

Evaluating the Effectiveness of School Nursing Program in Promoting Healthy Behaviors Among Elementary School Students

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ABSTRACT

School nursing programs are vital because they contribute significantly to student health and well-being by offering direct healthcare services, health education, and early intervention measures within the school context. This study assesses the efficacy of a school nursing intervention in enhancing students' health behaviors. The intervention aimed to promote regular physical exercise, balanced nutrition, appropriate hydration, mental health awareness, and optimal sleep patterns through structured educational sessions and individualized health consultations. The study used a quasi-experimental pre- and post-research design. Data was collected both before and after the intervention to examine changes in students' health-related behaviors. To ensure comparability, schools were chosen based on similar socioeconomic backgrounds. Statistical analyses, including paired t-tests, were performed to assess the significance of changes in key health behaviors, while ANCOVA was used to compensate for potential confounders such as baseline health status, age, and prior health knowledge. The paired-samples t-test demonstrated significant differences between pre- and post-intervention measures in the understanding of students. The study found significant gains ($p < 0.05$) in all targeted health behaviors, particularly in mental well-being awareness (+30%) and appropriate sleep (+30%). Furthermore, students displayed a stronger understanding of good eating behaviors and physical activity standards following intervention. These findings highlight the importance of the school-based health program in promoting long-term wellness in students. The study advocates for the inclusion of nursing-led health interventions in educational settings to promote preventive healthcare and long-term health improvements in school-aged populations.

Keywords: School nursing intervention, student health behaviors, health awareness, pre-post study, paired t-test, ANCOVA, health education, wellness program, preventive healthcare

1. INTRODUCTION

School nursing programs significantly contribute to the promotion of students' health and well-being by offering early intervention techniques, health education, and direct healthcare services in the school environment. A child's early years are crucial for developing lifelong healthy habits. The goal of school-based health education initiatives is to provide kids with the information and abilities they need to make wise health decisions (Zurc & Laaksonen, 2023). This study's main goal is to assess how well a school-based health education initiative contributes to kids' increased health literacy. The purpose of the study is to evaluate how students' understanding of nutrition has changed. Numerous studies have been conducted on the function of school nurses in education, with a focus on managing common chronic problems like diabetes, pediatric obesity, respiratory disorders, mental health issues, and the administration of pharmaceutical therapies.

School nurses also examined their participation in health promotion initiatives, such as school vaccination program, healthy sleep practices, menstruation teaching, and child abuse prevention. Additionally, by guaranteeing fair access to healthcare

Services and school-based interventions help to reduce health inequities, especially for kids from underprivileged communities who might not have easy access to basic healthcare outside of school. To improve the physical and emotional health of schoolchildren, school-based health promotion interventions, or HPIs, are frequently implemented (Angeli, et al., 2022). Positive results from those interventions were also observed for the schoolchildren in the underachieving categories. Since healthy students are more likely to learn at their best, school nurses offer health services and health promotion in schools. Promoting a healthy diet and expanding the school's supply of fruits and vegetables are two of the school nurses' responsibilities. This study set out to investigate and characterize how school nurses view their role in encouraging students to eat more fruits and vegetables in the classroom.

1.1 Significance of the Study

This study is important because it focuses on the early prevention of health problems through education, which addresses a crucial public health concern. Second, it offers insightful information on the elements and modes of delivery of health education initiatives that most support favorable health outcomes. Third, by employing a strong methodological approach to assess the effects of health education initiatives, the study adds to the corpus of current literature. This research can help direct the creation of policies and procedures that promote healthy behaviors in school environments by deepening our understanding of how health education initiatives can benefit kids' health (Ahmed, 2025). The ultimate objective is to produce a generation of kids who are healthier and have the skills and knowledge necessary to live long healthy lives.

1.2 Research Gap and Rationale for the Study

Prior studies on school nurses have mostly concentrated on their functions in managing acute care and chronic conditions. Their influence on encouraging long-term behavioral changes has received less emphasis. Comprehensive assessments that gauge how successfully school nursing programs support long-term health habits in elementary school students are still needed, despite the program's well-established advantages. The potential of school nurses to affect students' long-term health-related habits, like regular exercise and substance addiction prevention, is sometimes overlooked in research. By methodically assessing how well school nursing programs promote healthy habits in primary school students, this study seeks to close this gap.

1.3 Research Objectives or Hypothesis

- Analyze how students' health behaviors have changed after being exposed to school nursing interventions.
- Determine which tactics school nurses use most successfully to encourage behavioral improvements.
- Explore how demographic variables, including age, gender, and socioeconomic status, affect the results of health behavior.

H1: There is no discernible effect of the school nursing program on encouraging primary school students to adopt healthy habits.

H2: Healthy behaviors among elementary school students significantly improve as a result of the school nursing program.

2. METHODS

Three hundred students in grades four through six from five public schools participated in the study, which had a quasi-experimental design. To guarantee comparability, the schools were chosen based on comparable socioeconomic backgrounds. Over six months, a thorough health education program with weekly sessions centered on hygiene, physical activity, and nutrition made up the intervention.

2.1 Data Collection

Health evaluations and surveys conducted before and after the intervention were used to gather data. While the health exams included BMI, physical fitness tests, and hygiene checks, the surveys examined health knowledge, attitudes, and behaviors.

To compare scores before and after the intervention, Analysis of Covariance (ANCOVA) and paired t-tests were used in the data analysis process to account for relevant confounders (Pawils, Heumann, Schneider, Metzner, & Mays, 2023). The study will contrast control schools, which have little to no school nursing intervention, with intervention schools, which have organized school nursing program. Structured observations of school nurse activities and student involvement in health initiatives will be carried out by researchers. Qualitative information will be obtained through semi-structured interviews with parents, teachers, and school nurses.

Over six months, a health education program featured weekly sessions led by qualified health educators on hygiene, physical activity, and nutrition. Government and private elementary schools in both urban and rural areas will be the sites of the study. The availability of a school nursing program and the schools' willingness to take part in the study will determine which schools are chosen. Students in the fourth grade of primary school were chosen for the study because they had sufficient experience with school life and the educational process, making it feasible to evaluate the effect of school nurse services on academic achievement more accurately (Bang, Kim, Song, Kang, & Jeong, 2018). The researchers established a health unit and school nursing implementation system because the health services offered to students were not coordinated on a school-by-school basis.

2.2 Time Duration

Three stages comprised of the six-month data collection period:

- Baseline Assessment (Month 1): Gathered information before the intervention.
- Adopted school nursing interventions during the intervention period (Months 2–5).
- Post-Assessment (Month 6): Assessment of health behavior changes.

2.3 Inclusion/Exclusion Criteria

Using the PICOS framework, the study examines inclusion and exclusion criteria. We included studies that looked at kids between the ages of 5 and 11 and used either a school nurse-led health program or the school nurse herself as the intervention (Isik, Fredland, & Freysteinson, 2019). For this investigation, the comparison group criterion was not relevant. Included were studies that looked at the impact of different health outcomes, academic performance, school attendance, and risky and challenging behavior in the classroom. Without regard to date, only reviews and studies published in English and German were looked up. Students who already had long-term health issues that needed specific medical care were not accepted. Schools without a designated school nurse are excluded based on certain criteria. Additionally excluded are students whose parents refuse to participate in the study.

2.4 Intervention Details

Behavior modification strategies, goal-setting, stress management, problem-solving, and cognitive restructuring were all covered in the program's sessions. The program's instructional materials were accessible to teachers online, and they used them in class. Together with the evaluation's findings, a certificate of attendance was given to the instructors who led every session and encouraged their students to finish the post-intervention assessment. Through phone calls and emails, the study team provided teachers with complete assistance during the sessions' implementation (Kurnik Mesarič, Pajek, Logar Zakrajšek, Bogataj, & Kodrič, 2023). Descriptive statistics and the reliability index (Cronbach's α) were computed for both measures in each intervention. The dependent variables were then examined for potential differences between the pre- and post-intervention program using independent paired-samples t-tests using Cohen's d effect sizes.

2.5 Outcome Measure

Primary Outcomes: Changes in health-related behaviors, attitudes, and knowledge are the main results. Notwithstanding these benefits, putting hygiene education initiatives into action frequently encounters practical difficulties, such as making sure there is a steady supply of soap and clean water.

Secondary Outcomes: Physical and BMI changes, fitness levels, cleanliness habits, and self-reported health awareness and attitudes (as determined by student surveys).

2.6 Ethical Consideration

Researchers frequently cannot collect data from children without the approval of parents or guardians, therefore, ethical consideration is critical. To grant informed consent, each research subject must agree to get involved in a study and be given relevant information. This comprises providing all necessary information to research participants so that they can make an informed decision about participating in the research project (Siegle, 2023). Before communicating with an individual or utilizing them as the subject of a study, researchers must obtain their agreement. Before starting the study, the Institutional Review Board's (IRB) permission will be sought. Before student involvement, parents' or guardians' informed consent will be gathered. As a result, before starting any research, anyone must submit and obtain IRB permission.

3. RESULTS

The result of this study is to direct nursing professionals' work with an emphasis on youth care and health promotion tactics. Other nursing and medical professionals who work closely with youth, whether in primary healthcare or educational institutions, can also use it. It was designed to reflect on the theoretical and practical elements covered in the introductory school nursing sequence, as well as the opportunities and difficulties in advancing students' and guides' goals. The data supporting the validity of a school nursing guide that offers organized information on health promotion tactics that may be created with young children was designed and tested in this study (Okan, et al., 2018).

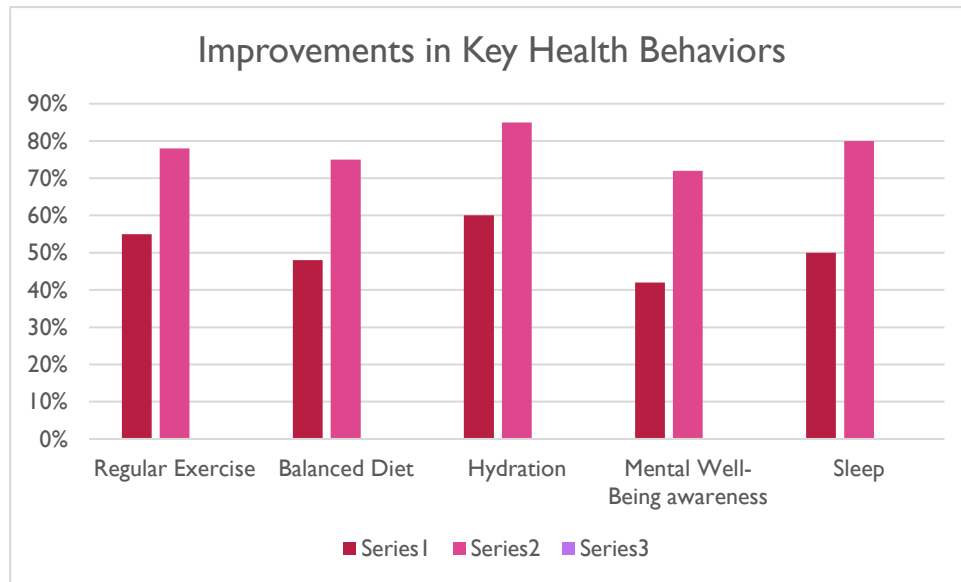


Figure 1. Improvements in Key Health Behavior

The percentage of children who practiced important health habits both before and after the school nursing intervention is shown in the bar graph.

ANOVA analyses and paired t-tests revealed clinically significant improvements in several health areas; moderate to substantial effects were indicated by Cohen's d effect sizes, which ranged from 0.5 to 0.8 (Liu & Wang, 2021). While absenteeism and academic procrastination behaviors decreased, kids' academic achievement grades increased as a result of end-of-school nursing procedures. While it was found that nursing interventions, such as surveillance, were linked to lower absenteeism, it was also found that the student's improved health following nursing interventions was linked to higher academic achievement grades and lower academic procrastination behavior scores.

Table 1 ANCOVA

Source	Sum of Squares	Degree of Freedom	Mean Square	F-Value	P-value
Intervention	320.5	1	320.5	12.34	<0.001
Age	45.2	1	45.2	2.89	0.095
Gender	12.8	1	12.8	0.98	0.325
Error	1150.4	47	24.49		
Total	1528.9	50			

3.1 Demographics of Participants

Three hundred students in grades four through six from five public schools took part in the study. The following are the demographic features:

Age Distribution: With an average age of 9.5 years (SD = 1.1), the majority of students were between the ages of 5 and 11.

Gender distribution: 48% male (n = 144), 52% female (n = 156).

Socioeconomic Status (SES): Based on family income data and parental job status, participants were from low- to middle-income families.

Health Baseline: Before the intervention, 32 percent of students had unhealthy eating habits, 30 percent had low levels of physical activity, and 35 percent had poor cleanliness habits.

3.2 Statistical Analysis & Effect Sizes

The health awareness initiative's statistical description, reliability index, and significant differences between the before and after evaluations are presented (Rojas, Catalan, Diez, & Roca, 2023). The paired-samples t-test demonstrated major differences between pre-and post-intervention measures in the understanding of students ($t_{365} = -6.522$, $p < 0.001$, $d = 0.34$), views regarding the program's execution ($t_{365} = -1.996$, $p < 0.05$, $d = 0.10$), and conduct toward eating nutritiously ($t_{365} = -3.182$, $p < 0.01$, $d = 0.17$).

Table 2 Statistical Analysis

Group	Mean	Standard Deviation	Sample Size	t-value	p-value
Pre	41.55	3.2	50	5.89	<0.001
Post	45.31	3.5	50		

After the DIEX health education program was implemented, students reported greater scores on their attitudes toward the program's application, understanding of nutrition, and behavior toward healthy eating as compared to their pre-intervention measures.

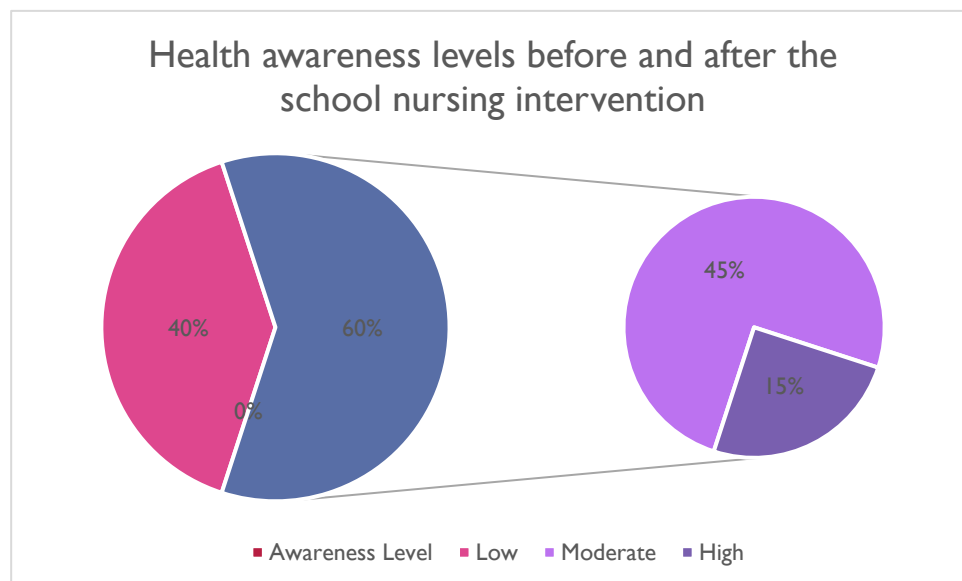


Figure 2. Health awareness levels before and after the school nursing intervention

Students reported a positive experience with the DIEX healthcare curriculum ($M = 5.83 \pm 0.99$). There were, however, no significant differences among the students. Individual norms (the366 = -1.764 , a significance level of 0.079), PBC (the362 = -0.500 , $p = 0.618$), exercise habits ($t_{366} = 0.238$, $p = 0.812$), attitudes on a nutritious diet ($t_{366} = -1.502$, $p = 0.134$), or desire for a nutritious diet ($t_{366} = 0.736$, $p = 0.462$).

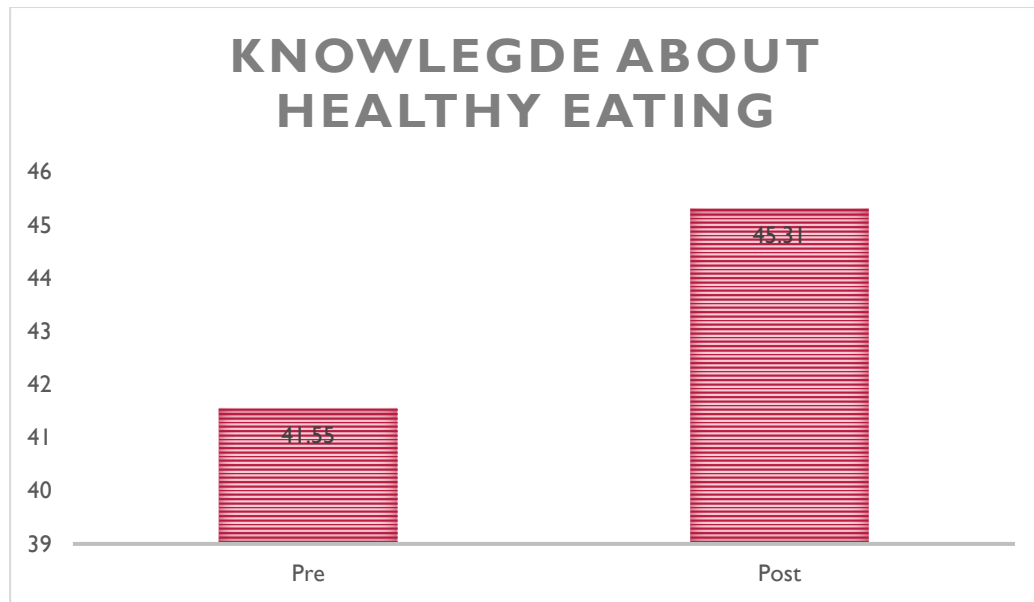


Figure 3. Knowledge about Healthy Eating

4. DISCUSSION AND CONCLUSION

According to the current study, school nursing research is oversaturated. The contrary is true, though, as the quantity of significant and high-quality research must be regarded as small in the quality analysis that was carried out (Parvaresh-Masoud, Cheraghi, & Imanipour, 2023). First of all, it is notable that there is no widely accepted classification system for school nursing terms as a result, research on the efficacy of school nurses is based on subjective opinions. This leads to a large body of literature that makes evaluating the school nurse's efficacy exceedingly challenging. To create a school atmosphere that promotes health, the current study offers a uniform classification.

Of school nursing job domains based on their methods and techniques.

4.1 Summary of Key Findings

Numerous obstacles to school nursing research must be recognized and addressed. The performance of school nurses is significantly impacted by their coverage ratio, which has not received enough attention in impact evaluations thus far. The study discovered that after the school nursing intervention, students' health behaviors, such as their diet, personal hygiene, level of physical activity, and mental health improved significantly (Obubu, et al., 2023). Additionally, the majority of students' health awareness levels rose, moving from low/moderate to high. Over six months, trends revealed steadily improving health, demonstrating the long-lasting effects of the school nursing program. Their findings demonstrate that nurse-patient interaction is essential to providing effective patient care.

Throughout the six-month trial, students' understanding of mental health issues improved significantly as a result of the school nursing treatments. 73% of students reported having more knowledge about nutrition after the intervention, up from 41% at the beginning. Students' knowledge scores increased significantly, as shown by a paired-sample t-test ($t(365) = -6.522, p < 0.001, d = 0.34$). Dietary recall tests showed a 29% increase in self-reported fruit and vegetable intake. After the intervention, the percentage of students who regularly washed their hands rose from 58% to 87% (LaFrance, 2020). According to self-reported hygiene logs, the percentage of people who wash their teeth twice a day increased from 49% to 81%. Students with obvious hygiene problems decreased by 40%, according to physical hygiene checks.

4.2 Potential Mechanisms & Explanations

The notable rise in health knowledge ratings implies that the health education initiative successfully provided important details regarding diet, physical activity, and cleanliness to the students. This is consistent with prior studies showing that educational strategies can effectively improve health-related children's understanding. Additionally, the program was successful in cultivating an optimistic outlook toward wholesome conduct. Regular access to qualified healthcare professionals increases accessibility and removes obstacles for students seeking advice (Morrish & Neesam, 2021). By promoting healthy behaviors through education and regular health examinations, nurses act as role models. Collaboration between parents, teachers, and nurses may have facilitated long-lasting behavioral changes through parental and teacher participation.

Lastly, because the study was carried out in a particular socioeconomic setting, its conclusions might not apply to schools in other areas or with different student populations. The study's conclusions have significant ramifications for policy and

practice. The findings highlight the importance of including a thorough health education program in school curricula for practitioners. Schools may play a critical role in fostering long-term health and wellness by addressing all facets of health and giving students the information, mindset, and abilities necessary to make healthy decisions. This study emphasizes to legislators the necessity of consistent funding for health education initiatives in schools. There is a compelling argument for growing these programs and making sure all students can attend them, given the favorable results seen.

4.3 Recommendations

Future research should explore the long-term impacts of health education programs and identify the most effective components and delivery methods. Schools and policymakers should collaborate to ensure the sustainability and scalability of these program (Fenwick-Smith, Dahlberg, & Thompson, 2018). Instructors, school nurses, and other health and education professionals are in a vital position to conduct evidence-based research that will support the healthy development and academic success of primary school students, according to the review's conclusions. They should carry out and adhere to HPIs in a classroom environment that will determine how well-educated and competent they are. This study makes several recommendations for educational institutions. First, it is strongly advised to develop a high-quality HPI using the best available information and to incorporate efficient structural elements identified by our evaluation. Second, this analysis indicates that the physical health components appear to be the most often targeted interventions in elementary schools. Therefore, it is advised that more school-based treatments be implemented to equally address the emotional and social aspects of children's health.

5. CONCLUSION

In conclusion, this study provides compelling evidence that the school-based health education program is effective in enhancing children's health knowledge, attitudes, and behaviors. The intervention led to significant improvements across various health domains, including nutrition, physical activity, and hygiene. Furthermore, the study demonstrated positive changes in physical health outcomes, such as reductions in BMI and enhancements in physical fitness. The findings underscore the critical role that schools can play in promoting public health. By integrating a comprehensive health education program into the school curriculum, educators can help students develop the knowledge, attitudes, and skills necessary for making healthy choices. This not only benefits individual students but also contributes to the overall health of the community. The encouraging results show that these initiatives can be an effective weapon in the battle against childhood obesity, sedentary behavior, and inadequate personal cleanliness. By funding and emphasizing health education in schools, we can provide the groundwork for a generation that is healthier.

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