

University of Missouri, St. Louis

IRL @ UMSL

Dissertations

UMSL Graduate Works

7-6-2022

Implementing A Child Friendly Menu Guide in A Pediatric Unit: Promoting Healthful Choices

Lauren Hull

University of Missouri-St. Louis, lelr69@umsystem.edu

Follow this and additional works at: <https://irl.umsl.edu/dissertation>



Part of the [Pediatric Nursing Commons](#)

Recommended Citation

Hull, Lauren, "Implementing A Child Friendly Menu Guide in A Pediatric Unit: Promoting Healthful Choices" (2022). *Dissertations*. 1206.

<https://irl.umsl.edu/dissertation/1206>

This Dissertation is brought to you for free and open access by the UMSL Graduate Works at IRL @ UMSL. It has been accepted for inclusion in Dissertations by an authorized administrator of IRL @ UMSL. For more information, please contact marvinh@umsl.edu.

**Implementing A Child Friendly Menu Guide in A Pediatric Unit:
Promoting Healthful Choices**

Lauren Hull

B.S.N., Nursing, Southeast Missouri State University, 2013

A Dissertation Submitted to the Graduate School at the University of Missouri-St. Louis
in partial fulfillment of the requirements for the degree
Doctor of Nursing Practice with an emphasis in Pediatric Nurse Practitioner

August 2022

Advisory Committee

Elise Schaller, DNP, MHA, APRN, CPNP-PC, Chairperson

Cathy Koetting, DNP, APRN, CPNP, PMHS, FNP-C, Committee Member

Andrea Horbey, D.O., FCAAP, FACOP, Committee Member

Copyright, Lauren Hull, 2022

Abstract

Problem: Over 1/3 of children in the United States are overweight or obese and children's nutritional status while hospitalized worsens rather than improves. Hospital meals have too many calories, too much sugar, and too few nutrients compared to recommended guidelines for children. The primary purpose of this quality improvement project is to increase the amount of healthy foods ordered by children in a southeastern pediatric hospital unit through implementation of a menu guide.

Methods: A quality improvement pre-post interventional pilot study was done through implementation of a child friendly menu guide promoting healthful eating. Data was collected by retrospective and prospective review of food orders over a two-month time period on a pediatric inpatient unit in a Southeastern Florida hospital.

Results: There was a statistically significant decrease in the amount of low health foods ordered in the post-implementation phase when compared to the pre-implementation phase (alpha value of 0.05, $p = 0.049$). Although there was not a statistically significant difference in high health and medium health orders, the means of each of these categories increased in the post-implementation phase. There was a 28% increase in healthy foods ordered and a 74% decrease in unhealthy foods ordered.

Implications for practice: Child friendly menu guides promoting healthy food options through menu labeling techniques have a positive impact on meal selections in a pediatric hospital unit. Utilizing menu guides can increase healthy foods ordered and decrease unhealthy foods ordered. Permanent use of menu guides that promote healthful eating are recommended in hospital settings.

The food and beverages people consume have a profound impact on their health (U.S. Department of Agriculture [USDA] & U.S. Department of Health and Human Services [HHS], 2020). A healthy lifestyle, including following a healthy dietary pattern, can help people achieve and maintain good health and reduce the risk of chronic diseases (USDA & HHS, 2020). A healthy dietary pattern consists of eating nutrient dense forms of foods and beverages across all food groups, in recommended amounts, and within calorie limits (USDA & HHS, 2020). The core elements that make up a healthy dietary pattern include vegetables, fruits, grains, dairy, protein, and oils (USDA & HHS, 2020). According to *Dietary Guidelines for Americans 2020-2025*, nutrient dense foods provide vitamins and minerals while having little added sugars, saturated fat, and sodium (USDA & HHS, 2020). Vegetables, fruits, whole grains, seafood, eggs, beans, peas, lentils, unsalted nuts and seeds, fat-free and low-fat dairy products, and lean meats and poultry are all considered nutrient dense foods (USDA & HHS, 2020).

Exposing young children to nutrient dense diets and supporting them in making healthy choices across all environments can help them to establish and maintain a healthy dietary pattern across all of their childhood (USDA & HHS, 2020). Unhealthy diets increase the risk of obesity and chronic diseases (Haines et al., 2019). An unhealthy diet is considered a diet that does not consist of nutrient dense foods. Currently more than one third of children in the United States are overweight or obese (Hudgens et al., 2017). Despite an increased recognition of the problem, childhood obesity has continued to increase over the past three decades, making this a growing epidemic in the United States (Mitchell et al., 2011). It is essential to establish healthy eating habits early in life to stop the progression of the obesity epidemic that the United States is experiencing. Daily

metabolism of children depends on receiving food and vitamins. The inadequate intake of essential nutrients strongly affects children's growth (Malek et al., 2019).

Recommended daily amounts of each food group at the 2,000-calorie level include: two and a half cups of vegetables, two cups of fruit, six ounces of grains, three cups of dairy, five and a half ounces of protein, and twenty-seven grams of oils (USDA & HHS, 2020). Specific recommendations for children vary based on age and body mass index (BMI). As the child grows their caloric intake should increase, thus increasing the amount of each food group they should consume (USDA & HHS, 2020). It is important to keep in mind that children under eight years of age typically require less than 2,000 calories per day, while adolescents may require more than 2,000 calories per day (USDA & HHS, 2020). Specific daily limits for children are recognized, including limiting sugar and saturated fats to less than 10% of calories (USDA & HHS, 2020). Fruit juice should be limited to four ounces per day at the lower calorie levels and no more than ten ounces per day at the highest calorie levels (USDA & HHS, 2020).

Children's nutritional status while hospitalized has been proven to actually deteriorate rather than improve (McCarthy et al., 2019). Hospital meals exceed caloric recommendations without meeting nutrient recommendations, and often include sugar sweetened beverages (Huang et al., 2016). Additionally, sick children who are hospitalized are more likely to be affected by nutritional impairment than children outside of the hospital setting. The effect of malnutrition on a child is not limited to their individual growth. Multiple studies show an association between deterioration of nutritional status upon admission or during hospitalization with increased mortality,

morbidity, prolonged length of hospital stay, and increased rates of complications such as infections (Malek et al., 2019).

The primary purpose of this quality improvement project is to increase the amount of healthy foods ordered by children in a southeastern pediatric hospital unit through implementation of a menu guide. The outcomes measured will be the number of healthful and unhealthful food options ordered for pediatric patient meals. The project aim is for a 25% increase in healthy food options selected after one month of implementation of a pediatric menu guide. The study question is: What is the impact of a child friendly menu guide promoting healthy food options through menu labeling techniques on meal selections in a pediatric hospital unit?

Review of the Literature

A systematic search of the evidence was conducted using the computerized databases of CINAHL, Medline, and PubMed. Keywords *nutrition, diet, food, meal choices, hospital, pediatrics, children, and menu* were used to guide the search. Results (n= 61,128) were filtered to include research articles published between 2015 and 2021 and peer reviewed, full text, English language articles. A refined search was completed using Boolean operators for: *Nutrition AND hospitalized children, Food AND hospitalized children, meals AND pediatric, menu labeling AND children, healthy AND menu AND children, and food selection AND children*. Results from the refined search generated 306 articles. Publications included in this review reported research on nutrition status or risks for hospitalized children, menu labeling interventions or promotions for children, healthy eating for children, food selection influences for children, or food and beverage selections in children's hospitals. Twelve articles met these criteria and were

selected for inclusion in this review. Publications excluded from this review were those that did not report research on nutritional status of hospitalized children, nutritional risks for children, menu labeling interventions or promotions for children, healthy eating for children, food selection influences for children, or food and beverage selections in children's hospitals.

Inadequate intake of essential nutrients strongly affects children's growth and sick children requiring hospitalization are more likely to be adversely affected by nutritional deficits (Malek et al., 2019). A prospective observational study and a cross sectional interventional study found hospitalized children present with higher rates of malnutrition. A retrospective chart review and retrospective research publication revealed increased rates of malnutrition among hospitalized children as well. One global retrospective chart review of hospitalized children identified a prevalence of undernutrition as high as 51% in pediatric patients (McCarthy et al., 2019). Poor nutrition status at admission or worsening of nutrition status during hospitalization is recognized to adversely affect clinical outcomes (McCarthy et al., 2019). A retrospective chart review and retrospective research publication mention an association with deterioration of nutritional status and disturbed immune response, delayed recovery, and increased rates of complications such as infections. A cross sectional interventional study and a prospective observational study discuss an increase in morbidity, mortality, and prolonged length of hospital stay in patients with nutritional impairment.

A retrospective chart review of hospitalized children throughout the world showed many hospital practices can influence or worsen nutritional status in children. Some of these practices include inadequate nutritional intake due to medical procedures

or hospital food, failure to prioritize nutrition care, lack of nutritional monitoring during hospital stay, and inadequate nutritional education or training of hospital staff (McCarthy et al., 2019). The chart review also identified limited menu food selection, child-unfriendly food, inflexible mealtimes, and unfavorable meal delivery systems are all frequent barriers to proper nutrition in hospitalized patients (McCarthy et al., 2019).

Although US hospitals routinely provide food to hospitalized children, meal selections are not considered nutrient dense based on the *Dietary Guidelines for Americans 2020-2025*. A telephonic survey found between 38 to 89% of American hospitals have fast food franchises, in addition to a hospital cafeteria, on their premises and contain on average 9-16 vending machines selling only energy dense, processed, nutrient poor foods (Basak et al., 2019). One cross-sectional study evaluating an American pediatric hospital identified 44% of daily meals exceeded caloric recommendations, 9% met fiber recommendations, 36% met fat recommendations, and 53% included sugar-sweetened beverages (Huang et al., 2016). This data suggests pediatric hospital meal orders do not meet recommended dietary guidelines. Hospitals should encourage patients to order meals that meet nutritional guidelines to prevent additional health risks (Huang et al., 2016).

The food environments children are exposed to in home, school, community, and hospital settings can influence the healthfulness of their diet (Haines et al., 2019). One mixed method interventional study examined the relationship between exposure to a variety of fruits and vegetables and their consumption in an American elementary school (Korinek et al., 2015). Results indicated exposure to a variety of fruits and vegetables

makes children more willing to select a wider variety of fruits, vegetables, and other healthy entrees (Korinek et al., 2015).

Menu based interventions guiding food selection for children have potential to promote healthier food choices and improve nutrients consumed (Ayala et al., 2017). A randomized controlled trial among Canadian hospitalized children revealed an increase of healthy menu items chosen after implementation of menu labeling techniques that promoted healthier items (Basak et al., 2019). Utilizing a “red light, yellow light, green light” label intervention, intake of fruits and vegetables increased, while the intake of less healthy menu items decreased (Basak et al., 2019). Another comparative pre-post interventional study compared traffic light style labeling and cartoon labeling on food purchasing at a children’s hospital in North Carolina. Traffic light labeling showed a significant decrease in the purchase of unhealthy food items, while cartoon labeling was associated with increased unhealthy items purchased (Whitt et al., 2018). Traffic light labeling of menu items has potential to decrease the amount of unhealthy food ordered in a pediatric hospital setting (Whitt et al., 2018).

A community-based participatory research framework study in rural Oregon showed calorie labeling in schools had a positive impact reducing the number of calories consumed by children during school lunches (Hunsberger et al., 2015). Students not only found the labels helpful in choosing healthier food, but calorie consumption also decreased by an average of 47 calories per day and fat intake reduced by 2.1 grams per day (Hunsberger et al., 2015). A “power plate” implementation in an Ohio elementary school evaluated whether or not small prizes and emoticons had an impact on food selection in elementary school students (Hudgens et al., 2017). The “power plate”

consisted of fat free milk, a fruit and vegetable, a whole grain, and a healthy entrée.

Emoticon stickers were placed next to the “power plate” options on the menu and ordering a power plate got the student a small prize. Results from this pilot study demonstrated an over 300% increase in “power plate” selection when small prizes were given (Hudgens et al., 2017).

In summary, it is essential for children to establish healthy eating habits and good nutrition as early in life as possible. Daily metabolism of children depends on receiving food and vitamins, and inadequate intake of essential nutrients strongly affects a child’s growth (Malek et al., 2019). With over one third of children in the United States being overweight or obese, this growing epidemic continues to be a major concern (Hudgens et al., 2017). Hospitalized children are at increased risk for malnutrition and worsening nutritional status during their hospital stay. Several studies mention an association with deterioration of nutritional status and disturbed immune response, delayed recovery, increased mortality, morbidity, prolonged length of hospital stay, and increased rates of complications. Hospitals do not have adequate nutritional interventions in place prioritizing healthful eating for children. Many studies revealed success in menu labeling interventions and increased healthful food options chosen by children. Weaknesses identified from the literature review include a limited amount of research completed on menu labeling interventions, specifically in regard to inpatient pediatric populations in a hospital setting. Many of the menu labeling interventions found were completed in school or restaurant settings. More research is needed on the impact of child friendly menu guides with menu labeling interventions in hospital environments. This project will answer the question: What is the impact of a child friendly menu guide promoting healthy

food options through menu labeling techniques on meal selections in a pediatric hospital unit?

The framework used to guide this clinical scholarship project is the Iowa Model of Evidence Based Practice. This framework is ideal for bedside clinicians seeking a systematic, evidence-based approach to promoting excellence in health care (Buckwalter et al., 2017). The Iowa Model provides a step-by-step process for clinicians to implement practice change with a focus on organization, collaboration, knowledge, and problem-focused triggers (Brown, 2014). The clinicians at the site of project implementation identified a problem; the clinical problem was hospitalized children making poor nutritional choices and meal orders were not meeting recommended dietary guidelines. This problem was identified as a priority needing to be addressed by the institution due to the overwhelming increase in childhood obesity and nutrition deficits in the US in recent years. The Iowa Model allows for piloting of a change project in practice and evaluation of outcomes, thus being the most suitable framework to use for this clinical scholarship project.

Methods

Design

Quality improvement implementation of a pre-post interventional pilot study was done. Data collection was completed through retrospective review of meal orders in January 2022 prior to implementation and prospective review of meal orders in February 2022 post-implementation.

Setting

The study setting was a 21-bed pediatric unit, located within a 204-bed for-profit hospital, in an urban community in Southeastern Florida. Staff involved in this setting were pediatric nurses and dietary workers.

Sample

A convenience sample of all pediatric patients admitted to the pediatric unit in the specified date ranges was used. Inclusion criteria was children between 2-21 years of age with regular diet orders. Exclusion criteria was children less than two years of age, children receiving parenteral nutrition, and children with restricted or modified dietary orders.

Approval Processes

Prior to the start of data collection, five levels of approval were obtained. The student's doctoral committee, Palms West Hospital management team, executive chef, and dietitian, University of Missouri St. Louis (UMSL) Graduate School, Palms West Hospital Institutional Review Board (IRB), and UMSL IRB. The project was determined not to be human subjects research and therefore exempt from IRB oversight by Palms West Hospital IRB. Minimal risk was associated with this study due to the retrospective and prospective design for data collection. No identifying information was collected thereby minimizing any ethical concerns.

Procedures

Stakeholders met and discussed the need for creating and implementing a children's menu with healthful food options. Planning included the creation of a pediatric menu guide with menu labeling interventions, as well as the creation of a data collection

instrument. Foods on the menu were categorized as “high, medium, and low” in regard to healthfulness. A meeting with the executive chef was held to review food options available for inclusion. In collaboration with the hospital dietitian and utilizing *Dietary Guidelines for Americans 2020-2025*, menu food items were categorized. A color-coded theme was used on the menu guide. Food items in green were labeled “Go! These are great healthy options” and were the most healthful. Food options in yellow were labeled “Slow! These options are okay sometimes” and were moderately healthy. Food options in red were labeled “Whoa! Choose these options once in a while” and were the least healthful. A data collection instrument was designed to place the number of food choices ordered into the appropriate categories.

Interventions included providing an in-service education to nursing staff and dietary staff on the pediatric menu guide and implementation of the menu guide by placing it as an insert into all existing menus in all patient rooms. Education with nursing staff and dietary staff included explanation of the problem, identification of the menu guide as a solution, interpretation of the menu guide, and how to instruct patients or families to use the guide when making food selections. Nursing staff were instructed to introduce the menu guide on admission of each patient to the unit, showing them the guide and how to place meal orders. Dietary staff were instructed to ask for meal selections by having the patient or a parent view the guide during their daily rounds.

Data Collection/Analysis

Data was collected on a weekly basis by retrieving the pediatric inpatient unit electronic food orders from the hospital executive chef. The executive chef met with the student investigator at the dietary office and provided a printout of food orders every

Friday during the data collection. The printouts encompassed food order data collected on the seven days prior. Data was collected for one month prior to implementation of the menu guide and one-month post-implementation. Data collection began in January 2022 and finished in March 2022. Breakfast, lunch, dinner, drink, condiment, side, and snack order data were tallied and analyzed using the data collection instrument. Each menu item was linked to a numerical value on the instrument in order to run data using descriptive statistics. Independent samples t-tests were run, comparing the number of meals ordered from each category of “high, medium, and low” health from pre-implementation and post-implementation of the menu guide.

Results

Food orders were collected from January 1 to February 28, 2022, with menu guide implementation occurring on February 1, 2022. There were 125 food options available to choose from every day. The menu guide separated these options into categories with 49 high health food options, 35 medium health food options, and 41 low health food options available to choose from. A total of 7,942 food orders were obtained in January and 7,403 food orders obtained in February. In January, there were 3,275 high health orders, 953 medium health orders, and 3,714 low health orders (Figure 1). In February, there were 4,210 high health orders, 1,058 medium health orders, and 2,135 low health orders (Figure 1).

The mean number of high health food orders in the pre-implementation phase was 66.8, compared to a higher mean of 85.9 in the post-implementation phase. A two tailed independent sample t-test identified there was not a statistically significant difference in the amount of high health foods ordered in January and February, based on alpha value of

0.05, $t(96) = -1.07$, $p = 0.286$ (Table 1). The mean number of medium health food orders in the pre-implementation phase was 27.2, compared to a higher mean of 30.2 in the post-implementation phase. A two tailed independent sample t-test identified there was not a statistically significant difference in the amount of medium health foods ordered in January and February, based on alpha value of 0.05, $t(68) = -0.43$, $p = 0.669$ (Table 1).

The mean number of low health food orders in the pre-implementation phase was 90.6, while the mean in the post-implementation phase was lower at 52.0. A two tailed independent sample t-test identified a statistically significant difference in the amount of low health foods ordered in January and February, based on alpha value of 0.05, $t(80) = 2.00$, $p = 0.049$ (Table 1).

Discussion

Although high health food orders and medium health food orders did not have a statistically significant change in the pre- and post-implementation phase of this study based on the statistical analysis done, the means of each of these ordering groups increased in the post-implementation phase, which is clinically significant (Table 1). The low health food orders did have a statistically significant difference in the means, with low health food orders decreasing after menu guide implementation. These results indicate a positive impact of the child friendly menu guide promoting healthy food options through menu labeling techniques on meal selections in a pediatric hospital unit. Children hospitalized during the post-implementation phase of the study ordered less low health foods and ordered more high and medium health foods.

A 28% increase in high health food orders was noted when comparing the pre-implementation phase to the post-implementation phase. This percentage exceeded the

project aim, which was a 25% increase in high health food orders. There was a 74% decrease in low health foods ordered after the menu guide was implemented. The most notable positive changes in low health foods ordered were juice, butter, and sugar. Juice orders went from 365 in month one to 195 in month two. Butter orders went from 390 in month one to 291 in month two. Sugar orders went from 493 in month one to 155 in month two. Limitations of the study included possible standardization of some meals delivered to patients in both phases. If patients did not place a personalized order, they were sent a standard tray of food decided upon by the chef for that day. In this study, it could not be determined how many standardized trays were delivered in either phase. Another limitation was some food items were readily available on the hospital unit without needing to be ordered, so these items could have been requested by some patients and that data was not tracked during this study.

Permanent use of menu guides promoting healthful eating are recommended in hospital settings. Giving parents and children knowledge on healthy and unhealthy food options available can help them make informed decisions on their nutritional health during a hospital stay. In order to sustain positive change in regard to nutrition and addressing the obesity epidemic, menu guides promoting healthful eating should be utilized. Recommendations for future studies include increasing the length of study period, studying the impact of menu guides in adult populations, and studying the impact of menu guides in other settings.

Conclusion

Child friendly menu guides promoting healthful food options through menu labeling techniques have a positive impact on food selections in a pediatric hospital unit.

Prior studies indicate children's nutritional status while hospitalized deteriorates rather than improves (McCarthy et al., 2019). Hospital meals have been proven to exceed caloric recommendations without meeting nutrient recommendations, and often include sugar sweetened beverages (Huang et al., 2016). Utilizing menu guides can increase healthy foods ordered and decrease unhealthy foods ordered, thus helping improve nutritional status while inpatient and increasing the likelihood of meeting nutritional recommendations. The results of this study show a significant decrease in low health food items ordered after implementation of the menu guide. Although not statistically significant, the means of both the high health and medium health food categories increased with use of the menu guide.

Advanced Practice Registered Nurses (APRNs) have an important role in pediatric health, nutrition education, and addressing the childhood obesity epidemic. APRNs can assist with improving pediatric health and nutrition by educating children and parents on nutritional guidelines by age and promoting healthy eating from infancy to adulthood. APRNs can help stop the childhood obesity epidemic by empowering children to take charge of their health and make healthier food choices.

References

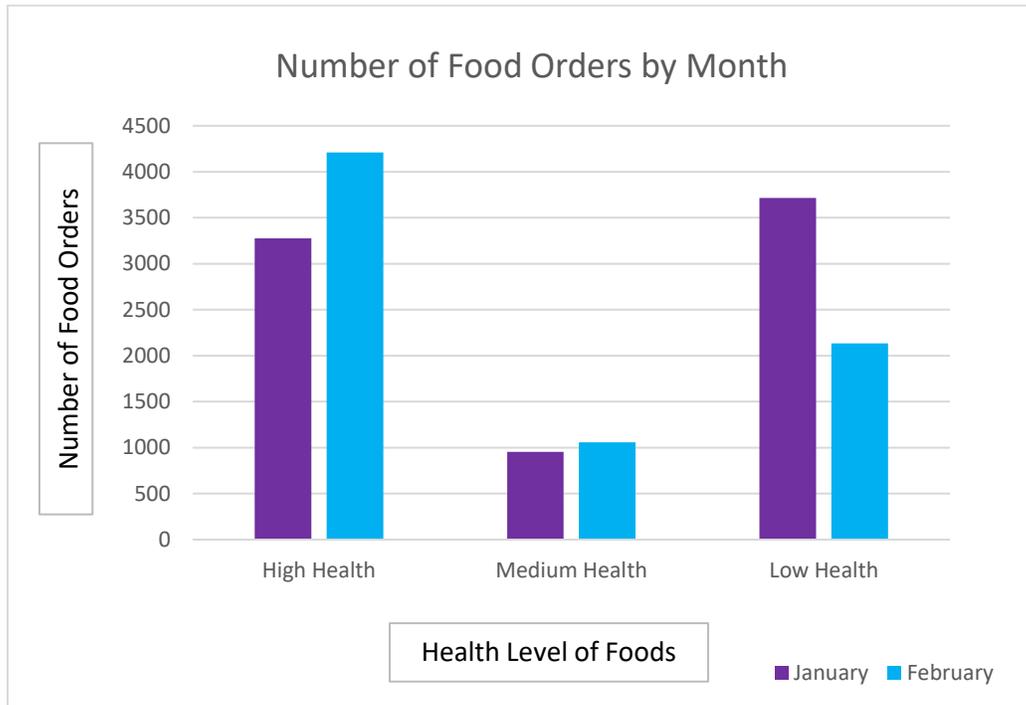
- Ayala, G. X., Castro, I. A., Pickrel, J. L., Lin, S. F., Williams, C. B., Madanat, H., Jun, H. J., & Zive, M. (2017). A cluster randomized trial to promote healthy menu items for children: The Kids' Choice Restaurant Program. *International Journal of Environmental Research and Public Health*, *14*(12), 1494.
doi.org/10.3390/ijerph14121494
- Basak, S., Steinberg, A., Campbell, A., Dupuis, A., Chen, S., Dayan, A. B., Dello, S., & Hamilton, J. (2019). All aboard meal train: Can child-friendly menu labeling promote healthier choices in hospitals? *The Journal of Pediatrics*, *204*, 59-65.e3. doi.org/10/1016/i.ipeds.2018.08.073
- Brown, C. G. (2014). The Iowa model of evidence-based practice to promote quality care: An illustrated example in oncology nursing. *Clinical Journal of Oncology Nursing*, *18*(2), 157-159. doi.org/10.1188/14.cjon.157-159
- Buckwalter, K. C., Cullen, L., Hanrahan, K., Kleiber, C., McCarthy, A. M., Rakel, B., Steelman, V., Tripp-Reimer, T., Tucker, S., & Authored on behalf of the Iowa Model Collaborative (2017). Iowa Model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing*, *14*(3), 175–182.
doi.org/10.1111/wvn.12223
- Gambra-Arzo, M., Alonso-Cadenas, J. A., Jiménez-Legido, M., López-Giménez, M. R., Martín-Rivada, Á., De los Ángeles Martínez-Ibeas, M., Cañedo-Villarroya, E., & Pedrón-Giner, C. (2019). Nutrition risk in hospitalized pediatric patients: Higher complication rate and higher costs related to malnutrition. *Nutrition in Clinical Practice*, *35*(1), 157-163. doi.org/10.1002/ncp.10316

- Haines, J., Haycraft, E., Lytle, L., Nicklaus, S., Kok, F. J., Merdji, M., Fisberg, M., Moreno, L. A., Goulet, O., & Hughes, S. O. (2019). Nurturing children's healthy eating: Position statement. *Appetite, 137*, 124-133.
doi.org/10.1016/i.appet.2019.02.007
- Huang, J. S., Chun, S., Cheung, C., Poon, L., & Terrones, L. (2016). The nutritional value of food service meals ordered by hospitalized children. *Clinical Nutrition ESPEN, 15*, 122–125. doi.org/10.1016/j.clnesp.2016.06.008
- Hudgens, M. E., Barnes, A. S., Lockhart, M. K., Ellsworth, S. C., Beckford, M., & Siegel, R. M. (2016). Small prizes improve food selection in a school cafeteria without increasing waste. *Clinical Pediatrics, 56*(2), 123-126. doi.org/10.1177/0009922816677546
- Hunsberger, M., McGinnis, P., Smith, J., Beamer, B. A., & O'Malley, J. (2015). Calorie labeling in a rural middle school influences food selection: Findings from community-based participatory research. *Journal of Obesity, 2015*, 531690. doi.org/10.1155/2015/531690
- Korinek, E. V., Bartholomew, J. B., Jowers, E. M., & Latimer, L. A. (2013). Fruit and vegetable exposure in children is linked to the selection of a wider variety of healthy foods at school. *Maternal & Child Nutrition, 11*(4), 999-1010. doi.org/10.1111/mcn.12035
- Malek, A., Hashemi, M., Anjomrooz, M., Torabi, P., & Imani, B. (2019). Malnutrition and medical nutrition therapy in hospitalized children: a case study of using national malnutrition screening tools in northeastern Iran. *African Health Sciences, 19*(1), 1566–1573. doi.org/10.4314/ahs.v19i1.31

- McCarthy, A., Delvin, E., Marcil, V., Belanger, V., Marchand, V., Boctor, D., Rashid, M., Noble, A., Davidson, B., Groleau, V., Spahis, S., Roy, C., & Levy, E. (2019). Prevalence of malnutrition in pediatric hospitals in developed and in-transition countries: The impact of hospital practices. *Nutrients*, *11*(2), 236. doi.org/10.3390/nu11020236
- Mitchell, N. S., Catenacci, V. A., Wyatt, H. R., & Hill, J. O. (2011). Obesity: Overview of an epidemic. *The Psychiatric Clinics of North America*, *34*(4), 717–732. doi.org/10.1016/j.psc.2011.08.005
- Saengnipanthkul, S., Chongviriyaphan, N., Densupsoontorn, N., Apiraksakorn, A., Chaiyarit, J., Kunnangja, S., Wongpratoom, S., Papakhee, S., Det-amnatkul, W., Monwiratkul, J., Saengpanit, P., Limthongthang, P., & Panthongviriyakul, C. (2021). Hospital-acquired malnutrition in paediatric patients: A multicentre trial focusing on prevalence, risk factors, and impact on clinical outcomes. *European Journal of Pediatrics*, *180*(6), 1761-1767. doi.org/10.1007/s00431-021-03957-9
- U.S. Department of Agriculture [USDA] and U.S. Department of Health and Human Services [HHS]. (2020). *Dietary Guidelines for Americans, 2020-2025*. 9th Edition.
- Whitt, O. R., Jilcott Pitts, S., Rafferty, A. P., Payne, C. R., & Ng, S. W. (2017). The effects of traffic light labelling versus cartoon labelling on food and beverage purchases in a Children's Hospital setting. *Pediatric Obesity*, *13*(4), 265-268. doi.org/10.1111/ijpo.12232

Appendix A.

Figure 1.

Number of Food Orders by Month

Note. Food orders were collected from January 1 to February 28, 2022, with menu guide implementation occurring on February 1, 2022. There were 125 food options were available to choose from every day. The menu guide separated these total options into categories with 49 high health food options, 35 medium health food options, and 41 low health food options available to choose from. A total of 7,942 food orders were obtained in January and 7,403 food orders obtained in February.

Table 1.

Independent Samples t-Test for High, Medium, Low Health Food Orders by Month

| | January | | February | | <i>t</i> -value | <i>p</i> -value | Cohen's <i>d</i> |
|---------------------------|---------|--------------------|----------|--------------------|-----------------|-----------------|------------------|
| | Mean | Standard Deviation | Mean | Standard Deviation | | | |
| High Health Food Orders | 66.84 | 76.28 | 85.92 | 98.42 | -1.07 | 0.286 | 0.22 |
| Medium Health Food Orders | 27.23 | 26.92 | 30.23 | 31.39 | -0.43 | 0.669 | 0.10 |
| Low Health Food Orders | 90.59 | 107.68 | 52.07 | 60.61 | 2.00 | 0.049 | 0.44 |

Note. High health food orders: N = 98. Degrees of Freedom for *t*-statistic = 96. Medium health food orders: N = 70. Degrees of Freedom for *t*-statistic = 68. Low health food orders: N = 82. Degrees of Freedom for the *t*-statistic = 80.