



A LITERATURE REVIEW : ROLE OF DIET AND REGIMEN IN MIGRAINE TRIGGER FACTORS

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ABSTRACT-

Background- Migraine is a headache usually on one side of the head of varying intensity, often accompanied by nausea and sensitivity to light and sound. Conventional therapies along with the alternative medicines have a good action on the treatment of migraine. Management strategies encompass indicated treatment for immediate relief during acute episodes. Preventive therapy to reduce frequency and severity, dietary modifications and personalized lifestyle adjustments.

Objectives- This Literature review aims to present the current status and future perspective on diet and migraine in order to stimulate further research and awareness with better health outcomes. To study migraine trigger factors, including stress, hormonal changes, dietary factors and environmental influences. To select personalized lifestyle adjustments for patients to manage migraine triggers and improve treatment outcomes.

Methods- The kind of literature are searched in Google scholar, Pub med, Science direct, Web database and Scopus. 50 articles including systematic reviews, cross over trials, clinical trials, cross sectional studies are studied out of which only 20 articles are included for the review of literature.

Results- Nutrition is an important aspect of migraine pathogenesis, as many migraineurs report food-related products as migraine triggers. Diet is an important element of lifestyle, it is a modifiable aspect, that needs further studies. This Literature review aims to present the current status and future perspective on diet and migraine in order to stimulate further research and awareness with better health outcomes. The inclusion of these elements like electrolytes, ketogenic diets or elimination of certain products like lipids, cholesterol and caffeine can decrease the frequency of migraine headache.

Keywords: dietary intervention in migraine, triggers, nutrition, disease modification, epigenetics, oxidative stress

INTRODUCTION-

Migraine is a type of benign and recurring syndrome of headache characterized by recurrent episodes of moderate to severe throbbing and pulsating pain on one side of head accompanied with any of the symptoms like nausea, vomiting, sensitivity to light, sensitivity to sound, sensitivity to smell, and other associated symptoms. [1] It is the most common cause of headache affects approximately 15% of women and 6% of men affecting their daily activities. Headaches that do not have any pathological cause are classified as migraine headaches. Migraine can often be recognized by its activators (red wine, menses, hunger, lack of sleep, glare, oestrogen, worry, perfumes, let down periods) and its

deactivators (sleep , pregnancy , exhilaration , triptans) [1] It is derived from the latin word "hemicrania" meaning half(hemi)skull(crania). This term was first used by Galenus of pergamon to describe the pain felt across one side of the head during the episode of headache. He also suggested pain originated in the meninges and vasculature of the head. [1]

The International headache society criteria for migraine include moderate to severe head pain, pulsating quality, unilateral aggravation by walking stairs or similar routine activity, attended with nausea and/or vomiting, photophobia and phonophobia and multiple attacks each lasting 4 to 72 hrs. Migraine often begin in adolescence or early adulthood can progress through 4 stages. -a) prodrome b) aura c) attack d) postdrome. [1]

PREVALENCE-

The prevalence of cases of migraine has been estimated to increase manifold due to lifestyle disturbances of so called socio-economic demands of day to day life. Due to nature and severity of pain individuals routine life is interfered with which also causes stress and thus exaggerate the illness. because classic migraine usually occurs with a visual aura lasting about 20 min and is often triggered by some environment associated factor. [1]

TYPES-

1. Migraine without aura (common migraine)-

In this syndrome no focal neurological disturbance precedes the recurrent headaches. Migraine without aura is the most common type of vascular headache. [1]

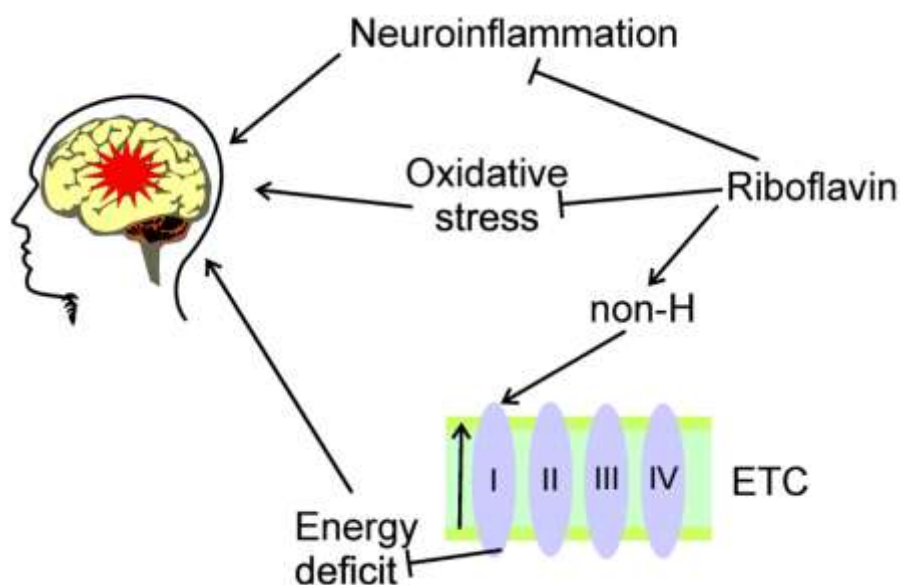
2. Migraine with aura (classic migraine)-

In this syndrome headache is associated with characteristic premonitory sensory, motor or visual symptoms. The most common premonitory symptoms reported by migraineurs are visual, arising from dysfunction of occipital lobe neurons, scotomas and/or hallucinations occurs in about 10% of patients. It usually begins as a small paracentral scotoma which slowly expands as a C shape. [1]

3. Basilar migraine-

In this kind, migraine episodes begin with total blindness accompanied or followed by vertigo, ataxia, dysarthria, tinnitus and a distal and perioral paresthesias in about 1/4th of patients. Confusional state supervenes, the neurologic symptoms usually persist for 20-30 min and are generally followed by a throbbing occipital headache. [1]

PATHOGENESIS-



Pathophysiology of migraine headache

SYMPTOMS ACCOMPANYING MIGRAINE ATTACKS-

SYMPTOM	%AFFECTED
• NAUSEA	87
• PHOTOPHOBIA /PHONOPHOBIA	82
• SCALP TENDERNESS	65
• VOMITTING	56
• VISUAL DISTURBANCES (PHOTOPSIA,	36

FORTICATION SPECTRA)

• PARESTHESIAS	33
• VERTIGO	33
• ALTERATION OF CONSCIOUSNESS(SYNCOPE,	18

SEIZURE,CONFUSIONAL STATE)

• DIARRHOEA	16
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→ SOURCE- From NH Raskin,Headache,2d ed.New York,Churchill Livingstone,1998

APPROACH TO A CASE OF MIGRAINE I/V/O DIET AND REGIMEN

Identify and then avoid trigger factors such as

- ◆ Hunger(avoiding meals,dehydration)
- ◆ Irregular sleep patterns(both lack of sleep and excessive sleep)
- ◆ Alcohol and other stimulants(eg.red wine,too much caffeine,coffee)
- ◆ Foods (eg.chocolate,certain cheeses,food additives,processed foods,)
- ◆ Organic odors(paints,thinners,perfumes)
- ◆ Sustained exertion(mental and physical)
- ◆ Acute changes in stress level
- ◆ Miscellaneous (glare,flashing lights,loud sounds)
- ◆ Certain Medications(vasodilators,OCP's etc.)
- ◆ Attempt to manage environmental shifts as -

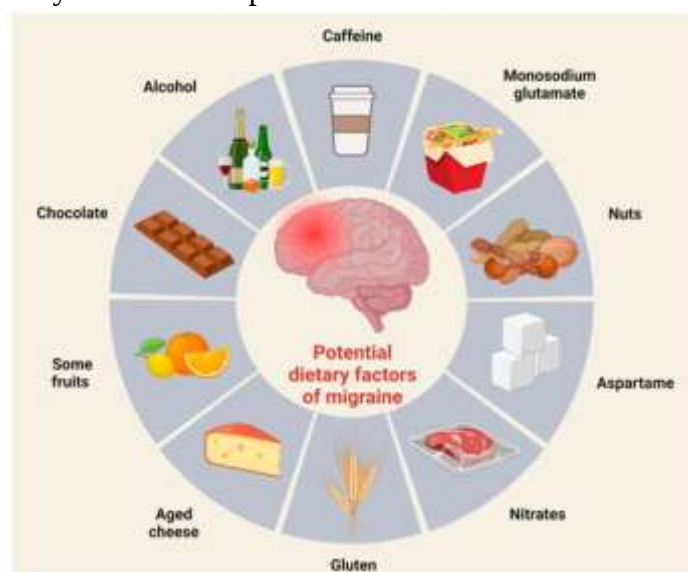
time zone shifts

High altitude

Barometric pressure changes

Weather changes

- ◆ Assess menstrual cycle relationship



OBJECTIVES-

In this study, I propose to describe the philosophical scientific correlation between the diet and regimen and migraine to broaden the understanding of the health and its deviation caused by various etiological factors such as dietary factors and lifestyle modifications.

MATERIALS AND METHOD-

- There is extensive literature found regarding the role of diet and regimen in the homoeopathic management of migraine. The kind of literature are searched in Google scholar, Pub med, Science direct, Web database and Scopus with following keywords- migraine, diet, nutrition, triggers etc.
- Usual dietary intakes were assessed using a semi-quantitative, food frequency questionnaire (FFQ) and dietary inflammatory index (DII) in majority of the studies.
- The Migraine Disability Assessments (MIDAS) and Visual Analog Scale (VAS) questionnaires were used to evaluate migraine disability, severity and the pain, duration and frequency of headaches.

INCLUSION CRITERIA-

Various studies related to the topic which are published in a peer reviewed journal are included. Lot of extensive studies have been done on role of dietary aspect in the prevention of Migraine. Observational studies, interventional trial, cross-over trial, systematic reviews are included for the review of literature.

EXCLUSION CRITERIA-

Articles with no proper evidence in prevalence study, survey, narrative reviews/expert opinion articles involving the adult population are excluded for this study.

OVER VIEW OF THE REVIEW OF LITERATURE-

S.N O.	ARTICLE	AUTHOR	YEAR OF PUBLICATION	NAME OF JOURNAL	ABSTRACT	RESULTS
1.	Migraine headaches : opportunities for management with precision nutrition	Brown, Benjamin I.	2022	Nutritional medicine journal	the clinical evidence for nutritional medicines for migraine, including diet and nutrient based intervention, from the perspective of personalized or precision nutrition is studied in this review.	Dietary interventions include generally healthy food plans, identification and avoidance of trigger foods, weight-loss diets, low glycemic load diets, ketogenic diets, gluten free diets, IgG-Led elimination diets and a high omega 3/low omega 6 diet.
2.	Role of diet and nutrition in migraine triggers and treatment: A systematic review	Nada Ahmad Hindiye, Nius hen Zhang, Mallory Farrar, Pixy Banerjee, Louise Lombard, Sheena K Aurora	2020	The journal of head and face pain	Migraine is a disabling primary headache disorder often associated with triggers. Diet related triggers are a common cause of migraine and certain diets have been reported to decrease the frequency of migraine attacks.	There is limited high quality randomized controlled trial data on diet patterns or diet related triggers. A few small randomized controlled trials have assessed diet interventions in preventing migraine attacks without strong results, high quality research is needed to confirm the effect of diet in people with migraine.
3.	The role of nutrients in the pathogenesis and treatment of migraine headaches: review	Nattagh-Eshtivani, Elyas, et al.	2018	Journal of biomedicine and pharmacotherapy	The aim of this study was to review randomized controlled trials assessing the effect of nutritional supplements on migraine patients. The deficiency of many nutrients including magnesium, niacin, riboflavin, cobalamin, coenzyme Q10, carnitine, alpha lipoic acid and vitamin D is associated with	Due to the possible side effects of pharmacological drugs and drug addictions, the use of nutrient compounds, alone or in combination with routine cures have been proposed..

					migraine.	
4.	Migraine and diet	Gazerani, Parisa	2020	Nutrients	Discussion on about various kinds of diet has been done elimination diets,migraine diets,epigenetic diet,gut-brain axis and probiotics.	Primary care physicians have recently provided best practice recommendations called SEEDS (Sleep,exercise,eat,dietary and stress)to help migraine patients by modifying their lifestyle components.
5.	Dietary considerations in migraine management:does a consistent diet improve migraine?	Alan G.Finkel,Juanita A.Yerry & J.Douglas Mann	2013	Current pain and headache reports	issue of dietary consistency of avoiding suspected food triggers.	Amongst all triggers,food is second only to stress as the most cited cause for headache.the usual list of triggers include processed,fermented, pickled or marinated foods,mono-sodium Glutamate,histamine especially in seafoods Foods containing omega 3 and omega 6 fatty Acids,baked goods,meat,diary products, And tyramine containing foods red wine, aged cheese, smoked fish, figs, beans, citrus fruits, avocados, bananas, and onions,caffeine and alcohol are considered major triggers,Removing identifiable triggers AND balancing dietary components are the basis of the historical use of elimination and replacement diets.
6.	A bidirectional view of migraine and diet relationship	Parisa gazerani	2021	Neuropsychiatric disease and treatment	This article is the study of Epidemiological findings which have demonstrated that choice of diet by individuals with migraine is different as compared with individuals without migraine which trigger the attack of migraine.	Diet is a potential trigger for migraine has been discussed in this study.So identification of personal food triggers in each individual seems valuable to assist with a better way of coping with migraine.It can be achieved by keeping diaries,avoidance behavior or elimination diets to help managing migraine.
7.	Nutrition intervention of a migraine: a randomized crossover trial	Anne E Bunner,ulka agrawal,joseph F Gonzales francesca valente,Neal D Bernard	2014	The Journal of headache and pain	The purpose of this study is to determine the effects of a low plant based diet intervention on migraine severity and frequency.	In a crossover design, vegan diet is associated with greater reduction in reported pain.Previous studies have shown that a vegan diet may be beneficial combining the advantages of a high fiber diet and a diet free of animal derived triggers.
8.	The relationship between dietary nutrients patterns and intensity and duration of migraine headaches.	Niki bahrapour,Atieh mirzababei,habib yarizadeh,ahmad muztaba barekzai, fazeh khorsha,cain C.T. Clark,khadijeh mirzaei	2022	British journal of nutrition	The aim of this study is to investigate the relationship between dietary nutrient patterns and intensity and duration of migraine headaches.	Our study found a significant relationship between the second identified dietary pattern, which included vitamin B ₁ , carbohydrate, vitamin B ₃ , vitamin B ₉ , protein, and total fibre and VAS and pain duration. Furthermore, we found a relationship between MIDAS and the first nutrient pattern, characterised by Ca, vitamin A, vitamin K, vitamin C, vitamin B ₆ , vitamin B ₂ and Mg, among women. Additionally, there was a significant association between the third nutrient pattern (vitamin D and B ₁₂) and pain duration. Overall, this research demonstrates that dietary nutrients patterns should be monitored closely in individuals suffering with migraine.
9.	Dietary aspects of migraine trigger factors	Fernanda C Rockett,vanessa R D Oliveira,kamila castro,marcia LF Chaves,alexandre da S perla,ingrid DS perry	2012	Nutrition reviews	The high frequency of possible specific dietary triggers validates efforts to elucidate the involvement of food-related factors in precipitating migraine	This study objectively shows the high frequency with which some of the dietary factors may precipitate migraines in migraineurs. The data accumulated here highlight the importance of recognizing these factors in the management of migraineurs.
10.	Nutrients to improve mitochondrial function to reduce	Michel fila,cezary chojnacki,Jan chojnacki,Janu	2021	nutrients	The mechanism of migraine pathogenesis is not completely clear, but nuclear magnetic	Several nutrients can be considered to supplement the diet to prevent and/or ameliorate migraine through the improvement in brain energy production by the amendment

	brain energy deficit and oxidative stress in migraine	sz Blasiak			resonance studies revealed brain energy deficit in migraineurs. As glycolysis is the main process of energy production in the brain, mitochondria may play an important role in migraine pathogenesis. Nutrition is an important aspect of migraine pathogenesis, as many migraineurs report food-related products as migraine triggers	of mitochondrial functions, and/or the decrease of oxidative stress. These are riboflavin, thiamine, magnesium ions, niacin, carnitine, coenzyme Q10, melatonin, lipoic acid, pyridoxine, folate, and cobalamin. They can supplement a normal, healthy diet, which should be adjusted to individual needs determined mainly by the physiological constitution of the individual. The intake of caffeine and alcohol should be tuned to the history of their use—withdrawal of these agents in a regular user may become a migraine trigger.
11.	The Healthy Eating Plate Advice for Migraine Prevention: An Interventional Study	Claudia altamura, Gianluca cecchi, maria bravo, nicoletta brunelli, alicia laudisio, paola di caprio, giorgia botti, matteo paolucci, yeganeh manon khazrai, fabrizio vernieri	2020	nutrients	This study aimed at evaluating the effect of the Healthy Eating Plate (HEP) education on migraine frequency and disability. This study showed that adherence to the HEP advice, particularly the reduction in carb, red and processed meat consumption, is useful in migraine management, reducing migraine frequency and disability.	In conclusion, this study suggests that an inclusive healthy diet can be beneficial in migraine management. General practitioners and headache specialists could also consider advising patients on a healthy diet, among other regimens, in migraine patients without comorbidity, according to individual preferences. This may have implications for the best migraine care and long-term benefits for health.
12.	A clinical approach to addressing diet with migraine patients	Margaret slavin , Jessica ailani	2017	Current neurology and neuroscience reports	Diet may play a role in triggering migraine, but available evidence on migraine and diet is limited. When advising patients on dietary changes to improve migraine, it is important to acknowledge the limits in evidence and the larger role that diet may play in lifestyle changes.	To date, there is no strong evidence to support any particular migraine diet. Some triggers appear to be cross-cutting across the broad migraine population (caffeine, alcohol, skipping meals), while others appear to be highly individualized. Priority should be given to monitor or challenge the most common triggers, but evidence does not support elimination diets to identify triggers for migraine prevention. Research is shifting in two major directions: (1) identification of specific, systematic methods of identifying an individual's personal food triggers (IgG-based elimination diets) and (2) investigation of broad dietary patterns (the ketogenic diet, high omega-3 diet, etc.). Further studies are needed to confirm efficacy before any of these are suggested as a routine treatment option for migraine prevention.
13.	Association between diet and migraine characteristics: the role of dietary inflammatory index	Faezah Khorsha, Atieh Mirzababaei, Nasim Ghodoosi, Mansoureh Togha, Mir Saeed Yekaninejad, Moen Askarpour, Khadijeh Mirzaei	2020	Current journal of neurology	Migraine is a neurologic disorder. Although, based on previous evidence, migraine is related with inflammation and oxidative stress, its relationship with the inflammatory potential of the diet is still unknown. Thus, the aim of this study was to show the correlation between Dietary Inflammatory Index (DII) and severity and duration of migraine headache.	The present study showed a direct association between headache frequency and DII. Nevertheless, no relationship was found between headache duration or migraine severity and DII score.
14.	Low lipid diet reduces frequency and severity of acute migraine	L.A. Ferrara, D. Pacioni, V. Di Fonzo, B.F. Russo, E.	2015	Nutrition, metabolism and cardiovascular	The aim of this randomized, crossover intervention trial is to evaluate the effects of a	This intervention trial, suggests that dietary habits strongly affect the frequency and severity of the attacks as an almost 50% reduction in total daily lipid intake (particularly

	attacks	Speranza,V.Carlino,F.Garguilo,F.Ferrara		ular diseases	low <u>lipid intake</u> on the incidence and severity of migraine crises, in comparison to a diet with moderate <u>lipid intake</u> .	saturated fats) combined with a 20% decrease in food energy intake significantly reduces the frequency and severity of migraine attacks even in comparison to a normal-fat diet with similar energy intake.
15.	The relationship between major dietary patterns and disease severity among migraine patients	Mansoureh togha,Shiva Nematgorgani, Faezeh Khorsha,Atieh Mirzababaei,Zeinab Ghorbani,Mir Saeed Yekaninejad,Ali Asghar Okhovat	2021	Archives of neuroscience	In this study we learned that nutritional factors can reduce and prevent the severity and frequency of migraine. In this study, it was assumed that adherence to different dietary patterns (healthy and unhealthy) could have a significant correlation with the severity of migraine.	The results of the study revealed that more adherence to the healthy dietary pattern is associated with lower severity in migraine headaches.
16.	The effect of three different ketogenic diet protocols in migraine and fatigue in chronic and high frequency episodic migraine:a pilot study	Yan Tereshko,Simone Dal Bello,Cherubino Di Lorenzo,Alice pittino,Francesca Fillippi,Enrico Belgrado,Christian Letteiri,Giovanni Merlino,Gian Luigi Gigli,Mariarosaria Valente	2023	Nutrients 2023	This study has been aimed to evaluate the efficacy of three different ketogenic diets on migraine and fatigue in chronic and high-frequency episodic migraineurs.	Pathologic fatigue is an important symptom that migraine patients frequently report.The effect on fatigue could be related to decreased migraine disability, frequency, and intensity.Moreover, a mild correlation exists between the mean reduction in FSS and the MIDAS and HIT-6 scores.
17.	All roads lead to the gut:the importance of the microbiota and diet in migraine	Eleonora Spekker,Gabor Nagy-Grocz	2023	Neurology international	Migraine, a prevalent neurological condition and the third most common disease globally, places a significant economic burden on society. Despite extensive research efforts, the precise underlying mechanism of the disease remains incompletely comprehended. Nevertheless, it is established that the activation and sensitization of the trigeminal system are crucial during migraine attacks, and specific substances have been recognized for their distinct involvement in the pathomechanism of migraine which primarily include the lack of dietary nutrients.	It is said what we eat we become.in the process of assimilation and absorption of the food we eat should be nutritious,healthy and should contain all necessary elements for the required metabolism
18.	Is there a relationship between dietary sodium and potassium intake and clinical findings of a migraine headache?	Arman Arab,Fariborz Khorwash,Zahra Heidari,Gholamreza Askari	2021	British journal of nutrition	Few studies have assessed the association between sodium (Na) and potassium (K) and migraine headaches. Among ionic constituents that directly contribute to neuronal excitability, evidence suggests that Na	The present findings suggest that a higher 24-h urine Na level is positively associated with a longer duration of migraine headaches.These findings, however, do not specify a cause-and-effect relationship, and there is a need for further research in this area to understand whether reduction of Na intake can improve these symptoms and also to discover the mechanisms that mediate this association.

					and to some extent K homoeostasis may play an important role in the pathophysiology of migraine headaches	
19.	Association between dietary caffeine intake and severe headache or migraine in US adults	Lu Zhang,Jiahui Yin,Jinling Li,Haiyang Sun,Yuanxiang Liu,Jiguo Yang	2023	Scientific reports	The relationship between current dietary caffeine intake and severe headache is controversial. Therefore, we investigated the association between dietary caffeine intake and migraines among American adults.	Our study showed that higher dietary caffeine intake is positively associated with a higher prevalence of severe headache in US adults. However, further prospective studies are needed to clarify whether increased dietary caffeine intake increases the risk of migraine.
20.	Association between copper intake and migraine:a cross sectional study	Yiyan Sun,Zhi jin,Junqing Zhang,Hongyu n Wu,Xiaotong Li,Leiyong Zhao,Wei peng	2023	Biological trace element research	Copper is an essential trace element, which is mainly derived from dietary intake. Foods such as animal liver and nuts contain high levels of copper and can be used as dietary supplements. Copper is an important factor involved in neuropeptide activation, neuronal myelin formation, neurotransmitter synthesis, energy production, and iron metabolism in the body. Impaired copper homeostasis could lead to severe neurological symptoms. Excess or deficiency of copper may adversely affect neuronal function and interfere with specific neuropeptide pathways	In conclusion, we found a non-linear correlation between copper intake and migraine and found an inflection point.so dietary copper intake may have a positive impact on the prevention and treatment of migraine.

RESULTS-

The above table shows various studies that are done on migraine cases with diet and regimen with good citation numbers.Although the above studies provided statistically significant results in favor of dietary interventions in cases of migraine both clinically and theoretically.

DISCUSSION-

The study of the various review of literature in context to the subject of study signifies an important role of nutrition and dietary elements in the precipitation of migraine headaches. The inclusion of these elements like electrolytes,ketogenic diets or elimination of certain products like lipids,cholesterol and caffeine can decrease the frequency of migraine headaches.This review of literature will also help in the clinical aspect in treatment of migraine.

CONCLUSION-

In conclusion we find that from all the literature studied dietary factors are an important aspect to be taken into consideration while studying the cases of migraine.The nature, severity and duration of migraine headaches vary in direct correlation with nutrition.Our findings have important implications for both clinical practice,preventive and public health guidance.However, more basic research is still needed to explore the mechanism of nutrition in prevention and management of intensity,frequency and duration of migraine headaches.

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