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Assessment of Physical Activity Behaviors and Perspectives in Epilepsy Patients

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Abstract

Objective: Physical exercise has been shown to improve mood, memory, and overall quality of life in people with epilepsy. Still, studies indicate that individuals with epilepsy are less active than the general population. We aimed to determine the physical activity levels of individuals with epilepsy and to gain insight into their perspectives on it.

Methods: This study administered a survey to patients with epilepsy at a single tertiary care center between July 2024 and February 2025. The questionnaire developed by the research team had 21 questions and three sections. The survey assessed participants' frequency of physical activity, their opinions on sports and epilepsy, and sociodemographic information.

Results: A total of 202 participants (59.4% female) completed the survey. 49.0% of the patients did not exercise regularly, while 13.9% exercised more than three times a week. The most preferred sports were walking (16.8%) and running (11.4%). The patients stated the reasons for not exercisingr of having a seizure (35.1%), lack of time (33.2%), lack of motivation (21.3%), not seeing it as necessary (20.8%), and side effects of epilepsy medications (4.5%). 77.2% of patients had not asked their doctor any questions about physical exercise, and 66.8% had never been informed by their doctor about the importance of physical activity. 45.5% of the patients were supported by their environment regarding physical exercise, while 25.7% were discouraged from engaging in physical exercise.

Conclusion: Patients with epilepsy require improved information regarding the benefits of physical exercise, and neurologists should address this need.

Keywords: Epilepsy, physical activity, seizure

INTRODUCTION

Epilepsy is a common, chronic neurological disorder that affects over 50 million people worldwide.[1] The stigma and prejudice associated with epilepsy continue to affect sports participation, physical activity, and many other areas of an individual's life.[2] Despite the well-documented benefits of sports and physical activity for quality of life and disease prevention in the general population,[3,4] participation in sports by individuals with epilepsy had been regarded as risky until recent years.[5] This recommendation likely stemmed from concerns that sports activities could cause injuries, trigger seizures, and adversely affect the course of the disease.[5] Recently, there has been a trend towards encouraging, rather than restricting, participation in sports activities, as it has been shown to contribute to seizure control,[6,7] to lower the risk of diabetes, hypertension, obesity, and coronary heart disease, and to have positive psychosocial effects.[8-11] The International League Against Epilepsy (ILAE) Task Force on Sports and Epilepsy published a consensus statement in 2016.[12] This consensus statement provides recommendations to promote general well-being in sports activities and to facilitate the globalization of treatment certifications related to sports participation. The patient's eligibility for almost every sport was determined by the seizure-free period, seizure type, seizure timing, and other factors.[12] However, despite a recent trend encouraging participation in sports activities, research has shown that epilepsy patients do not engage in sufficient physical activity and sports.[11,13,14]

In our study, participants were asked about their knowledge, attitudes, and behaviors regarding exercise to identify factors that increase or decrease the likelihood of engaging in exercise.

METHODS

Study Design

The study was conducted at Karaman Training and Research Hospital Neurology Clinic, and participants were included between July 2024 and February 2025. Karamanoğlu Mehmetbey University Ethics Committee approved the study protocol in accordance with the

ethical standards outlined in the Declaration of Helsinki (approval no: 08-2024/02, date: 24.07.2024). All participants were informed of the possible risks and benefits, and written informed consent was obtained.

Partipicants

Eligible participants were patients aged 18 years or older who had a clinical and electrophysiological diagnosis of epilepsy at Karaman Training and Research Hospital. Those with comorbid psychiatric disorders and those who had diseases that could lead to serious physical disabilities (such as cerebral palsy) were excluded from the study. According to the specified criteria, 202 patients participated in the study. Participation was entirely voluntary; no incentives were offered. Furthermore, no sanctions were imposed on patients in the event of non-participation.

Questionnaire Study

The survey form was developed by the research team based on literature reviews and personal experiences. The survey assessed participants' physical activities, general views of and knowledge about sports and epilepsy, and sociodemographic information. This survey study consists of 21 questions divided into three sections. The first section contains demographic information and comprises six questions. The second section focuses on participants' disease status and contains four questions. In the third part, the physical exercise habits and perspectives of patients with epilepsy are examined using 11 questions. The results were compared with the medical records of neurologists to enhance the accuracy of the answers.

Statistical Analysis

Recorded data were analyzed using the SPSS, version 27.0 (SPSS Inc., Armonk, NY). A reliability analysis was performed on the survey questionnaire (Cronbach's alpha: 0.720). Also, a validity analysis was performed with a Kaiser-Meyer-Olkin value of 0.739 and Bartlett's test $p<0.001$.

The normality of numerical data distribution was examined using the Shapiro-Wilk test. Normally distributed continuous variables were presented as the mean and standard deviation, non-normally distributed continuous variables were presented as the median and interquartile range (25^{th}-75^{th} percentiles), and qualitative data were expressed as frequencies and percentages. Numeric variables were analyzed using the t-test or the Mann-Whitney U test depending on whether the data followed a parametric distribution. The categorical variables were compared using Pearson's chi-square test and the linear-by-linear association test, based on expected counts and numbers of cases. Binary logistic regression analyses were performed to identify variables associated with exercise status. Spearman correlation analysis was applied to assess correlations involving exercise frequency. A 95% confidence level and a 5% margin of error were used. Therefore, the p-value was considered significant when $p<0.05$.

MAIN POINTS

- The levels of physical activity among people with epilepsy remain lower than those in the general population.
- Fear of experiencing a seizure is a primary reason patients with epilepsy do not engage sufficiently in physical activity.
- Patients should informed about the benefits of physical exercise, and healthcare professionals should emphasize its importance.

RESULTS

Overall, 210 patients were approached to complete the survey. Of these, eight declined to participate, leaving 202 patients included in the study. Approximately 90% of patients were under the age of 55. 59.4% (n=120) of the patients were female and 40.6% (n=82) were male; 77.2% graduated from high school or had a lower level of education, and 22.8% (n=17) graduated from university or had a higher level of education. 31.2% of the patients were working full-time, 6.9% were working part-time, and 61.9% were not working. Based on body mass index (BMI), 45% of the patients were of normal weight, 33.7% were overweight, and 19.3% were obese or morbidly obese; the mean BMI of the patients was 25.3. The sociodemographic characteristics of the patients are shown in Table 1.

According to the ILAE 2017 seizure classification, 72 patients had generalized onset seizures, 124 patients had focal onset seizures, and 34 patients had unknown onset seizures. 53.5% of patients had epilepsy for more than 10 years, 52.5% had seizures once or twice per year or less, and 36% (n=73) had not had a seizure in the past year. More than 80% have no systemic disease; the most common systemic conditions are hypertension, diabetes mellitus, and asthma. Seven patients presented with a single seizure episode, whereas 19 patients experienced seizures exclusively during nocturnal sleep. 56.4% (n=114) of patients received monotherapy; 43.6% (n=88) received polytherapy.

Table 1. Sociodemographic characteristics of patients (n=202)

Age category (n/%)	
18-24	43 (21.3)
25-34	49 (24.3)
35-44	52 (25.7)
45-54	37 (18.3)
55-64	19 (9.4)
65 or older	2 (1.0)
Gender (n/%)	
Female	120 (59.4)
Male	82 (40.6)
Basal mass index (n/%)	
Underweight	4 (2.0)
Normal	91 (45.0)
Overweight	68 (33.7)
Obese	36 (17.8)
Extremely obese	3 (1.5)
Education (n/%)	
High school or less	156 (77.2)
University or more	46 (22.8)
Employment (n/%)	
Full time (35 h/week or more)	63 (31.2)
Part time (less than 35 h/week)	14 (6.9)
Unemployed	125 (61.9)

49.0% of the patients did not exercise at all, while 13.9% exercised more than three times per week. The most preferred sports were walking (16.8%) and running (11.4%). Patients reported the following reasons for insufficient exercise: fear of having a seizure (35.1%); lack of time (33.2%); lack of motivation (21.3%); not seeing it as necessary or not feeling the need (20.8%); side effects of epilepsy medications (4.5%); and 7.4% did not specify a reason (Figure 1). 77.2% of the patients had not asked the doctor any questions about physical activity, and 66.8% had never been informed about physical activity by their doctors. 45.5% of the patients were supported by their environment about physical exercise, while 25.7% were discouraged.

Patients who did not engage in physical exercise had a median BMI of 25.9 (7.6), whereas those who engaged in physical exercise had a median BMI of 24.5 (6.1). BMI in the exercise group was significantly lower ($p<0.01$).

In binary logistic regression analysis, compared with the 18-24 age group, the 35-44 age group was associated with a decreased likelihood of exercising [odds ratio (OR)=0.071, $p<0.001$], whereas being male was associated with an increased likelihood of exercising (OR=2.863, p=0.024). Working part-time (OR=0.036, $p<0.001$) and full-time (OR=0.296, $p<0.01$) were found to be associated with a decreased likelihood of exercising compared with not working. Receiving polytherapy (OR=0.210, $p<0.001$) was also associated with a decreased likelihood of exercising.

No statistically significant association was observed between the level of physical activity and seizure frequency (p=0.371). Among patients who exercised, no correlations were found among age, gender, BMI, education status, and employment status (Table 2). Similarly, no correlation was found among focal and generalized seizures, disease duration, monotherapy and polytherapy status, time of last seizure, history of single seizures, history of nocturnal seizures, and exercise frequency.

Patients were divided into four categories according to the anti-seizure drugs they were using: those using drugs with at least one high BMI and strong evidence of weight gain (Valproate, Carbamazepine, Pregabalin, Gabapentin, Vigabatrin); those using drugs with at least one low BMI and strong evidence of weight loss (Topiramate, Zonisamide); those using these drugs in combination; and those using other anti-seizure drugs not thought to affect weight control significantly. Patients taking medications that had no effect on BMI (n=70), those taking medications that increased BMI (n=92), and those taking medications that decreased BMI (n=32) were compared with respect to BMI and exercise frequency. Patients taking both BMI-increasing and BMI-decreasing drugs (n=8) were excluded from the comparison.

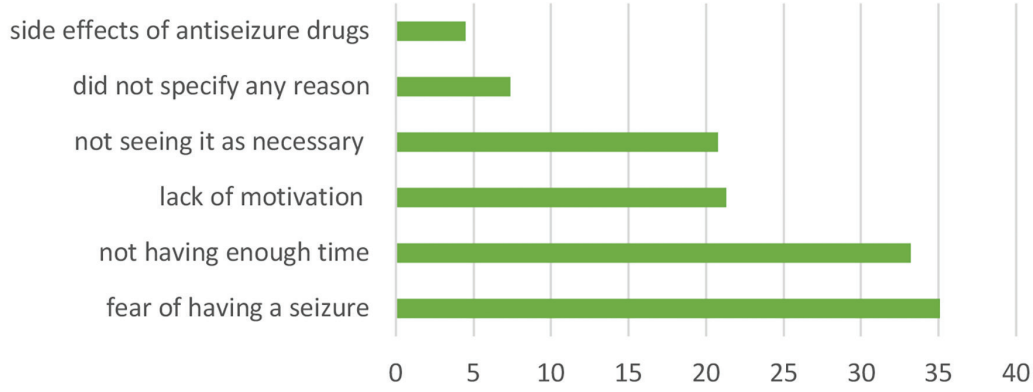

Figure 1. Reasons why patients with epilepsy do not exercise regularly

Table 2. Logistic regression analysis of exercise status

	B	SE	P	OR	95% CI for OR	
Age					**Lower**	**Upper**
18-24			<0.01			
25-34	-0.666	0.577	0.248	0.514	0.166	1.592
35-44	-2.650	0.700	**<0.001**	**0.071**	0.018	0.279
45-54	-1.322	0.708	0.062	0.267	0.067	1.068
55-64	-1.501	1.829	0.412	0.223	0.006	8.039
>65 age	-0.666	0.577	0.248	0.514	0.166	1.592
Gender	1.052	0.465	0.024	2.863	1.152	7.116
Working status						
Non-working			<0.001			
Full time	-3.315	0.879	**<0.001**	**0.036**	0.006	0.204
Part-time	-1.218	0.468	**<0.01**	**0.296**	0.118	0.741
Constant	1.965	3.110	0.527	7.135		

Nagelkerke R^2: 0.435, SE: Standard error, OR: Odds ratio, CI: Confidence interval

No significant differences were found between anti-seizure drugs and BMI or exercise frequency (p=0.228 and p=0.666, respectively).

DISCUSSION

We investigated the physical activity levels and perspectives of patients with epilepsy. It was determined that 49.0% of the patients did not exercise regularly. A study conducted in Norway found that a sedentary lifestyle is more common in patients with epilepsy than in healthy individuals.[15] In Brazil, another study reported that 49% of patients with epilepsy do not engage in regular physical activity.[16] Research in Germany showed that 42% of healthy individuals participate in regular sports, compared with only 25% of patients with epilepsy.[17] Additionally, in our country, the rate in the general population was 22% among women and 39% among men, according to the 2022 data from the World Health Organization.[18] In a study conducted among university students in our country, the prevalence of physical inactivity was 29.9%.[19] This rate indicates that patients with epilepsy are less likely to exercise than the general population.

We found that the most common barriers to exercise in patients with epilepsy were fear of having a seizure (35.1%), insufficient time (33.2%), lack of motivation (21.3%), and not seeing it as necessary (20.8%). Our findings are consistent with the literature. In a similar study, lack of motivation (41%) was the most prominent factor, followed by personal safety concerns (27%), fear of seizures (19%), and limited access to exercise facilities (18%).[20] In another study, "fatigue after activity" and "not having time for activity" were the most common barriers.[21] In a recent study, lack of time (24.7%) and fear of having a seizure (19.7%) were the most frequently reported reasons.[14] Although it is believed that the fatigue and weight-loss side effects of anti-seizure drugs could pose an obstacle, this rate was only 4.9% in our study. Among patients with epilepsy who engage in regular physical activity, walking (16.8%) and running (11.4%) are the most preferred forms of exercise. Another study found that epilepsy patients most frequently engaged in hiking (18%) and walking (14%).[21] In a single-center survey, walking was the preferred form of physical activity, chosen by 97.8% of participants.[14]

In our study, 14.3% of epilepsy patients experienced a seizure during physical activity, and 13.8% had a seizure afterward. A similar study found that about 18% of people with epilepsy reported having a seizure before, during, or after physical activity. In this study, 56% of those who believed that seizures prevented them from exercising reported having a seizure during physical activity, while only 9% of those who thought seizures did not prevent them from exercising reported experiencing a seizure.[20] In another study, 47% of epilepsy patients reported having seizures during or immediately after exercise at least once, with 11% experiencing them very frequently (>10%); however, only 2% actually experienced seizures during or immediately after exercise.[15] This highlights the subjective nature of patient reports in survey studies. This could have been the case in our study as well.

The study revealed no significant correlation between the frequency of seizures and participation in physical activity. Several studies suggest that physical activity can help control seizures.[6,7,22] A study examining the consequences of physical activity in people with epilepsy suggested that physical activity may reduce the incidence of epileptic seizures by decreasing the production of proinflammatory biomarkers.[22] Another study examining the impact of an exercise program on overall health and seizure frequency in epilepsy patients found that exercise decreases seizure occurrences.[6] However, meta-analysis studies have not demonstrated a clear link between seizure frequency and physical activity.[11,23] One meta-analysis included three studies examining the relationship between physical activity and seizure frequency, and only one found that physical activity was associated with fewer seizures.[11] Another meta-analysis study suggested that exercise seemed to decrease seizure frequency; however, it emphasized that the changes were not statistically significant and cannot be recommended for seizure control in patients with drug-resistant epilepsy.[23]

According to the BMI, 19.3% of the patients were classified as obese, compared with 17% in the general population of our country.[24] From this perspective, obesity rates in patients with epilepsy did not differ from those in the general population. A recent study revealed that the obesity rate in patients with epilepsy (20.4%) is higher than that in healthy adults (9.6%).[25] Another study involving 822,071 patients with epilepsy identified an obesity rate of 28.3%.[26] Furthermore, as anticipated, our study revealed that individuals who did not engage in regular physical exercise had significantly higher BMI than individuals who engaged in regular physical exercise.

Our study did not detect correlations among anti-seizure drugs, BMI, and physical activity. Although anti-seizure drugs have been implicated in causing obesity in patients with epilepsy, specific studies on this topic are lacking, and the underlying mechanisms remain unclear.[25] Recent studies largely support the notion that topiramate and zonisamide cause weight loss, with mechanisms that may involve hypothalamic insulin and leptin signaling.[27,28] Several studies indicate that valproic acid causes weight gain by increasing leptin levels and inducing hyperinsulinemia, while carbamazepine promotes weight gain by enhancing adipogenesis through inhibition of Wnt/β-catenin expression.[29,30] Additionally, gabapentin, pregabalin, vigabatrin, and perampanel have been shown to contribute to weight gain.[30,31] In our study, the results may not have been statistically significant because group distributions were not homogeneous and group sizes were unequal. There are no studies specifically examining the relationship between anti-seizure drugs and physical activity. One study compared the physical activity rates of patients receiving monotherapy and those receiving polytherapy and showed that polytherapy affected exercise habits independently of seizure frequency.[21] Our study found no significant difference in exercise habits between patients receiving polytherapy and those receiving monotherapy.

Our study found that 25.7% of patients' relatives attempted to discourage patients from engaging in physical exercise. A study conducted in Brazil reported a rate of 14%, while a survey in South Korea reported a rate of 52.8%.[16,21] The differences in rates may stem from cultural variations in the stigma associated with epilepsy. This discouragement appears to stem from the belief, among family members and the public, that physical exercise can trigger seizures.

We determined that 77.2% of the patients did not ask their doctors any questions about physical exercise, and 66.8% were not informed by their doctors about physical activity. Another study on physical activity and exercise reported that approximately 45% of patients patients had never discussed sports-related recommendations with their doctors.[17] A study of 60 patients reported that 6 were prevented from exercising by their families and doctors.[16] In 2015, the ILAE Task Force on Sport and Epilepsy released a comprehensive report that provided guidance on the sports and types of exercise considered safe based on seizure frequency and type. After the ILAE published this report, Arida et al.[32] surveyed neurologists to assess their knowledge of the importance of physical activity for people with epilepsy and their awareness of the ILAE report. Over 90% of neurologists participating in the survey endorsed physical activity for individuals with epilepsy and agreed that exercise can reduce comorbidities. However, only 40% were aware of the ILAE recommendations, whereas 35% reported having no knowledge of physical activity for people with epilepsy. Arida et al.[32] emphasized that doctors are aware of the benefits of exercise, but discussing exercise with patients is a different matter; doctors should also proactively provide information about exercise rather than merely responding when patients ask.[33]

Study Limitations

First, as with most survey data, our data were based on self-reporting; however medical records were reviewed to account for possible false recall or rejection. Second, the representativeness of the results may be limited, particularly with respect to socioeconomic characteristics, because our patients were recruited from a single small city.

CONCLUSION

Patients with epilepsy should be encouraged to exercise, as with the general population. Regular exercise positively impacts both the mental and physical health of individuals. Furthermore, studies have demonstrated that physical activity can help control seizures and reduce comorbidities associated with epilepsy, such as depression. Conversely, some patients may avoid exercise because of fear of experiencing a seizure during physical activity, and their families often attempt to dissuade them. Neurologists must fully comprehend the ILAE consensus published in 2015 and inform patients about it. Additionally, all physicians should promote regular physical activity and educate caregivers about the benefits of exercise and the necessary precautions, such as wearing protective clothing.

Ethics

Ethics Committee Approval: Karamanoğlu Mehmetbey University Ethics Committee approved the study protocol in accordance with the ethical standards outlined in the Declaration of Helsinki (approval no: 08-2024/02, date: 24.07.2024).

Informed Consent: All participants were informed of the possible risks and benefits, and written informed consent was obtained.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Z.Y., Concept: Z.Y., Design: Z.Y., M.A.G., Data Collection or Processing: M.A.G., Analysis or Interpretation: M.A.G., Literature Search: Z.Y., Writing: Z.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

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REFERENCES

1. Fiest KM, Sauro KM, Wiebe S, et al. Prevalence and incidence of epilepsy. *Neurology*. 2017;88(3):296-303. [Crossref]
2. Mayor R, Gunn S, Reuber M, Simpson J. Experiences of stigma in people with epilepsy: a meta-synthesis of qualitative evidence. *Seizure*. 2022;94:142-160. [Crossref]
3. Dhuli K, Naureen Z, Medori MC, et al. Physical activity for health. *J Prev Med Hyg*. 2022;63(2 Suppl 3):E150-E159. [Crossref]
4. Mahindru A, Patil P, Agrawal V. Role of physical activity on mental health and well-being: a review. *Cureus*. 2023;15(1):e33475. [Crossref]
5. Pimentel J, Tojal R, Morgado J. Epilepsy and physical exercise. *Seizure*. 2015;25:87-94. [Crossref]
6. Häfele CA, Rombaldi AJ, Feter N, et al. Effects of an exercise program on health of people with epilepsy: a randomized clinical trial. *Epilepsy Behav*. 2021;117:107904. [Crossref]
7. Green R, Abe C, Denney DA, et al. Physical activity status and quality of life in patients with epilepsy - survey from level four epilepsy monitoring units. *Epilepsy Res*. 2021;173:106639. [Crossref]
8. Vooturi S, Potharaju A, Kandula A, et al. Prevalence of overweight and obesity and trends of physical activity in people with epilepsy - an observational study. *J Med Sci Res*. 2019;7(3):66-69. [Crossref]
9. Bhatt G, Mukkamala N. Impact of exercise intervention on cardiovascular fitness in patients with epilepsy: a quasi-experimental study. *J Clin Diagn Res*. 2024;18(10):15-18. [Crossref]
10. Hu Z, Tang L, Xu X, Zhan Y. Association between physical activity and psychosocial status in adults with epilepsy: results from the 2022 National Health Interview Survey. *Epilepsy Behav*. 2024;156:109836. [Crossref]
11. Johnson EC, Helen Cross J, Reilly C. Physical activity in people with epilepsy: a systematic review. *Epilepsia*. 2020;61(6):1062-1081. [Crossref]
12. Capovilla G, Kaufman KR, Perucca E, Moshé SL, Arida RM. Epilepsy, seizures, physical exercise, and sports: a report from the ILAE task force on sports and epilepsy. *Epilepsia*. 2016;57(1):6-12. [Crossref]
13. Tedrus GMAS, Sterca GS, Pereira RB. Physical activity, stigma, and quality of life in patients with epilepsy. *Epilepsy Behav*. 2017;77:96-98. [Crossref]
14. Alexander HB, Arnel M, O'Connell N, et al. A single-center survey on physical activity barriers, behaviors and preferences in adults with epilepsy. *Epilepsy Behav*. 2023;149:109491. [Crossref]
15. Nakken KO. Clinical research physical exercise in outpatients with epilepsy. *Epilepsia*. 1999;40(5):643-651. [Crossref]
16. Arida RM, Scorza FA, de Albuquerque M, Cysneiros RM, de Oliveira RJ, Cavalheiro EA. Evaluation of physical exercise habits in Brazilian patients with epilepsy. *Epilepsy Behav*. 2003;4(5):507-510. [Crossref]
17. Steinhoff BJ, Neusiiss K, Thegeder H, Reimers CD. Leisure time activity and physical fitness in patients with epilepsy. *Epilepsia*. 1996;37(12):1221-1227. [Crossref]
18. World Health Organization. Physical activity Türkiye 2022 country profile. 2022 [cited 2025 Apr 24]. [Crossref]
19. Kundakcı YE, Karaman S, Ateş MS. Physical activity, leisure-time management, perceived barriers to physical activity and mental well-being among Turkish university students. *Discover Mental Health*. 2024;4(1):54. [Crossref]

20. Ablah E, Haug A, Konda K, et al. Exercise and epilepsy: a survey of midwest epilepsy patients. *Epilepsy Behav*. 2009;14(1):162-166. [Crossref]
21. Han K, Choi-Kwon S, Lee SK. Leisure time physical activity in patients with epilepsy in Seoul, South Korea. *Epilepsy Behav*. 2011;20(2):321-325. [Crossref]
22. Cavalcante BRR, Improta-Caria AC, Melo VH de, De Sousa RAL. Exercise-linked consequences on epilepsy. *Epilepsy Behav*. 2021;121:108079. [Crossref]
23. Duñabeitia I, Bidaurrazaga-Letona I, Diz JC, Colon-Leira S, García-Fresneda A, Ayán C. Effects of physical exercise in people with epilepsy: a systematic review and meta-analysis. *Epilepsy Behav*. 2022;137:108959. [Crossref]
24. T.C. Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü, Sağlıklı Beslenme ve Hareketli Hayat Dairesi Başkanlığı. Obezite. [cited 2025 Apr 24]. [Crossref]
25. Li YX, Chen RX, Lv XR, Zi Q, Zhang FM, Li Y. Investigation of the relationship between body mass index and epilepsy. *Epilepsy Behav.* 2025;165:110295. [Crossref]
26. Pfeifer MT, Kostev K, Doege C. Sex-related associations between body mass index and the incidence of epilepsy. *Epilepsy Behav*. 2022;136:108926. [Crossref]
27. Wajid I, Vega A, Thornhill K, et al. Topiramate (topamax): evolving role in weight reduction management: a narrative review. *Life*. 2023;13(9):1845. [Crossref]
28. Domecq JP, Prutsky G, Leppin A, et al. Drugs commonly associated with weight change: a systematic review and meta-analysis. *J Clin Endocrinol Metab*. 2015;100(2):363-370. [Crossref]
29. Im DU, Kim SC, Chau GC, Um SH. Carbamazepine enhances adipogenesis by inhibiting Wnt/β-catenin expression. *Cells*. 2019;8(11):1460. [Crossref]
30. Nazish S. Obesity and metabolic syndrome in patients with epilepsy, their relation with epilepsy control. *Ann Afr Med*. 2023;22(2):136-144. [Crossref]
31. Hamed SA. Antiepileptic drugs influences on body weight in people with epilepsy. *Expert Rev Clin Pharmacol*. 2015;8(1):103-114. [Crossref]
32. Arida RM, Sales EP do N, Teixeira-Machado L, Prado GF do, Gutierre RC, Carrizosa J. Neurologists' knowledge of and attitudes toward physical exercise for people with epilepsy in Latin America. *Epilepsy Behav.* 2022;131:108705. [Crossref]
33. Volkers N. Stop stigma, start exercising: how clinicians can encourage people with epilepsy to engage in physical activity. *Epigraph*. 2023;25(1):14-20. [Crossref]