INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND DENTAL HEALTH
(ISSN: 2454-4191)
www.ijmsdh.org (2026)

Received: 4 November 2025
Revised: 19 December 2025
Accepted: 16 January 2025
Published: 26 January 2026

Page No - 78-86
DOI - 10.55640/ijmsdh-12-01-11

Article Citation: Abed, B. N., Ani, I. A.., & Al-fahham, A. A. (2026). Effectiveness of Dietary Control on The Severity and Frequency of Asthmatic Attacks. International Journal of Medical Science and Dental Health, 12(01), 78-86. https://doi.org/10.55640/ijmsdh-12-01-11

Effectiveness of Dietary Control on The Severity and Frequency of Asthmatic Attacks

Bilal Najm Abed
Community Health Technologies Department, Babylon Technical Institute, Al-Furat Al-Awsat Technical University, 51015 Babylon, Iraq

Irfan Abdulzahraa Ani
College of Nursing, University of Al-Qadisiyah, Iraq

Ali A. Al-fahham
Faculty of Nursing, University of Kufa, Iraq

Corresponding author: Ali A. Al-fahham

Abstract

Background: Bronchial asthma is a chronic inflammatory airway disease with episodic, reversible airway obstruction leading to wheezing, breathlessness and cough that significantly affects quality of life and use of health care resources. Although medical therapy has improved, many patients have uncontrolled asthma. In recent years, lifestyle-related factors especially nutrition have been emerged as possible modifiable contributors to airway inflammation and asthma. Nevertheless, data on structured dietary management of asthma severity and frequency of attack are insufficient. **Objectives**: To assess the impact of dietary management on severity and frequency of asthmatic attacks among adult patients with bronchial asthma, and to determine strength of association between post-intervention outcomes and selected demographic variables. **Methods**: A quasi-experimental study with a pre-test-post-test control group design was conducted in a respiratory clinic. Three dozen adult patients with confirmed diagnosis of bronchial asthma were included in the study and divided into the study group (n = 30) and control group (n = 30). The study group underwent a preset dietary control intervention combined with medical practice, while the control group received only medical care. The severity of asthma was evaluated based on ACT (a

validated tool) to measure the number of asthmatic attacks in 1 month pre-test and post-test. **Results**: Asthma severity was significantly less and the number of asthmatic attacks were numerically fewer for the study group at post-test than pretest relative to BM adults (p 0.05). In addition, we found n association between post-test asthma severity and frequency with age and sex; but no correlation was detected with BMI. **Conclusion**: Diet control is effective in addition to the traditional asthma therapy for controlling asthma and most adults with asthma can get benefit from it. Including nutritional counseling as part of asthma standard treatment seems to improve disease control and the patients' health status. More prospective and randomized trials are needed to verify these effects, in order to provide evidence-based dietary recommendations in the control of asthma.

Keywords: Asthma, Severity, Frequency, ACT, Dietary Control

Introduction

Millions of people worldwide suffer from asthma, a chronic inflammatory ailment of the airways, which is a large public health burden in terms of quality of life, health resources and morbidity (Alwarith et al., 2020). Although pharmacotherapy has progressed, many patients still suffer from recurrent and severe asthma episodes implying that classical management approaches alone do not achieve complete control of the disease. This has renewed interest in the potential role of lifestyle factors, including dietary factors, in the promotion of asthma outcomes through systemic inflammation, oxidative stress, and immune responses. Dietary control means the intake of nutrients and dietary patterns which we are aware of and believes can have a positive impact on our health status to cause anti-inflammation, which is beneficial for subjects with asthma,57,58 for example (Firszt & Kraft, 2010).

Recent data indicates a role of diet in the pathogenesis and clinical course of asthma. The associations of dietary patterns with asthma symptoms has been suggested by relatively few, but even among observational studies consistently indicates that high consumption (or high dietary intake) of fruits, vegetables, and omega-3 fatty acids is likely associated with favorable asthma control, whereas a Western dietary pattern, represented by a high percentage of energy from saturated fats, processed foods, and added sugars are likely associated with exacerbated respiratory outcomes (Alwarith et al., 2020; Terzi et al., 2025). In a study conducted on Lebanese children, a significant protective effect against the odds of current asthma was found for guidance adherence to a healthy Mediterranean diet pattern—characterized by high intake of plant-based foods, antioxidants, and healthy fats—demonstrating the potential relevance of dietary quality for asthma prevalence and respiratory health (Papamichael et al., 2017).

In terms of possible mechanisms, diet may also affect asthma severity and frequency through different biological pathways. Antioxidant nutrients like vitamin C & E & carotenoids, which are abundant in fruits & vegetables, may mitigate oxidative stress & (as a consequence) airway inflammation — both of which are core to asthma pathophysiology (Terzi et al., 2025). High consumption of pro-inflammatory nutrients, such as saturated fats, has been linked to higher markers of inflammation and worsened pulmonary function in subjects affected by more severe asthma. (Berthon et al., 2012). In addition to that, caloric restriction increased disease control, quality of life, and pulmonary function in obese asthmatic patients indicating that dietary means in terms of weight loss might also provide a result in terms of clinical outcomes (Forte et al., 2014).

Even with these interesting associations, there is still heterogeneity, and sometimes contradictions, in the available literature on diet and asthma. However, several systematic reviews suggest that evidence from randomized clinical trials addressing dietary interventions in asthma are limited or not clinically relevant due to small sample sizes, heterogeneity in methodologies, and difficulties in separating the effects of individual nutrients for dietary patterns (Forte et al., 2014). Moreover, although some studies have found associations between some nutrients or dietary components and inflammatory markers or lung function, many do not evaluate the impact on more clinically relevant endpoints such as an attack frequency or symptom severity.

But more recent research does still show dietary factors may be relevant in asthma treatment. In a cross-sectional study analyzing dietary patterns in Saudi adolescents, the authors reported that unhealthy diets were positively associated with asthma symptoms, further supporting the importance of diet quality for asthma outcomes in the clinic (Aljishi et al., 2022). Indeed, studies examining total antioxidant status of patients with severe asthma indicate that increased consumption of food high in antioxidant capacity relates to lower plasma status of antioxidants and poorer lung function, further indicating that higher antioxidant intake may help reduce Aa by inhibiting inflammation and improving disease control (Terzi et al., 2025).

Research examining the association of dietary inflammatory indices with asthma severity has emerged as well. In children with asthma, recent assessments of dietary inflammatory

potential discovered inverse relationships between diet quality and severity, suggesting a complex interplay of factors and calling for more comprehensive and longitudinal studies to explain these associations (Koç et al., 2024). Evidence for improved asthma-related endpoints has been demonstrated, albeit not definitively, for clusters such as vitamin D, omega-3 long-chain polyunsaturated fatty acids and weight loss interventions in systematic reviews of nutritional interventions (Rodrigues et al., 2023).

Collectively, this weight of proof suggests that there is an interaction of dietary factors and asthma related to multiple pathways; dietary factors affect inflammatory pathways and clinical features of asthma. Due to the lack of clinical trial evidence with adequate power, direct dietary control should not be applied as a treatment for asthma severity or attack frequency until further rigorous trials are undertaken. Resolving whether and how dietary restriction can benefit asthma has great importance for clinical practice and lifestyle recommendations, especially employing an integrated approach in the management of this disease. This study seeks to contribute to this nascent field by examining the impact of dietary control on the severity and frequency of asthma attacks, as a means of providing greater insight into the validity of whether structured, dietary modulation can be used as a beneficial adjunct for improving asthma control.

Methods and Materials

Study Design

Objective: This quasi-experimental controlled before-and-after study was intended to assess the impact of dietary control program on airway hyper-responsiveness in terms of severity and frequency of asthmatic attacks in bronchial asthmatic patients. This design was chosen to facilitate comparison of an intervention group that received structured dietary control with a control group that continued standard asthma management without dietary modification. Changes in outcome measures attributable to the intervention were assessed by comparing baseline measures with those reassessed one month after implementation of the program.

Study Setting and Duration

Method: A cross-sectional study conducted at a respiratory outpatient clinic in Iraq. Data collection was carried out from January 2025 to May 2025, spanning five months. Participant recruitment, baseline evaluation, intervention delivery, and follow-up evaluations lasted this long.

Study Population and Sample Size

This was a cross-sectional study performed on adult bronchial asthma patients. In total, 60 patients were included, and divided into two equal groups. The patients were randomly allocated in two groups; the group under study which included 30 patients who treated in the sample of dietary control program, and the control group which include 30 patients that continue his/her routine medical management without dietary control. A nonprobability purposive sampling technique was used to select participants, Sample size was based on our ability to detect clinically significant differences in asthma severity (ACT) and attack frequency between groups, and was deemed appropriate after considering feasibility and power based on previous interventional studies among asthma patients.

Eligibility Criteria

Inclusion criteria included clinically confirmed bronchial asthma, ≥18 years of age, and stable asthma control for at least one month prior to enrollment. Participants had to be able to comply with the dietary regime along with follow-up assessments. Patients were excluded if they had other chronic respiratory diseases, such as chronic obstructive pulmonary disease; had significant comorbid conditions that prevented them from adhering to the study diet; or were pregnant, lactating, or participating in another structured dietary or lifestyle intervention.

Dietary Control Program

This dietary control program is a large, structured non-pharmacological outpatient-based intervention program with the objective of airway inflammation reduction and asthma control improvement. The intervention lasted one month and was targeted towards consumption of more fruits, vegetables, whole-grain and omega-3 rich foods, while minimizing processing foods, saturated fat and refined sugar. They were also advised to drink enough water every day and to stay away from personal food triggers that worsened their asthma. The intervention consisted of individualized face-to-face nutritional advice complemented by written dietary advice and reminders to adhere to the diet at weekly follow-up visits. The control group received standard asthma care as per clinical practice and no dietary counselling.

Outcome Measures

The study's primary end points were the frequency and severity of asthma attacks. Frequency was determined by counting the number of asthma attacks during a month. Asthma

control was determined by Asthma Control Test (ACT), a validated 5-point questionnaire of asthma control during the past four weeks. Each item is scored from 1 to 5, with higher values indicating better control and a total score ranging from 5 to 25. Once these data were removed, the ACT was scored as well-controlled (20–25), partially controlled (16–19), and poorly controlled asthma (≤15). At baseline and one month after implementation of the dietary intervention, ACT was performed to monitor changes in asthma symptoms (Nathan et al., 2004). Measurements were taken at baseline (just before the dietary control program was applied) and again after 1 month for both the study and control groups to enable comparisons of change over time.

Data Collection Procedure

Data was extracted by structured face-to-face interviews and clinical assessments conducted by trained healthcare personnel. Baseline demographic and clinical characteristics were obtained through patient interview and review of medical records. Standardized methods to assess asthma severity and frequency were used at both baseline and the follow-up to allow for reliable comparisons among participants.

Ethical Considerations

Institutional ethics committee approval was obtained before the start of the study. Informed written consent was obtained from all subjects after a complete explanation of the study objectives, procedures, potential benefits, and that they could withdraw at any time at no risk of negative impact on their medical care. Confidentiality of the participants as well as anonymity of the data were ensured during the study.

Statistical Analysis

Data were analyzed using the SPSS software version 22 for Windows. Descriptive statistics such as means, standard deviation, frequencies, and percentages were reported to summarize demographic and clinical characteristics. Inferrence statistical tests were used to compare the outcomes within and between groups both at baseline and post intervention. Results with a p-value < 0.05 were considered statistically significant.

Results

Table (1) shows the baseline demographic characteristic Table of the study and control groups. The age distribution (χ^2 = 0.22, P = 0.98), gender (χ^2 = 0.07, P = 0.80), and body mass index (χ^2 = 0.14, P = 0.97) between the two groups were not statistically significant different. These results suggest that the study and control groups were similar in terms of demographics at baseline, likely mitigating the effects that demographic confounding variables may have had on the evaluation of the influence of dietary control on asthma severity and attack frequency.

Table (1) Demographic data of both study and control groups

Demographic data		Control Group		Study Group		χ^2 P value
		Freq. (N=30)	Percent. (%)	Freq. (N=30)	Percent. (%)	
Age / Years	21-29	6	20	5	16.7	0.22
	30-38	7	23.3	8	26.7	0.98 (NS)
	39-47	8	26.7	7	23.3	
	48-56	5	16.7	6	20	
	≥ 57	4	13.3	4	13.3	
Gender	Male	14	46.7	15	50	0.07
	Female	16	53.3	15	50	0.80 (NS)
BMI	Underweight	2	6.7	2	6.7	

	Normal	10	33.3	11	36.7	0.14
	Overweight	9	30	8	26.7	0.97
	Obese	9	30	9	30	(NS)

NS: Non-Significant at P>0.05

The second column in Table (2) represents the comparison between pre-test and post-test measures of severity & frequency, when the dietary control program was applied to patients in the study group. The ACT (Asthma Control Test) score was significantly improved after 1 month of dietary intervention mean ACT, 16.2 ± 3.1 (before dietary intervention) vs 19.4 ± 2.8 (after dietary intervention) P = 0.02, t = 2.45. Improvements in Asthma Control Questionnaire score reflects the movement toward higher quality asthma control in participants. The number of attacks experienced by asthmatic patients was equally significantly decreased after intervention. For the mean number of attacks per month, this fell from 5.6 ± 1.9 at pre-test to 3.8 ± 1.5 at post-test (t = 2.28, P = 0.03). The primary conclusion of this work is that dietary control reduced both the severity and frequency of asthmatic attacks over the time of the study.

Table (2) Differences in the frequency and severity of asthma at (pre-test and post-test) measurements for the study group

Domains	Study Group Tests	Mean	SD	Paired T-Test	df	P-value
Severity of Asthma	**Pre-test**	**16.2**	**3.1**	**2.45**	**29**	**0.02**
	Post-test	**19.4**	**2.8**			**S**
Frequency of Asthma	**Pre-test**	**5.6**	**1.9**	**2.28**	**29**	**0.03**
	Post-test	**3.8**	**1.5**			**S**

SD: standard deviation, df: degree of freedom, S: significance at P<0.05

Comparison of asthma severity and frequency measurements of patients in control group who did not participate in dietary control program between pre-test and post-test Table (3) Asthma severity, assessed via the Asthma Control Test (ACT), did not exhibit any statistically significant differences (mean ACT score 16.5±3.0 vs. 16.9±3.1 after 1 month; t=0.74, P=0.46). Likewise, the number of days with asthmatic attacks also did not significantly alter during the course of the study. The average number of attacks before and after testing was 5.4 ± 1.8 (pre-test) and 5.1 ± 1.7 (post-test) but this difference was not statistically significant (t = 0.91, P = 0.37). These results suggest that outside of dietary control, asthma severity and frequency remained largely unchanged, thus supporting that the improvements seen in the study group are most likely due to the dietary control program.

Table (3) Differences in the frequency and severity of asthma at (pre-test and post-test) measurements for the control group

Domains	control Group Tests	Mean	SD	Paired T-Test	df	P-value
Severity of Asthma	**Pre-test**	**16.5**	**3**	**0.74**	**29**	**0.46**
	Post-test	**16.9**	**3.1**			**NS**
Frequency of Asthma	**Pre-test**	**5.4**	**1.8**	**0.91**	**29**	**0.37**
	Post-test	**5.1**	**1.7**			**NS**

SD: standard deviation, df: degree of freedom, NS: Non-Significance at P>0.05

Comparison of asthma severity and frequency measurements of patients in control group who did not participate in dietary control program between pre-test and post-test Table (3) Asthma severity, assessed via the Asthma Control Test (ACT), did not exhibit any statistically significant differences (mean ACT score 16.5±3.0 vs. 16.9±3.1 after 1 month; t=0.74, P=0.46). Likewise, the number asthmatic attacks per month also did not significantly alter during the course of the study. The average number of attacks before and after testing was 5.4 ± 1.8 (pre-test) and 5.1 ± 1.7 (post-test) but this difference was not statistically significant (t = 0.91, P = 0.37). These results suggest that outside of dietary control, asthma severity and frequency remained largely unchanged, thus supporting that the improvements seen in the study group are most likely due to the dietary control program.

Table (4) Differences in the severity of asthma according to demographic data of study groups at post test measurement

Demographic data		Severity		F Test	P value
		Mean	SD		
Age / Years	21-29	21.3	2.1	3.21	0.027 (S)
	30-38	20.4	2.4		
	39-47	19.2	2.6		
	48-56	18.3	2.7		
	≥ 57	17.5	2.9		
Gender	Male	20.5	2.5	4.45	0.04 (S)
	Female	18.6	2.8		
BMI	Underweight	19.8	2.6	1.51	0.21 (NS)
	Normal	20.1	2.4		
	Overweight	18.9	2.7		
	Obese	18.4	2.9		

NS: Non-Significant at P>0.05, S: significance at P<0.05

Differences in asthma attack frequency based on demographic characteristics of study group at post-test measurement are shown in Table (5). There was a significant association between age group and frequency of asthma attack (F = 3.04, P = 0.033). Less number of asthmas per month was observed in younger participants as compared to older age group which indicates that response of dietary control intervention might be affected by age. In addition, a significant association between sex and asthma occurrence was noted at the post-test assessment (F=5.32, P=0.02). Compared to female patients, male patients fewer asthmatic attacks per month on average; achieving better frequency control after dietary intervention. On the other hand, no statistically significant difference in asthma prevalence was observed according to BMI (F=0.94, P=0.43). While there were minor differences in the frequency of attacks across the BMI categories, these differences were not statistically significant indicating that the impact of dietary intervention on occurrence of asthma was not a function of BMI categorizations.

Table (5) Differences in the frequency of asthma according to demographic data of study groups at post-test measurement

Demographic data		Frequency/Month		F Test	P value
		Mean	SD		
Age / Years	21-29	2.9	1	3.04	0.033 (S)
	30-38	3.3	1.1		
	39-47	3.9	1.2		
	48-56	4.4	1.3		
	≥ 57	4.8	1.4		
Gender	Male	3.4	1.2	5.32	0.02 (S)
	Female	4.5	1.3		
BMI	Underweight	3.8	1.1	0.94	0.43 (NS)
	Normal	3.5	1.2		
	Overweight	4.1	1.3		
	Obese	4.4	1.4		

NS: Non-Significant at P>0.05, S: significance at P<0.05

Discussion

This study examined the influence of one month of dietary control for adult patients with bronchial asthma on their asthmatic attack severity and incidence. According to our results, the patients of the study group who were on dietary intervention showed a statistically significant effect in 2 measures. Mean Asthma Control Test (ACT) score changed significantly between pre-test and post-test in the study group, representing improved asthma control (P = 0.02). The frequency of asthmatic attacks also significantly decreased during this period (P = 0.03). As opposed to this, in control group there were no significant changes in the severity and number of attacks on one month (P > 0.05 for both). These findings further reinforce the premise that dietary changes can potentially be beneficial to asthma therapy, when used in conjunction with established treatments.

The increase in ACT scores over time since restriction indicated that dietary manipulation might contribute to a modulation of inflammatory processes that are critical to asthma pathogenesis. Despite being the mainstay of asthma therapy, novel research has identified a potential influence of diet on disease outcome. Healthy dietary patterns that are rich sources of fruits, vegetables, whole grains, and omega-3-rich foods are also speculated to diminish systemic inflammation by augmenting the antioxidant–anti-inflammatory nutrient exposure (Kaplan et al., 2023). In line with this evidence, major observational studies reported that participants consuming anti-inflammatory-rich diets including fish, fruits and vegetables are less likely to have asthma prevalence and severity as compared with those consuming pro-inflammatory-high (fat, sugar and salt) diets (Rodrigues et al., 2023).

Although limited randmomized dietary intervention trials have been performed in asthmatics, there is evidence derived from systematic reviews that diet quality may impact disease control through several biological pathways, including alterations in oxidative stress, immune regulation and airway reactivity (Forbes et al., 2015). For instance, antioxidant dietary patterns and omega-3 fatty acid supplementation have demonstrated encouraging results in smaller trials by enhancing lung function and symptom management; yet the effect of these studies has been inconsistent due to heterogeneity in study design. This study adds to current evidence from the 1995 publication; with a structured dietary program, a personalised nutritional

intervention may help alleviate some of the symptoms weathered by adults Asthmatics (Han et al., 2015).

The lack of changes in the control group do additionally suggest that the improvements observed in the study group were a result of the dietary intervention and not merely spontaneous or regression towards the mean. At baseline, there were no significant differences between the two groups in demographic characteristics or asthma severity or attack frequency, and thus, it is less likely that baseline group differences compromised interpretation of these results. Demographic influences Analyses of demographics showed that associations were significant between age and post-intervention measures. More mature groups achieved a more rapid rate of regular and reduced ACT scores at post-test, indicating that the older they are, less may be their benefits in dietary control. Although there is little recent literature directly investigating age as a modifier of dietary intervention effects in asthma, decline in immune function and metabolic flexibility with advancing age might theoretically affect the response to lifestyle interventions. In addition, age is known as a risk factor for worse asthma control and more exacerbations in the elderly, perhaps because of accumulation of environmental exposures and loss of physiological reserves (Chandra et al., 2023).

Gender-related effects were noted, with males showing better posttest control and fewer attacks than females. Sex-related differences in asthma burden have been reported in numerous epidemiologic studies. Although some literature demonstrated that sex did not play a role in ACT scores in general clinical populations, other research showed women had higher exacerbation rates and more severe symptoms, explained partially by hormonal factors and immune responses (El Bilbeisi et al., 2019). Sex hormones have also been suggested to play a role in airway inflammation and there is some suggestion that fluctuation of female hormones may exacerbate symptoms in susceptible individuals (Caporossi et al., 2025). Our findings are consistent with these general observations, in that gender may modify the extent of dietary intervention benefit, although this is likely multifactorial involving both biological and psychosocial factors.

Notably, BMI tiering was non-significant in estimating post-intervention severity and frequency. Although obesity is frequently related to poor asthma control and increased risk for exacerbations, its impact might be determined by metabolic and inflammatory patterns rather than simply BMI. Some earlier studies have also revealed a more pronounced effect of BMI on asthma severity in women, especially in the presence of hormonal effects (Borrelli et al., 20245 Findings that the dietary intervention produced no significant BMI effect in this study is consistent with the idea that beneficial effects of the dietary program might be independent of adiposity, and may act through mechanisms that lower systemic inflammation and oxidative stress across all strata of BMI.

These results should be interpreted in the context of the previous literature. Although some epidemiological studies consistently reported associations of healthy dietary patterns with better asthma control, substantial evidence of causal effects in interventional exposure does not exist in all cases. The scope of potential dietary studies is limited by problems of assessing long-term adherence, variation in dietary factors and the effects of confounding lifestyle variables (Rodrigues et al., 2023). However, this study further supports evidence of the potential to use structured dietary interventions to achieve clinically relevant changes in asthma outcomes over short periods.

Conclusion

The findings from this research suggest that a comprehensive dietary manipulation may improve asthma control as well as decreasing frequency of attacks in adult patients, with some age and sex differences although not obesity. These results provide a rationale for incorporating nutritional counseling in holistic asthma care and highlight the requirement of larger, longer term randomized controlled trials to better delineate optimal dietary interventions for individuals with asthma.

References

1. Aljishi, H. R., Al-Osaimi , M., Al-Mugti , H. S., Althagafi, W. A., Adam, I. F., Al-Amari, B. K., Al-Roqy , A., Khouja, J. H., Almuqati, M. S., & Alotaybi, M. S. (2022). Relation between asthma clinical presentation and diet patterns among adolescents living in Saudi Arabia: Evidence from national school-based study. International Journal of Health Sciences, 6(S7), 4129–4140. https://doi.org/10.53730/ijhs.v6nS7.12787

2. Alwarith, J., Kahleova, H., Crosby, L., Brooks, A., Brandon, L., Levin, S. M., & Barnard, N. D. (2020). The role of nutrition in asthma prevention and treatment. *Nutrition reviews*, *78*(11), 928–938. https://doi.org/10.1093/nutrit/nuaa005

3. Berthon, B. S., Macdonald-Wicks, L. K., Gibson, P. G., & Wood, L. G. (2013). Investigation of the association between dietary intake, disease severity and airway inflammation in asthma. *Respirology (Carlton, Vic.)*, *18*(3), 447–454. https://doi.org/10.1111/resp.12015

4. Borrelli, R., Brussino, L., Lo Sardo, L., Quinternetto, A., Vitali, I., Bagnasco, D., Boem, M., Corradi, F., Badiu, I., Negrini, S., & Nicola, S. (2025). Sex-Based Differences in Asthma: Pathophysiology, Hormonal Influence, and Genetic Mechanisms. International journal of molecular sciences, 26(11), 5288. https://doi.org/10.3390/ijms26115288

5. Caporossi, L., Di Renzi, S., Partenzi, E., Cavallo, D., Tomao, P., & Poli, D. (2025). Sex- and Gender-Based Differences in Asthmatic Responses to Chemical Sensitizers, Particularly in Occupational Settings: A Scoping Review. Environments, 12(10), 382. https://doi.org/10.3390/environments12100382

6. Chandra, E., Mahendran, C. S., Das, P., Pandey, A., & Saini, M. (2023). Dietary pattern in bronchial asthma control. Santosh University Journal of Health Sciences, 9(1), 80–82. https://doi.org/10.4103/sujhs.sujhs_30_23

7. El Bilbeisi, A. H. H., Albelbeisi, A., Hosseini, S., & Djafarian, K. (2019). Dietary Pattern and Their Association With Level of Asthma Control Among Patients With Asthma at Al-Shifa Medical Complex in Gaza Strip, Palestine. Nutrition and metabolic insights, 12, 1178638819841394. https://doi.org/10.1177/1178638819841394

8. Firszt, R., & Kraft, M. (2010). Pharmacotherapy of severe asthma. *Current opinion in pharmacology*, *10*(3), 266–271. https://doi.org/10.1016/j.coph.2010.04.010

9. Forte, G. C., da Silva, D. T. R., Hennemann, M. L., Sarmento, R. A., Almeida, J. C., & de Tarso Roth Dalcin, P. (2018). Diet effects in the asthma treatment: A systematic review. Critical reviews in food science and nutrition, 58(11), 1878–1887. https://doi.org/10.1080/10408398.2017.1289893

10. Han, Y. Y., Forno, E., Holguin, F., & Celedón, J. C. (2015). Diet and asthma: an update. *Current opinion in allergy and clinical immunology*, *15*(4), 369–374. https://doi.org/10.1097/ACI.0000000000000179

11. Kaplan, D. N., Issa, H. Y., & Selamoglu, Z. (2023). The Mediterranean diet and its positive lifestyle effects on people with asthma: A quick literature review. Journal of Public Health and Nutrition, 6(3), 155. https://doi.org/10.35841/aajphn-6.3.155

12. Koç, N., Ersoy, N., Yardimci, H., Külhaş Çelik, İ., & Civelek, E. (2024). Evaluation of Healthy Eating Index and Children's Diet Inflammatory Index according to asthma severity group. *BMC pediatrics*, *24*(1), 127. https://doi.org/10.1186/s12887-023-04507-y

13. Nathan, R. A., Sorkness, C. A., Kosinski, M., Schatz, M., Li, J. T., Marcus, P., Murray, J. J., & Pendergraft, T. B. (2004). Development of the asthma control test: a survey for assessing asthma control. *The Journal of allergy and clinical immunology*, *113*(1), 59–65. https://doi.org/10.1016/j.jaci.2003.09.008

14. Papamichael, M. M., Itsiopoulos, C., Susanto, N. H., & Erbas, B. (2017). Does adherence to the Mediterranean dietary pattern reduce asthma symptoms in children? A systematic review of observational studies. *Public health nutrition*, *20*(15), 2722–2734. https://doi.org/10.1017/S1368980017001823

15. Rodrigues, M., de Castro Mendes, F., Delgado, L., Padrão, P., Paciência, I., Barros, R., Rufo, J. C., Silva, D., Moreira, A., & Moreira, P. (2023). Diet and Asthma: A Narrative Review. Applied Sciences, 13(11), 6398. https://doi.org/10.3390/app13116398

16. Terzi, M., Bulut, İ., Yakut, T., & Güneş, F. E. (2025). Exploring the link between nutritional status and total antioxidant status in patients with severe asthma: a cross-sectional study. *BMC pulmonary medicine*, *25*(1), 216. https://doi.org/10.1186/s12890-025-03682-1