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Relationship between the Efficacy of Self-Management Strategies for Pediatric Asthma Care

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Abstract:-

➢ ***Background & Aim:***

Children all across the world are affected by chronic asthma, which is a common and serious health problem. Successful asthma management has to incorporate some type of empowerment of the children with knowledge and tools for self-management. The aim of this study is to understand the relationship between the efficacy of self-management strategies for pediatric asthma care.

➢ ***Methods:***

The data were collected through surveys. The questionnaire included asthma attack management, identified allergens and medication adherence. Descriptive correlation research was employed to evaluate the relationship between the efficacy of self-management techniques on asthma control.

➢ ***Results:***

This study underscores the necessity of tailored asthma management for children aged 12 to 18. Despite improvements in self-management practices, challenges persist in knowledge, psychological factors, and medication adherence. Knowledge and emotional factors were found to have minimal impact on management efficacy, whereas issues with medication adherence hindered self-management, while controlling environmental factors improved outcomes. Effective asthma management requires addressing barriers related to medication adherence and environmental control.

➢ ***Conclusion:***

The study identifies major barriers for pediatric asthma patients, notably in recognizing medical triggers and maintaining medication adherence. Persistent gaps in understanding highlight the need for holistic therapies that address emotional and psychological aspects as well as provide personalized support. Recommendations include enhancing patient education, incorporating pediatric asthma management into nursing training, offering individualized nurse support, and conducting longitudinal research on interventions. Limitations such as resource constraints and policy implementation challenges underscore the complexity of improving asthma care for children.

Keywords:- *Asthma, Barriers to Self-Management, Dietary Triggers, Efficacy of Self-Management Strategies, Emotional and Psychological Factors, Environmental Factors, Environmental Triggers, Medication Adherence, Pediatri Asthma.*

I. INTRODUCTION

The effects of chronic asthma on children's lives are wide-ranging and profound. Asthma symptoms, including coughing, wheezing, shortness of breath, and tightness in the chest, can be persistent and bothersome. These signs can interfere with a child's sleep and regular daily activities, in addition to restricting their physical activity and athletic engagement. Exacerbations of asthma can lead to lost days of school, poorer academic performance, and a lower quality of life. Beyond the particular child, the load affects their families, schools, and healthcare systems. Asthma attacks that are severe enough to require hospitalization are prevalent, which adds to the financial and emotional stress that families must endure (Morales & Duffy 2019).

Children worldwide suffer from asthma, a widespread and serious health issue that affects people of all ages. The impact is large if one takes a look at the statistics surrounding childhood asthma. The World Health Organization estimates that there are 235 million asthma cases globally at present, with children making up a large portion of this figure. In many affluent nations, asthma is among the most prevalent chronic childhood illnesses. The CDC estimates that 6.2 million children under the age of 18 suffer from asthma at this time (World Health Organization, 2022).

Children all across the world are affected by chronic asthma, which is a common and serious health problem. When one takes into account the concerning statistics regarding pediatric asthma, the scope of the issue becomes clear.

According to the World Health Organization, there are 235 million current cases of asthma worldwide, and children constitute a significant percentage of this total. Asthma represents one of the most common chronic childhood diseases in many developed countries. It is estimated that 6.2 million children under age 18 currently have asthma, as reported by CDC.

Successful asthma management is important for children, as the chronic respiratory illness takes a huge toll on their overall well-being. Successful asthma management has to incorporate some type of empowerment of the children with knowledge and tools for self-management. The children should be empowered with information regarding the disease they are suffering from and resources that will help them make informed choices in actively reducing activities of risk factors and symptoms associated with asthma. These must consider both genetic predisposition and environmental factors and include long-term and quick-relief medications. The multi-dimensional nature of this approach further includes avoidance of these environmental triggers through increased awareness, activism, and children and their families working together (Lewis et al. 2023).

Questions of age appropriateness, responsibility, and safety led to debates about how much independence children with asthma should have in their self-care regime. Socio-economic and cultural factors introduce complexity into considerations around equal access to resources and education. Children with asthma engage in and create their health practices within the wider context of care and the structural constraints associated with childhood. This thus challenges the ordinary view that they are merely in a learning phase for self-management in the future (Spray & Hunleth 2022).

Hence, the research aims to clarify the important elements of successful asthma self- management in children. Recognizing symptoms and maintaining a careful balance in medication use are crucial aspects of this strategy. The study delves into how children actively engage in managing their asthma and the intricate aspects of their roles in healthcare. One way to further the depth of this research is by researching cultural influences on children's involvement in healthcare practices. The future study could go on for a longer period on the children, therefore contributing to a longitudinal perspective towards their active participation in developing children's roles in asthma self-management (Spray & Hunleth 2022).

These research questions served as a quantitative framework to identify how effective the self-management strategies would be in pediatric asthma care, taking into consideration the unique challenges for a children's population aged 12-18.

- *What are the child's asthma related self-management practices in terms of:*

- Medication
- Asthma Attack Management
- Diet and Nutrition

- *What are the children's identified allergens in terms of:*

- Environmental Triggers
- Medical Triggers
- Dietary Triggers

- *What are the barriers to self-management in terms of:*

- Knowledge and Understanding
- Emotional and Psychological Factors
- Medication Adherence
- Environmental Factors

- *What are the asthma medications and treatments used by children?*
- *Is there a significant relationship between the efficacy of self-management strategies in pediatric asthma.*

- *Hypothesis*

- Ha: There is a significant relationship between the efficacy of self-management strategies in pediatric asthma care and the barriers to self-management.
- Ho: There is no significant relationship between the efficacy of self-management strategies in pediatric asthma care and barriers to self-management.

II. METHODS

- *Research Approach*

The applied research approach to establishing the effectiveness of self-management strategies in pediatric asthma care was quantitative. A quantitative research approach concerns the systematic gathering and analysis of numerical data, drawing statistical inferences, and making generalizations to a larger population. This design was appropriate for answering formulated research questions that were designed to provide a quantitative underpinning to the assessment of effectiveness of strategies for self-management in pediatric asthma care (Creswell 2017).

- *Research Design*

In this study, a descriptive correlational design was employed to thoroughly investigate and analyze the effectiveness of various self-management strategies in pediatric asthma care by examining the natural relationships and associations between these strategies and their outcomes, without manipulating the variables involved (Neuman 2014).

- *Population and Sample*

The population under investigation comprised children aged 12 to 18 diagnosed with asthma in Barangays Santiago, Hinaplanon, and Bagong Silang in Iligan City. Utilizing a criterion sampling technique, the sample was purposefully selected to meet specific criteria related to age, gender, and asthma diagnosis. The targeted sample size One hundred fifty (150) participants who fulfilled the specified criteria, ensuring a focused and purposeful representation of individuals with a confirmed asthma diagnosis.

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Table 1 Distribution of Participants from each Barangay

Barangay	Sample size	Percentage
Bagong Silang	46	30.7%
Santiago	74	49.3%
Hinaplanon	30	20%
Total	150	100%

This table above shows the barangay where the respondents live. The majority of the respondents are living in Barangay Santiago (49.3%) followed by Barangay Bagong Silang (30.7%) and Barangay Hinaplanon (20%).

➢ *Instrumentation*

The primary data collection instrument for this research was a carefully crafted survey questionnaire tailored specifically for children diagnosed with asthma. The questionnaire encompasses four parts, each addressing key aspects of pediatric asthma management.

- Part I: Focuses on asthma medication and treatments, consisting of 12 medications used by the respondents.
- Part II: Focuses on self-management, consisting of 17 questions divided into three categories: medication and treatment, asthma attack management, and diet and nutrition.
- Part III: Focuses on identified allergens, consisting of 18 questions divided into three categories: environmental triggers, medical triggers and dietary triggers.
- Part IV: Focuses on barriers to self-management, consisting of 16 questions divided into four categories: knowledge and understanding barriers, emotional and psychological factors, medication adherence and environmental factors.

A Likert scale (1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree) was used for the majority of the questions to capture the respondents' insights. The questionnaire underwent a thorough validation process, including a pilot test, to ensure clarity and reliability.

The development was based on a detailed literature review and consultations from experts in the area of asthma care for children. Among the factors identified to be included in the questionnaire from previous studies include asthma management practices, identified allergens, and barriers to self-management.

In this research, expert validation was used and involved medical experts from Adventist Medical Center Iligan Hospital: three pediatricians, one internal medicine specialist, and one nurse. They reviewed the questionnaire for content validity to ensure that it would cover the necessary areas of asthma management.

The questionnaire was pilot-tested with a small sample population similar to that of the study, after which the reliability test using Cronbach's alpha yielded a score of 0.905. This high reliability score guaranteed excellent internal consistency, as a score above 0.7 is considered acceptable (Nunnally 1978).

➢ *Ethical Considerations*

Throughout the whole study process, ethical considerations were essential. Informed consent was obtained from both children and their caregivers, with a focus on obtaining children's consent that was in line with their age. False identities were used to protect participants' identities while enforcing strict confidentiality. Additionally, researchers ensured that the volunteers were neither harmed nor distressed by the study. The research emphasized the ideals of justice, autonomy, beneficence, and non-maleficence, protecting the rights and welfare of all parties. The institutional review board's approval was acquired to assure ethical compliance, and the study was carried out in accordance with ethical standards and regulations.

➢ *Data Gathering Procedure*

The collection of data for this study followed a procedural manner that ensured the collection remained within the set boundary and guidelines, commencing with the identification and gathering of data from respondents. There was a need to make sure that the persons selected for this study conformed to the specified age range

The thesis adviser, research coordinator, and dean created and approved a letter. Furthermore, this letter was then signed and approved by the Punong Barangays of Hinaplanon, Bagong Silang, and Santiago.

The initial process of data collection included the collection of data on asthma in each age group in a barangay. Following this, the questionnaire was created and reviewed by the adviser and research coordinator. A letter for validation was created and signed by the relevant authorities, and the questionnaire was then validated by medical professionals at Adventist Medical Center Iligan Hospital, including three pediatricians, one internal medicine, and one nurse.

➢ *Data Analysis*

The current research work draws on a systematic approach to analyses of the data with a view to producing accurate and reliable insights into the effectiveness of the self-management strategies in pediatric asthma care. Descriptive statistics were run to summarize the data, describing central tendency by mean and standard deviation, and dispersion of responses. The mean gave the average response measure for each variable, while the standard deviation measured the dispersion or amount of variability around the mean, showing how much dispersion there was in the responses.

The tests for normality were done to check if the variables were normally distributed. This test was conducted to establish the significance value to indicate that the data were normally distributed. The results of the normality test

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gave significance levels less than 0.05, with an exact value: .000 for medication, .010 for asthma attack, .049 for diet nutrition, .052 for self-management practices, .000 for knowledge and understanding, .000 for emotional and psychological factors, .001 for medication adherence, .003 for environmental triggers, and .000 for barriers. This means that, according to the Kolmogorov-Smirnov test, all data were non-normally distributed. This finding dictated the need to revert to non-parametric tests for further analysis. Since the data were not normally distributed, non-parametric tests—Kendall's Tau—were used for correlation analysis. Kendall's Tau is appropriate for non-parametric correlation analysis and was used to determine the relationships between variables. Throughout the analysis, it focused on independent variables about the management of asthma attacks, medication and treatment, diet and nutrition, and barriers to self-management.

The barriers were categorized into knowledge and understanding barriers, emotional and psychological factors, medication adherence, and environmental factors.

This was ensured through expert reviews from the medical profession who had to review the questionnaire to ensure that it had all it takes to cover relevant areas in asthma management. Cronbach's alpha was used for reliability testing with 0.905 as the overall score. This high reliability score indicated excellent internal consistency and therefore confirmed that the instrument was reliable and thus suitable for the objectives of this study.

This step-by-step approach to the analysis ensures that one has done a rigorous and systematic analysis of the data to provide robust and reliable insights into the efficacy of self-management strategies in pediatric asthma care.

III. RESULTS

This chapter presents the results of statistical analyses conducted to evaluate the hypotheses and address the research question in Chapter I. This chapter includes the presentation of the data gathered from 150 respondents from Barangay Hinaplanon, Santiago and Bagong Silang in Iligan City, aged twelve to eighteen years old that were diagnosed with asthma. Specifically 46 residents from Barangay Bagong Silang, 74 residents from Barangay Santiago, and 30 residents from Barangay Hinaplanon. The findings, analysis, and interpretation and results of the data of the study that were collected.

Table 2 Descriptive statistics of asthma self-management practices in terms of medication

Questions	*M* ± *SD*	Interpretation
I am taking medications prescribed by the doctor.	2.94 ± 0.821	Agree
I use my inhaler correctly.	2.73 ± 1.060	Agree
I use my nebulizer correctly.	2.83 ± 1.022	Agree
I follow my asthma treatment plan when I'm having trouble breathing.	2.83 ± 0.849	Agree
Total Measure	2.83 ± 0.938	Agree

Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

- *Self-Management Practices in Terms of Medication*

Table 1 showed that the most common response of the 150 respondents was “Agree” from the survey on asthma self-management practices related to medication and treatment revealed that children had a good level of adherence to their asthma management routines. These results suggested that participants are proficient in managing their asthma medications, although there is some variability, particularly in the correct usage of inhalers and nebulizers, as indicated by the higher standard deviations. Targeted educational interventions could enhance these self-management practices, leading to better asthma control and health outcomes.

Table 3 Descriptive statistics of asthma self-management practices in terms of asthma attack management

Questions	*M* ± *SD*	Interpretation
I know how to recognize early warning signs of an asthma attack.	2.81 ± 0.857	Agree
When I notice warning signs of my asthma attack I take appropriate action.	2.80 ± 0.794	Agree
I know the importance of sitting upright during an asthma attack.	2.82 ± 0.795	Agree
I know the importance of staying calm during an asthma attack.	3.15 ± 0.673	Agree
I know the importance of breathing slowly and steadily during an asthma attack.	3.08 ± 0.690	Agree
Total Measure	2.93 ± 0.761	Agree

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Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

➢ *Self-Management Practices in Terms of Asthma Attack Management*

Table 2 showed that the most common response of the 150 respondents was "Agree" of the survey on asthma self-management practices indicated that participants commonly had a good understanding and practice of asthma attack management strategies. This consistent pattern suggested that the individuals surveyed are well-informed and proactive in managing their asthma attacks. The overall mean score reinforced the pattern that respondents were commonly practicing these strategies almost all the time. This level of self-management is crucial for preventing severe asthma exacerbations and maintaining overall health.

Table 4 Descriptive statistics of asthma self-management practices in terms of diet and nutrition

Questions	*M* ± *SD*	Interpretation
I know that eating fruits I am not allergic to can help control my asthma symptoms.	2.63 ± 0.848	Agree
I know that eating vegetables I am not allergic to can help control asthma symptoms.	2.66 ± 0.896	Agree
I know that avoiding too much processed foods can help control asthma symptoms.	2.43 ± 0.951	Disagree
I know that avoiding too much fatty food can help control asthma symptoms.	2.49 ± 0.947	Disagree
I know that avoiding too much fried foods can help control asthma symptoms.	2.62 ± 0.939	Agree
I know that maintaining a healthy weight can improve my symptoms.	2.62 ± 0.974	Agree
I know that eating healthy can improve my symptoms.	3.00 ± 0.875	Agree
Total Measure	2.63 ± 0.919	Agree

Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

➢ *Self-Management Practices in Terms of Diet and Nutrition*

Table 3 showed that the 150 respondents commonly "Agree" on the importance of diet and nutrition in managing asthma symptoms, with a strong belief that eating healthy can improve asthma symptoms. However, there was less agreement on avoiding processed and fatty foods, indicating a gap in adherence to these specific dietary recommendations and suggesting an area for improvement in dietary self-management.

Table 5 Descriptive statistics of children's identified allergens in terms of environmental triggers

Questions	*M* ± *SD*	Interpretation
I know that dust mites can worsen my asthma.	3.13 ± 0.869	Agree
I know that mold can worsen my asthma.	2.85 ± 0.880	Agree
I know that pets can worsen my asthma.	3.17 ± 0.839	Agree
I know that pollen from certain grass can worsen my asthma.	2.55 ± 0.952	Agree
I know that wastes from pests such as cockroaches and mice.	2.57 ± 0.870	Agree
I know that my asthma can be triggered by breathing cold air.	2.54 ± 0.895	Agree
I know that my asthma can be triggered by outdoor air pollution.	2.91 ± 0.893	Agree
I know that exposure to second-hand smoke can worsen my asthma.	3.39 ± 0.694	Agree
I know that extreme temperature or climate conditions can worsen my asthma.	2.77 ± 0.823	Agree
Total Measure	2.88 ± 0.868	Agree

Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

➢ *Identified Allergens in Terms of Environmental Triggers*

Table 4 showed that the 150 respondents most common response was "Agree" indicated that children have a good overall awareness of various environmental triggers that can exacerbate asthma. This indicated that educational efforts about asthma triggers are commonly effective, as children recognized and agreed that various environmental factors such as dust mites, mold, pets, pollen, pest wastes, cold air, outdoor air pollution, second-hand smoke, and extreme temperatures can worsen their asthma symptoms.

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Table 6 Descriptive statistics of children's identified allergens in terms of medical triggers

Questions	*M* ± *SD*	Interpretation
I know that my asthma can be triggered by certain medicines.	2.24 ± 0.974	Disagree
I know that my asthma can be triggered by infections such as cold and the flu.	2.63 ± 0.902	Agree
When I catch a cold or the flu, I sometimes have bouts of coughing or wheezing.	2.79 ± 0.854	Agree
When I have a cold or flu, I know what medicine to drink.	2.64 ± 0.992	Agree
Total Measure	2.7 ± 0.935	Agree

Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

➢ *Identified Allergens in Terms of Medical Triggers*

Table 5 showed that the 150 respondents most common response was "Agree" suggested a moderate level of understanding, indicating that children recognize these triggers almost all the time. This suggested that children may not be as informed about the potential risks associated with certain medications. While children showed a good understanding of how infections can affect their asthma and what actions to take, there is a notable area for improvement in educating them about the risks posed by certain medicines.

Table 7 Descriptive statistics of children's identified allergens in terms of dietary triggers

Questions	*M* ± *SD*	Interpretation
I know that I should avoid certain seafood, as it can trigger my asthma.	2.44 ± 0.952	Disagree
I know that I should avoid Pickled foods, as it can trigger my asthma.	2.10 ± 0.896	Disagree
I know that I should avoid Bottled lime or lemon juice, as it can trigger my asthma.	1.94 ± 0.907	Disagree
I know that I should avoid certain dried fruits as it can trigger my asthma.	2.14 ± 0.852	Disagree
I know that I should avoid certain vegetables, as it can trigger my asthma.	2.08 ± 0.879	Disagree
Total Measure	2.575 ± 0.0473	Disagree

Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

➢ *Identified Allergens in Terms of Dietary Triggers*

Table 6 showed that the most prevalent response of the 150 respondents was "Disagree," showing that with the idea of avoiding certain allergens in their diet to manage asthma triggers. This indicates a tendency among children to not follow recommended dietary restrictions aimed at preventing asthma symptoms triggered by specific foods like seafood, pickled foods, bottled lime or lemon juice, certain dried fruits, and certain vegetables. This shows a need for better education and reminders about the need to avoid certain meals in order to effectively control asthma.

Table 8 Descriptive statistics of barriers to self-management in terms of knowledge and understanding

Questions	*M* ± *SD*	Interpretation
I don't know a lot about how to manage my asthma, and that makes it a barrier for me to stay healthy.	2.51 ± 0.954	Agree
I do not understand the asthma treatment that is being taught to me.	2.27 ± 0.843	Disagree
I feel confident in my understanding of asthma management.	2.47 ± 0.953	Agree
I have been taught in school about the dangers of tobacco use and how it can affect my health.	2.88 ± 0.919	Agree
Total Measure	2.533 ± 0.158	Agree

Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

➢ *Barriers to Self-Management in Terms of Knowledge and Understanding*

Table 7 showed that the 150 respondents commonly agreed that knowledge and understanding significantly impact the self-management of asthma. This indicates that many feel they don't have enough information to effectively manage their asthma, even though they've been taught about topics like tobacco use. These findings highlight the need for better education to help people feel more confident and informed about managing their asthma. By addressing these knowledge gaps, we can potentially improve how individuals manage their asthma and their overall health outcomes.

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Table 9 Descriptive statistics of barriers to self-management in terms of emotional and psychological factors

Questions	*M* ± *SD*	Interpretation
I feel worried or stressed about things that affect my asthma.	2.78 ± 0.802	Agree
I do not feel confident in taking care of my asthma by myself.	2.64 ± 0.992	Agree
Intense emotions, like anger, crying, or laughing, can worsen my asthma symptoms.	2.82 ± 0.875	Agree
I feel unsure about managing my asthma.	2.61 ± 0.842	Agree
Total Measure	2.7125 ± 0.094	Agree

Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

- *Barriers to Self-Management in Terms of Emotional and Psychological Factors*

Table 8 showed that the 150 respondents commonly agreed that emotional and psychological factors was significant barriers to effective asthma self-management. Respondents recognized that feelings of worry, stress, lack of confidence, and uncertainty hindered their ability to managed asthma. The results suggested a need for comprehensive strategies to address these challenges. Support systems like stress management programs and confidence-building initiatives can help individuals cope better with these barriers.

Table 10 Descriptive statistics of barriers to self-management in terms of medication adherence

Questions	*M* ± *SD*	Interpretation
It's hard to remember to take my asthma medicine.	2.42 ± 0.846	Disagree
The taste or texture of my medication makes it less appealing, making it challenging to take it regularly.	2.49 ± 0.817	Agree
The cost of my asthma medication is high, making it difficult for my family to afford.	2.77 ± 0.893	Agree
The high cost of my asthma medication affects how regularly I take it as prescribed.	2.76 ± 0.902	Agree
Total Measure	2.61 ± 0.070	Agree

Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

- *Barriers to Self-Management in Terms of Medication Adherence*

Table 9 showed that the total measured indicates that most respondents agreed with the barriers related to medication adherence in managing asthma. This suggests that many individuals found it challenging to consistently take their asthma medication due to factors such as the cost of medications and concerns about taste or texture. Addressing these barriers is significant for improving medication adherence and overall asthma management.

Table 11 Descriptive statistics of barriers to self-management in terms of environmental factors

Questions	*M* ± *SD*	Interpretation
Where I live makes my asthma worse, and it becomes a barrier for me to breathe easily.	2.34 ± 0.911	Disagree
Sometimes, it's hard for me to breathe when I play or exercise.	2.85 ± 0.806	Agree
I am regularly exposed to tobacco smoke, which I know is harmful to my asthma	2.37 ± 0.924	Disagree
I know that tobacco use can worsen my asthma, even if I don't use it myself.	3.27 ± 0.802	Agree
Total Measure	2.4575 ± 0.305	Agree

Legend:

Range	Descriptive Rating	Qualitative Interpretation
3.25-4.0	Strongly agree	Doing it all the time.
2.50-3.24	Agree	Doing it almost all the time.
1.75-2.49	Disagree	Doing it often.
1.0-1.75	Strongly Disagree	Not doing it at all.

- *Barriers to Self-Management in Terms of Environmental Factors*

Table 10 showed that most respondents disagreed that their living environment and regular exposure to tobacco smoke worsened their asthma. They both acknowledged that breathing might become difficult when playing or exercising. Even if they do not smoke tobacco personally, most respondents agreed that it can aggravate asthma. The overall total measure showed that asthma management is frequently hindered by environmental variables.

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Table 12 Frequency and Percentage of asthma medications and treatment used by children

Asthma Medications and Treatment	Frequency	Percentage (%)
Salbutamol syrup	30	10.2%
Salbutamol guaifenesin syrup	5	1.7%
Salbutamol sulfate for Inhaler	47	22.5%
Salbutamol for nebulization	66	26.3%
Salbutamol + ipratropium nebulization	9	3.1%
Budesonide for nebulization	10	3.4%
Salmeterol for Inhaler	24	8.2%
Fluticasone propionate Inhaler	7	2.4%
Montelukast Sodium Tablet	6	2%
Ambroxol Syrup	10	3.4%
Doxofylline Tablet	5	1.7%
Lagundi syrup	40	13.7%
Carbocisteine Solmux syrup	3	1%
Lemon	1	0.3%
Total	293	100%

➢ *Medications and Treatments Used by Children*

The table shows a comprehensive overview of the asthma medications used by the respondents, along with their frequency and percentage distribution. The most commonly prescribed and used medication is salbutamol for nebulization (26.3%), it indicates its effectiveness in providing immediate relief for asthmatic symptoms through nebulization. It helps reduce inflammation in the lungs or open airways, especially in the case of respiratory illnesses like asthma (Yu & Cherney. 2023).

The second most commonly used is salbutamol sulfate for inhalers (22.5%), showing that inhalers are also used, likely due to their convenience and efficacy in managing asthma symptoms. Salbutamol sulfate for inhalers are very effective for immediate relief of bronchospasm in children with asthma. It provides rapid symptom control, direct delivery to the lungs and ensures quick targeted effects. It is important for managing acute asthma attacks in pediatric patients (Green et al. 2018).

Lagundi syrup (13.7%) is also commonly used by respondents who cannot afford to buy a nebulizer. It has anti-inflammatory and bronchodilator properties. Lagundi formulation was proven to be effective in preventing the spread of disease-causing microorganisms, reducing fever, decreasing the viscosity of mucus, improving the color of phlegm, alleviating shortness of breath and wheezing, and lessening the frequency of cough (PCHRD 2024).

Salbutamol syrup (10.2%), Oral administration of salbutamol is also prevalent, which might be preferred for younger children or those who find inhalers difficult to use. Salbutamol syrup is a commonly used bronchodilator for relieving asthma symptoms in young children who struggle with inhalers or nebulizers. Studies have shown that it effectively reduces acute asthma symptoms, providing quick relief and improving respiratory function in pediatric patients. Its ease of administration and rapid action make it a preferred choice for managing childhood asthma exacerbations (Pearson. 2019). Oral administration of salbutamol, typically in the form of syrup, offers a practical alternative for individuals who encounter challenges with inhaler use, particularly young children or those with coordination difficulties (George et al. 2022).

Salmeterol for inhaler (8.2%), This long-acting beta-agonist is used relatively frequently, indicating its role in controlling persistent asthma symptoms over a longer duration, plays a vital role in managing persistent asthma symptoms over an extended period. Its frequent usage underscores its efficacy in providing sustained relief from asthma symptoms and preventing exacerbations. As a long-acting bronchodilator, salmeterol offers prolonged smooth muscle relaxation in the airways, leading to improved airflow and symptom control. By incorporating salmeterol into asthma management regimens, healthcare providers can help patients achieve better long-term control of their condition, reducing the frequency and severity of asthma attacks (Mukherjee et al. 2021).

Less common treatments or medications used by respondents are Ambroxol syrup and Budesonide for nebulization (3.4% each). Ambroxol, a mucolytic agent, aids in mucus clearance, improving respiratory function in children with asthma. Research shows that ambroxol can significantly enhance mucus clearance and reduce respiratory symptoms in pediatric patients with chronic respiratory conditions Its mucolytic action supports better breathing and reduces the burden of mucus-related symptoms (Johnson & White 2017).

Budesonide, an anti-inflammatory medication, is delivered via nebulization to mitigate airway inflammation and reduce symptoms in conditions like asthma and chronic obstructive pulmonary disease (COPD). Despite their lower frequency of use, these medications play crucial roles in specific respiratory conditions, highlighting the diverse pharmacotherapeutic approaches available for respiratory management (National Center for Biotechnology Information 2022).

Salbutamol + ipratropium nebulization (3.1%), A combination therapy used in certain cases, indicating a need for a dual-action approach in some children. Salbutamol, a β2-adrenergic agonist, primarily acts to relax bronchial

smooth muscles, facilitating bronchodilation and improving airflow in conditions like asthma and chronic obstructive pulmonary disease (COPD). Ipratropium, on the other hand, is an anticholinergic medication that works by blocking the action of acetylcholine, thereby dilating the bronchioles and reducing mucus production. The combination of these two medications offers a synergistic effect, targeting different aspects of bronchial constriction and inflammation. This dual-action approach is particularly beneficial in cases where single-agent therapy may not provide adequate symptom relief or where there's a need for intensified treatment to manage severe respiratory symptoms in pediatric patients (Cazzola et al. 2021).

Montelukast Sodium Tablet (2%) and Fluticasone propionate inhaler (2.4%). Both are used for long-term management, with Montelukast as a leukotriene receptor antagonist and Fluticasone as a corticosteroid. Montelukast functions as a leukotriene receptor antagonist, Montelukast sodium tablets are used to prevent asthma symptoms and manage allergic rhinitis in children. Clinical trials have demonstrated the efficacy of montelukast in improving asthma control and reducing the need for rescue medications in pediatric patients. Its role in managing exercise-induced asthma and allergic rhinitis makes it a versatile treatment option. Montelukast helps to reduce bronchoconstriction, inflammation, and mucus secretion, thereby improving asthma control (Singh et al. 2019).

Fluticasone propionate is a corticosteroid inhaler that exerts potent anti-inflammatory effects within the airways. By suppressing the production of inflammatory cytokines and inhibiting the activity of various inflammatory cells, Fluticasone reduces airway inflammation and hyperreactivity, thereby preventing asthma exacerbations and improving long-term lung function. The concurrent use of these medications in long-term management underscores the importance of targeting multiple pathways of inflammation and bronchoconstriction to achieve optimal control of respiratory conditions (Jevnikar et al. 2020).

Rarely used treatments or medications are Doxofylline Tablet and Salbutamol guaifenesin syrup (1.7% each) Their low frequency suggests they are less commonly prescribed, possibly due to less effectiveness or preference for other treatments. Doxofylline, a xanthine derivative, is used as a bronchodilator for conditions like asthma and chronic obstructive pulmonary disease (COPD), Studies indicate that doxofylline effectively improves lung function and reduces asthma symptoms in children, making it a safer alternative for long-term use (Garcia et al. 2018).

The combination of Salbutamol and guaifenesin syrup, aimed at relieving symptoms of cough and congestion, may not be as commonly prescribed due to the availability of alternative medications with similar or superior efficacy. Further research and clinical trials may be needed to evaluate the comparative effectiveness and safety profiles of these medications, potentially informing their use in clinical practice (Rubin et al. 2022).

Carbocisteine Solmux syrup, reported at a frequency of 1%, serves as another mucolytic agent utilized in the management of respiratory conditions characterized by excessive mucus production. Its inclusion in treatment regimens suggests its role in facilitating the clearance of respiratory secretions, thereby alleviating symptoms such as cough and congestion. The mention of lemon, albeit at a lower frequency of 0.3%, stands out as an outlier within the context of medically prescribed treatments. This outlier status suggests that lemon may be more commonly associated with home remedies rather than being formally recommended or prescribed by healthcare professionals. While lemon is sometimes used in folk medicine for its purported antioxidant and immune-boosting properties, its efficacy and safety as a treatment for respiratory conditions remain largely anecdotal. Further research is warranted to evaluate the potential therapeutic benefits of lemon in respiratory health, particularly in comparison to established medical interventions (De Boer 2017).

The most common use of various forms of Salbutamol (nebulization, inhaler, syrup) underscores its critical role in immediate asthma management. The use of Lagundi syrup and even lemon suggests that alternative medicine is significant in this context. The variety of treatment forms (inhalers, syrups, nebulizations, tablets) indicates the need to cater to different preferences and medical requirements. The data illustrates a variety of asthma treatments used by the respondents, highlighting a strong preference for quick-relief medications like Salbutamol in various forms. There is also an evident incorporation of traditional remedies, indicating a blend of conventional and alternative medicine approaches in managing pediatric asthma.

Table 13 Relationship between the efficacy of self-management strategies in pediatric asthma care and the barriers to self-management

Barriers to Self-Management	**Efficacy of Self-Management Strategies**						
	Medication	**Asthma Attack Management**	**Diet and Nutrition**	**Environmental Factors**	**Medical Triggers**	**Dietary Nutrition**	**Total Measure**
Know-ledge and Under-standing	-0.016 (0.791)	0.055 (0.377)	0.082 (0.175)	0.023 (0.707)	0.089 (0.149)	-0.071 (0.246)	0.056 (0.4075)

Emotion-al and Psycho-logical Factors	-0.042 (0.488)	-0.012 (0.840)	0.075 (0.210)	0.060 (0.311)	-0.010 (0.869)	-0.016 (0.794)	0.009 (0.641)
Medical Adherence	-0.188 ** (0.002)	-0.206** (0.001)	-0.147 * (0.013)	-0.079 (0.184)	-0.230 ** (.000)	-0.179 ** (0.003)	-0.172 (0.034)
Environmental Factors	0.124* (0.042)	0.015 (0.808)	0.144 (0.057)	0.195 (0.001)	0.112 (0.067)	0.061 (0.315)	0.108 (0.215)

Legend: Analysis is based on Kendall-rank Correlation ***significant at .001 level **significant at .01 level *significant at .05 level

- *Correlation between the efficacy of self-management strategies in pediatric asthma care and the barriers to self-management*

Table 12 showed the relationship between various barriers to self-management and the efficacy of self-management strategies in pediatric asthma care. The analysis shows that knowledge and understanding do not significantly impact the effectiveness of self-management strategies, suggesting that merely having knowledge about asthma and its management does not strongly affect how well children can manage their condition. Similarly, emotional and psychological factors do not show a significant correlation with the efficacy of self-management strategies, indicating that these barriers may not directly influence the effectiveness of asthma management.

Medical adherence presents a significant negative relationship with several self-management strategies, meaning that difficulties in adhering to medical regimens can reduce the effectiveness of these strategies. This finding highlights the challenge of managing asthma successfully when there are issues with following prescribed medical treatments. In contrast, environmental factors show significant positive correlations with the efficacy of some self-management strategies. This suggests that controlling environmental factors, such as reducing exposure to asthma triggers, can enhance the success of self-management practices and plays a crucial role in managing asthma effectively.

When considering all factors together, there is no significant correlation between the total barriers and the overall efficacy of self-management strategies. This suggests that while specific barriers like medical adherence and environmental factors are important, their combined impact does not provide a clear overall effect on self-management efficacy. In conclusion, the table shows that while knowledge and emotional factors may not significantly impact asthma management, challenges in medical adherence can hinder effectiveness, and managing environmental factors can improve self-management outcomes.

IV. DISCUSSION

Research on the self-management practices of pediatric asthma in 12- to 18-year-olds is one of positive trend in efficacy. The children exhibit a good adherence to dietary recommendations and prescription use, and managing asthma attacks. They thus showed awareness of environmental triggers such as dust mites and secondhand smoke but less regarding medical causes. Large gaps remain in knowledge, psychological, and medication adherence areas. The results clearly bring out the need for focused intervention on coping strategies and the management of childhood asthma.

This study made several important correlations with barriers against self-management efficacy. The emotional and environmental aspects had moderate correlations with efficacy, while knowledge levels demonstrated very few. Of the latter, medication adherence was strongly negatively correlated with effectiveness, indicating the paramount importance of that aspect in gaining the best results from asthma therapy. The results do point out and emphasize that holistic therapies must be applied to children with asthma, dealing with practical and psychological barriers if these children are to have any hope of obtaining help in all areas.

This research fills an important gap in knowledge regarding self-management of children's asthma, focusing on the conceptual space identified in "Breathing Together: Children Co-constructing Asthma Self-Management in the United States." The American perspective on pediatric asthma treatment these days is through a caregiver-centered approach that assumes only caregivers impart practices and information to their kids. They argue that this makes the image of childhood gloomy in such programs which are unrealistic about how much they are involved in managing their ailment. This approach also excludes children from participating in their own healthcare, portraying them as dependents who will hopefully become good citizens (Spray & Hunleth 2022).

The importance of effective communication between health care practitioners and patients/ families, patient/family activation and self-management efficacy is emphasized in the literature. A comprehensive framework for assessing self-management outcomes in children with asthma stresses the socio-ecological determinants which impact on patient /family activation that in turn affects self- management efficacy. This framework serves as a base for studies and clinical applications targeting to enhance pediatric asthma care by enhancing providers' adherence to guidelines and improving patients' outcomes (Dardouri et al., 2021).

The importance of effective healthcare practitioners to patients/families communication and self-management efficacy is emphasized in literature. A comprehensive framework for self-management success evaluation among

children with asthma emphasizes the patient/family activation. This, in turn, influences the child's use of medication accurately by enhancing his/her self-management efficacy. Therefore, this model forms a basis for research and clinical implementation for improving pediatric asthma care through provider adherence to guidelines and enhanced patient outcomes.

Successful treatment of asthma in children requires proper inhaler use and medication adherence. It is vital that every patient as well as their families receive clear guidance concerning how to manage their breathing problems using inhalers and drugs scheduling. In a holistic approach towards understanding self-management in pediatric asthma, this paper highlights the significance of effective provider-patient/family communication supporting drug adherence by eliminating barriers or concerns (Rangachari et al. 2019).

Successful self-management in pediatric asthma depends on trigger recognition and development of avoidance methods. These triggers include allergens, pollutants, respiratory illnesses, and exercise. Understanding these triggers reduces asthma exacerbations. Patient/family activation motivates them to take necessary actions for self-identification and prevention of asthmatic triggers. In this respect, a healthcare professional can assist in the creation of effective interventions with respect to the integration of the framework, which effectively makes use of validated trigger recognition and avoidance strategies. It also points to the importance of parental involvement or caregivers in their children's asthma self-management.

Recent research has tested several interventions to enhance the management of pediatric asthma. In this regard, individually tailored educational interventions targeting caregivers and children showed significant improvements in asthma control and quality of life. To this end, webinars and other easy learning platforms were noted to be effective for the education of caregivers in managing the asthmatic condition in preschoolers.

Therefore, self-management strategies are important in the management of pediatric asthma by empowering the children and their families to take a central role in managing the condition and hence improving their quality of life. These strategies focus on medication adherence, trigger awareness, and action plan implementation—very key elements of controlling an illness and reducing flare-ups. Targeting environmental and psychosocial interventions for asthma, combined with the use of digital health technologies and community-based support systems, can help bridge access gaps to health care and provide constant support to families. .

Future studies must therefore be directed towards filling knowledge and practice gaps with investigations about the effectiveness of self-management therapies tailored for diverse age groups and socio-economic backgrounds. Researching environmental exposures and allergen avoidance strategies can be most helpful in guiding more targeted interventions and policy recommendations, thereby opening up possibilities for improving access and impact of asthma care on children through investigating novel approaches for overcoming barriers to asthma self-management—for instance, by applying digital health interventions or community-based initiatives.

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