

Effect of exercise on adult asthmatic patients in Riyadh 2022

To Cite:

Youness J, Hussamuldin A, Alzahrani Y, Aboushark Y, Sankari S, Almeahmadi B, Alanazi M, Alsulaiman Q. Effect of exercise on adult asthmatic patients in Riyadh 2022. *Medical Science* 2022; 26:ms415e2491. doi: <https://doi.org/10.54905/disssi/v26i128/ms415e2491>

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Peer-Review History

Received: 26 September 2022
Reviewed & Revised: 29/September /2022 to 12/October/2022
Accepted: 15 October 2022
Published: 17 October 2022

Peer-review Method

External peer-review was done through double-blind method.

URL: <https://www.discoveryjournals.org/medalscience>



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ABSTRACT

Background: Asthma is a chronic inflammatory disease of the airways characterized by wheezing; shortness of breath, chest tightness, and coughing that varies in severity and duration over time. The aim is to assess the effects of physical activity in adult asthma patients in Riyadh in 2022. **Methods:** A cross-sectional study contains an online questionnaire which composed of a message addressing the respondent and the purpose of the survey; the respondent's health status and the outcomes before and after exercising. Data collected in January-February 2022. Statistical Package for the Social Sciences (SPSS) helped analyze data and present the results. Suitable statistical tests of significance were used, considering a significant p-value of < 0.05 . **Results:** A total of 143 participants, 81% were female, the mean age was 23.8, 92% were non-smokers, and 68% used inhalers for relief. Before exercising: 60% were asymptomatic, affected sleep in 79%, 50% took medications and 53% had daily activity limitations. After exercising: 66% were asymptomatic, 73% had sleep problems and 45% took medications with no daily limitations in 51%. 13% of participants had pre-exercise asthma control, and 11% remained controlled post-exercise. 45% suffered from partially controlled asthma, and 30% became partially controlled. 43% had uncontrolled asthma and 42% were still uncontrolled. There is a statistically significant link between inactivity and asthma control $p = 0.001$. **Conclusion:** This data proves that exercise is a positive factor for asthmatic patients to decrease the frequency of medication usage and the incidence of sleep disturbances.

Keywords: Adults, Asthma, Physical Exercise.

1. INTRODUCTION

Asthma is a heterogeneous chronic inflammatory airway disease defined by a history of airway symptoms such as coughing, chest tightness, shortness of breath, and wheezing, with varying degrees of airflow limitation and intensity (Panagiotou et al., 2020). Risk factors include genetic factors, environmental influences, infectious diseases, and maternal smoking (Subbarao et al., 2009; Khayat et al., 2021). Asthma is one of the most common chronic diseases

among young people in high- and middle-income countries. Uncontrolled asthma is a significant public health burden in many parts of the world. Asthma health problems lead to increased disability and medical costs. Controlling asthma has many health benefits, such as reduced disability, absenteeism, reduced health care costs, and improved quality of life. Regular exercise has many positive effects on chronic diseases other than asthma, such as cardiovascular disease, diabetes, obesity, hypertension, and depression. However, the potential impact on asthma control is still poorly differentiated, and asthmatics are advised to refrain from physical activity for fear of exercise-induced asthma symptoms (Heikkinen et al., 2018). Although there is no cure for patients with asthma, several pharmacological interventions have been shown to significantly improve symptoms. The use of inhaled corticosteroids and long-acting beta 2 agonists can help control asthma clearly improved. Patients are therefore classified as having controlled asthma, partially controlled asthma, or uncontrolled asthma. Poor control of asthma increases emergency room visits and hospitalizations. Exercise interventions showed that asthmatic patients improved in lung function, quality of life, shortness of breath, and control therapy. If exercise has a positive impact on controlling asthma, it could be an important therapeutic modality for patients with partially control of asthma or poor compliance with prescription medications (Dogra et al., 2011). Understanding the impact of physical activity on people with asthma and their families can help design better ways to improve quality of life. Our goal is to assess the impact of physical activity in adults with asthma in Riyadh in 2022.

2. MATERIALS AND METHODS

This study is a cross-sectional study. The area represents Riyadh city, the capital city of KSA. The target population is adults diagnosed with bronchial Asthma. A special questionnaire was used for data collection, composed of three sections: the first part was a message addressing the respondents, identifying the target population, and explaining the purpose of the survey. The second section included important information about the respondents regarding health states and co-morbidities. The third section focused on the respondent's outcomes including quality of life before and after exercising. Data collected in January-February 2022, the link was shared on social media .The data was cleared, coded, and entered by using the SPSS program.

3. RESULTS

A total of 143 participated in the study. The findings from the descriptive statistics of participants' personal information are shown in Table 1. It showed that 81.1% (116) of the participants were female and 18.9% (27) were male. The mean age was 23.8 +2.7 years old. Also, it shows the majority of the participants were high school graduates 97.90% (140).

Table 1 Personal data N=143

Gender		
	Frequency	Percent
Male	27	18.9
Female	116	81.1
Total	143	100.0
Age		
	Frequency	Percent
18-28 years	118	82.5
29-38 years	6	4.2
39-48 years	11	7.7
49 years and more	8	5.6
Total	143	100.0
Marital Status		
	Frequency	Percent
Single	114	79.7
married	26	18.2
divorced/separated	2	1.4
widowed	1	0.7
Total	143	100.0
Education Level		
	Frequency	Percent
not educated	2	1.4
elementary school	1	0.7

middle/high school	140	97.9
Total	143	100.0
Occupation		
	Frequency	Percent
student	73	51.0
employed	36	25.2
unemployed	34	23.8
Total	143	100.0

Table 2 Asthma Condition before exercise N=143

Before exercise, did you had symptoms twice a day for a week during last month		
	Frequency	Percent
Yes	57	39.9
No	86	60.1
Total	143	100.0
Before exercise, did asthma affect your sleep during last month		
	Frequency	Percent
Yes	113	79.0
No	30	21.0
Total	143	100.0
Before exercise, did you used to take medication twice in a week during last month		
	Frequency	Percent
Yes	72	50.3
No	71	49.7
Total	143	100.0
Before exercise, did asthma limited your daily activities during last month		
	Frequency	Percent
Yes	67	46.9
No	76	53.1
Total	143	100.0

This table 2 shows the condition of asthma among the participants before exercise. During last month 60.1% answered that they didn't have symptoms twice a day for a week and 79% of participants' asthma was affecting their sleep. 50.3% used to take their medication two times in a week last month, while 53.1% with asthma didn't limit their daily activities. This table 3 shows the Severity of Asthma Control before exercise. 12.6% were controlled, 44.8% were partially controlled and 42.7% were uncontrolled.

Table 3 The severity of Asthma Control before exercise N=143

Asthma Severity before starting exercise		
	Frequency	Percent
controlled	18	12.6
partially controlled	64	44.8
uncontrolled	61	42.7
Total	143	100.0

Table 4 Asthma Condition after exercise N=143

After exercise, did you had symptoms twice a day for a week during last month		
	Frequency	Percent
Yes	48	33.6
No	95	66.4
Total	143	100.0

After exercise, did asthma affect your sleep during last month		
	Frequency	Percent
Yes	104	72.7
No	39	27.3
Total	143	100.0
After exercise, did you used to take medication twice in a week during last month		
	Frequency	Percent
Yes	64	44.8
No	79	55.2
Total	143	100.0
After exercise, did asthma limited your daily activities during last month		
	Frequency	Percent
Yes	70	49.0
No	73	51.0
Total	143	100.0

This table 4 shows the condition of asthma among the participants after exercise. During last month 66.4% answered that they didn't have symptoms twice a day for a week and 72.7% of participants' asthma was affecting their sleep. 44.8% used to take their medication two times in a week during the last month, while 51% with asthma didn't limit their daily activities.

Table 5 The severity of Asthma Control after exercise N=143

Asthma Severity after starting exercise		
	Frequency	Percent
controlled	28	19.6
partially controlled	55	38.5
uncontrolled	60	42.0
Total	143	100.0

The table 5 shows that 28 participants (19.6%) were controlled after starting exercise and shows that 55 participants (38.5%) were partially controlled, on the other hand, the rest of the participants (60) (42%) were uncontrolled. This table 6 shows the Participant's Physical Activity Level. During last week 48.3% answered that they did not do any effort and 88.1% of the participants didn't do any biking. 42.0% used to walk less than one-hour last week. 85.3% did not do any gardening. This table 7 shows that 134 out of 143 participants (93.7%) had low physical activity levels, 9 participants (6.3 %) had moderate physical activity levels, and surprisingly no one of the participants (0%) had high physical activity levels.

Table 6 Participant's Physical Activity Level N=143

During last week, how long did you do: swim, run, football or play tennis?		
	Frequency	Percent
did not do any effort	69	48.3
less than one hour	38	26.6
one to three hours	30	21.0
more than three hours	6	4.2
Total	143	100.0
During last week how long did you use your bike		
	Frequency	Percent
did not do any effort	126	88.1
less than one hour	10	7.0
one to three hours	6	4.2
more than three hours	1	.7
Total	143	100.0
During last week, how long did you walk?		
	Frequency	Percent
did not do any effort	15	10.5

less than one hour	60	42.0
one to three hours	56	39.2
more than three hours	12	8.4
Total	143	100.0
During last week, how long did you do homework or took care of children?		
	Frequency	Percent
did not do any effort	61	42.7
less than one hour	31	21.7
one to three hours	30	21.0
more than three hours	21	14.7
Total	143	100.0
During last week, how long did you do gardening?		
	Frequency	Percent
did not do any effort	122	85.3
less than one hour	18	12.6
one to three hours	2	1.4
more than three hours	1	.7
Total	143	100.0

Table 7 The severity of Participant's Physical Activity Level N=143

Physical Activity Level		
	Frequency	Percent
Low physical activity level	134	93.7
Moderate physical activity level	9	6.3
High physical activity level	0	0.0
Total	143	100.0

Table 8 Effect of Exercise on Asthma P-value=0.001

Asthma condition before starting exercise	Asthma condition after starting exercise				Total
		controlled	partially controlled	uncontrolled	
Controlled		16 (11.2%)	1 (0.7%)	1 (0.7%)	18 (12.6%)
Partially controlled		9 (6.3%)	43 (30.1%)	12 (8.4%)	64 (44.8%)
Uncontrolled		3 (2.1%)	11 (7.7%)	47 (32.9%)	61 (42.7%)
Total		28 (19.6%)	55 (38.5%)	60 (42.0%)	143 (100.0%)

This table 8 represents the relationship between asthma conditions before exercise and after it, it shows the participants who had controlled asthma before exercise 18 (12.6%), 16 (11.2%) remain controlled, 1 (0.7%) became partially controlled and 1 (0.7%) became uncontrolled. Among the participants who had partially controlled asthma 64 (44.8%), 9 (6.3%) became controlled, 43 (30.1%) remains partially controlled and 12 (8.4%) were uncontrolled. On the other hand, of the participants who had uncontrolled asthma before the exercise 61 (42.7%) 3 (2.1%) became controlled, 11 (7.7%) became partially controlled and 60 (42%) remain uncontrolled. The data analyses of the participant` are statistically significant associations with their states before exercise as a negative factor for asthma. Expectedly, the analysis findings suggested that there is statistically significant association was found between not doing exercise and asthma control (figure 1).

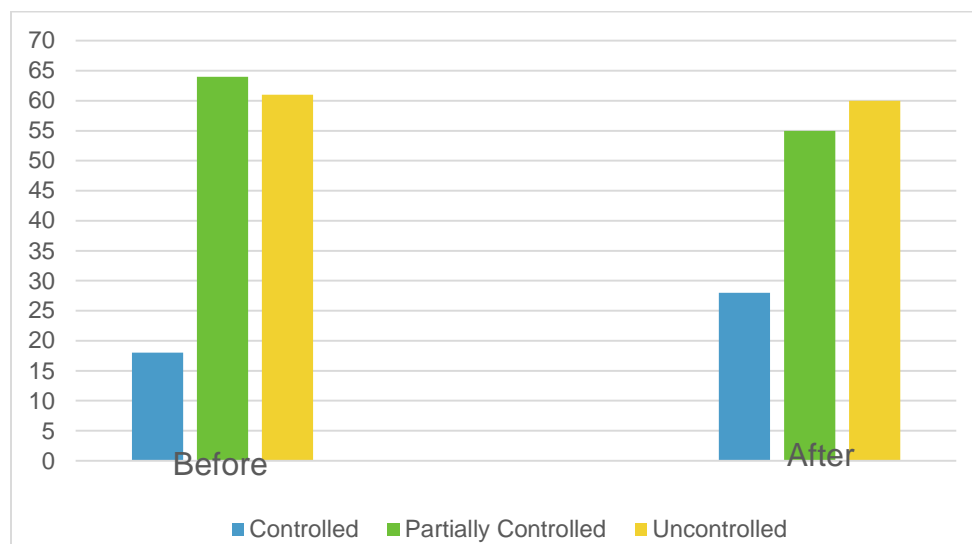


Figure 1 Condition of Asthma pre and post physical exercise.

4. DISCUSSION

Data has proven that maximum of the individuals have been of center age. The majority of them have been ladies which have been anticipated due to the fact they're generally greater sensitive, and this is going consistent with the take a look at via way of means of (Melgert et al., 2007) which indicated that maximum of the sufferers have been ladies and Some can be defined via way of means of variations in a genetic level, however a massive a part of this phenomenon constitutes complicated interactions among developmental variations, immune function, and resident lung cells due to intercourse hormones. Most individuals that have been identified with bronchial allergies are allergic, and this is going consistent with a preceding take a look at via way of means of (Subarrao et al., 2009), that confirmed that Environmental factors, together with contamination and publicity to endotoxins, may also have a defensive impact or may also act as threat factors, relying in element at the length of publicity at some stage in infancy and child-hood. The majority of individuals exercising which turned into now no longer anticipated as it worsens bronchial allergies and this is going in evaluation with the take a look at carried out via way of means of (Dogra et al., 2011) that indicated that a based exercising intervention can enhance the asthma. Additionally, supervised exercising observed via way of means of duration of self-administered exercising maintained the control of asthma and ended in tremendous upgrades in cardio health and perceived the control of asthma.

The majority of participants with an asthma diagnosis claimed that their condition interferes with their sleep. This is in line with our expectations, as we anticipated that some people with asthma might not get enough sleep because of congestion, secretions, snoring, nighttime coughing, wheezing, and breathing problems. Sleep problems that go untreated can make asthma worse and reduce quality of life. Sleeping after exercise affected the majority of participants, which is in contrast to a study by (Francisco et al., 2018) that found that aerobic exercise could reduce the frequency and incidence of nighttime symptoms in adults and children with asthma, and that performing aerobic exercise under supervision for 8 weeks (twice a week) could improve nighttime symptoms and aerobic health and lessen inflammatory lung disease

According to a study by (Wu et al., 2020), regular exercise for at least 20 minutes, two or three times per week over four weeks has significant positive effects on FEV1, PEF, FVC, and FEF, as well as a better quality of life and improved lung function. Nearly two-fifths of participants did not take medications after exercise. Exercise is always recommended even if you have asthma. The prevention of chronic diseases and the management of health all depend on regular physical activity. Regular exercise can help you manage a chronic disease if you already have one.

Regular exercise could help asthma by expanding your lung capacity under a doctor's care, encouraging blood flow to your heart and lungs, enhancing stamina and endurance, reducing airway inflammation, and enhancing overall lung health. Exercise can assist you in gaining greater control over the symptoms of your asthma in addition to taking prescription medicine.

5. CONCLUSION

Finally, we discovered that exercise is beneficial for asthma in terms of reducing the frequency of utilization of symptomatic drugs and the affliction of sleep. Our findings demonstrated the need for additional thorough controlled studies to examine the

connections between drug use, physical activity, quality of life, airway hyper responsiveness, and lung function, particularly airway inflammation. To assess how asthma is being managed in ambulatory care in KSA to create policies with the help of specialists and family doctors. Health care practitioners should keep advising patients to stay away from tobacco smoke in public places. The link between drug intake, airway inflammation, lung function, airway hyper responsiveness, and physical activity should be examined in more thorough controlled trials. A review of current outpatient asthma management in Riyadh develops guidelines with the participation of general practitioners and experts. Health professionals should continue to recommend avoidance of environmental tobacco smoke. Systematic programs should be implemented to identify the allergens to which a person is sensitized and to eliminate or at least significantly reduce allergen exposure in sensitized individuals.

Acknowledgment

We thank Almaarefa University, Riyadh, Saudi Arabia for supporting the steps of this work.

Ethical consideration

Ethical approval from the Institutional review board (IRB) of Almaarefa University College of Medicine (Ethical approval code: IRB08-18092022-85) was met before data collection began and the purpose of the study was clearly explained to the participants. They are assured that data from this study will be used for scientific purposes only, that ethical concerns and legal issues was considered, and that participation is completely voluntary.

Authors' contribution

All authors had substantial contribution to the paper, YMA and YYA and SS and ABH designed the study and prepared the proposal. YMA and ABH analyzed and interpreted data. BSA and MMA and QMA wrote results and discussion. JOY checked and revised every step of this paper. All authors have collected data and critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Funding

This study has not received any external funding.

Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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