Scientific Research Publishing

Health, 2023, 15, 1191-1201
https://www.scirp.org/journal/health
ISSN Online: 1949-5005
ISSN Print: 1949-4998

Evaluation of the Coordinated Approach to Child Health (CATCH) Program in Third through Fifth Graders in Northern Illinois

Paulina Karecka[1], Tyson Copeland[1], Henna Muzaffar[2*]

[1]School of Health Studies, Northern Illinois University, DeKalb, IL, USA
[2]College of Health & Human Sciences; Northern Illinois University, DeKalb, IL, USA
Email: *hmuzaffar@niu.edu

How to cite this paper: Karecka, P., Copeland, T. and Muzaffar, H. (2023) Evaluation of the Coordinated Approach to Child Health (CATCH) Program in Third through Fifth Graders in Northern Illinois. *Health*, **15**, 1191-1201.
https://doi.org/10.4236/health.2023.1511079

Received: September 30, 2023
Accepted: November 4, 2023
Published: November 7, 2023

Abstract

Background: The Coordinated Approach to Child Health (CATCH) is a school-based health education program, grounded in Social Cognitive Theory (SCT), and designed to improve dietary habits and increase physical activity among children and adolescents. The objective of this study was to evaluate the effectiveness of CATCH program, delivered by dietetic interns and Northern Illinois University (NIU) students, to 3rd-5th graders in Northern Illinois, in increasing their nutrition knowledge and healthy choices behavior. **Methods:** In total, 167 elementary school children in grades 3 - 5 in Northern Illinois participated in a non-experimental program evaluation study. We delivered 6 CATCH lessons throughout the academic year to five elementary schools. Lessons were focused on "Go, Slow, and Whoa" food categories to help children understand healthier food choices. Validated questionnaires from the CATCH Global Foundation were administered in classrooms and online, pre/post intervention, to assess nutritional knowledge and healthy choices. **Results:** Children in third through fifth grades significantly increased their knowledge about nutrient dense foods, $p < 0.001$, $p < 0.001$, $p < 0.001$, respectively. Fourth and fifth graders exhibited a significant increase in their ability to make healthier food choices, $p = 0.03$ and $p = 0.007$, respectively. As grade level increased from third to fifth grade, improvement in nutrition knowledge and adoption of healthy food choices did not increase significantly, $p = 0.973$ and $p = 0.637$, respectively. **Conclusion:** We conclude that children in grades 3 - 5 who participated in the 6 lessons of the CATCH program expanded their nutritional knowledge and 4th and 5th graders improved their ability to make healthier choices. Conducting evaluations of health promotion programs is imperative to determine the impact of the program,

*Corresponding author.

as well as to explore possible improvements in content and delivery for future implementation.

Keywords

Schools, Nutrition Knowledge, Healthy Choices, Social Cognitive Theory

1. Introduction

National data shows that 31 percent of children under the age of 18 are overweight and 17 percent are obese [1]. There have been numerous health promotion programs focusing on improving children's eating and exercise habits, however, childhood obesity continues to prevail at astronomical rates. Children who are overweight or obese are at higher risk of developing chronic health problems, such as T2DM, high cholesterol, and hypertension (HTN) [1]. They are also likely to maintain that weight status into their adulthood, affecting their health and medical risks into the future [2]. Although there are several factors that could contribute to a child's weight gain, diet and lifestyle are significant contributors. Educating children on the consumption of healthy foods such as fruits, vegetables, whole grains, and low-fat dairy options is needed across all school levels [3]. According to the President's Council on Sports, Fitness & Nutrition, children must learn the value of a well-balanced diet and how vital it is to overall good health [3]. Children need to understand the basics of a well-balanced meal and adopt healthy eating to thrive as adults.

The Dietary Guidelines for Americans are evidence-based food and beverage recommendations aimed to promote health, prevent chronic disease, and aid in reaching and maintaining healthy weight [3]. Healthful diets following these recommendations include whole fruits and vegetables, whole grains, low-fat dairy products, various protein foods, and healthy oils while limiting calories from added sugars and saturated fats, and reducing sodium intake [4]. Health benefits of consuming a nutritious diet include reduced risk for heart disease, obesity, type 2 diabetes (T2DM), and some cancers [5]. American children do not consume adequate amounts of fruits, vegetables, fiber, and several other nutrients associated with healthful diets that are essential for optimal growth, weight management, and reduction of health risks [6].

Schools can play an important role in the promotion of healthy eating among children. Although most public schools (99 percent) offer nutrition education at some point in their curriculum, there is limited evidence on the extent, quality and effectiveness of the nutrition messages students are receiving [7]. Nutrition education can be integrated in the health curriculum, science classes, or school health programs [7]. Nutrition education programs delivered by teachers in elementary schools have shown modest effects on a child's nutritional knowledge and eating behaviors: reducing children's energy intake, increasing fruit

and vegetable consumption, and reducing sugar consumption [8]. Despite research showing that schools can have a positive impact on children's nutritional outcomes, schools and teaching staff often report barriers that restrict nutritional education programming and delivery, such as lack of appropriate resources, expertise, motivation, and capacity to deliver evidence-based nutrition education [9].

The Coordinated Approach to Child Health (CATCH) program is a school-based nutrition education program focused on promoting healthy eating, increasing physical activity, and reducing screen time to combat childhood obesity [10]. CATCH aims to improve the nutrition and physical activity behaviors of elementary school children both in and out of school using age-appropriate curricula to teach about physical activity and healthy eating [10]. CATCH curriculum is framed within Social Cognitive Theory (SCT) to influence individual behavior via changes to personal (knowledge, self-efficacy), behavioral, and environmental factors. The program lessons are designed to incorporate SCT factors for promoting physical activity, encouraging nutritious food options, and reinforcing behaviors shown to improve health outcomes [11]. CATCH programs require a significant amount of support from staff, teachers, parents, and volunteers who help run the program. . This research article reports on the evaluation of the CATCH program delivered by dietetic interns and university students from Northern Illinois University (NIU) to elementary school children (grades 3-5) in Northern Illinois elementary schools. Evaluation of school health promotion programs is essential to advance implementation science assessing effectiveness and impact of such programs.

2. Methods

In Northern Illinois, CATCH program material was adapted by NIU CATCH team comprising of NIU professors, dietetic interns, and student volunteers from varied health majors for implementation in local schools. The program was then delivered by NIU students and dietetic interns to children in grades 3 - 5 in the Sycamore and Genoa-Kingston school districts. Prior to delivery of lessons, dietetic interns and student volunteers participated in a training presented by a NIU professor. The training session lasted approximately two hours and provided information about the lessons, examples, and tips on how to deliver a successful lesson to all grade levels involved. The education materials comprise of six 25-minute lessons for each grade level, delivered monthly during the school year (**Table 1**). The nutrition lessons focused on the GO, SLOW, and WHOA food categories [12]. The goal of using this method was to distinguish a healthier option from a less healthy option. For example, students were taught that the goal is to eat more GO foods than SLOW foods, and to eat WHOA foods only in very small amounts. GO foods can be eaten daily and include whole grains, unprocessed fruits and vegetables, and foods low in fat, salt and added sugar. SLOW foods are defined as those that may be slightly processed and may have some added salt, fat, or sugar. Lastly, WHOA foods are those that have the highest

Table 1. CATCH lesson plan curriculum.

Grade	Lesson #	Lesson Title	Lesson Description
3	1	Heart Health	To review the body's circulatory system and the important effects that healthy eating and exercise have on the heart.
	2	Heart Smart	To identify activities that are healthy and unhealthy for your heart.
	3	The 'Whole' Truth	To distinguish between whole grains and processed foods.
	4	Sometimes Sweet	To identify the types of added sugars in food and beverages.
	5	Yoga Kids	To discuss the importance of all types of activities.
	6	Go Foods Fill Us Up!	To raise awareness of how eating lower-calorie, nutrient-dense foods can increase satiety more as compared with eating calorie-dense foods.
4	1	Ready, Set, GO For Health!	To review the importance of physical activity and healthy eating
	2	Energy Balance	To review the importance of achieving energy balance, balancing the amount of food and drinks they consume (energy in) to provide the right amount of fuel their bodies need for healthy growth, everyday living, and physical activity (energy out).
	3	GO! For Energy Balance	To recognize the importance of choosing GO foods to keep their body in energy balance.
	4	SNACK-vertising GO Foods	To identify the types of added sugars in food and beverages.
	5	Less Mindless Eating	To identify mindless eating and ways to reduce their own mindless eating.
	6	Food Fat Facts	To distinguish between healthy and unhealthy fats.
5	1	Breaking Through Barriers	To practice making healthy choices by applying four options they can use to overcome barriers to doing GO activities and eating GO foods.
	2	MyPlate	To review MyPlate and apply it to a cafeteria menu.
	3	Going for FIT	To recognize that physical activities should be done frequently, with intensity, and for 60 minutes a day.
	4	Portion Distortion	To recognize portion sizes and apply the MyPlate guidelines.
	5	Be Your Best You!	To explore the concept of the media's impact on our healthy body images.
	6	Plan of Action	To develop a plan of action to incorporate physical activity into a healthy lifestyle.

fat and sugar content.

This study's goal was to evaluate the effectiveness of the CATCH program for 3rd through 5th grade participants in Northern Illinois elementary schools. Specifically, the study aimed to measure if there was a significant improvement in nutrition knowledge and healthy food choices after one year of program participation in 3rd, 4th, and 5th grade children. The study also assessed whether there was a significant difference between grades in nutrition knowledge and healthy food choice improvement after one year of program participation.

This was a non-experimental program evaluation study using a convenience, purposive sample of children, in grades third through fifth, in five elementary schools (North, North Grove, South East, Genoa, and South Prairie) in Northern

Illinois. Due to the Covid-19 pandemic, Genoa, North, and South Prairie elementary schools were the only schools that participated in the posttest, which ultimately impacted the total number of participants in the study. The study population for the pretests was roughly 800 students from Sycamore and Genoa Counties. Following the posttest, the final sample size was 167 students, as only children who completed both the pretest and posttest were included in the final dataset to evaluate for changes in their nutrition knowledge and healthy food choices. Institutional Review Board (IRB) approval was obtained at Northern Illinois University prior to data collection, entry, and analysis.

Researchers obtained permission from the Sycamore and Genoa school districts to deliver the CATCH program to the elementary schools in Northern Illinois. The researchers then contacted school principals in both districts and asked for their permission for delivering the program in their respective schools. Once the schools agreed to participate, the CATCH team delivered parental consent and child assent forms to the schools to recruit children in third, fourth, and fifth grade classrooms. Consent and assent forms were placed in each child's take-home folders for their parents or caregivers to read and sign if they allowed their child to be a part of the study.

NIU student volunteers and dietetic interns delivered the CATCH program from September 2019 to May 2020. The first three in-person lessons took about 20 - 30 minutes per session in the classroom and the last three virtual intervention sessions also took about 20 - 30 minutes per lesson to complete at home. Due to the COVID-19 pandemic, one NIU professor and one NIU student volunteer created CATCH videos for lessons 4, 5 and 6 based on the curriculum for the students to watch at home. This program adaptation was made to ensure continuation of the program during the COVID-19 virtual era.

The questionnaire used for this study at baseline and post-intervention included questions from two validated surveys from the CATCH program curriculum: The CATCH Healthy Choices Survey and The CATCH Nutritional Knowledge Survey [9] [13]. The pre/posttest questionnaire consisted of items measuring healthy choices, nutritional knowledge, and children's perception of the program. Example questions include: a question asking about healthy choices, "Which is a healthier choice? Apple Sauce or Fresh Apple?"; a question testing nutritional knowledge, "Which food is a GO food? Hot Dog or Orange?"; and a question about children's perception of the program, "I enjoyed the CATCH program, Yes or No?". Pretest surveys were administered in the class at the beginning of the first lesson and took approximately 15 minutes for all the students to complete. At the end of the CATCH program, posttest surveys were administered using the web-based platform, Qualtrics, due to COVID-19 limitations. The survey link was sent by the school principal to all students who participated in the initial surveys. All participants received approximately one month to complete their posttests.

A paired sample t-test was used to determine if there was any significant in-

crease in nutrition knowledge and healthy choices from pre- to post-assessment. A One-Way ANOVA test was used to determine if there was a grade level difference between CATCH participants for improvement in nutrition knowledge and adoption of healthy food choices. Descriptive statistics were used to report students' age, grade level, gender, and race/ethnicity. Statistical Package for the Social Sciences (SPSS) version 26 was used for data analysis. Significance was set at $p < 0.05$.

3. Results

Eight hundred (n = 800) participants completed the pretest survey. However, due to COVID-19 restrictions and modifications to the delivery of posttest surveys, only one hundred sixty-seven (n = 167) participants completed both pre and posttest surveys. Only participants who completed the survey at baseline and post intervention were included in data analysis and generation of results. Of these 167 participants, 80 were girls (48%) and 87 were boys (52%). Out of these 167 participants, 121 were White (72.5%), 5 were African American (3%), 28 were Hispanic (16.8%), and 13 were Other (7.8%). Of the 167 participants, 32 were third graders (19.2%), 56 were fourth graders (33.5%), and 79 were fifth graders (47.3%).

After participating in six sessions of the CATCH program, all three grades of children displayed a statistically significant increase in nutrition knowledge about nutrient dense food (Table 2). Children in the 3rd grade increased their knowledge about nutrient dense foods by an average of M = 1.78 points (SD = 2.35), with a large effect (d = 0.75) per Cohen's guidelines. Children in 4th grade increased their knowledge by an average of M = 1.82 points (SD = 2.68), with a medium effect (d = 0.67). Children in 5th grade increased by an average of M = 1.37 points (SD = 2.23), with a medium effect (d = 0.42) (Figure 1).

Participants also demonstrated improvements in adopting healthy food choices following the interventions. Children in 3rd grade were able to make healthier food choices by an average of M = 0.65 points (SD = 2.00). However, this was not a statistically significant improvement. Children in 4th grade were

Table 2. Changes in nutrition knowledge and food choices.

Outcome Variables	Grade	n	Pre-survey M (SD)	Post-Survey M (SD)	Mean Difference M (SD)	p-value
Nutritional knowledge score (Max Points = 20)	3rd	32	14.53 (2.03)	16.31 (2.77)	1.78 (2.35)	0.000*
	4th	56	14.94 (2.51)	16.79 (2.43)	1.82 (2.68)	0.000*
	5th	79	15.36 (2.63)	16.74 (3.16)	1.37 (3.23)	0.000*
Food Choice score (Max Points = 14)	3rd	32	11.93 (1.86)	12.59 (1.10)	0.65 (2.00)	0.074
	4th	56	12.28 (1.55)	12.85 (1.47)	0.57 (1.91)	0.030*
	5th	79	12.43 (1.89)	13.07 (1.11)	0.64 (2.06)	0.007*

*p-value significant at <0.05.

also able to make healthier food choices by an average of M = 0.57 points (SD = 1.91), with a small effect (d = 0.29) measured per Cohen's guidelines. Similarly, children in 5th grade were able to make healthier food choices by an average of M = 0.64 points (SD = 2.06), with a small effect (d = 0.31) measured (Figure 2).

As grade level increased from 3rd to 5th grade, there was not a significant difference between grades for improvement in nutrition knowledge and adoption of healthy food choices. In both comparisons, the difference in pre and posttest for healthy choices and knowledge scores revealed no statistical significance (p = 0.973 and p = 0.637 respectively).

4. Discussion

This study evaluated the CATCH program in third through fifth graders in Northern Illinois over the course of one academic year. In six sessions, the CATCH program significantly improved participant's knowledge about nutrient dense foods. Although increased nutrition knowledge does not always lead to significant behavior changes, SCT mediators can be examined with these measurements, providing context to better assess and predict behavior changes [14]. Research suggests that there are many factors that influence children's nutrition

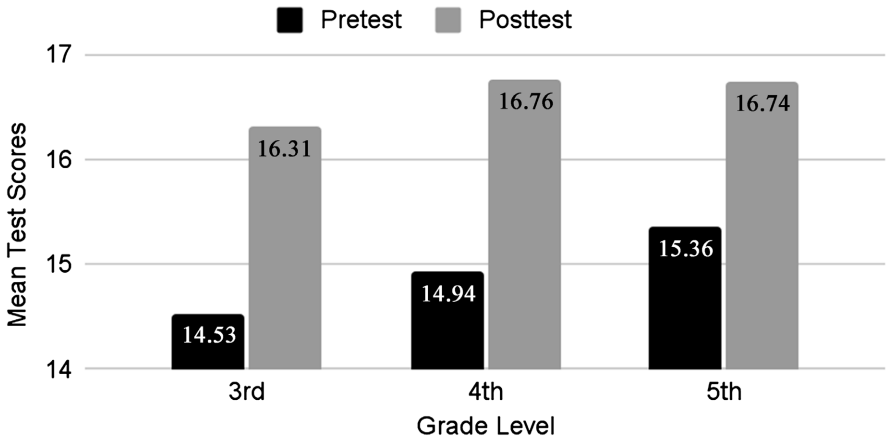

Figure 1. Pre-post nutritional knowledge results by grade.

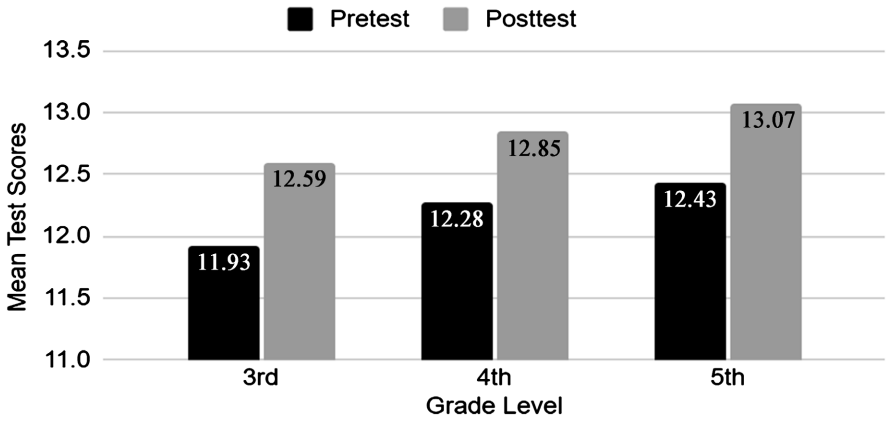

Figure 2. Pre-post healthy choices results by grade.

knowledge, self-efficacy, and healthy lifestyle choices. SCT is the most used theoretical framework that supports these three key components. Promoting physical activity, healthy eating, and preventing obesity in youth are more likely to be achieved when using the SCT model [15]. The CATCH program is based on this theory, highlighting the relationship between personal factors (knowledge, personal responsibility), social and physical environments, and behavior in its lesson plans. However, this evaluation of the CATCH program did not incorporate SCT variables, which limits the ability of this study to assess improvement in SCT mediating variables.

Children in grades fourth and fifth significantly increased their ability to make healthier food choices. However, significant improvements for healthier food choices were not seen for third graders. It should be noted that the fourth and fifth grade participants had received the CATCH program for 1 - 2 years more than third graders, exposing them to nutrition education and healthy choices for longer. Increase in nutrition knowledge and improvement in psychosocial mediators, such as SCT mediating variables, precedes changes in the actual behaviors [16] [17]. Since the current study did not evaluate the SCT constructs, we were not able to assess if third graders improved in the mediating variables which act as antecedents to behavior change. One significant construct of the SCT is self-efficacy, which has been positively correlated with healthy behaviors [18]. While survey instruments on nutrition and physical activity exist, they primarily measure knowledge and behavior, and only a few evaluate self-efficacy [14]. Evaluation of self-efficacy, personal responsibility, and other SCT variables would provide additional context to the program's effects on nutritional knowledge and behaviors [19].

Between grade levels, children did not show significant differences in improvement for the outcome variables. This may be due to the research not testing the same individual over the course of three years. In a 3-year follow-up study conducted between 1995 and 1998, CATCH participants maintained a lower total fat and saturated fat diet, compared to those children not receiving this program. These results demonstrate the program's lasting positive influences on children who participate [10]. Current research may be skewed because it only looked at the uneven number of participants in each grade, over just a one-year period. For future research, CATCH program effectiveness can be measured across grades of CATCH participation by tracking children's nutrition knowledge and food choice scores over multiple school years of participation.

5. Limitations

The following limitations must be acknowledged for this study. While the anticipated sample size was roughly 800 participants between all five schools, due to COVID-19 pandemic and transition to web-based delivery of the program and the posttest survey, the final count was 167 participants from three schools. That limited the strength of the statistical tests and overall program evaluation. Addi-

tionally, to accommodate COVID-19 restrictions, lessons 4 - 6 were delivered as short videos to watch at home and the posttests were delivered using a web-based survey system and not in a classroom setting. Students could have taken the posttest without watching the lesson videos or watched the videos without taking the posttest. There was also limited control in sending the surveys to the participants once they were sent to the principals, including the inability to send email reminders. Furthermore, there was little control over students' individual honest work, as parents, grandparents, caregivers, or siblings could partake in the posttests, skewing overall data and validity of the evaluation. It would also be best to see the results when pre and posttest data is collected in the same format, whether it's via paper or online surveys. Another limitation was that we did not evaluate SCT constructs, such as the examination of the environmental, personal, and behavior factors that could provide a suitable context for assessing the effectiveness of the program. Lastly, third graders received the CATCH program for one year less than fourth graders and two years less than fifth graders, and fourth graders received the CATCH program for one year less than the fifth graders. In the future, we can follow the same cohort of participants for three consecutive years to evaluate the accumulative effectiveness of CATCH program over multiple years of instruction.

6. Future Applications

While the unforeseen circumstances of the COVID-19 pandemic limited the current research in numerous ways, it also uncovered opportunities for improvement moving forward. Future research is needed to evaluate the effectiveness of virtual attributes of health promotion programs with elementary school children as such programs may become more appealing for schools to accommodate in their busy schedules with pressures to meet all the academic standards and testing criteria. A study of the Digital Education to Limit Salt in the Home (DELISH) program used weekly online interactive education sessions to improve knowledge, self-efficacy, and behaviors in 83 children over a 5-week period. Participating children had improved scores for salt-related knowledge and self-efficacy, indicating that the interactive online sessions were engaging for the targeted school grades [20]. These approaches, as applied to the CATCH program could help improve children's nutrition knowledge and food choices while requiring fewer school resources. It would be best to see the results when pre and posttest data is collected in a consistent format, whether it's via paper or online surveys. Lastly, using focus groups with children to provide feedback for CATCH program when delivered by college students could offer more specific insight on their perception of CATCH in Northern Illinois.

7. Conclusion

The evaluation of the CATCH program in third through fifth graders was found to have a strong positive effect on children's nutritional knowledge after receiv-

ing 6 sessions of the program. Both fourth and fifth graders also revealed significant improvement in making healthier choices after completion of the CATCH program. Third graders did show a higher score in the post-test for healthy choices; however, the results were statistically non-significant. The findings from this study add to the existing pool of research that aims to improve nutrition education programs for prevention of childhood obesity and highlights the need for continuing such interventions in the future. Partnerships between universities and school districts can make programs more sustainable, with dietetic interns and university students presenting nutrition education lessons rather than the school staff and teachers. As the burden of knowledge and time-constraints severely limits school teaching staff, establishing these partnerships with universities can enable school systems to offer health promotion programs for improving school children's health, increasing their nutrition knowledge, and informing their food choices.

Notes

This study was reviewed and approved by the Northern Illinois University Institutional Review Board.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Gavin, M.L. (2018) Overweight and Obesity (for Parents). KidsHealth. https://kidshealth.org/en/parents/overweight-obesity.html

[2] Ogden, C.L., Carroll, M.D., Curtin, L.R., Lamb, M.M. and Flegal, K.M. (2010) Prevalence of High Body Mass Index in US Children and Adolescents, 2007-2008. *Journal of the American Medical Association*, **303**, 242-249. https://doi.org/10.1001/jama.2009.2012

[3] HHS Office, Council on Sports. (2017) Importance of Good Nutrition. HHS.gov. https://www.hhs.gov/fitness/eat-healthy/importance-of-good-nutrition/index.html

[4] Chapter 1 Key Elements of Healthy Eating Patterns. Key Recommendations: Components of Healthy Eating Patterns—2015-2020 Dietary Guidelines. https://health.gov/dietaryguidelines/2015/guidelines/chapter-1/key-recommendations/

[5] Nutrients and Health Benefits. (2019) ChooseMyPlate. https://www.choosemyplate.gov/eathealthy/vegetables/vegetables-nutrients-health

[6] Vital Signs: Fruit and Vegetable Intake among Children—United States, 2003–2010. Centers for Disease Control and Prevention, 2014. https://www.cdc.gov/Mmwr/preview/mmwrhtml/mm6331a3.htm

[7] Nutrition Education in Public Elementary and Secondary Schools, 2013 https://nces.ed.gov/surveys/frss/publications/96852/

[8] Dudley, D.A., Cotton, W.G. and Peralta, L.R. (2015) Teaching Approaches and Strategies that Promote Healthy Eating in Primary School Children: A Systematic

Review and Meta-Analysis. *International Journal of Behavioral Nutrition and Physical Activity*, **12**, Article No. 28. https://doi.org/10.1186/s12966-015-0182-8

[9] Cotton, W., Dudley, D., Peralta, L. and Werkhoven, T. (2020) The Effect of Teacher-Delivered Nutrition Education Programs on Elementary-Aged Students: An Updated Systematic Review and Meta-Analysis. *Preventive Medicine Reports*, **20**, Article ID: 101178. https://doi.org/10.1016/j.pmedr.2020.101178

[10] Franks, A., Kelder, S., Dino, G., *et al.* (2023) School-Based Programs: Lessons Learned from Catch, Planet Health, and Not-on-Tobacco. In: Hassan, A., Ed., *School Nutrition and Activity*. Apple Academic Press, New York, 173-188.

[11] Botterman, L. (2023) Dietetic Interns Serve Side of fun with Nutrition, Wellness Lessons. NIU Newsroom. https://newsroom.niu.edu/dietetic-interns-serve-side-of-fun-with-nutrition-wellness-lessons/

[12] Catchglobal. (2020) Community Health Programs: Health Education Curriculum. https://catchinfo.org/about/

[13] Jakubowski, T.L., Perron, T., Farrell, A., Kenner, C. and Hullings, C. (2018) The Smart Nutrition and Conditioning for Kids (SNACK) Program. *The American Journal of Maternal/Child Nursing*, **43**, 278-284. https://doi.org/10.1097/NMC.0000000000000463

[14] Hall, E., Chai, W., Koszewski, W. and Albrecht, J. (2015) Development and Validation of a Social Cognitive Theory-Based Survey for Elementary Nutrition Education Program. *International Journal of Behavioral Nutrition and Physical Activity*, **12**, Article No. 47. https://doi.org/10.1186/s12966-015-0206-4

[15] Coulthard, H. and Sealy, A. (2017) Play with Your Food! Sensory Play Is Associated with Tasting of Fruits and Vegetables in Preschool Children. *Appetite*, **113**, 84-90. https://doi.org/10.1016/j.appet.2017.02.003

[16] Ball, K., MacFarlane, A., Crawford, D., *et al.* (2009) Can Social Cognitive thEory Constructs Explain Socio-Economic Variations in Adolescent Eating Behaviours? A Mediation Analysis. *Health Education Research*, **24**, 496-506. https://doi.org/10.1093/her/cyn048

[17] Guillaumie, L., Godin, G. and Vezina-Im, L.A. (2010) Psychosocial Determinants of Fruit and Vegetable Intake in Adult Population: A Systematic Review. *International Journal of Behavioral Nutrition and Physical Activity* **7**, Article No. 12. https://doi.org/10.1186/1479-5868-7-12

[18] Williams, S.L. and French, D.P. (2011) What Are the Most Effective Intervention Techniques for Changing Physical Activity Self-Efficacy and Physical Activity Behavior—And Are They the Same? *Health Education Research*, **26**, 308-322. https://doi.org/10.1093/her/cyr005

[19] Liao, M.-Y. (2014) An Evaluation of an Airline Cabin Safety Education Program for Elementary School Children. *Evaluation and Program Planning*, **43**, 27-37. https://doi.org/10.1016/j.evalprogplan.2013.10.001

[20] Grimes, C.A., Booth, A., Khokhar, D., *et al.* (2018) Digital Education to Limit Salt in the Home (DELISH) Program Improves Knowledge, Self-Efficacy, and Behaviors Among Children. *Journal of Nutrition Education and Behavior*, **50**, 547-554. https://doi.org/10.1016/j.jneb.2018.04.002