Improving Knowledge of Healthy Eating Habits among Secondary School Students: An Action Research Study in Mysuru, Karnataka

Nandini K. V.[1] and Bettaswamy H. B.[2]

[1]Teacher Trainee, BGS B.Ed. College, Kuvempunagar, Mysuru, Karnataka, India | nandininavya18@gmail.com

[2]Assistant Professor, BGS B.Ed. College, Kuvempunagar, Mysuru, Karnataka, India | ravibettaswamy@gmail.com

Abstract

Healthy eating knowledge is an important component of adolescent health education. This action research study examined whether a structured classroom-based awareness activity was associated with improved knowledge of healthy eating habits among Grade 9 students at Gokula High School, Kuvempunagar, Mysuru, Karnataka. The sample comprised 20 students (10 girls and 10 boys). A pre-test was administered, an educational awareness intervention was conducted, and the same assessment approach was followed by a post-test. Scores were analysed using descriptive statistics and paired-samples t-tests. The overall mean score increased from 15.25 (SD = 2.20) at pre-test to 25.60 (SD = 2.62) at post-test, a mean gain of 10.35 points. The paired-samples test indicated a statistically significant increase, $t(19) = 20.75$, $p < .001$. Improvements were also observed among girls, $t(9) = 17.82$, $p < .001$, and boys, $t(9) = 12.53$, $p < .001$. These findings suggest that the educational activity was associated with improved test performance related to healthy eating. Given the small, single-school sample and the absence of a comparison group and follow-up assessment, the results should be interpreted cautiously and do not establish changes in students' actual dietary behaviour.

Keywords: action research, healthy eating, nutrition awareness, secondary school students, pretest and post-test

Introduction

Adolescence is a period of rapid physical, cognitive, and social development during which food preferences and eating routines can become increasingly independent. Schools provide an important setting for age-appropriate nutrition education because students can discuss food choices, balanced diets, meal patterns, and locally available nutritious foods in a structured learning environment. Nutrition education can help students recognize food groups and make informed choices about everyday foods.

Research conducted in Karnataka has documented concerns about adolescents' dietary patterns, including low consumption of fruits and green leafy vegetables and variation in meal-skipping and food choices. Mandolikar et al. (2019) examined dietary habits and family-related factors among adolescents in Mangaluru. Vijayalakshmi et al. (2022) described dietary patterns and health status among adolescents in rural Bengaluru. Rakshitha et al. (2024) reported food-consumption patterns among schoolchildren aged 10–16 years in Mysuru. These studies provide local context for nutrition education while showing that eating patterns are shaped by influences beyond the classroom.

School-based studies in other Indian settings have also examined dietary patterns and nutrition education. Kotecha et al. (2013) investigated dietary patterns among school-going adolescents in urban Baroda, while Rathi et al. (2017) described food-consumption patterns among adolescents aged 14–16 years in Kolkata. These

studies highlight concerns relating to food choices and meal patterns. The present study focuses on students' knowledge-test performance before and after a classroom-based awareness activity; it does not directly measure dietary behaviour, nutritional status, or health outcomes.

Review of Related Literature

Kotecha et al. (2013) investigated dietary patterns among school-going adolescents in urban Baroda, India. Their study considered food habits, food preferences, and meal patterns, providing evidence about the variety of foods consumed by adolescents in an urban Indian setting. The study is relevant because it shows the value of examining adolescents' everyday food choices when designing nutrition education. Its cross-sectional approach differs from the present study, which compares knowledge-test scores before and after an educational activity.

Rathi et al. (2017) examined food-consumption patterns among adolescents aged 14–16 years in Kolkata, India. The study explored consumption across food groups and reported concerns about fruit and vegetable consumption and the intake of energy-dense snack foods. This research provides a useful comparison for understanding food choices among secondary-school-age adolescents. It suggests that school nutrition education should address food preferences and everyday eating contexts rather than rely only on general advice.

Mandolikar et al. (2019) conducted a school-based cross-sectional study in Mangaluru, Karnataka, focusing on adolescents' dietary habits and family-related correlates. The study is especially relevant because it was conducted in Karnataka and highlights the influence of family and sociodemographic circumstances on dietary practices. Its findings reinforce the importance of recognising that students' food choices may be shaped by factors outside school, including household routines and access to different foods.

Vijayalakshmi et al. (2022) described dietary patterns and health status among adolescents in rural Bengaluru. Their study considered food patterns and nutritional indicators, providing regional evidence on adolescent nutrition. This work is relevant because it emphasises the importance of understanding dietary practices in relation to adolescent nutritional needs. However, the current action research measures knowledge-test scores and cannot draw conclusions about students' nutritional status.

Rakshitha et al. (2024) explored food-consumption patterns among schoolchildren aged 10–16 years in Mysuru. Because it was conducted in the same city, it provides important local context. Its focus on consumption patterns differs from the current study's focus on knowledge before and after a classroom-based awareness activity. Together, these studies help distinguish between understanding what students eat and assessing whether nutrition education is associated with improved knowledge.

Synthesis and research gap: The reviewed literature indicates that adolescent dietary practices are associated with food preferences, family circumstances, and the availability of different foods. Studies from Karnataka and other Indian settings establish the relevance of nutrition-related concerns among school-age adolescents. However, the studies differ in setting, sample, method, and outcome. The present study addresses a practical school-level question by examining whether students' knowledge-test scores improve following an educational awareness activity in a selected secondary school in Mysuru. Given its one-group pre-test–post-test design, the findings are interpreted as changes in measured knowledge rather than proof of changes in actual dietary behaviour.

Statement of the Problem

The study addressed the following problem: whether a structured educational awareness activity is associated with improved knowledge of healthy eating habits among Grade 9 students in a selected secondary school in Mysuru city.

Objectives

1. To assess students' knowledge of healthy eating habits before the educational intervention.
2. To implement an educational awareness activity on balanced diets and healthy food choices.
3. To compare students' pre-test and post-test scores following the intervention.
4. To describe pre-test and post-test score changes separately for girls and boys.

Research Question

Is there a statistically significant difference between students' pre-test and post-test scores after the educational awareness activity on healthy eating habits?

Methodology

Research Design

The study used a one-group pre-test–post-test action research design. Students completed a pre-test, participated in an educational awareness activity, and then completed a post-test. The design is suitable for examining change within the participating group.

Setting and Participants

The study was conducted at Gokula High School, Kuvempunagar, Mysuru, Karnataka. The sample comprised 20 students in Grade 9: 10 girls and 10 boys.

Instrument and Scoring

A knowledge test on healthy eating habits was used for the pre-test and post-test. The recorded scores indicate a maximum possible score of 30. The original report does not provide the test items, evidence of content validation, reliability estimates, or whether identical items were used at both administrations. These details should be documented in the final submission.

Action Research Intervention

The reported action plan included a questionnaire/survey on eating habits, games involving boys and girls, group discussions, and an awareness program on balanced diets and millets. The listed activity durations were 30 minutes, 1 hour, 45 minutes, and 1 hour, respectively. The report should clarify the actual sequence, delivery dates, facilitator, learning materials, attendance, and which activities occurred between the pre-test and post-test.

Stage	Activity reported	Duration reported
1	Survey/questionnaire on eating habits	30 minutes
2	Games involving boys and girls	1 hour
3	Group discussions	45 minutes
4	Awareness programme on balanced diet and millets	1 hour

Procedure

A pre-test was administered to assess students' initial knowledge. The educational awareness activities were then conducted, after which a post-test was administered. Individual pre-test and post-test scores were compared.

Data Analysis

Means and standard deviations were calculated for pre-test and post-test scores. Mean gain was calculated as post-test score minus pre-test score. Paired-samples t-tests were used to assess within-group score changes for

the full sample and separately for girls and boys. Tests were two-tailed; $p < .001$ is reported where applicable. Statistical significance should be interpreted alongside the small sample size and study design.

Results

Overall Pre-test and Post-test Scores

Assessment	N	Mean	SD	Mean gain
Pre-test	20	15.25	2.20	—
Post-test	20	25.60	2.62	10.35

The overall mean score increased from 15.25 (SD = 2.20) at pre-test to 25.60 (SD = 2.62) at post-test. The mean gain was 10.35 points out of 30. This corresponds to an increase from 50.83% to 85.33% of the maximum score, or 34.50 percentage points.

Gender-wise Descriptive Results

Group	N	Pre-test mean	Pre-test SD	Post-test mean	Post-test SD	Mean gain
Girls	10	17.00	1.49	27.10	2.13	10.10
Boys	10	13.50	1.08	24.10	2.23	10.60

Girls' mean scores increased from 17.00 to 27.10, a mean gain of 10.10 points. Boys' mean scores increased from 13.50 to 24.10, a mean gain of 10.60 points. These descriptive results show improvement in both groups; they do not by themselves establish that the size of improvement differed significantly by gender.

Percentage Scores

Group	Pre-test (%)	Post-test (%)	Increase (percentage points)
Girls	56.67	90.33	33.67
Boys	45.00	80.33	35.33
Overall	50.83	85.33	34.50

Paired-samples t-tests

Group	N	Mean gain	t	df	p-value	Interpretation
All students	20	10.35	20.75	19	< .001	Statistically significant increase
Girls	10	10.10	17.82	9	< .001	Statistically significant increase
Boys	10	10.60	12.53	9	< .001	Statistically significant increase

The paired-samples t-test showed a statistically significant increase in scores for the full sample, $t(19) = 20.75$, $p < .001$. Separate analyses also indicated significant increases among girls, $t(9) = 17.82$, $p < .001$, and boys, $t(9) = 12.53$, $p < .001$. These tests compare pre-test and post-test scores within each group; they do not test whether the gains differ significantly between girls and boys.

Discussion

The results indicate that students scored higher after participating in the reported educational awareness activities. The overall mean gain of 10.35 points, together with statistically significant paired-samples tests, is consistent with improved performance on the healthy-eating knowledge assessment after the intervention. Both girls and boys showed gains in their scores.

The findings are broadly relevant to prior studies in Karnataka that have described adolescent dietary patterns and the importance of nutrition awareness (Mandolikar et al., 2019; Vijayalakshmi et al., 2022; Rakshitha et al., 2024). However, those studies investigated dietary patterns and related factors, whereas the present report evaluates pre-test and post-test knowledge scores. The results should therefore not be interpreted as evidence that students changed their actual food consumption, nutritional status, or health outcomes.

Several limitations should be considered. The sample was small and drawn from one school. No comparison group was used, and there was no reported follow-up to assess retention. The report does not provide details on the instrument's validity or reliability, and the intervention description requires further specification. Repeated exposure to the test, maturation, or other influences may also contribute to score changes. Future action research could include a clearer intervention protocol, validated assessment items, follow-up measurement, and observation or diary-based measures of dietary practices.

Educational Implications

Teachers may use structured, interactive nutrition education—including guided discussion of balanced meals, locally available foods, millets, and practical food choices—as part of school health education. Activities should be age-appropriate and culturally relevant, and should avoid shaming students or families for food choices shaped by affordability, access, or household circumstances. Involving parents and school staff may help connect classroom learning with everyday food environments.

Conclusion

In this one-group action research study involving 20 Grade 9 students at a selected school in Mysuru, mean knowledge-test scores increased from 15.25 before the educational awareness activity to 25.60 afterward. The mean gain was 10.35 points, and paired-samples t-tests indicated statistically significant pre-test to post-test improvements in the full sample and in the girls' and boys' groups. The findings suggest that the activity was associated with improved test performance on healthy eating knowledge. Because of the small sample, single-school setting, and lack of a comparison group or behavioural follow-up, conclusions should be limited to the observed score change.

Appendix A. Individual Pre-test and Post-test Scores

Note. Participant codes are assigned for presentation; the original report did not provide participant identifiers. The maximum score is inferred as 30 from the original percentage calculations.

Participant	Group	Pre-test	Post-test	Gain	Gain as % of maximum score
P01	Girl	16	24	8	26.67%
P02	Girl	18	26	8	26.67%
P03	Girl	17	27	10	33.33%
P04	Girl	15	29	14	46.67%
P05	Girl	19	30	11	36.67%
P06	Girl	16	25	9	30.00%

P07	Girl	18	27	9	30.00%
P08	Girl	17	28	11	36.67%
P09	Girl	15	25	10	33.33%
P10	Girl	19	30	11	36.67%
P11	Boy	13	24	11	36.67%
P12	Boy	15	22	7	23.33%
P13	Boy	14	25	11	36.67%
P14	Boy	13	21	8	26.67%
P15	Boy	12	27	15	50.00%
P16	Boy	15	22	7	23.33%
P17	Boy	13	24	11	36.67%
P18	Boy	14	28	14	46.67%
P19	Boy	12	23	11	36.67%
P20	Boy	14	25	11	36.67%

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