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“A STUDY TO ASSESS THE EFFECTIVENESS OF GAME BASED LEARNING IN PROMOTING HEALTHY EATING HABITS AMONG SCHOOL CHILDREN IN SANTHAPETA SCHOOL, CHITTOOR [DISTRICT], ANDHRA PRADESH”.

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Abstract: Healthy eating during childhood is essential for optimal growth, development, and the prevention of nutrition-related diseases. However, increasing consumption of junk food, inadequate nutritional awareness, and sedentary lifestyles have led to unhealthy eating habits among school-aged children. Schools provide an ideal environment for nutrition education, and innovative teaching strategies such as game-based learning have shown promise in improving children's knowledge, attitudes, and dietary behaviors. High-quality evidence, including the randomized controlled trial by Kato-Lin et al. (2020), demonstrated that mobile game-based interventions can positively influence children's food choices. Furthermore, systematic reviews by Nora Suleiman-Martos et al. (2021) and Mohapatra and Mohandas (2024) support the effectiveness of gamification in nutrition education, while recent Indian school-based studies (2024) indicate its relevance in culturally similar settings. This study aims to assess the effectiveness of game-based learning in promoting healthy eating habits among school children at Santhapeta School, Chittoor District, Andhra Pradesh. Specifically, it evaluates changes in students' knowledge, attitudes, and healthy eating practices following a game-based educational intervention. The findings are expected to provide evidence for integrating gamified nutrition education into school health programs, thereby encouraging healthier food choices and contributing to the prevention of childhood obesity and other diet-related health problems.

Keywords : Game-Based Learning, Healthy Eating Habits, Nutrition Education, School Children, Gamification, Dietary Behaviour, School Health Promotion, Childhood Nutrition

I. INTRODUCTION

Healthy eating during childhood and adolescence is fundamental for optimal growth, cognitive development, academic performance, and long-term health. Dietary habits established during these formative years often continue into adulthood, making childhood a critical period for developing healthy eating behaviors. However, unhealthy dietary practices among school-aged children have increased considerably due to the growing consumption of processed and fast foods, limited nutritional awareness, and increasingly sedentary lifestyles. These behaviors contribute to nutritional deficiencies, overweight and obesity, and the early onset of lifestyle-related diseases such as type 2 diabetes and cardiovascular disorders.

Schools provide an ideal environment for promoting healthy eating because they reach children during their formative years and offer opportunities to integrate health education into the curriculum. Effective nutrition education can improve children's knowledge, attitudes, and food choices; however, the success of such programs depends largely on the teaching strategies employed. Traditional classroom-based methods often have limited effectiveness in sustaining children's interest and translating knowledge into healthy dietary practices.

Game-based learning has emerged as an innovative and engaging educational approach that combines learning with interactive play, thereby enhancing student participation, motivation, knowledge retention, and behavior change. Growing evidence supports the effectiveness of gamification in nutrition education. A high-quality randomized controlled trial by **Kato-Lin et al. (2020)** demonstrated that a mobile game-based intervention significantly improved children's healthy food choices, providing strong evidence for the effectiveness of game-based nutrition education. Furthermore, systematic reviews by **Suleiman-Martos et al. (2021)** and **Mohapatra and Mohandas (2024)** concluded that gamification-based interventions consistently improve nutrition knowledge, healthy eating attitudes, and dietary behaviors among children and adolescents across diverse educational settings.

Recent school-based intervention studies conducted in India have also demonstrated the effectiveness of interactive and game-based nutrition education in improving students' nutritional knowledge and healthy eating practices. These findings provide culturally relevant evidence supporting the implementation of gamified learning approaches within Indian school settings, where dietary patterns are rapidly changing due to urbanization and the increased availability of processed and convenience foods.

The prevalence of unhealthy eating habits among Indian school children has become a significant public health concern. Rapid nutrition transition, increased marketing of energy-dense foods, and changing lifestyle patterns have contributed to poor dietary practices among children, increasing the burden of obesity and nutrition-related non-communicable diseases. Therefore, innovative, engaging, and culturally appropriate educational interventions are urgently needed to promote healthier food choices during childhood.

Santhapeta School in Chittoor District, Andhra Pradesh, represents a typical educational setting where children are increasingly exposed to environmental and social factors influencing unhealthy dietary behaviors. The coexistence of traditional dietary practices with the growing availability of processed and fast foods makes this school an appropriate setting for evaluating nutrition education interventions.

Against this background, the present study aims to assess the effectiveness of game-based learning in promoting healthy eating habits among school children at Santhapeta School, Chittoor District, Andhra Pradesh. Specifically, the study evaluates whether a game-based nutrition education intervention can improve students' knowledge, attitudes, and healthy eating behaviors. The findings are expected to contribute evidence supporting the integration of game-based learning into school health education programs to promote lifelong healthy dietary practices among children.

II . METHODOLOGY

This study was conducted at Selected School Santhapeta among school children Using Quasi experimental research design. The research approach for the study used was Evaluative Approach. The study sample size is 50. Sample was selected by using purposive sampling technique. Data was collected by using a structured questionnaire . After collecting data from all participating students, results were recorded. Descriptive and inferential statistics were employed to analyze knowledge of children about healthy eating habits.

Sampling Technique

A sampling technique refers to the systematic approach used to select a portion of the population that effectively represents the whole. For this study, a non-probability convenience sampling technique was utilized, chosen for its feasibility and the ready accessibility of eligible participants.

Sampling Criteria

Sampling criteria are the predetermined attributes or conditions that individuals must meet to qualify for inclusion in the target population. These criteria ensure that the selected participants accurately reflect the essential characteristics required for the study objectives.

Inclusion Criteria

- The children who are studying in Santhapeta government school chittoor, Andhra Pradesh.
- The children who are willing to participate in the study

Exclusion Criteria

- Incomplete data
- Absence during intervention
- Participants who aren't present during data collection.
- Children who participated in the pilot study.
- Schoolchildren who are unwilling to participate

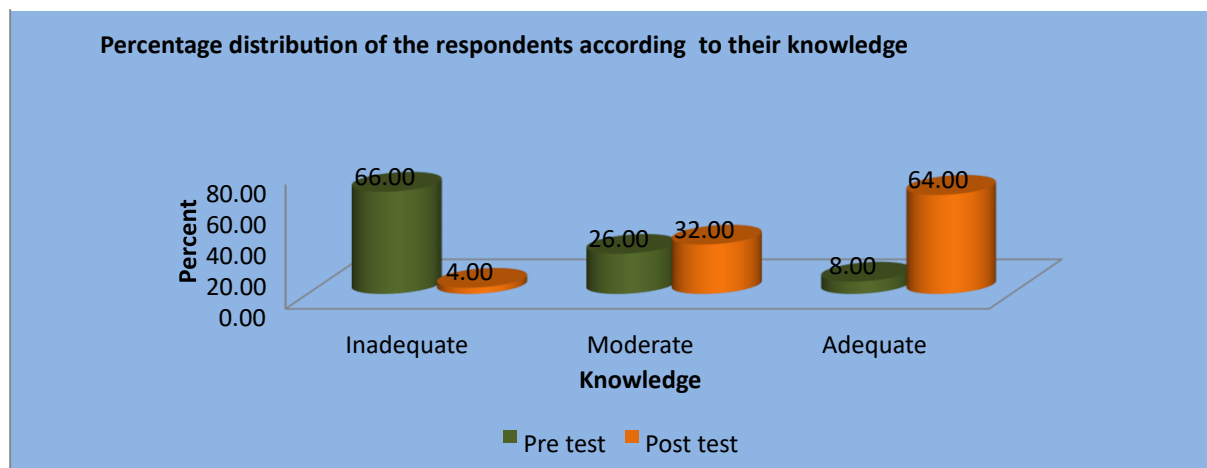
III . INSTRUMENTS USED FOR DATA COLLECTION

The research tool is an instrument that serves as the primary means of collecting reliable data and deriving meaningful conclusions. In accordance with the objectives of the present study, a self-structured questionnaire was developed to assess the knowledge, attitudes, and healthy eating practices of school children. The questionnaire was designed to evaluate the effectiveness of the game-based learning intervention in improving children's understanding of healthy nutrition, fostering positive attitudes toward healthy eating, and encouraging healthy dietary behaviors.

IV . RESULT

Percentage distribution of the respondents according to their knowledge

S.No	Level of Knowledge	Pre test		Post test	
		Frequency	Percent	Frequency	Percent
1	Inadequate	33	66.00	2	4.00
2	Moderate	13	26.00	16	32.00
3	Adequate	4	8.00	32	64.00
	Total	50	100.00	50	100.00



Inference

The above data shows that “Level of Knowledge – Pre-test and Post-test” Before the intervention, most students (66%) showed inadequate knowledge, while only 8% displayed adequate understanding. However, after the intervention, there was a significant improvement, as 64% of the respondents achieved adequate knowledge, and inadequate knowledge dropped sharply to 4%. This indicates that the educational intervention was highly effective, resulting in a marked increase in students' knowledge levels.

V . DISCUSSION

The findings of the present study demonstrate that the game-based learning programme significantly improved healthy eating knowledge and promoted positive dietary behaviours among school children. The intervention effectively transformed students' knowledge from predominantly inadequate to adequate levels, indicating that interactive educational strategies are more engaging and impactful than conventional teaching approaches. Overall, the study supports existing evidence that game-based learning is an effective, enjoyable, and culturally appropriate method for nutrition education. Integrating such interventions into school health programmes has the potential to strengthen children's nutrition knowledge, encourage healthier food choices, and contribute to the prevention of nutrition-related diseases.

VI. RECOMMENDATIONS

- Conduct regular in-service training to enhance knowledge of grooming standards.
- Implement and enforce clear institutional grooming policies.
- Monitor compliance through periodic supervision and audits.
- Integrate grooming standards into continuing education and performance appraisal.
- Promote positive attitudes through leadership role modelling.

CONCLUSION

Across diverse contexts, game-based nutrition education (board games, web-apps, card games, serious games) consistently improves knowledge in school-aged children; some interventions also positively influence attitudes, behaviors, and even over longer follow-up BMI.

REFERENCE

- Lakshman et al. (2010) conducted a cluster randomized controlled trial and found that school-based nutrition education significantly improved children's nutrition knowledge, supporting the effectiveness of classroom interventions.
- Sharma et al. (2013) reported that interactive nutrition education modules significantly enhanced primary school children's knowledge and promoted healthier eating behaviors.
- Viggiano et al. (2014) demonstrated through the *Kaledo* board game intervention that game-based nutrition education effectively promoted healthy lifestyle behaviors among school children.
- Uzşen and Başbakal (2019) found that game-based nutrition education significantly improved healthy eating knowledge and dietary behaviors among primary school students.
- Chagas et al. (2020) showed that the *Rango Cards* game significantly improved food consumption patterns, nutrition knowledge, and self-efficacy among high school students in a cluster randomized controlled trial.
- Kato-Lin et al. (2020) conducted a randomized controlled trial and demonstrated that a mobile game intervention significantly improved healthy food choices, providing strong evidence for the effectiveness of digital game-based nutrition education.
- Espinosa-Curiel et al. (2020) developed the *FoodRateMaster* video game and reported that it effectively increased healthy eating awareness and nutrition knowledge among Mexican children.
- Abdollahi et al. (2021) found that an educational escape game significantly improved nutrition-related knowledge among adolescents, highlighting the value of serious games in nutrition education.
- Schliermann et al. (2022) reported that a serious game combined with parental involvement significantly enhanced obesity prevention and healthy lifestyle behaviors among school children.
- Yazdani et al. (2023) demonstrated that a self-learning, problem-solving game effectively improved students' personal health knowledge and healthy nutrition behaviors.
- Barak and Yachin (2024) found that science-based educational escape games significantly improved nutrition knowledge, awareness, collaboration, and reflective learning among participants.
- Aigner et al. (2024) introduced *NutriMine*, a Minecraft-based serious game, demonstrating the potential of digital gaming platforms to encourage healthy dietary practices.
- Liu et al. (2025) conceptualized the *All You Can Eat (AYCE)* educational game as an innovative tool for promoting healthy eating habits among young children through interactive gameplay.
- Tuah et al. (2025) reported high usability and learner engagement for the AYCE educational game, supporting its feasibility as a nutrition education intervention.
- Glorioso et al. (2025) found that the *NutriQuest* game was highly acceptable among Grades 2 and 3 students, with children reporting excellent usability, navigation, and engagement while improving awareness of healthy eating.
- Gan et al. (2019) demonstrated that the *Healthy Foodie* nutrition game application significantly reinforced previous nutrition education and improved healthy eating practices among school-aged children.
- Smith et al. (2019) developed and validated a reliable Healthy Diet Behavior Scale, confirming that brief dietary assessment tools can effectively measure healthy eating behaviors.