



Original Research Article

EFFECTIVENESS OF A NURSE-LED EDUCATIONAL INTERVENTION ON KNOWLEDGE AND HEALTHY LIFESTYLE PRACTICES AMONG UPPER-PRIMARY SCHOOL CHILDREN IN A SELECTED COMMUNITY SCHOOL IN WEST BENGAL, INDIA

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ABSTRACT

Background: Healthy lifestyle behaviours established during childhood can influence health and well-being throughout the life course. Schools provide an important setting for health promotion because they offer sustained access to children during a formative period of behavioural development. Nurses can contribute to school health promotion through structured education and reinforcement of healthy behaviours. The objective is to evaluate the effectiveness of a nurse-led educational intervention on knowledge and healthy lifestyle practices among upper-primary school children.

Materials and Methods: A pre-experimental, one-group pre-test–post-test design was adopted among 60 upper-primary school children in a selected community school in West Bengal, India. Participants were recruited using convenience sampling during January–March 2026. Baseline knowledge and healthy lifestyle practices were assessed before the intervention. A structured nurse-led educational intervention was delivered through three classroom-based sessions of approximately 45 minutes each. Post-intervention assessments were conducted using the same instruments. Data were analysed using descriptive statistics and paired-samples t-tests. Associations between selected sociodemographic characteristics and baseline outcomes were assessed using the chi-square test.

Results: The mean knowledge score increased from 12.4 ± 3.1 at pre-test to 18.7 ± 2.6 at post-test, with a mean improvement of 6.3 points (95% CI: 5.4–7.2; $p < 0.001$). The mean healthy lifestyle practice score increased from 42.6 ± 6.8 to 52.3 ± 5.9 , with a mean improvement of 9.7 points (95% CI: 8.5–10.9; $p < 0.001$). Large effect sizes were observed for knowledge (Cohen's $d = 2.18$) and practice (Cohen's $d = 1.53$). Age, class, residence, and socioeconomic status were significantly associated with baseline knowledge and practice scores.

Conclusion: The findings suggest that a structured nurse-led educational intervention may improve knowledge and reported healthy lifestyle practices among upper-primary school children. School-based nurse-led health education may therefore be a useful approach for strengthening health promotion during childhood. Further controlled studies with larger samples and longer follow-up are warranted.

Keywords: healthy lifestyle; school health; nurse-led intervention; health education; children; knowledge; lifestyle practices.

INTRODUCTION

Healthy behaviours established during childhood can influence health trajectories across the life course. Dietary habits, physical activity, sedentary behaviour, sleep, hygiene, and other daily practices are shaped by individual, family, school, and community environments. Consequently, early health promotion is increasingly recognized as an important component of preventing unhealthy behavioural patterns and supporting children's physical and psychosocial well-being.^[1-3]

Schools represent a strategic setting for health promotion because they provide sustained access to children during a formative period of behavioural development. School-based interventions can combine health education with opportunities for reinforcement and practical application. Nurses, through their health-promotion and educational roles, are well positioned to deliver interventions that translate health information into developmentally appropriate and actionable behaviours.^[4-6]

Knowledge is an important prerequisite for health-promoting behaviour, although increased knowledge does not necessarily result in behavioural change. Educational interventions that incorporate interactive teaching, practical examples, reinforcement, and age-appropriate communication may be more likely to influence both knowledge and reported lifestyle practices. Nurse-led interventions may also facilitate the integration of health education into routine school health activities.^[7-9]

Despite the importance of healthy lifestyle behaviours during childhood, evidence regarding the effectiveness of structured nurse-led educational interventions among upper-primary school children in community school settings remains limited. There is therefore a need to evaluate whether a targeted educational intervention can improve children's knowledge and healthy lifestyle practices.^[10-12]

The present study was undertaken to evaluate the effectiveness of a nurse-led educational intervention on knowledge and healthy lifestyle practices among upper-primary school children in a selected community school in West Bengal, India.^[13-15]

Aim: To evaluate the effectiveness of a nurse-led educational intervention on knowledge and healthy lifestyle practices among upper-primary school children.

Objectives

1. To assess the baseline level of knowledge and healthy lifestyle practices among upper-primary school children.
2. To administer a structured nurse-led educational intervention on healthy lifestyle practices among upper-primary school children.
3. To evaluate the effectiveness of the structured nurse-led educational intervention by comparing pre-intervention and post-intervention

knowledge and healthy lifestyle practice scores among upper-primary school children.

MATERIALS AND METHODS

Study Design: A pre-experimental, one-group pre-test-post-test design was adopted to evaluate the effectiveness of a structured nurse-led educational intervention on knowledge and healthy lifestyle practices among upper-primary school children. The design was represented as O₁-X-O₂, where O₁ denotes the pre-intervention assessment, X denotes the nurse-led educational intervention, and O₂ denotes the post-intervention assessment.

Study Setting and Participants: The study was conducted among upper-primary school children attending a selected community school in West Bengal, India. A total of 60 children participated in the study. Participants who met the predefined eligibility criteria and were available during the study period were recruited.

Eligibility Criteria

Children were eligible to participate if they:

- Were enrolled in the selected upper-primary school;
- Were aged 10–13 years;
- Were studying in the specified eligible classes;
- Were able to understand Bengali or English; and
- Were available during the study period.

Children who were absent during the intervention or either assessment, or who were unable to complete the study procedures, were excluded.

Sampling and Sample Size: A total of 60 upper-primary school children were recruited using a convenience sampling technique. Recruitment was conducted during January to March 2026. All eligible children who met the inclusion criteria and were available during recruitment were invited to participate.

The sample size was based on an a priori calculation for a paired pre-test-post-test comparison, using a two-sided significance level of 0.05, statistical power of 80%, and an anticipated moderate effect size. An allowance for approximately 10% attrition was considered. Based on these assumptions, a target sample of 60 participants was selected. All 60 recruited participants completed both the pre-intervention and post-intervention assessments.

Nurse-Led Educational Intervention

A structured nurse-led educational intervention was developed to provide age-appropriate information and practical guidance concerning healthy lifestyle practices.

The intervention covered:

- balanced and nutritious dietary practices;
- consumption of fruits and vegetables;
- regular physical activity;
- reduction of prolonged sedentary and screen-based behaviour;
- adequate sleep and healthy daily routines;
- personal hygiene;

- prevention of unhealthy lifestyle behaviours; and
- practical strategies for maintaining healthy habits at home and school.

The intervention was delivered by a nurse through three classroom-based sessions, each lasting approximately 45 minutes. The sessions provided age-appropriate education on healthy dietary habits, physical activity, personal hygiene, adequate sleep, and limiting sedentary behaviour.

Interactive teaching, demonstrations, audio-visual presentations, charts, demonstration materials, and informational leaflets were used. Each session included focused teaching, participant interaction, clarification of questions, and reinforcement of key health messages.

Outcome Measures

Knowledge: Knowledge regarding healthy lifestyle practices was assessed using a structured 30-item questionnaire covering dietary practices, physical activity, personal hygiene, sleep, and sedentary behaviour. Each correct response was awarded one point, while an incorrect or "don't know" response was scored zero. The total possible score ranged from 0 to 30, with higher scores indicating better knowledge.

Healthy Lifestyle Practices: Healthy lifestyle practices were assessed using a structured 25-item practice scale covering diet, physical activity, hygiene, sleep, and sedentary behaviour. Items were scored according to the predefined response and scoring system, with a total possible score ranging from 25 to 100. Higher scores indicated more favourable reported healthy lifestyle practices.

Validity and Reliability: The study instruments were reviewed for content validity by a panel of six experts with expertise in nursing, statistics, and public health. The experts evaluated the relevance, clarity, and appropriateness of the items.

The reliability of the instruments was assessed using Cronbach's alpha. The overall reliability coefficient was 0.86, indicating good internal consistency.

Data Collection Procedure: Following institutional permission and ethical approval, eligible children were enrolled in the study. Baseline demographic information and pre-test knowledge and healthy lifestyle practice assessments were completed before delivery of the intervention.

The nurse-led educational intervention was subsequently administered according to the predefined intervention protocol. Following

completion of the intervention and the specified follow-up interval, the same assessment instruments were administered as a post-test. All completed questionnaires were checked for completeness, coded, and entered for statistical analysis.

Ethical Considerations: Permission to conduct the study was obtained from the concerned school and/or community authorities. Written informed consent was obtained from parents or legal guardians, and child assent was obtained where applicable.

Participation was voluntary. Confidentiality and anonymity were maintained throughout the study, and participants were informed of their right to withdraw from the study without disadvantage.

Statistical Analysis: Data were analysed using IBM SPSS Statistics version 26.0. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize participant characteristics and study variables.

Pre-test and post-test knowledge and practice scores were compared using paired-samples t-tests. Mean differences and 95% confidence intervals were reported. Cohen's d was used to estimate the magnitude of the intervention effect. Associations between selected sociodemographic characteristics and baseline outcomes were assessed using the chi-square test after categorization of the outcome variables as appropriate. Statistical significance was set at $p < 0.05$.

RESULTS

Participant Characteristics: A total of 60 upper-primary school children participated in the study. Participants were aged 10–13 years, with 22 (36.7%) aged 10–11 years and 38 (63.3%) aged 12–13 years. There were 32 (53.3%) males and 28 (46.7%) females.

Most participants were from rural areas (58.3%) and nuclear families (61.7%). The largest proportion belonged to the OBC category (36.7%). Secondary education was the most frequently reported educational level among fathers (40.0%) and mothers (41.7%). Agriculture/farming was the most frequently reported paternal occupation (28.3%).

Forty percent of participants belonged to families with a monthly income of ₹10,000–20,000, while 56.7% belonged to the middle socioeconomic group.

Table 1: Sociodemographic characteristics of the participants (N = 60)

Sociodemographic variable	Category	n	%
Age (years)	10–11	22	36.7
	12–13	38	63.3
Sex	Male	32	53.3
	Female	28	46.7
Class	VI	20	33.3
	VII	20	33.3
	VIII	20	33.3
Residence	Rural	35	58.3
	Urban	25	41.7
Religion	Hindu	48	80.0

	Muslim	8	13.3
	Christian	4	6.7
Social category	General	18	30.0
	OBC	22	36.7
	SC	14	23.3
	ST	6	10.0
Type of family	Nuclear	37	61.7
	Joint/extended	23	38.3
Family size	≤4 members	24	40.0
	5–6 members	25	41.7
	≥7 members	11	18.3
Father's education	Primary or below	12	20.0
	Secondary	24	40.0
	Higher secondary	14	23.3
	Graduate or above	10	16.7
Mother's education	Primary or below	16	26.7
	Secondary	25	41.7
	Higher secondary	12	20.0
Father's occupation	Graduate or above	7	11.7
	Government service	8	13.3
	Private service	12	20.0
	Self-employed	15	25.0
	Agriculture/farming	17	28.3
Monthly family income (₹)	Other	8	13.3
	<10,000	18	30.0
	10,000–20,000	24	40.0
	20,001–30,000	12	20.0
	>30,000	6	10.0
Socioeconomic status	Lower	18	30.0
	Middle	34	56.7
	Upper	8	13.3

Knowledge Scores: The mean knowledge score increased from 12.4 ± 3.1 at pre-test to 18.7 ± 2.6 at post-test, with a mean improvement of 6.3 points (95% CI: 5.4–7.2). The paired-samples t-test

demonstrated a statistically significant improvement in knowledge scores following the intervention ($t = 14.2$, $p < 0.001$). The effect size was large (Cohen's $d = 2.18$).

Table 2: Comparison of pre-test and post-test knowledge scores

Outcome	Pre-test Mean $\pm$ SD	Post-test Mean $\pm$ SD	Mean Difference	95% CI	Test statistic	p-value	Effect size
Knowledge score	12.4 ± 3.1	18.7 ± 2.6	6.3	5.4–7.2	$t = 14.2$	<0.001	Cohen's $d = 2.18$

Healthy Lifestyle Practice Scores: The mean healthy lifestyle practice score increased from 42.6 ± 6.8 before the intervention to 52.3 ± 5.9 after the intervention, with a mean change of 9.7 points (95% CI: 8.5–10.9). The paired-samples t-test

demonstrated a statistically significant improvement in healthy lifestyle practice scores ($t = 16.1$, $p < 0.001$). The corresponding effect size was large (Cohen's $d = 1.53$).

Table 3: Comparison of pre-test and post-test healthy lifestyle practice scores

Outcome	Pre-test Mean $\pm$ SD	Post-test Mean $\pm$ SD	Mean Difference	95% CI	Test statistic	p-value	Effect size
Practice score	42.6 ± 6.8	52.3 ± 5.9	9.7	8.5–10.9	$t = 16.1$	<0.001	Cohen's $d = 1.53$

Association with Participant Characteristics

The association between selected sociodemographic characteristics and baseline knowledge and healthy lifestyle practice scores was assessed using the chi-square test.

Statistically significant associations were observed between age, class, residence, and socioeconomic status and baseline knowledge scores ($p < 0.05$).

Similarly, age, class, residence, and socioeconomic status were significantly associated with baseline healthy lifestyle practice scores ($p < 0.05$).

No statistically significant associations were observed between sex, religion, social category, or type of family and baseline knowledge or healthy lifestyle practice scores ($p > 0.05$).

Table 4: Association between selected characteristics and baseline outcomes

Characteristic	Knowledge χ^2	p-value	Practice χ^2	p-value
Age	8.24	0.016*	6.87	0.032*
Sex	1.92	0.166	2.31	0.128
Class	7.68	0.022*	8.94	0.011*
Residence	5.96	0.015*	4.21	0.040*
Religion	3.47	0.176	2.84	0.242

Social category	4.18	0.243	5.32	0.150
Type of family	1.63	0.202	2.76	0.097

Significant associations were observed between age, class, residence, and socioeconomic status and baseline knowledge and practice scores ($p < 0.05$).

DISCUSSION

The present study evaluated the effectiveness of a structured nurse-led educational intervention on knowledge and healthy lifestyle practices among upper-primary school children. The findings demonstrated significant improvements in both outcomes following the intervention.

Knowledge scores increased substantially from pre-test to post-test. This finding suggests that structured, age-appropriate health education delivered by a nurse can improve children's understanding of healthy lifestyle behaviours. The use of interactive teaching, demonstrations, audio-visual materials, and reinforcement may have contributed to improved retention and understanding of the educational content.

The improvement in healthy lifestyle practice scores is also noteworthy. Although knowledge alone does not necessarily result in behavioural change, the observed increase in reported practice scores suggests that the intervention may have helped children translate health information into everyday behaviours. Practical examples and repeated reinforcement may have facilitated this process.

The large effect sizes observed for both knowledge and practice indicate that the magnitude of improvement was substantial within the study sample. However, because the study used a one-group pre-test–post-test design without a comparison group, the findings should be interpreted cautiously. Changes could potentially have been influenced by factors other than the intervention, including exposure to other health information, maturation, or testing effects.

Significant associations were also observed between age, class, residence, and socioeconomic status and baseline knowledge and practice outcomes. These findings suggest that sociodemographic factors may influence children's access to health information and opportunities to practise healthy behaviours. Such factors should therefore be considered when designing school-based health education programmes.

The findings support the potential role of nurses in delivering structured health-promotion interventions within school settings. Nurses can provide developmentally appropriate education, reinforce healthy behaviours, identify gaps in knowledge, and collaborate with teachers and families to support sustained lifestyle changes.

Strengths of the Study: The study had several strengths. It addressed multiple dimensions of healthy lifestyle behaviour, including diet, physical activity, hygiene, sleep, and sedentary behaviour. The intervention incorporated interactive and

practical teaching approaches rather than relying solely on didactic education. In addition, both knowledge and reported lifestyle practices were assessed, allowing evaluation of changes beyond knowledge alone.

Limitations: The study has several limitations. The one-group pre-test–post-test design without a control group limits causal inference. Convenience sampling from a single school and the small sample size ($n = 60$) may limit the generalizability of the findings. Self-reported practice measures may be subject to recall and social-desirability bias. The short follow-up period also limits assessment of the sustainability of behavioural changes. Future studies should use randomized controlled designs, larger multisite samples, objective outcome measures, and longer follow-up periods.

Implications for Nursing Practice: The findings have implications for school and community nursing practice. Nurses can incorporate structured lifestyle education into routine school health programmes. Regular educational sessions addressing nutrition, physical activity, hygiene, sleep, and sedentary behaviour may help strengthen children's health knowledge and encourage healthier daily practices. Collaboration between nurses, teachers, parents, and community health personnel may further reinforce healthy behaviours. Nurses can also identify children who require additional health education or support and provide individualized guidance where appropriate.

CONCLUSION

The present study demonstrated significant improvements in knowledge and reported healthy lifestyle practice scores following a structured nurse-led educational intervention among upper-primary school children. The findings suggest that school-based nurse-led health education may be a useful strategy for promoting healthy lifestyle behaviours during childhood.

However, because the study used a one-group pre-test–post-test design and convenience sampling, the findings should be interpreted cautiously. Further research using controlled designs, larger samples, and longer follow-up is recommended to establish the effectiveness and sustainability of nurse-led lifestyle interventions among school-aged children.

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