https://doi.org/10.48047/AFJBS.6.7.2024.4167-4179

African Journal of Biological Sciences

Journal homepage: http://www.afjbs.com

Research Paper Open Access

The Effect of Family Centered Empowerment on the Quality of Life of School Age Children with Bronchial Asthma and their Parents

Nehal Shehta Arabie [1*], Azza Abdalsemia Elewa [2], Safaa Salah Ismail [3]

[1] Assistant Lecturer at Pediatric Nursing Department, Faculty of Nursing, Badr University in Cairo, Egypt.

[2] Assistant professor of Pediatric Nursing, Faculty of Nursing, Helwan University, Helwan, Egypt

[3] Professor of Pediatric Nursing, Faculty of Nursing, Helwan University, Helwan, Egypt

Corresponding author: Nehal Shehta Arabie.

Email: nehal.shehta@bue.edu.eg

Article History

Volume 6, **Issue** 7, 2024

Received: 05 July 2024

Accepted: 12 August 2024

Published: 15 August 2024

doi: *10.48047/AFJBS.6.7.2024.4167-4179*

Abstract:

Background: A common chronic disease among school-age children is bronchial asthma, which causes significant health and social impacts. An empowerment program helps children, and their families improve their quality of life. This study aimed to evaluate the effect of family-centered empowerment on the quality of life of school-age children with bronchial Asthma and their parents. **Methods**: A quasi-experimental research design with a pre- and post-test was used to conduct this study. A purposive sample of 70 school-age children with bronchial asthma and their parents was included in the study. The study was conducted at the Center for Chest Disease in Giza. Three tools were used to collect data: Interview Questionnaire Sheet which included personal characteristics of the parents and children, as well as an assessment of the parents' knowledge about bronchial asthma. Children's Quality of Life Scale (PAQLQ) to assess the quality of life of school-age children. Parents' Quality of Life Scale to assess the quality of life of the parents. **Results**: The study revealed that 84.3% of the parents had satisfactory knowledge after the implementation of the empowerment program, compared to 40% before the program. Additionally, 28.5% of the school-age children studied had a high quality of life after the program, whereas only 17.1% had a high quality of life before the program. **Conclusion**: The family-centered empowerment program improves the quality of life for asthmatic children and their parents, helps prevent acute asthma attacks, and enhances the self-management of children with asthma.

Keywords: Bronchial Asthma, Family-centered empowerment, Empowerment Quality of life, School-age

1. Introduction

The school-age stage, typically ranging from 6 to 12 years, is crucial for developing positive self-esteem, a sense of belonging, and competence as children transition into the school environment. During this period, children shift from egocentric thinking to engaging with the world through interactions with peers and their surroundings **(Thorpe et al., 2024).**

Physiologically, this stage begins with the shedding of the first deciduous tooth and concludes at the onset of puberty, marked by the emergence of the final permanent teeth (excluding wisdom teeth). Each child's development must be individually assessed, with noticeable variations in physical growth, body proportions, and the genetic influences on height and weight during these years **(Ismail et al., 2012).**

Bronchial asthma in pediatric patients exhibits similarities to the condition in adults but also poses distinct challenges in the pediatric population **(Čibirkaitė et al., 2024).** It is a primary contributor to emergency department visits, hospitalizations, and absenteeism from school among children **(Simões et al., 2022).**

Family-centered care focuses on providing comprehensive care to both children and their parents within the healthcare system, ensuring that the care plan addresses the needs of the entire family rather than just the individual child or parent. This approach recognizes all family members as recipients of care **(Hart et al., 2020).**

Collaborative approaches in family-centered care emphasize the importance of aligning healthcare services with the priorities, preferences, and values of school-age children and their parents. This perspective recognizes the critical role of involving both children and parents as key partners in improving healthcare quality and safety, not just in direct care interactions, but also in broader efforts to enhance healthcare systems **(McCarthy et al., 2022).**

Quality of life is a multifaceted concept influenced by various factors, including physical health, mental wellness, autonomy, social connections, and environmental contexts. It encompasses an individual's physical health status, psychological well-being, level of independence, social relationships, and interactions with significant environmental elements **(Agrawal et al., 2021).**

Empowerment in healthcare involves equipping individuals or communities with the knowledge, skills, and attitudes necessary to make informed decisions about their care. It emphasizes the importance of addressing the specific needs of school-age children and their families **(Mittal et al., 2024).** Empowerment is achieved through effective communication, support, information sharing, and knowledge building **(Aps et al., 2020).**

Pediatric nurses play a pivotal role in the management of bronchial asthma. Their expertise and dedication significantly impact the lives of children and their families, providing essential support and education to parents and empowering them to care for their asthmatic children in various settings. Whether in primary care, school care, acute care, ambulatory care, care-coordination, or intensive care, pediatric nurses' contributions are invaluable and greatly appreciated **(Adamu Aliyu et al., 2024).**

METHODOLOGY

Study design

The study utilized a quasi-experimental research design, which included both pre-intervention and post-intervention phases of an empowerment program.

Study settings

The research was carried out at the Center for Chest Diseases in Giza, which is linked with the Ministry of Health of the Giza Governorate.

Participants

A purposive sample consisting of 70 school-aged children diagnosed with bronchial asthma, along with their accompanying parents, was selected for the study.

Data collection tools

Tool I: An interview questionnaire sheet:

This tool included the following parts: **Part 1;** Personal characteristics of the studied parents as age, level of education, and employment. **Part 2;** Personal characteristics of school-age children as age, gender, educational grade, and the number of children in the room. **Part 3: Parent's knowledge about bronchial Asthma:** The tool adapted from **Taminskiene et al. (2019)**, consists of 19 multiple-choice questions regarding asthma and its contributing factors. Correct answer is scored one point, while incorrect answer scored zero points. The total score is out of 19 points, which is then converted into a percentage score. The knowledge level is categorized as follows: Satisfactory Knowledge: A score of ≥ 70% (13 or more points out of 19) and Unsatisfactory Knowledge: A score of < 70% (fewer than 13 points).

Tool II: Children' quality of life:

The tool adopted from **Abdel-Hammed et al. (2021)** to assess children's quality of life includes three domains: activities (5 items), symptoms (10 items), and psychological aspects (6 items). It uses a three-point Likert scale with responses ranging from "never" (1 point), "sometimes" (2 points), to "always" (3 points). Total score ranges from 1 to 63 points, which are summed and converted into a percentage score. This percentage score is classified into three categories: a high score (≥ 70%) corresponds to 44-63 points, a moderate score (50% to 70%) corresponds to 31-43 points, and a low score (< 50%) corresponds to 21-30 points.

Tool III: Quality of Life of Parents scale:

The Quality of Life of Parents scale, adopted from **Taminskiene et al. (2019),** is used to assess parents' quality of life and includes 13 items related to feelings of helplessness or fear when a child has a bronchial asthma attack. The scale consists of 39 points and is rated using three Likert scales: "strongly agree" (3), "agree" (2), and "disagree" (1) for positive items, with the reverse scoring for negative items. The total score ranges from 13 to 39 points, which is then converted into a percentage. Scores are categorized as follows: a high score (≥ 70%) corresponds to 27-39 points, a moderate score (50% to < 70%) corresponds to 19-26 points, and a low score (< 50%) corresponds to 13-18 points.

Validity and Reliability

The validity of the data collection tools was ensured by three pediatric nursing experts who verified that the tools adhered to established theory and thoroughly covered all relevant content. Reliability, which measures the consistency of results across time, observers, and test components, was assessed using the Cronbach alpha test. The high Cronbach alpha values of 0.817 for knowledge, 0.870 for parents' quality of life, and 0.914 for children's quality of life indicate strong internal consistency, confirming the tools' reliability.

Ethical considerations

The study adhered to strict ethical guidelines and obtained necessary approvals and consent from participants. The Research Ethical Committee of the Faculty of Nursing at Helwan University in Egypt (NUR 30) reviewed and approved the study protocol on August 17, 2022. Verbal informed consent was obtained from the parents prior to their participation, ensuring they understood the study's purpose and voluntarily agreed to take part. The researcher maintained the utmost confidentiality throughout the study. All collected data remained strictly confidential and was used solely for research purposes. The anonymity of both the nurses' and parents' data was strictly

maintained, with no personally identifiable information disclosed. The researcher also ensured that no physical, psychological, or emotional harm would come to the parents or children involved in the study.

Fieldwork

Following the acquisition of necessary approvals to initiate the study, samples were systematically collected at the hospital on two designated days each week—Tuesday and Wednesday—during the hours of 9:00 AM to 12:30 PM. The researcher first established a trusting relationship with the participants, then individually interviewed each parent and school-age child during the assessment phase to explain the study's purpose. Afterward, the parents and their children completed the study tools, which took approximately 30 minutes to complete. The researcher interviewed 5-7 parents and their children from the center daily, and data were collected through an interview questionnaire. Data collection for this study spanned six months, from May 15, 2023, to January 15, 2024.

Teaching methods included lectures, discussions, brainstorming, role play, demonstrations, re-demonstrations, media presentations, PowerPoint, and handouts. The researchers also prepared booklets and disks. The empowerment program was conducted through the following four phases:

Assessment phase:

Initially, the researcher interviewed each school-age child and their parent individually for 15-30 minutes to complete the study tools. Following the interview, the researcher addressed any questions the parents or children had. The researcher then analyzed the questionnaire results to assess the parents' needs and knowledge deficits regarding bronchial asthma.

Planning phase:

Based on the initial assessment and a review of the relevant literature, the researcher designed the content of the nursing intervention to address the actual needs of the parents studied. The intervention was written in simple language, and parents were encouraged to participate through continuous motivation and reinforcement.

Implementation phase:

The intervention aimed to provide the studied parents with cognitive knowledge, psychomotor skills, and a positive attitude toward the intervention's effect on their child's health status. The program lasted six months, including one month for pre- and post-empowerment program implementation. Each session lasted 30-45 minutes, depending on the physical and mental readiness of the parents and their child.

Evaluation phase:

Upon completing the program, a post-intervention evaluation was conducted using the same pre-program tool to assess the outcomes. The health status assessment and follow-up record sheet were used once before the program.

Statistical analysis

The gathered data was systematically coded and entered into the Statistical Package for the Social Sciences (SPSS). Following the completion of data entry, a thorough review was conducted to identify any potential errors. The data was subsequently analyzed using SPSS to produce frequency tables accompanied by percentages. Qualitative data were represented in terms of numbers and percentages, while quantitative data were summarized using the mean and standard deviation, as deemed appropriate. The Chi-square probability distribution was employed to analyze categorical variables. Additionally, a t-test, which is an inferential statistical method, was utilized to assess whether there was a significant difference between the means of two groups. Correlation

coefficients were calculated to evaluate the strength of the relationships between variables. Results were deemed statistically significant when $P \leq 0.05$ and highly significant when $P < 0.01$.

RESULTS

Table (1): Distribution of the studied parents according to their characteristics (n=70)

Items	N	%
Age (Year)		
25< 35	18	25.7
35< 45	42	**60.0**
45≤ 55	10	14.3
$\bar{x}$ S.D = 38.85±4.61		
Father's educational level		
Not read and write	2	2.9
Read and write	2	2.9
Intermediate education	38	**54.3**
Bachelor's degree	25	35.6
Postgraduate	3	4.3
Mother's educational level		
Not read and write	3	4.3
Read and write	5	7.1
Intermediate education	41	**58.6**
Bachelor's degree	20	28.6
Postgraduate	1	1.4
Mother's job		
Work	31	44.3
Not work	39	**55.7**
Father's job		
Employee	38	**54.3**
Free Business	24	34.3
Literal	8	11.4
One of the family members suffers from bronchial Asthma		
Yes	7	10.0
No	63	**90.0**
If the answer is yes, mention the relationship n=70		
Brother-sister	40	57.1
Father- mother	20	28.6
Grandfather-grandmother	10	14.3
Uncle	0	0
Sources of pollution near the house		
Yes	18	25.7

Items	N	%
No	52	**74.3**
If the answer is yes, what are n=18		
Open-air waste-burning	6	33.3
Car's exhaust	7	**38.9**
Factories pollutants	5	27.8

Table (1) shows that less than two-thirds (60%) of the parents studied were aged between 35 and 45 years, with a mean age of 38.85±4.61 years. Regarding education, more than half of the fathers (54.3%) and mothers (58.6%) had an intermediate educational level. Additionally, over half of the mothers (55.7%) were not employed, while more than half of the fathers (54.3%) were employed. Furthermore, less than one-fifth (10%) reported that a family member had bronchial asthma, and slightly more than a quarter (25.7%) reported pollution sources near their home.

Table (2) Distribution of the studied school-age children according to their data (n=70)

Items	No	%
Age (Year)		
6<8	40	**57.1**
8<10	17	24.3
10≤ 12	13	18.6
$\bar{x}$ S.D = 8.31±1.06		
Gender		
Male	45	**64.3**
Female	25	35.7
Educational grade		
First to third grade	47	**64.1**
Fourth to sixth grade	23	32.9
The number of children in the room		
One child	6	8.6
Two Childs	46	**65.7**
Three children	13	18.6
Four children	5	7.1
Residence		
Rural	5	7.1
Urban	65	**92.9**
Is there a family history of smoking?		
Yes	29	41.4
No	41	**58.6**

Table (2) shows that the mean age of the studied schoolchildren was 8.31±1.06 years, with more than half being between 6 and 8 years old. Additionally, less than two-thirds (64.3% and 64.1%) of the children in the first and third grades, respectively, were males. Nearly two-thirds (65.7%) of

them shared a room with one other child. The majority (92.9%) lived in the city, and more than two-fifths (41.4%) had a family history of smoking.

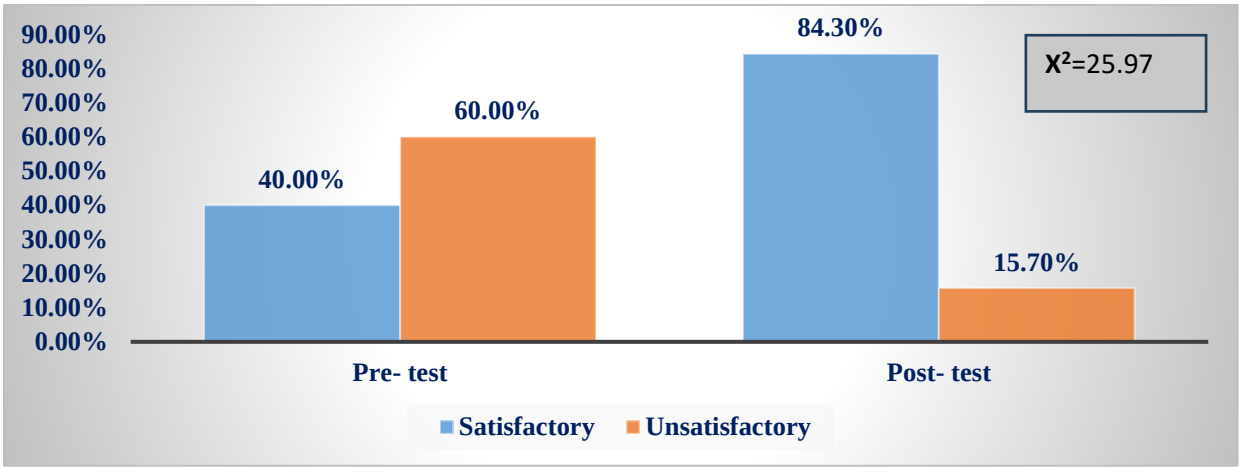

Figure (1) Percentage of parents with total knowledge about bronchial Asthma in pre-and post-implementation of the empowerment program (n=70)

Figure (1) shows that a substantial majority (84.3%) of the parents surveyed demonstrated satisfactory knowledge following the implementation of the empowerment program, in contrast to only two-fifths (40%) who exhibited satisfactory knowledge prior to the program. Furthermore, the results indicate a highly statistically significant difference in the knowledge levels of the studied parents regarding bronchial asthma before and after the implementation of the empowerment program.

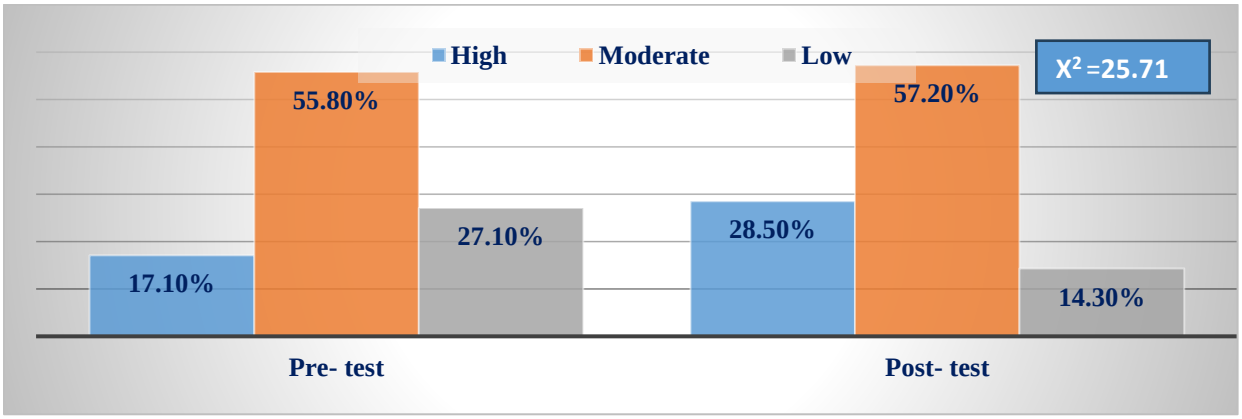

Figure (2): Percentage of children pre-and post-implementation of the empowerment program regarding their total quality of life as school-age children with bronchial Asthma (n=70)

Figure (2) shows that more than a quarter (28.5%) of the studied school-age children had a high quality of life after the empowerment program was implemented, compared to less than a quarter (17.1%) who had a high quality of life before the program.

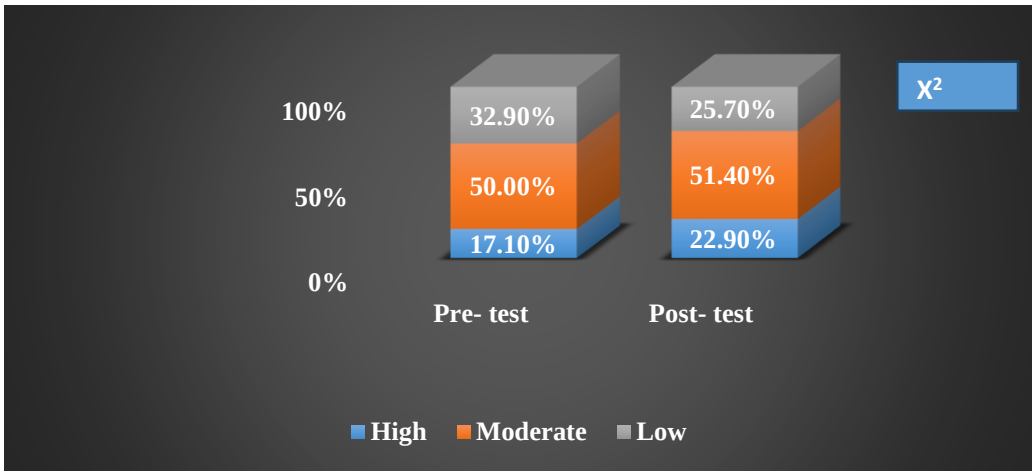

Figure (3): Percentage of the studied Parents regarding their total quality of life before and after the empowerment program was implemented (n=70)

Figure (3) reveals a statistically significant difference between the studied parents' total quality of life before and after the empowerment program implementation (p = .000**). Less than a fifth (22.9%) of the studied parents had a high quality of life after the empowerment program, compared to less than two-fifths (17.1%) who had a high quality of life before the program. Additionally, over half (50% and 51.4%) had a moderate quality of life before and after the program. Furthermore, less than a third (32.9% and 25.7%) had a low quality of life before and after the program, respectively.

Table (3): Correlation of quality of life pre- and post-empowerment program implementation regarding the total domain for studied children (n=70)

Items	Preprogram		Post-program		Chi-square p-value
	No	%	No	%	
Activities					
High	13	18.6	26	37.1	**11.03**
Moderate	44	62.8	39	55.7	**.000****
Low	13	18.6	5	7.1	
Symptoms					
High	11	15.7	18	25.7	**10.245**
Moderate	35	50.0	40	57.2	**.000****
Low	24	34.3	12	17.1	
Psychological side					
High	12	17.1	17	24.3	**10.628**
Moderate	37	52.9	41	58.6	**.000****
Low	21	30.0	12	17.1	

Table (3) shows highly statistically significant differences between pre- and post-implementation of the empowerment program regarding all domains of quality of life, including activities, symptoms, and psychological effects, with a p-value of (.000**).

Table (4): Correlation between studied variables at pre- and post-empowerment program implementation (no=70)

Variables		Total knowledge	Total quality of life for Parent
Total knowledge	**r** **p**		
Total quality of life for Parent	**r** **p**	**0.552** **.000****	
Total quality of life for children	**r** **p**	**0.625** **.001****	**0.654** **.003****

Table (4) presents a statistically significant positive correlation between the overall knowledge of the participating parents and the overall quality of life for both the parents and their children (p = .001). Moreover, a highly significant positive correlation exists between the parents' overall quality of life and that of their school-age children (p = .005). Additionally, there is a highly significant positive correlation between the parents' total quality of life and the quality of life of their children, which is influenced by the children's age (p = .003).

DISCUSSION

Concerning the characteristics of the studied parents, the results **(Table 1)** revealed that less than two-thirds of the parents were aged between 35 and 45 years. More than half of both fathers and mothers had intermediate educational levels. Additionally, more than half of the mothers did not work, whereas more than half of the fathers were employed. This study disagrees with **Abd-El Aziz et al. (2023)** in their study titled “Effect of Educational Program Based on PRECEDE PROCEED Model on Mothers’ Performance Regarding Care of Children with Asthma,” which found that less than half of the mothers were under 30 years of age.

The same table showed that less than one-fifth of the participants reported having a family member with bronchial asthma, and slightly more than a quarter reported the presence of pollution sources near their homes. This result contrasts with a study conducted by **Volosovets et al. (2020)** titled "Bronchial Asthma in Children of Ukraine: Medical and Environmental Parallels of Morbidity and Prevalence," which found that more than half of newly diagnosed bronchial asthma cases were observed in children, aligning with global trends. This study agrees that air pollutant emissions from stationary sources are a cause of bronchial asthma.

Regarding the characteristics of school-age children, the results (Table 2) demonstrated that the mean age of the children was 8.31 ± 1.06 years, with more than two-thirds being between 6 and 9 years old. Additionally, less than two-thirds were males in educational levels from first to third grade. Less than two-thirds had two children per room, most lived in urban areas, and more than two-fifths had a family history of smoking. This finding about children developing asthma in families with smoking members is supported by **Mohammed et al. (2020)** in their study titled “Prevalence of Bronchial Asthma among School-Aged Children in Elmaraghah Center in Sohag

Governorate," which showed that children exposed to smoking had 1.7 times the risk of developing asthma compared to those who were not exposed. This result is also supported by **Muchlis et al. (2023)** in their recent study entitled "Cigarette Smoke Exposure and Stunting Among Under-Five Children in Rural and Poor Families in Indonesia," which indicated that more than two-thirds (71%) of children living with smoking parents were affected.

The current research revealed a statistically significant positive correlation between the total knowledge of parents, their overall quality of life, and the quality of life of their school-age children. Additionally, a highly significant positive correlation was identified between the overall quality of life of parents and that of their school-age children. These findings align with the results of **Fathala et al. (2022),** who also reported a highly significant positive correlation between parents' quality of life and that of their school-age children.

The study proposed that family-centered empowerment programs would have a beneficial effect on the quality of life for both asthmatic children and their parents. The results supported this hypothesis, indicating an improvement in the quality of life for children following the implementation of the parental empowerment program. From the researcher's perspective, this enhancement can be attributed to the program's emphasis on empowering parents through educational sessions. These sessions equipped parents with vital knowledge and skills necessary for effective asthma self-management, leading to a decrease in acute episodes and improved control of trigger factors, which ultimately resulted in favorable health outcomes.

In a related study, **Taib et al. (2021)** found that a significant number of parents reported considerable improvements in both asthma control and the quality of life of their school-age children after engaging in a family-based asthma self-management program. The researchers attributed these positive results to the effectiveness of the parental empowerment program, which enhanced parental knowledge regarding bronchial asthma.

CONCLUSION

The findings of the current study indicate that the empowerment program led to a significant enhancement in parents' overall knowledge. Moreover, there was a notable improvement in the quality of life for both parents and their children following the implementation of the program. A highly significant positive correlation was identified between parents' total knowledge and their quality of life, as well as that of their school-age children ($p = .001$). Additionally, a strong positive correlation was observed between parents' overall quality of life and their children's total quality of life ($p = .005$), along with a significant correlation between parents' quality of life and their children's overall quality of life ($p = .003$).

Recommendations

In the light of the finding of this study, the following points are recommended:

A continuous health education program every season in the center of chest disease about bronchial asthma, periodic prevention programs, and reorientation sessions about bronchial asthma for children and parents are required to keep the positive effect of the education program that can be attained through a well-organized follow-up. Make posters or banners about practices of bronchial asthma and prevention. Future research is required to evaluate a health education program about bronchial asthma in the center chest around the country to confirm the result.

Limitations of the study

The study was conducted with a limited sample size within a specific geographical region, which may affect the generalizability of the findings. While the results provide insights, they may not fully represent the broader population of children with bronchial asthma. The use of self-reported questionnaires from both children and parents introduced potential response biases, as participants

might have provided socially desirable answers, impacting the accuracy and reliability of the data. Additionally, uncontrollable factors such as the severity of asthma, socio-economic conditions, and family educational backgrounds may have influenced the results and should be considered in future research.

Authors' Contributions

S.M.A planned the study and prepared the manuscript, Writing the original and final manuscript drafts, educational program training, and administration. H.R.T Supervised, reviewed and interpreted data and the manuscript. S.S.I Conceptualization, Methodology, Data curation. Both H.R.T and S.S.I reviewed and interpreted of data and the manuscript. The author(s) read and approved the final manuscript.

Conflict of Interests

The authors affirm that they have no known conflicts of interest or competing financial interests that could have influenced the conduct or findings of this research.

Acknowledgements

The authors express their gratitude and appreciation to all children who contributed to this study, and their caregivers involved in the research.

REFERENCES

- Abd-El Aziz, S., Abdel-Salam, A., & Mohamed El Sayed Sharshour, S. (2023). Effect of Educational Program Based on PRECEDE PROCEED Model on Mothers' Performance Regarding Care of Children with Asthma. Egyptian Journal of Health Care, 14(3), 972–988. DOI: 10.21608/ejhc.2023.326186
- Abdel-Hameed, A., Bahgat, S., & Abo-Zaid, A. (2021). Assessment of Quality of Life of Asthmatic Children Attending the Outpatient Clinic in Zagazig University Hospital (Quality of Life of Asthmatic Children, 27(6):1050–1056. DOI 10.21608/zumj.2019.15945.1425
- Adamu Aliyu, D., Akashah Patah Akhir, E., Saidu, Y., Adamu, S., Ismail Umar, K., Sadiq Bunu, A., & Mamman, H. (2024). Optimization techniques for asthma exacerbation prediction models: A systematic literature review. *IEEE Access: Practical Innovations, Open Solutions*, *12*, 110862–110890. https://doi.org/10.1109/access.2024.3440502
- Agrawal, S., Iqbal, S., Patel, S. J., Freishtat, R., & Kochhar-Bryant, C. (2021). Quality of life in at-risk school-aged children with asthma. Journal of Asthma, 58(12).1680-1688. DOI: 10.1080/02770903.2020.1825732
- Aps, J., Lim, L. Z., Tong, H. J., Kalia, B., & Chou, A. M. (2020). Diagnostic efficacy of and indications for intraoral radiographs in pediatric dentistry: a systematic review. European archives of pediatric dentistry: official journal of the European Academy of Pediatric Dentistry, 21(4), 429–462. DOI: /10.1007/s40368-020-00532-y
- Beemer. L. R., Lewis. T. C., Ajibewa, T. A., Dopp, R., B Eisman, A., & Hasson, A. (2022). Classroom-Based Strategies to Reduce Physical Activity among Children with Asthma. Prevention Science, 23(4), 587–597. DOI: 10.1007/s11121-022-01347-7

- Centers for Disease Control and Prevention, (2020): National Health Interview Survey data, Department of Health & Human Services, USA. Retrieved from: https://www.cdc.gov/asthma/nhis/209/data.htm
- Čibirkaitė, A., Bubnaitienė, V., Hansted, E., Gurskis, V., & Vaidelienė, L. (2024). Quality-of-life assessment in children with mild to moderate bronchial asthma. *Medicina (Kaunas, Lithuania)*, *60*(5), 771. https://doi.org/10.3390/medicina60050771
- Fathala, A., Okby, O., Mansour, E., & Hassan, R. (2022). Effect of Parents' Empowerment on Quality of Life among School-Aged Children with Bronchial Asthma. Menoufia Nursing Journal, 7(2), 95-110. DOI: 10.21608/menj.2022.262794
- Hart, J. L., Turnbull, A. E., Oppenheim, I. M., & Courtright, K. R. (2020). Family-centered care during the COVID-19 era—journal of pain and symptom management, 60(2), e93-e97. DOI: 10.1016/j.jpainsymman.2020.04.017
- Ismail, S. S., & El-Mohsen, A. S. A. (2012). Headache in school-age children and its possible related expected predisposing factors: an assessment study. LIFE SCIENCE JOURNAL-ACTA ZHENGZHOU UNIVERSITY OVERSEAS EDITION, 9(1), 617-627.
- MacGeorge, C. A., King, K., Andrews. A. L... Sterba, K., Johnson, E., Brinton, D. L, & Ford, D. (2022). School nurse perception of asthma care in school-based telehealth. Journal of Asthma, 59(6), 1248-1255. DOI: 10.1080/02770903.2021.1904978
- Mittal, P., Kalra, S., Dadhich, A., & Ajmera, P. (2024). Empowering children for better health with child-to-child approach: a systematic literature review. *Health Education (Bradford, West Yorkshire, England)*, *124*(1/2), 63–85. https://doi.org/10.1108/he-09-2023-0093
- Mohammed, M., ABDELAKHER, A., SHOKRY, D., & SAFAA, A. (2020). Prevalence of bronchial asthma among school aged children in Elmaraghah Center in Sohag Governorate. The medical journal of cairo university, 88(June), 1097-1101. DOI: 10.21608/MJCU.2020.110846
- Muchlis, N., Yusuf, R. A., Rusydi, A. R., Mahmud, N. U., Hikmah, N., Qanitha, A., & Ahsan, A. (2023). Cigarette Smoke Exposure and Stunting Among Under-five Children in Rural and Poor Families in Indonesia. Environmental health insights, 17, 11786302231185210. https://doi.org/10.1177/11786302231185210
- Serebrisky, D., and Wiznia, A. (2019). Pediatric Asthma: A Global Epidemic, 85(1): 1–6. Shields, L. (2015): What is Family Centered Care? 3(2)139. DOI: 10.5750/ejpch. v3i2.993
- Simões, J., Batista, M., & Tilley, P. (2022). The Immune Mechanisms of Severe Equine Asthma-Current Understanding and What Is Missing. Animals, 12(6), 744. https://doi: 10.3390/ani12060744
- Taib, F., Isa, R., KPubalan, J., & Mansor, W. (2021). The Effect of Paediatric Asthma Education Programme (Paep) on Use of Inhaler and the Health-related Quality of Life of Asthmatic Children Caregiver in Hospital Universiti Sains Malaysia. Malaysian Journal of Medicine & Health Sciences, 17(3). https://medic.upm.edu.my/upload/dokumen/2021061417152216_2020_1188.pdf

- Taminskiene, V., Alasevicius, T., Valiulis, A., Vaitkaitiene, E., Stukas, R., and Hadjipanayis, A. (2019). Quality of life of the Family of children with Asthma is unrelated to asthma severity, 178-369. DOI: 10.1007/s00431-018-3306-8
- Thorpe, K., Panthi, N., Houen, S., Horwood, M., & Staton, S. (2024). Support to stay and thrive: mapping challenges Australia's early years' educators face to the national workforce strategy 2022–2031. The Australian Educational Researcher, 51(1), 321–345. DOI: 10.1007/s13384-022-00607-3
- Volosovets, O., Bolbot, Y., Kryvopustov, S., Mozyrska, O., Kryvopustova, M., Prokhorova, M., & Kupkina, A. (2020). Bronchial Asthma in children of Ukraine: medical and environmental parallels of morbidity and prevalence. Medicni perspektivi, 25(3), 184-191. DOI: 10.26641/2307-0404.2020.3.214861