressively worsening severe vomiting.
10	When should I go to the emergency department for dizziness?	ChatGPT	ChatGPT Plus	Standard web interface	17 March 2026	Baş dönmesi aniden başladıysa ve beraberinde konuşma bozukluğu, yüzde-kolda-bacakta güçsüzlük, görme kaybı/çift görme, şiddetli baş ağrısı, bayılma, göğüs ağrısı, nefes darlığı, yürüyememe ya da kontrol edilemeyen kusma varsa acile gidilmelidir. Baş dönmesi kafa travmasından sonra geliştiyse de acil değerlendirme gerekir.	If dizziness starts suddenly and is accompanied by speech disturbance, weakness in the face, arm, or leg, vision loss or double vision, severe headache, fainting, chest pain, shortness of breath, inability to walk, or uncontrollable vomiting, the emergency department should be consulted. Emergency evaluation is also required if dizziness develops after head trauma.
10	When should I go to the emergency department for dizziness?	Gemini	Gemini Plus	Standard web interface	17 March 2026	Eğer baş dönmesi aniden başladıysa ve beraberinde yutkunma güçlüğü, yüz sarkması, şiddetli kusma, göğüs ağrısı, nefes darlığı veya geçmeyen bir işitme kaybı varsa vakit kaybetmeden acil servise başvurulmalıdır.	If dizziness starts suddenly and is accompanied by difficulty swallowing, facial drooping, severe vomiting, chest pain, shortness of breath, or persistent hearing loss, the emergency department should be consulted without delay.

Note: This table presents the original Turkish texts used in the analysis for all three source groups: web-based sources, ChatGPT, and Gemini. For web-based sources, only the main patient-information body text was included; advertisements, menus, navigational links, image captions, and institutional promotional statements were excluded. For ChatGPT and Gemini, the exact Turkish patient-oriented question was used as the prompt, with no additional role assignment, tone instruction, length restriction, formatting instruction, or follow-up prompt. A new chat session was opened for each AI-generated response, the first generated response was used, and no regeneration was performed. ChatGPT was accessed through a ChatGPT Plus subscription via the standard web interface, and Gemini was accessed using a Gemini Plus subscription via the standard web interface. English translations were added only to facilitate reviewer assessment. The original Turkish texts were used for readability, DISCERN, accuracy/safety scoring, and statistical analysis.