RESEARCH PAPER

Effectiveness of Structured Teaching Program on Knowledge Regarding Asthma Management of Children among School Teachers in Selected Schools: A Quasi Experimental Study

Ms. Diksha Dinesh Kamble[1*], Ms. Bincy K. P.[2], Ms. Namrata Perkawar[3], Ms. Trusha Lambat[4]

[1]M.Sc. Nursing, Department of Pediatric Nursing, VSPM Madhuribai Deshmukh Institute of Nursing Education, Nagpur, Maharashtra University of Health Sciences, Nashik (MUHS) Maharashtra, India.

[2]Associate professor and HOD of Child Health Nursing, Department of Pediatric Nursing , VSPM Madhuribai Deshmukh Institute of Nursing Education, Nagpur, Maharashtra University of Health Sciences, Nashik (MUHS) Maharashtra, India.

[3]Assistant professor ,Department of Pediatric Nursing, VSPM Madhuribai Deshmukh Institute of Nursing Education, Nagpur, Maharashtra University of Health Sciences, Nashik (MUHS) Maharashtra, India.

[4]Assistant professor, Department of Pediatric Nursing, VSPM Madhuribai Deshmukh Institute of Nursing Education, Nagpur, Maharashtra University of Health Sciences, Nashik (MUHS) Maharashtra, India.

*Corresponding author: Diksha Dinesh Kamble

Received: 25th Aug, 2026 | Revised: 1st Sep, 2026 | Accepted: 5th Sep, 2026 | Available Online: 7th Oct, 2026

ABSTRACT

Asthma is one of the most common chronic respiratory conditions affecting children and may cause acute episodes requiring prompt recognition and appropriate management. Since children spend a substantial amount of time at school, teachers can play an important role in identifying asthma symptoms, providing immediate assistance, and supporting children with asthma. Improving teachers' knowledge through structured education may enhance preparedness and promote safer asthma management in school settings.

Objectives: The study aimed to assess the effectiveness of a structured teaching program on knowledge regarding asthma management of children among school teachers in selected schools and to determine the association between pre-test knowledge scores and selected demographic variables.

Methods: A quantitative approach with a quasi-experimental one-group pre-test–post-test design was adopted. A total of 100 school teachers were selected using a non-probability convenience sampling technique. Data were collected using a demographic data sheet and a 30-item self-administered structured knowledge questionnaire. The reliability coefficient of the questionnaire was r = 0.967. After the pre-test, participants received a structured teaching program regarding asthma management, and the post-test was conducted seven days later. Descriptive and inferential statistics were used for analysis.

Results: In the pre-test, 64% of school teachers had good knowledge and 36% had average knowledge. The mean pre-test knowledge score was 12.72 ± 1.90. In the post-test, 65% had very good knowledge and 35% had excellent knowledge, with a mean score of 23.78 ± 1.17. The mean difference was 11.06 ± 2.03. The calculated paired t-value was 54.23, with p = 0.0001, indicating a statistically significant improvement. Pre-test knowledge was significantly associated with age and educational status, while other selected demographic variables showed no significant association.

Conclusion: The structured teaching program was highly effective in improving school teachers' knowledge regarding asthma management in children. Regular educational programs for teachers may strengthen school-based asthma care and improve preparedness for asthma-related emergencies.

Key words: Asthma management; Children; School teachers; Structured teaching program; Knowledge.

How to cite this article: Diksha Dinesh Kamble, Bincy K. P., Namrata Perkawar, Trusha Lambat. Effectiveness of Structured Teaching Program on Knowledge Regarding Asthma Management of Children among School Teachers in Selected Schools: A Quasi Experimental Study. Int J Drug Deliv Technol. 2026;16(89s):1625-1630. DOI: 10.25258/ijddt.16.89s.169

INTRODUCTION

Asthma is a heterogeneous chronic respiratory disorder characterized by airway inflammation, variable expiratory airflow limitation, bronchial hyper-responsiveness, and recurrent episodes of wheezing, breathlessness, chest tightness, and cough. It is one of the most common non-communicable diseases and the most frequent chronic respiratory condition affecting children. According to the World Health Organization (WHO), an estimated 363 million people were living with asthma globally in 2023, with approximately 442,000 deaths attributable to the disease. The burden is disproportionately greater in low- and lower-middle-income countries because of underdiagnosis, undertreatment, environmental

exposures, and inadequate access to appropriate therapy [1].

Childhood asthma represents an important public health and educational concern. Global Burden of Disease 2021 estimates indicated approximately 95.7 million cases of asthma among children aged 0–14 years, corresponding to an age-standardized prevalence of about 4,758 per 100,000 children. Children aged 5–9 years demonstrated particularly high prevalence [2]. In India, a systematic review and meta-analysis involving 167,626 children across 33 studies estimated the pooled prevalence of childhood asthma at 7.9% (95% CI: 6.3–9.6%), while school-based studies showed a prevalence of 7.6%. Prevalence was comparatively higher among boys and children living in urban areas [3].

Asthma affects not only physical health but also sleep, concentration, participation in physical activity, school attendance, academic performance, and quality of life. Acute exacerbations may develop suddenly during school hours following exposure to exercise, dust, smoke, allergens, respiratory infections, or other triggers. Because children spend a considerable portion of their waking hours in school, teachers may be among the first adults required to recognize worsening asthma and initiate appropriate assistance.

Current asthma-management recommendations emphasize symptom recognition, avoidance of preventable triggers, appropriate inhaler therapy, correct inhaler technique, and individualized asthma action plans [4]. Therefore, strengthening school teachers' knowledge regarding childhood asthma is an important component of creating a safe and supportive school environment.

Need for the Study

Effective asthma management in children requires early recognition of symptoms, appropriate use of prescribed reliever medication, prompt management of acute exacerbations, and timely referral when severe respiratory distress occurs. School teachers play an important role in ensuring children's safety because they supervise students during classroom activities, sports, and other school-related events. However, inadequate knowledge and limited preparedness among teachers may delay appropriate responses during asthma emergencies.

A 2023 study involving 207 primary school teachers reported that 63.8% had unsatisfactory asthma knowledge, particularly regarding routine asthma medications and the management of acute attacks [5]. Similarly, Sapien et al. found that a one-hour educational session improved teachers' general asthma knowledge from 60% to 70% and increased their ability to recognize respiratory distress from 66.7% to 88.9% [6]. Kawafha and Tawalbeh also demonstrated significantly higher knowledge scores among teachers receiving asthma education compared with controls [7]. Furthermore, Al Aloola et al. reported improvements in teachers' asthma awareness and first-aid competence following a school-based educational programme [8].

These findings highlight the importance of structured educational interventions for school teachers. Assessing existing knowledge and identifying its association with selected demographic variables can help determine specific learning needs. Therefore, the present study aims to assess the effectiveness of a structured teaching programme on knowledge regarding asthma management in children among school teachers in selected schools using a quasi-experimental one-group pre-test–post-test design.

Scholar's View

From the scholar's perspective, asthma management education for school teachers is an essential component of child safety and school health promotion. Teachers should possess adequate knowledge to identify early warning signs, recognize respiratory distress, understand prescribed asthma medications, and initiate appropriate actions during an acute exacerbation. The reviewed studies indicate that educational interventions can improve asthma-related knowledge, symptom recognition, and first-aid competence among teachers [5–8]. A structured teaching programme may therefore help address knowledge gaps through systematic and standardized instruction. Evaluating its effectiveness can provide useful evidence for planning school-based asthma education and strengthening teachers' preparedness for asthma emergencies.

Aim

To assess the effectiveness of structured teaching program on knowledge regarding asthma management of children among school teachers in selected schools.

OBJECTIVES

Primary Objective

To assess the pre-test and post-test knowledge score regarding asthma management of children among school teachers in selected schools with selected demographic variables.

Secondary Objectives

1. To evaluate the effectiveness of a structured teaching program on knowledge regarding asthma management of children among school teachers in selected schools.
2. To associate the pre-test knowledge score regarding asthma management of children among

school teachers in selected schools with selected demographic variables.

RESEARCH METHODOLOGY

Objectives: To assess the knowledge regarding asthma management in children among school teachers before and after the structured teaching program; to evaluate the effectiveness of the structured teaching program by comparing pre-test and post-test knowledge scores; and to determine the association between pre-test knowledge scores and selected demographic variables.

Research Approach and Design: A quantitative research approach was adopted using a quasi-experimental, one-group pre-test–post-test design ($O_1 \rightarrow X \rightarrow O_2$).

Sample and Sample Size: The sample consisted of 100 school teachers from selected schools who fulfilled the eligibility criteria.

Sampling Technique: A non-probability convenience sampling technique was used to select the participants.

Tool Description: Data were collected using a structured tool comprising two sections. Section A included seven demographic variables: age, gender, educational qualification, working experience, area of residence, school location, and monthly family income. Section B consisted of a 30-item self-administered multiple-choice questionnaire assessing knowledge regarding asthma management in children. Each correct answer received one mark, with a maximum possible score of 30. Content and construct validity were assessed by 29 experts.

Reliability: The questionnaire's reliability was assessed using Karl Pearson's correlation coefficient among 10 participants, yielding \(r = 0.967\), indicating high reliability.

Pilot Study: A separate pilot study was not explicitly reported in the provided methodology. The 10 participants used for reliability testing should not be described as a pilot-study sample unless a pilot study was actually conducted.

Data Collection and Analysis: Data were collected from 12 to 18 November 2025. The structured teaching program was administered after the pre-test, and the post-test was conducted seven days later. Descriptive statistics, the paired t-test, and the Chi-square test were used for analysis, with statistical significance set at ($p < 0.05$)

RESULT

Demographic characteristics of School Teachers

The demographic findings showed that the largest proportion of school teachers, 42.0%, were aged 25–35 years, followed by 25.0% in the 35–45 years age group, 23.0% below 25 years, and 10.0% above 45 years. The majority of participants were female (90.0%), while 10.0% were male.

Regarding educational status, more than half of the school teachers, 54.0%, had a Diploma in Education, 27.0% had a Bachelor of Education, and 19.0% had a Master of Education. In relation to work experience, the majority, 58.0%, had 2–4 years of experience, followed by 26.0% with less than one year, 9.0% with 5–7 years, and 7.0% with more than seven years of experience.

Most participants, 92.0%, resided in urban areas, while 8.0% were from rural areas. All the school teachers, 100%, were working in schools located in urban areas.

With regard to monthly family income, more than half of the participants, 51.0%, had a monthly income of ₹20,001–₹30,000, followed by 28.0% earning more than ₹30,001, 18.0% earning ₹10,001–₹20,000, and 3.0% earning below ₹10,000. Overall, the study population was predominantly female, urban-dwelling, diploma-qualified, and relatively early in their teaching careers.

Assessment of Level of the Pre Test Knowledge Score Regarding Asthma Management of Children Among School Teachers in Selected Schools

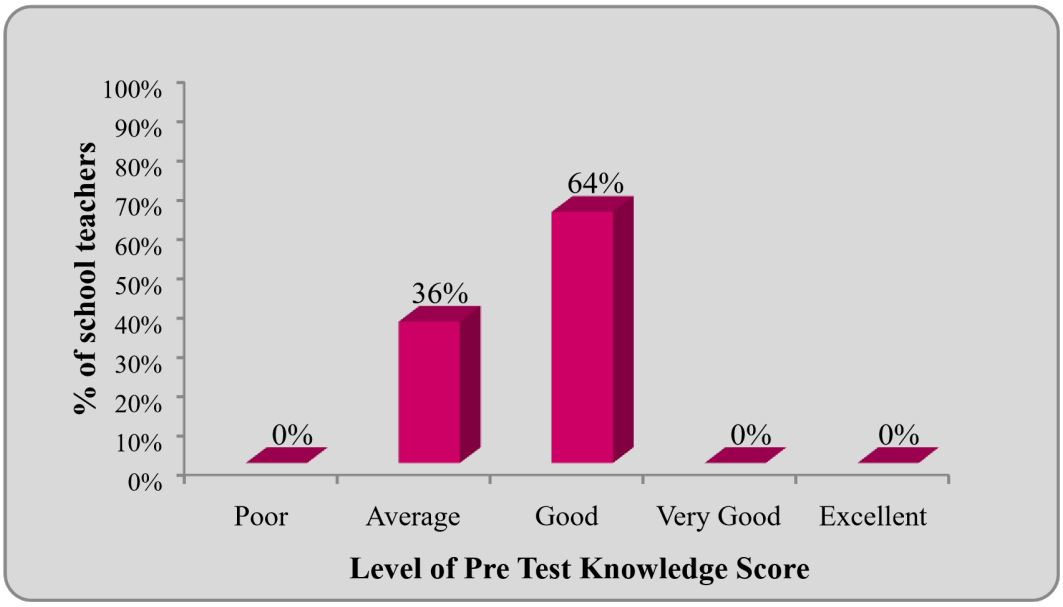


Fig.1: assessment of level of the pre test knowledge score regarding asthma management of children

Figure 1 shows the pre-test knowledge level of school teachers regarding asthma management in children. The majority of school teachers, 64 (64%), had a good level of knowledge, while 36 (36%) had an average level of knowledge. None of the participants had poor, very good, or excellent knowledge in the pre-test.

The pre-test knowledge scores ranged from a minimum of 8 to a maximum of 16 out of 30. The overall mean pre-test knowledge score was 12.72 ± 1.90, with a mean percentage knowledge score of 42.40 ± 6.34%.

These findings indicate that although the majority of school teachers had a good level of knowledge, their overall mean knowledge regarding asthma management in children was relatively limited before administration of the structured teaching program.

Assessment of Level of the Post Test Knowledge Score Regarding Asthma Management of Children among School Teachers in Selected Schools

Table.1: Assessment of level of the post test knowledge score regarding asthma management of children among school teachers in selected schools

n= 100

Level of knowledge score	Score Range	Level of Knowledge Score	
		Frequency (f)	Percentage(%)
Poor	0-6	0	0
Average	7-12	0	0
Good	13-18	0	0
Very Good	19-24	65	65
Excellent	25-30	35	35
Minimum score		20	
Maximum score		26	
Mean knowledge score		23.78 ± 1.17	
Mean % Knowledge Score		79.26 ± 3.92	

Table 1 shows the post-test knowledge level of school teachers regarding asthma management in children. The majority of school teachers, 65 (65%), had a very good level of knowledge, while 35 (35%) had an excellent level of knowledge. None of the participants had poor, average, or good knowledge in the post-test.

The post-test knowledge scores ranged from a minimum of 20 to a maximum of 26 out of 30. The overall mean post-test knowledge score was 23.78 ± 1.17, with a mean percentage knowledge score of 79.26 ± 3.92%. These findings indicate a marked improvement in the knowledge of school teachers regarding asthma management in children following the structured teaching program.

Evaluation of the Effectiveness of Structured Teaching Programme on Knowledge Regarding Asthma Management of Children among School Teachers from Selected Schools

Table.2: Significance of difference between knowledge score in pre and post test of School Teachers n=100

Test	Mean	SD	Mean Difference	Tabulated value	t-value	p-value
Pre Test	12.72	1.90	11.06±2.03	1.98	54.23	0.0001 S,p<0.05
Post Test	23.78	1.17				

Table 2 shows the comparison between the pre-test and post-test knowledge scores of school teachers regarding asthma management in children. The mean pre-test knowledge score was 12.72 ± 1.90, which increased to 23.78 ± 1.17 in the post-test. The mean difference between the pre-test and post-test scores was 11.06 ± 2.03.

The calculated paired t-value was 54.23, which was much higher than the tabulated value of 1.98. The obtained p-value was 0.0001, which was statistically significant at $p<0.05$.

Therefore, the findings indicate a highly significant improvement in the knowledge scores of school teachers after administration of the structured teaching program. Hence, the structured teaching program was found to be effective in improving knowledge regarding asthma management in children among school teachers in selected schools.

Association of Level of Pre Test Knowledge Score Regarding Asthma Management of Children among School Teachers in Selected Schools in Relation to their Demographic Variables

The analysis of the association between pre-test knowledge scores regarding asthma management in children and selected demographic variables showed that age and educational status were significantly associated with the pre-test knowledge scores of school teachers.

For age, the calculated F-value was 3.32 with $p = 0.002$, which was statistically significant at $p<0.05$. Similarly, educational status showed a significant association with pre-test knowledge, with an F-value of 6.07 and $p = 0.002$.

However, no statistically significant association was observed between pre-test knowledge scores and gender ($t = 1.37$, $p = 0.17$), working experience ($F = 0.84$, $p = 0.44$), area of residence ($t = 0.53$, $p = 0.59$), or monthly family income ($F = 0.45$, $p = 0.71$), as all these p-values were greater than 0.05.

The association with location of the school could not be tested because all participants were from schools located in urban areas, resulting in no variability in this demographic characteristic.

Overall, the findings indicate that age and educational status were the only demographic variables significantly associated with pre-test knowledge regarding asthma management in children among school teachers.

DISCUSSION

The present study demonstrated that the structured teaching program was highly effective in improving school teachers' knowledge regarding asthma management in children. Before the intervention, 64% of teachers had good knowledge and 36% had average knowledge, while none had very good or excellent knowledge. The mean pre-test knowledge score was 12.72 ± 1.90. Following the structured teaching program, 65% of teachers achieved very good knowledge and 35% achieved excellent knowledge. The mean post-test score increased to 23.78 ± 1.17, with a mean difference of 11.06 ± 2.03. The calculated paired t-value of 54.23 ($p=0.0001$) confirmed a statistically significant improvement.

These findings are consistent with Kawafha and Tawalbeh [7], who conducted a randomized controlled trial among school teachers. Teachers who participated in three asthma educational sessions demonstrated significantly higher asthma knowledge at both post-tests compared with the control group ($p<0.001$), confirming the effectiveness of planned asthma education for teachers.

Similarly, Korta Murua et al. [9] reported a significant improvement in teachers' asthma knowledge after an educational intervention. Their mean knowledge score increased from 16.1 ± 3.4 before intervention to 22.3 ± 4.1 after intervention, and the improvement remained significant after three months ($p<0.001$).

Comparable findings were reported by Al Aloola et al. [8], who evaluated a school-based asthma educational program. Teachers' median asthma awareness score increased from 11 to 15 ($p<0.001$), while competence in asthma-related first aid increased markedly from 1.4 ± 2.3 to 9.8 ± 0.5 ($p<0.001$).

The present study also found that pre-test knowledge was significantly associated with age and educational status, whereas gender, working experience, area of residence, and monthly family income were not significantly associated. Overall, the present findings and previous studies consistently indicate that structured educational interventions can substantially improve teachers' knowledge and preparedness for managing childhood asthma, supporting the inclusion

of regular asthma-management training within school health programs.

CONCLUSION

The present study was conducted to assess the effectiveness of a structured teaching program on knowledge regarding asthma management in children among school teachers in selected schools. The findings showed that, before the intervention, most teachers had only average to good knowledge regarding childhood asthma management. None of the participants had very good or excellent knowledge at the pre-test stage.

After administration of the structured teaching program, a substantial improvement was observed in the knowledge level of the school teachers. The majority achieved very good knowledge, while the remaining participants attained an excellent level of knowledge. The significant increase in the mean post-test knowledge score compared with the pre-test score confirmed that the structured teaching program was effective in improving teachers' knowledge regarding asthma management in children.

The study also revealed that pre-test knowledge was significantly associated with age and educational status, whereas gender, working experience, area of residence, and monthly family income were not significantly associated with knowledge scores.

Overall, the study concludes that structured and planned educational interventions are effective in enhancing school teachers' preparedness to recognize and manage asthma-related problems in children. Regular asthma education and training for school teachers may contribute to timely identification, appropriate first-response management, and improved safety of children with asthma in school settings.

Conflict of Interest: The authors certify that they have no involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

Funding Source: There is no funding Source for this study.

REFERENCES

1. World Health Organization. Asthma. Geneva: World Health Organization; 2026.
2. Zheng J, Jin YJ, Wang CH, Feng C, Lai XY, Hua SQ, et al. Global, regional, and national epidemiology of allergic diseases in children from 1990 to 2021: findings from the Global Burden of Disease Study 2021. BMC Pulm Med. 2025;25:54. doi:10.1186/s12890-025-03518-y.
3. Daniel RA, Aggarwal P, Kalaivani M, Gupta SK. Prevalence of asthma among children in India: a systematic review and meta-analysis. Lung India. 2022;39:357-367. doi:10.4103/lungindia.lungindia_706_21.
4. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention: 2026 GINA Strategy Report. Fontana, WI: Global Initiative for Asthma; 2026.
5. Brosso L, Zonta JB, Levada AF, Barbosa NG, Lima RAG, Okido ACC. Knowledge and experience of Primary Education teachers regarding childhood asthma: mixed study. Rev Esc Enferm USP. 2023;57. doi:10.1590/1980-220X-REEUSP-2022-0329en.
6. Sapien RE, Fullerton-Gleason L, Allen N. Teaching school teachers to recognize respiratory distress in asthmatic children. J Asthma. 2004;41(7):739-743. doi:10.1081/JAS-200027983.
7. Kawafha MM, Tawalbeh LI. The effect of asthma education program on knowledge of school teachers: a randomized controlled trial. West J Nurs Res. 2015;37(4):425-440. doi:10.1177/0193945914528070.
8. Al Aloola NA, Saba M, Nissen L, Alewairdhi HA, Alaloola A, Saini B. Development and evaluation of a school-based asthma educational program. J Asthma. 2017;54(4):419-429. doi:10.1080/02770903.2016.1218015.
9. Korta Murua J, Pérez-Yarza EG, Pértega Díaz S, Aldasoro Ruiz A, Sardón Prado O, López-Silvarrey Varela A, et al. Impact of an asthma educational intervention programme on teachers. An Pediatr (Barc). 2012;77(4):236-246. doi:10.1016/j.anpedi.2012.02.017
10. Sapien, R. E., Fullerton-Gleason, L., & Allen, N. (2004). Teaching school teachers to recognize respiratory distress in asthmatic children. Journal of Asthma, 41(7), 739–743. https://doi.org/10.1081/JAS-200027983 PubMed