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PILOT TESTING A NUTRITION AND MOTIVATIONAL INTERVIEWING CURRICULUM FOR NURSING STUDENTS

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PILOT TESTING A NUTRITION AND MOTIVATIONAL INTERVIEWING
CURRICULUM FOR NURSING STUDENTS

BY
TAYLOR BENSON BERLINSKY

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE
IN
NUTRITION AND FOOD SCIENCES

UNIVERSITY OF RHODE ISLAND

2019

MASTER OF SCIENCE THESIS
OF
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2019

ABSTRACT

Background: Nurses are often overlooked as resources for childhood obesity prevention efforts. Although some studies have focused on educating nurses about obesity prevention, few have included training in motivational interviewing (MI). The purpose of this study was to develop and pilot a nutrition and MI curriculum and assess the feasibility, acceptability, and preliminary efficacy with undergraduate nursing students.

Methods: The curriculum included three 2.5-hour sessions and one follow-up session. Using a non-experimental pre-post study design, nutrition and MI knowledge, self-efficacy, and curriculum satisfaction were evaluated via self-reported surveys. During the follow-up session, participants practiced their MI skills with a trained standardized patient, and all practice sessions were video recorded. Statistical analyses included descriptive statistics, paired sample t-tests, Wilcoxon signed rank test, and MI proficiency was assessed using MITI 3.3.1 coding.

Results: All 13 participants were seniors in an undergraduate nursing program and identified as non-Hispanic, White and were on average 22 years of age. Results showed a statistically significant increase in nutrition knowledge (pre: 18.6 ± 2.1 , post: 20.5 ± 2.5 ; $p=0.003$). Results showed there was a statistically significant increase in self-efficacy (pre: 3, post: 4; $p=0.002$), and 9 participants obtained beginning MI proficiency in at least one category. The majority of participants reported being very (63.6%) or extremely (9.1%) satisfied with the curriculum and training.

Conclusion: This pilot improved nutrition knowledge and self-efficacy related to MI, although some changes are required to improve the curriculum for future use. Given that nurses play important roles in both school and healthcare settings, developing effective childhood obesity prevention training curriculums for them is crucial.

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I have a lot to be grateful for and look forward to what the future brings in my career as a registered dietitian.

PREFACE

This thesis was prepared in manuscript format following the author guidelines for the *Journal of Nursing Education*. After submitting this thesis, the manuscript may be submitted for publication.

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MANUSCRIPT

**“Pilot Testing a Nutrition and Motivational Interviewing Curriculum
for Nursing Students”**

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INTRODUCTION

Childhood obesity is a major public health problem in the United States. Nationally, 31.8% of 2 to 19 year old children and adolescents are overweight or obese, which is associated with dietary habits, physical activity (PA) level, and sleep, among other factors.^{1,2} Obesity poses a risk to children's health because it is linked to insulin resistance and type 2 diabetes, breathing and musculoskeletal problems, as well as poorer academic scores and social and psychological problems such as bullying and depression.^{3,4} It is also associated with health problems later in life, such as chronic diseases, including type 2 diabetes, cardiovascular disease, cancer, asthma, and shorter lifespans.^{1,4} Given that childhood obesity is associated with later obesity as well as increased healthcare costs, it is key to prevent it with a multifaceted approach.²

Because childhood obesity is a growing public health issue, there are efforts to provide training to the healthcare workforce to target childhood obesity prevention. Nurses are a crucial part of the healthcare system, and therefore providing them with educational tools to prevent obesity could improve the state of obesity in America. There are few programs and curriculums available to educate nurses about obesity prevention that include motivational interviewing (MI). Given that not all universities require nursing students to take a nutrition course, it is important to establish a curriculum that provides nutrition education including the importance of PA and sleep to prepare the students to participate in obesity prevention.⁵ While reaching parents and children with childhood obesity prevention efforts can be challenging, one strategy to include parents is through nurses who have contact with children in primary care providers' (PCP) offices, schools, and health clinics. Although nurses can play a key role in the implementation of effective and sustainable childhood obesity prevention programs, they are often not

utilized as resources in this setting.⁶ They are well placed to address obesity prevention, but expanding nurses' skills in this area is necessary in order to redirect this public health opportunity.⁷ Examples of skills that need improvement are determining risk for overweight or obesity, confidence in their knowledge, and tools to provide patients with information and education.⁷

Nurses can help play a role in obesity prevention, but they need additional education, training, and practice opportunities.⁸⁻¹¹ There are several barriers that nurses face when it comes to aiding in childhood obesity prevention, including lack of knowledge and self-efficacy.¹² It has been shown that brief training can help equip nurses with nutrition and MI knowledge to aid in their childhood obesity prevention skills.¹³ Other examples of successful programs relate more closely to the application of obesity prevention, rather than nurse education.¹⁴ A randomized controlled trial found that school nurses were able to successfully implement a program to increase PA in schools with 251 student participants, showing a decrease in screen time, an increase in PA time, and a decrease in body mass index (BMI). Given the scarcity of available programs, additional research is necessary to determine which interventions and behavior change techniques would be helpful to nurses.¹¹

When targeting obesity prevention at the individual level, establishing or changing health behaviors related to eating, PA, and sleep are important. However, changing health behaviors and establishing new ones can be challenging. One useful tool is MI, which is a patient-centered method used to increase intrinsic motivation and resolve ambivalence to facilitate behavior change.¹⁵ It has generally been a successful tool in facilitating behavior change, such as consumption of healthier foods, though nurses require training to use it effectively to prevent obesity.¹⁶ One problem that has

arisen is that obesity itself is not a behavior, so healthcare providers must target specific behaviors that contribute to obesity in order to effectively utilize MI.¹⁷ Some studies have shown found that nurses' MI proficiency is generally low, but training and practice can help improve MI skills and increase proficiency.¹⁷⁻¹⁹

Nurses are often overlooked as a resource for childhood obesity prevention efforts, and it is important to provide them with training in health behaviors related to obesity, along with skills for helping patients improve these behaviors. Therefore, the purpose of this study was to develop and pilot a nutrition and MI curriculum, assess the feasibility, acceptability, and preliminary efficacy with undergraduate nursing students. We hypothesize that the curriculum will increase knowledge about nutrition-related health behaviors, self-efficacy around conducting MI, and that participants will have high satisfaction with the curriculum.

METHODS

Participant Recruitment

The sample size was 13 nursing students. The small sample size was because the participants were students who were completing their pediatric rotations at the time the pilot was scheduled. Though there were 109 students completing their pediatric rotation, it was only feasible to include two rotation groups due to scheduling conflicts. Nursing faculty who were involved with the curriculum development recruited students in their rotation groups to participate in the study. In order to be included in the study, participants had to be enrolled in the University of Rhode Island (URI) undergraduate nursing program as well as courses including Practicum in Nursing of Children (NUR 434) or Practicum in Community Health Nursing (NUR 444). There were no students

who were excluded from participation in the study. Demographic information on the sample are found in Table 1.

After obtaining approval by the Institutional Review Board (IRB), nursing students who were enrolled in either NUR 434 or NUR 444 were recruited by the professors for these courses. These students were required to participate in the nutrition curriculum as part of their course work. Though the curriculum was a requirement of the courses, students had the opportunity to opt out of the study. All of the students chose to participate in the study, and a signed consent was obtained from them at the beginning of the first session.

Study Design and Procedures

This study collected primary data and utilized a non-experimental pre-post study design. An obesity prevention curriculum was developed for nursing students at URI in order to increase their knowledge and self-efficacy related to nutrition and MI as well as their ability to conduct MI to aid in childhood obesity prevention. The curriculum was developed and then pilot tested with a group of nursing students to then assess the impact of the curriculum on students' knowledge, self-efficacy, ability to conduct MI, and satisfaction with the program.

In order to develop the nutrition curriculum, a literature review of existing curriculums was conducted in addition to examining existing URI nursing courses to ensure that there was not an overlap of material. Topics were chosen based upon the literature and best practice applications in the healthcare field. Examples of these topics included social determinants of health, clinical and school recommendations for childhood obesity prevention, and an introduction to MI. An outline of the curriculum was presented in a two-hour meeting with a team of six nutrition and nursing faculty.

There were discussions regarding the types of activities that would be included in the curriculum, and revisions were suggested to the curriculum draft. After the review process was completed, revisions were made to the curriculum.

The curriculum that was developed is outlined in Table 2. The first of three sessions included an introduction to the pilot and the topics of childhood obesity, social determinants of health, and modifiable risk factors. There were several activities to give the participants experiential learning experiences during this session. These included group and class discussions, two case studies about social determinants of health and the roles of healthcare professionals in prevention and treatment of obesity, and creating a systems map of the risk factors for obesity.

The second session included the topics of clinical recommendations for childhood obesity, school recommendations, and an introduction to MI. The activities participants completed during this session included group and class discussions, a case study regarding best practices and clinical recommendations, an online Harvard implicit test to help them understand their personal biases related to obesity, and beginners' practice with MI.

The third and final informative session covered topics including resources and referrals in addition to the second MI instruction portion. Both of these were followed by a summary and conclusion discussion. The MI portion included ways MI is useful for obesity prevention and the four basic skills of MI, along with demonstrations. The summary and conclusion were a recap of all the topics previously covered during the pilot, and the purpose of this was to bring everything together succinctly. The one activity during this session was practicing MI through role play with classmates.

During the final follow-up session, there was a 30-minute review of the nutrition and MI material previously covered. Students then individually practiced their MI skills with standardized patients (SP). Three SPs, or trained actors, came from the University of Massachusetts to complete 10-minute MI practice sessions individually with each of the participants. The SPs were provided with a script created by the researchers to standardize the topics talked about during each session. These sessions were video recorded, and the Motivational Interviewing Treatment Integrity Code (MITI) 3.1.1 was used to code each entire recording. The SPs also provided feedback about the sessions with each participant using a form to fill out what they felt were each participant's strengths and areas for improvement. Because there were only three SPs, the participants were waiting between individual sessions for their turns. During this time, they separated into groups of three or four. On iPads, they used the app "Change Talk" to further practice their MI skills. This app provided the opportunity to interview patients using MI by providing choices for what to ask, say, or tell the patient, and then provided feedback at the end of each interview. Once the sessions with the SPs were over, the participants took the post-survey and satisfaction survey.

Measures

Sociodemographic Questionnaire

Sociodemographic questions were included in the pre-survey. There were questions regarding gender, age, race and ethnicity, and education, among others.

Nutrition Knowledge & Self-Efficacy Questionnaire

Participants' knowledge, self-efficacy, and satisfaction was assessed using a pre- and post-survey. The pre-post survey asked 48 questions related to knowledge and self-efficacy in nutrition and MI. After the curriculum was taught, students completed a post-

survey that was comprised of the same questions on the pre-survey, excluding the sociodemographic questions. The pre-post survey can be found in Appendix C.

Because there were no validated instruments in current literature used to evaluate nutrition curriculum for nursing students, original evaluation tools were developed for this pilot. The surveys took approximately 15 to 20 minutes for participants to complete. The mean was taken of each of the totals to determine the sample's knowledge about nutrition and MI as a whole. Self-efficacy was determined through four questions on the pre- and post-surveys. Participants were asked about their confidence in knowledge related to childhood nutrition, confidence in ability to teach others current nutrition-related knowledge, confidence in applying MI skills with patients in general practice, and confidence in applying MI skills with patients related to childhood obesity. Participants were asked to rate their self-efficacy on a five-point Likert scale from 1 (not at all confident) to 5 (extremely confident). The scores were combined similarly to the knowledge questions by finding the self-efficacy of each participant and then finding the mean overall self-efficacy of the sample related to each of the four questions.

Participant Satisfaction Questionnaire

Participants also took a survey in response to their satisfaction with the curriculum, which had questions about overall satisfaction with the pilot, curriculum topics, time spent on curriculum, and any changes they would make to the curriculum for the future. These questions were asked using five-point Likert scale from 1 (not at all satisfied) to 5 (extremely satisfied). There were additional satisfaction questions regarding how much time was spent on each individual topic. These questions were rated on a three-point scale, with 1 being too little time, 2 being the right amount of time, and 3 being too much time. This survey can be found in Appendix D. Additionally, after each

session, participants completed a shorter satisfaction survey related to that specific session, and this can be found in Appendix E. These questions were similar to the overall satisfaction survey, with questions about curriculum topics, time spent on these topics, and any suggestions for improvement to the curriculum.

MI Adherence

The participants were observed and evaluated on their ability to apply acquired knowledge to conduct MI to prevent childhood obesity in the video recorded sessions with the SPs. All video recordings from MI practice sessions with SP's were coded using MITI 3.1.1, which can be found in Appendix F. One trained researcher coded each of the videos to minimize biases. This coder was trained by an experienced MITI coder. MITI requires the coder to determine how the participant used MI in several different categories, which then determine whether the participant meets beginning proficiency or not. MITI uses behavior counts to determine frequency of behaviors in five different categories. In order for participants to reach beginning proficiency, their scores must reach an average of 3.5 out of 5 for global spirit, 1 for reflection to question ratio, 50% for percent open questions, 40% for percent complex reflections, and 90% for percent MI-adherent. The scores must be even higher to reach MI competency.

Data Analysis

Descriptive statistics for study variables were calculated and included means or medians and standard deviations (SD) for continuous variables as well as frequencies and percentages for categorical variables. Paired sample t-tests were run to determine if there was a statistically significant difference in pre- and post-survey knowledge score. Wilcoxon signed rank was used to determine statistical significance of non-parametric data, including self-efficacy. The MI videos were coded using MITI 3.3.1 to determine

proficiency levels of the participants' MI skills. Percent frequencies including mean and SD were also run for the MI data to compare scores to levels of proficiency set by MITI. All data were analyzed using SPSS version 25. Significance was set at $p < 0.05$.

RESULTS

Participant Characteristics and Feasibility

All eligible undergraduate nursing students who were in the selected rotation groups opted to participate in the study. All of the nursing students were fourth year students, or seniors, in the URI nursing program. The mean age of the participants was 21.6 ± 1.6 , and all participants identified as White and non-Hispanic. All of the participants took Nutrition and Food Science (NFS) 207 in the past, which is a general nutrition course. None of the participants had previous MI training. More information about the participants' demographics can be found in Table 1. All 13 participants completed both the pre- and post-surveys, 11 participants completed the satisfaction survey, and all 13 completed the MI practice session, though only 12 were included in the results due to video malfunction for one participant. Only 11 participants completed the satisfaction survey because the remaining two did not completely finish the survey during the follow-up session. They were prompted via email to complete the survey but did not finish it. Additionally, all 13 participants were able to attend each session.

Nutrition Knowledge and Self-Efficacy

Table 3 provides an overview of nutrition knowledge results, showing that there was a statistically significant mean increase in nutrition knowledge from pre-survey ($77.56\% \pm 8.76$) to post-survey ($85.26\% \pm 10.29$). Therefore, there was a mean increase in knowledge by 7.7% correct answers. Some of the commonly missed questions for the post-survey were related to the percent of children and adolescents who were obese, risk

factors of obesity, the role of registered dietitians, and the funding of the Supplemental Nutrition Assistance Program (SNAP). There was also a statistically significant increase in nutrition knowledge (total score=24, pre: 18.6 ± 2.1 , post: 20.5 ± 2.5 ; $p=0.003$).

Table 4 provides an overview of self-efficacy around nutrition and MI. There was a statistically significant increase in self-efficacy regarding confidence with overall nutrition knowledge ($p=0.002$). There was an increase in confidence in knowledge related to childhood nutrition from a median of 3 to 4. There was also an increase in confidence in ability to teach others current nutrition-related knowledge from a median of 3 to 4.

Participant Satisfaction

Eleven of the participants responded to this survey. For overall satisfaction, 27.3% of participants responded that they were moderately satisfied, 63.6% responded that they were very satisfied, and the remaining 9.1% responded that they were extremely satisfied. For total time spent on the pilot, 9.1% said they were slightly satisfied, 36.4% said they were moderately satisfied, 36.4% said they were very satisfied, and 18.2% said they were extremely satisfied. The median overall satisfaction with the curriculum and overall satisfaction with time spent was 4 (very satisfied). Participants were also asked questions more specific to their satisfaction with the amount of time on each topic using a different scale. A more detailed breakdown of the participants' responses can be found in Tables 5 and 6.

All of the participants agreed that the curriculum prepared them to effectively incorporate childhood obesity prevention into their future practices. When asked what changes they would make to the curriculum, there were a couple who responded that they think more time is needed to be spent on MI. There were others who thought the curriculum should have been more focused on nursing students. One participant stated

that, “I think that for me I need this needs to be more relevant to nursing. Have more ways that we can actually help than refer patients to outside resources since the doctors are the ones that have to write the referrals.” Others believe that no changes needed to be made to the curriculum. All participants agreed that the curriculum could be useful for future nursing students, and most thought that the MI was the most useful portion because they learned how to speak with patients in a new way. They also liked the interactive activities that were incorporated into each session. Alternately, many participants believed that there was too much time spent on the curriculum overall. One participant said, “The three 2.5-hour lectures were very dry and repetitive to what we have previously learned several times. I think it would be helpful to recap but could have been a significantly less amount of time.” Another said, “I didn’t like the dietary guidelines or social determinants because we spent a lot of time on it and we already had a background knowledge from nursing. I think more time on MI and interventions to prevent childhood obesity would be more effective.”

When asked if they had any additional comments, one participant suggested that, “This information could be made into a simulation day during the semester. It might be most helpful during the pediatric rotation,” though this curriculum was taught during their pediatric rotation. Overall, the participants were satisfied with what they were taught, but had some helpful suggestions for altering the curriculum for future use.

There were also short satisfaction surveys which were taken at the end of each of the sessions. These questions focused on what they liked and didn’t like, improvements that could be made for the next session, and time spent on topics. During the first session, many participants liked the interactive activities and disliked the lengthy lecture times. Some also thought portions of the lectures were too repetitive. All participants agreed that

enough time was spent on each topic, and some thought too much time was spent on certain talking points.

During the second session, most of the participants liked the MI portion the most. One said, “I find motivational interviewing very relevant for us as nurses and I liked the lecture.” Many found that the lecture was too long and that it was difficult to focus for the whole duration of the session, and thus their comments for improvement for the next session mainly focused on shortening the session time and making it more concise. They also stated that, “more hands-on activities” and, “break[ing] it up into group work” would be helpful.

During the third session, all the participants agreed that their favorite part of the session was being able to practice the material they learned related to MI. One participant stated, “I think it really helped me to feel more confident in my abilities to do MI. I’m still not completely confident but the role playing definitely helped.” Some participants disliked the length of the session and some also thought it was repetitious with MI content. One participant stated that an MI performance evaluation would have been helpful.

MI Adherence

All 13 participants completed an MI practice session with an SP, but due to a recording issue, data are only available for 12 participants. Overall, the MI scores were not proficient. There were some participants who reached beginning proficiency in certain categories, but some were unable to reach beginning proficiency in any categories. The mean score for global spirit was 2.89 (SD=0.78), but there were two participants who reached beginning proficiency in this category. For reflection to question ratio, the mean was 0.26 (SD=0.16), and none of the participants were proficient

in this category. The mean for percent open questions was 38% (SD=0.12), and only three participants were able to achieve the minimum beginning proficiency score of 50% open questions. The mean score for percent complex reflection was 14% (SD=0.21), and two participants were able to reach beginning proficiency for this category. Conversely, there were also eight participants who earned 0% complex reflections. For the remaining category, percent MI-adherent, the mean score was 55% (SD=0.34). Only one participant was able to reach beginning proficiency in this category. Of the five categories, there was only one participant who reached beginning proficiency in two of those categories. Eight participants were able to reach beginning proficiency in one category, while the remaining three participants did not reach beginning proficiency in any categories.

There were three questions regarding MI knowledge in the pre- and post-surveys, and all participants answered two of them correctly on both surveys. Three of the participants answered the remaining MI question incorrectly. There was not a significant increase in knowledge related to MI regarding the three survey questions ($p = 0.08$). Conversely, the participants' increase in MI-related self-efficacy indicates that knowledge and self-efficacy were gained through this training. There was an increase in confidence in applying MI with patients in general practice from a median of 2 (slightly confident) to 4 (very confident), as well as an increase in confidence in applying MI skills with patients related to childhood obesity from a median 2 (slightly confident) to 3 (somewhat confident).

DISCUSSION

This study aimed to develop a childhood obesity prevention curriculum for undergraduate nursing students and test the initial feasibility and efficacy to increase: 1) participants' knowledge about MI and health behaviors associated with obesity, and 2)

participants' self-efficacy and ability to apply knowledge to conduct MI and discuss health behaviors related to childhood obesity. Results indicate that it is feasible to incorporate a short childhood obesity prevention curriculum into existing nursing curriculum, that all participants completed all sessions, and participants were generally satisfied with the curriculum. The pilot succeeded in improving knowledge and self-efficacy related to nutrition and MI. The increase in knowledge from pre to post measurements supports the first hypothesis, showing that the curriculum helped increase nursing students' knowledge about MI and health behaviors associated with obesity. The increase in self-efficacy supports the second hypothesis. Additionally, the participants reported positive satisfaction with the pilot, which supports the third hypothesis. It was displayed that the curriculum can be effective for increasing nursing students' knowledge, self-efficacy, and MI skills, which can be applied not only to childhood obesity prevention, but their general practice. Though the participants' self-efficacy seemed higher than the skills they displayed in the MI session, they were still able to build upon their MI skills. Participants were able to meet some beginning proficiency criteria for MI, but none of them reached beginning proficiency overall. It is possible that the pilot was shown to be effective at increasing knowledge and self-efficacy because the curriculum was concentrated on topics that the participants had little exposure to in their education thus far. The MI portion of the curriculum was less successful because of the amount of time spent on this during the pilot, which will be discussed in further detail below.

Given the important role nurses play in school and healthcare settings, finding ways to incorporate obesity prevention into practice is crucial. Nurses are often underutilized as resources in obesity prevention, and many could also benefit from additional

nutrition education due to the unavailability of educational programs outside of limited nutrition undergraduate curriculums. Programs are being developed in response to the idea that nurses can aid in childhood obesity prevention. Thus, this pilot is similar to other studies in that nurses and other healthcare professionals aim to reduce childhood obesity through intervention programs. One study observed changes in knowledge, skills, and self-efficacy when nurses provided parents with childhood obesity prevention strategies after a curriculum intervention.²⁰ The curriculum had some similar topics to the present curriculum including BMI, diet, PA, screen time, and recommendations for patients.²⁰ This study found that nurses were able to provide nutrition-related advice to patients in 60% of consultations and that the workshop was able to provide them with valuable obesity prevention resources.²⁰ These studies are similar in nature because of the measured outcomes and similar findings of increased knowledge. There are also some differences, including the use of MI in the present study and that the nurses in the other study were able to apply their knowledge to educate parents about prevention strategies. In addition to this, there are studies which focused on nurses' desire to participate in childhood obesity prevention programs and what areas of education are necessary for nurses.²¹ This is similar to some of the data collected in the present study because the nursing students shared which topics they felt comfortable with in addition to ones they felt they needed more exposure to.

Conversely, the present study does differ from all of these studies. Some studies focused on school-based interventions with children that were nurse-run, rather than focusing on nurse education itself.²² Determining effectiveness of programs using weight, diet, PA, or self-efficacy outcomes for the children could also be an effective strategy because it allows the nurses to apply their skills and knowledge to real situations.

Additionally, to our knowledge, there are no existing studies that are quite like the present pilot because of the inclusion of MI training. The existing curriculums focused more on teaching nurses information, rather than additionally providing them with a tool like MI to apply what they have learned. Though there was one study that included both nutrition and MI, it was a 3-hour workshop, rather than a curriculum, and less in-depth than the present study.²⁰ This seemed to be an effective strategy to educate nursing students about childhood obesity prevention because they saw it as not only helpful in that situation, but applicable to their careers as a whole.

While the participants provided positive feedback about the addition of MI to the pilot, they also believed that not enough time was spent on this particular aspect of the training. Because most participants correctly answered the MI pre-survey questions, there was only a slight increase in knowledge on the post-survey because there was little room for improvement. The hypothesis regarding an increase in knowledge related to MI can be supported based on the surveys, but not significantly because there was little room for improvement ($p=0.08$). Ideally, they should have received more time for MI training, though current literature does not identify a certain number of hours required to become proficient in MI. It is a skill that must be built and reinforced over time. This would also align with the scores that they received on their SP practice sessions because more MI training likely would have allowed them to earn higher scores and reach beginning proficiency. A more well-rounded MI training would include extended sessions where the students learn more about the interviewing process itself, as well as additional time practicing. More experience with practicing MI before they were evaluated in the video sessions could have increased their self-efficacy. MI proficiency comes with experience with real patients and learning techniques that are successful and unsuccessful. With the

time restraints of the present pilot, due to scheduling and availability of participants and staff, this in-depth MI training was not realistic. Though, it would be beneficial for future use of the curriculum to have this more comprehensive MI training.

Though the pilot was successful at increasing knowledge and self-efficacy, some changes are required to improve the curriculum for future use. One participant stated, “I didn’t like the dietary guidelines or social determinants because we spent a lot of time on it and we already had a background knowledge from nursing. I think more time on MI and interventions to prevent childhood obesity would be more effective.” When comparing this statement to the survey responses, it seems that reviewing the dietary guidelines was necessary for most participants because only three correctly answered the related question at baseline, and three still answered it incorrectly after the pilot. It seems that for the social determinants portion, omitting this would be more appropriate for the pilot because all participants answered this question correctly for the pre- and post-survey. They also learn about it in other courses. One participant suggested that providing performance evaluations for their MI practice would have been helpful, so adding this for the future could be beneficial for participants. Another change that most participants favored was making the sessions shorter. Three-hour sessions of lessons and activities proved to be too long of a time span, as participants gave feedback that they were having trouble concentrating by the end of each session. One possibility is separating the sessions into four 2-hour sessions. This would add an additional hour, which could be dedicated to MI, thus taking into account the feedback regarding the need for additional time dedicated to MI and shorter sessions. Another change that could be made is spending more time on questions that a high percent of participants did not answer correctly in the post-survey.

There were some limitations with this pilot study. One of the major pieces of feedback that participants provided regarded overall time spent on the pilot. As previously mentioned, most of them thought that three 2.5-hour sessions were too long and that their concentration was lost by the end of the sessions. They also would have liked more time spent on MI, particularly with practicing their skills. Additional MI training time would likely correlate to better proficiency scores during the SP practice sessions. The small sample size of this pilot also limits the study because it may not be externally valid with other populations. Because the study was a pilot and the sample size was already small, there was no control group. In addition to this, the population was quite homogenous in terms of sex, age, race, and ethnicity. There were also some problems related to technology, and thus not every participant took the satisfaction surveys and one of the MI videos was missing. Another limitation is that the instruments utilized were not validated. This is primarily due to the fact that there were no instruments available for a study of this kind because of its original nature. Additionally, though the syllabus was reviewed, it is possible that what was taught in class may have deviated somewhat. The participants did receive handout materials, which can be found in Appendix J, but a more thorough review of the curriculum beyond the syllabus could have been helpful before the participants completed the post-surveys.

There were also many strengths associated with this pilot. To our knowledge, this is one of the first pilots of its kind due to the inclusion of MI training. Therefore, the use of MI is unique to this program compared to similar ones. Another strength was that the program was shown to be successful in increasing knowledge and self-efficacy related to nutrition and MI, as well as positive results regarding satisfaction with the curriculum. Once modified, this curriculum could be effectively integrated into the undergraduate

nursing curriculum in order to teach a larger number of nursing students about obesity prevention. Another use for the curriculum would be creating a simulation day where the students learn about nutrition and MI and have simulations practicing MI skills. It has the potential to have a larger impact on obesity in the future once more nurses have been educated about nutrition and using MI in their practice. The present study also extends the literature about nursing and childhood obesity prevention.

There are several applications relevant to the present study. This pilot can be adapted for future use not only by URI, but by other universities or organizations concerned with educating nurses or nursing students about nutrition, MI, and childhood obesity prevention. It can also be used as a resource for current nurses who are no longer students but want to extend their knowledge about nutrition and MI. The pilot can be used as a guide to create similar curriculums to educate nurses, as well. This pilot study also extends the literature on topics related to nurses and nursing students and their efforts in obesity prevention.

CONCLUSION

The pilot succeeded in improving knowledge and self-efficacy related to nutrition and MI, but some changes are required to improve the curriculum for future use. Given the important role nurses play in school and healthcare settings, finding ways to incorporate obesity prevention is crucial. Those in the nursing profession are interested and driven to aid in childhood obesity prevention and are eager to gain more knowledge to help them with this endeavor. Future studies may benefit from using this curriculum to educate nurses or nursing students and then having them apply their knowledge to sessions with children and their parents. This would help to determine the effectiveness of nurses' education related to nutrition and their proficiency levels with using MI in real

counseling situations. This study is a good starting point for creating interprofessional, educational tools that will help to prevent childhood obesity in the future.

TABLES

Table 1. Demographic Characteristics of Nursing Students

n=13	
Characteristics	n (%)
Demographics	
Age (M, SD)	21.62 ± 1.56
Gender (Female)	13 (100%)
Race/Ethnicity	
Hispanic/Latino	0 (0%)
White	13 (100%)
Previous Education	
4th Year (Senior)	13 (100%)
Past Nutrition Courses	13 (100%)
Past Nutrition Training	1 (7.7%)
Past MI Training	0 (0%)

Table 2. Overview of Curriculum for Pilot

Topic	Material Covered
Introduction Session One	<ul style="list-style-type: none"> - Definition of childhood obesity - Effects on the body - Morbidity and mortality - Healthcare costs - Obesity prevalence by subgroups (race, ethnicity, age), increase in prevalence - Role of healthcare professionals
Social Determinants of Health Session One	<ul style="list-style-type: none"> - Definition and overview of social determinants of health - Documentary “In Sickness and in Wealth” - Determinants of obesity
Modifiable Risk Factors Session One	<ul style="list-style-type: none"> - Modifiable versus non-modifiable risk factors - Socio-ecological model - General risk factors for obesity - Risk factors through the life cycle
Session One Activities	<ul style="list-style-type: none"> - Group and class discussions - Case study: social determinants of health - Case study: roles of healthcare professionals in prevention & treatment - Create a systems map of risk factors for obesity
Clinical Recommendations Session Two	<ul style="list-style-type: none"> - Best practices for clinical setting - Dietary guidelines/MyPlate - Physical activity, sleep, screen time recommendations - Obesity screening tools - Bias and discrimination related to obesity
School Recommendations Session Two	<ul style="list-style-type: none"> - Best practices for school setting - Existing programs in schools
Introduction to MI Session Two	<ul style="list-style-type: none"> - Behavior change theories - Definition and history of MI - Components of MI (process, spirit, principles, basic skills)
Session Two Activities	<ul style="list-style-type: none"> - Group and class discussions - Case study: best practices and clinical recommendations - Discover your own bias: Harvard implicit test - Beginner practice with MI
Resources and Referrals Session Three	<ul style="list-style-type: none"> - Using MI to provide patients with resources and referrals - SNAP, SNAP-Ed, WIC, RDs, CACFP, SBP and NSLP
MI Session Three	<ul style="list-style-type: none"> - Ways MI is useful for obesity prevention - Four basic skills of MI with demonstration
Summary and Conclusion Session Three	<ul style="list-style-type: none"> - Recap of everything previously covered in the pilot to bring all topics together
Session Three Activities	<ul style="list-style-type: none"> - Practice MI through role play with classmates
Practicing MI	<ul style="list-style-type: none"> - Practice through role play with classmates - Practice sessions with SPs - Practice using the “Change Talk” application

Table 3. Nutrition and Motivational Interviewing Knowledge Pre- and Post-Training

n=13	Correct Score Pre-Training Mean $\pm$ SD	Correct Score Post-Training Mean $\pm$ SD	Change in Mean Score Mean	t-value
Raw Knowledge Score	18.62 $\pm$ 2.10	20.46 $\pm$ 2.47	1.84	-3.66*
Percent Knowledge	77.56 $\pm$ 8.76	85.26 $\pm$ 10.29	7.7%	

*p<0.05

Table 4. Self-Efficacy Related to Nutrition Knowledge and MI Skills

n=13	Level of Confidence					Mean / Median Response Before Training	Mean / Median Response After Training	Mean Response Change
	Not at all Confident (1)	Slightly Confident (2)	Somewhat Confident (3)	Very Confident (4)	Extremely Confident (5)			
	(% pre / post)							
Confidence in knowledge related to childhood nutrition	0 / 0	23.1 / 0	76.9 / 23.1	0 / 69.2	0 / 7.7	2.77 / 3	3.85 / 4	1.08
Confidence in ability to teach others current nutrition- related knowledge	15.4 / 0	30.8 / 0	53.8 / 30.8	0 / 61.5	0 / 7.7	2.38 / 3	3.77 / 4	1.39
Confidence in applying MI skills with patients in general practice	23.1 / 0	61.5 / 7.7	15.4 / 38.5	0 / 53.8	0 / 0	1.92 / 2	3.46 / 4	1.54
Confidence in applying MI skills with patients related to childhood obesity	30.8 / 0	53.8 / 7.7	15.4 / 46.2	0 / 46.2	0 / 0	1.85 / 2	3.38 / 3	1.53

Table 5. Overall Program Satisfaction

n=11	Level of Satisfaction					Median Overall Satisfaction
	Not at all Satisfied (1)	Slightly Satisfied (2)	Somewhat Satisfied (3)	Very Satisfied (4)	Extremely Satisfied (5)	
	% satisfaction					
Overall Satisfaction with Training	0	0	27.3	63.6	9.1	4
Over Satisfaction with Learning Time	0	9.1	36.4	36.4	18.2	4

Table 6. Satisfaction Related to Time Spent on Topics

n=11	Level of Satisfaction			
	Too Little Time (1)	Right Amount of Time (2)	Too Much Time (3)	
Topic	(% satisfaction)			Median (scale 1-3)
Introduction	0	81.8	18.2	2
Social Determinants of Health	0	45.5	54.5	3
Modifiable Risk Factors	0	81.8	18.2	2
Clinical Recommendations	27.3	63.6	9.1	2
School Recommendations	27.3	63.6	9.1	2
Introduction to MI	9.1	72.7	18.2	2
Resources and Referrals	9.1	90.9	0	2
Summary and Conclusion	0	100	0	2
Practicing MI	18.2	72.7	9.1	2

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APPENDICES

A. EXTENDED LITERATURE REVIEW

Overweight and Obesity Definitions

Overweight and obesity are labels for ranges of weight that are greater than what is generally considered healthy for a given height.¹ They identify ranges of weight that have been shown to increase the likelihood of certain diseases and other health problems.¹ Overweight and obesity are chronic conditions that are the result of an energy imbalance over time.¹ When more calories are consumed than are being used by the body, it leads to weight gain.¹ There are also body mass index (BMI) scores that provide definitions for overweight and obese, though these scores are different for adults and children.¹ An adult is considered overweight if their BMI score is between 25.0 and 29.9 and obese if the score is between 30.0 and 34.0.¹ There are also different classes of obesity, which determines the severity of obesity.² A child with a BMI that falls between the 5th and the 84th percentile is considered a healthy weight.² Children are considered underweight if their BMI is in the 4th percentile or less, overweight if their BMI falls between the 85th and the 94th percentiles, obese if their BMI is in the 95th percentile or above.² Considering the BMI numbers as a trend at each well-child visit is also important because it allows healthcare professionals to determine if the child's growth is normal compared to other children.²

Childhood Obesity

Childhood obesity is a major public health problem in the US, with 31.8% of two to 19 year old children and adolescents who are overweight or obese.³ Nationally, about 12.7 million children and adolescents are obese.⁴ The combined overweight and obesity rate for Rhode Islanders ages ten to 17 years old is 36.3%, ranking fifth highest in the

nation.³ In Providence, 24% of children ages two to five, 30% of children ages six to 11, and 25% of children ages 12 to 17 are obese.⁵ Obesity poses a major issue for health because it is associated with numerous chronic diseases, including type 2 diabetes, cardiovascular disease, cancer, and asthma.^{3,5} It is also linked with shorter lifespans, poorer academic scores, as well as social and psychological problems such as bullying and depression.^{5,6} It is costly to treat chronic diseases related to obesity, and therefore, prevention would save the healthcare industry money, but this requires a multifaceted approach.⁴

There are numerous programs available in Rhode Island for obesity prevention, including the Supplemental Nutrition Assistance Program (SNAP), Women, Infants and Children (WIC), physical education time requirements in schools, early childhood education (ECE) centers have regulations for nutrition, PA, breastfeeding, and screen time standards, among others.^{3,4} Conversely, obesity prevention programs that involve nurses are sparse.⁷ There is a critical need for additional programs involving nurses given their widespread access to children in different areas of healthcare.⁷

Social Determinants of Health

There are innumerable factors that impact the health of a person, which are called social determinants of health.⁸ The five key areas that impact social determinants of health include economic stability, education, social and community context, health and health care, and neighborhood and built environment.⁸ There are also sectors that fall into each of these categories, which include employment, food security, housing instability, graduation from high school, discrimination, access to health care, access to foods that support healthy eating patterns, among several others.⁸ It has also been found that the social ecological model (SEM) effectively displays the relationship between social determinants of health and obesity.⁹ Simply put, the SEM is a model that begins within

the person and moves to external environment, which include individual, interpersonal, organizational, community, and policy.⁹ A connection has been found between attaining all levels of this model and normal weight, while individuals who struggle reaching the lower levels of individual and interpersonal fulfillment are more likely to be overweight or obese.⁹

Risk Factors that Lead to Obesity

A risk factor is any attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or injury.¹⁰ A modifiable risk factor is one that can be changed or removed, and a non-modifiable risk factor is one that cannot be changed.¹⁰ Examples of modifiable risk factors include diet, PA and sleep, while non-modifiable risk factors include genetics, race and maternal diabetes. These are all examples of risk factors that lead to obesity and are accompanied by many more including gestational weight gain, sedentary behaviors, low family income, rapid infant growth and maternal smoking.

Some risk factors are variant based upon the stage of life. There are different risk factors that can impact a person from the time they are an infant to the time they are an adult. A pregnant woman can put her baby at risk for developing obesity if she smokes, if she gains too much weight during gestation, if she or her husband is obese or if she has diabetes. Race and ethnicity can also put a pregnant mother's child at risk for obesity.

Once a baby is born, there are different risk factors that can put them at risk of becoming obese.¹¹ The first 1,000 days of an infant's life are crucial because they are linked to several risk factors that are associated with obesity, including higher maternal pre-pregnancy BMI, prenatal tobacco exposure, maternal excess gestational weight gain, high infant birth weight, and accelerated infant weight gain.¹¹ There are other risk factors during infancy that can indicate obesity development later in life. Rapid infant growth

and being large for gestational age (LGA) are two risk factors. LGA is an infant with a birth weight that exceeds the 90th percentile. Whether or not the baby is breastfed or formula fed is a debated topic, but it is difficult to determine that breastfeeding is better for a baby due to the complexity of obesity. The numerous factors that can impact a child's risk for obesity makes it difficult to define a correlation between breastfeeding and weight status. A child's weight status when they are an infant can also lead to obesity as a toddler, particularly when there are drastic changes in weight.¹² Rapid increases in weight for length during the first six months of life can increase the risk of obesity when the child turns three years old.¹² As a child grows into school-aged years followed by adolescence, risk factors include poor diet quality, limited access to healthy foods, advertisements for unhealthy foods on television, limited PA and sedentary behaviors, screen time and inadequate sleep.¹²

Throughout the lifespan, people are at higher risk for developing obesity if they have a low income. Those individuals are more likely to live in particular neighborhoods where they may feel it is unsafe to do PA outdoors, or they may live too far from a grocery store that sells fresh produce. Low income families may be unable to afford some healthy foods even if they do have access to them. Another barrier that low-income families face is transportation; some rely on using public transportation, which can make trips to the grocery store a barrier.

Role of Healthcare in Obesity Prevention

While reaching parents and children with prevention efforts can be challenging, one way is through nurses who have contact with children in primary care providers' (PCPs) offices, schools, and clinics. Nurses can play a key role in the implementation of sustainable and effective obesity prevention programs in schools, but they are often overlooked as resources.¹³ They are well placed to address obesity prevention, but

improving nurses skills in this area is necessary in order to redirect this missed public health opportunity.¹⁴ When a child is born, it is imperative that s/he and the parent interact with nurses during well-child visits and later in life through school systems. There are several reasons this is critical; patients benefit from receiving nutritional care and show reduced incidences of obesity, type 2 diabetes, and hypertension, among other chronic diseases in inpatient, outpatient, and community settings.⁷ The Center for Disease Control and Prevention (CDC) has funded a Wellness Change Tool for hospitals to improve their environments using food, beverages, PA, breastfeeding, and tobacco restrictions.⁴

Healthcare Professionals and Prevention Interventions

Because childhood obesity is such a large public health issue, all healthcare professionals must work to reduce it.¹⁵ Several studies have been completed where PCP mediated interventions to reduce and prevent obesity, which included behavioral, educational, or technological interventions.¹⁵ In this review, nine studies were examined to understand the effectiveness of the interventions used, and there were varying inclusion criteria for each of them.¹⁵ There were three studies in which children were included if their BMI was $\geq 85^{\text{th}}$ percentile, one study where the children were required to be overweight, obese, or at risk for obesity with specific BMI cutoffs, among others.¹⁵ The outcomes studied mainly focused on changes in BMI and lifestyle changes, and most studies showed positive changes.¹⁵ It is also highlighted that the PCPs had healthcare teams that included nurses and RDs, but the PCP facilitated screening, diagnosing, counseling, and referring patients in these studies.¹⁵

There is another review study with similar findings regarding PCPs providing obesity prevention interventions.¹⁶ This review observed 31 intervention studies that were

focused on intervention programs' effects on BMI and other weight outcomes.¹⁶ It was found that the more effective interventions were treatment interventions that were behavior based, as well as that there is general support for these treatment interventions in a PCP setting.¹⁶

Best Practice Recommendations for Nurses and Obesity Prevention

There are no specific best practice clinical recommendations that outline how nurses should handle obesity prevention and management, and additional research is necessary before official guidelines can be developed.^{16,17} Although there are unclear recommendations for healthcare providers in terms of their approach to obesity prevention, it is recognized that nurses are at the front line for obesity prevention because they work in such a wide range of settings.¹⁸ General practices and recommendations for pediatric obesity prevention are available but have not been defined as best practices.^{19,20} The Official Journal of the American Academy of Pediatrics released an article outlining approaches and roles for pediatricians in primary prevention of obesity. Obesity prevention requires a multi-sector approach because of its complexity.¹⁹ Generally accepted ways to prevent obesity include first routinely measuring the patient's BMI percentage for age at well-child visits to determine if the child's BMI is a risk factor.^{21,22} It is important the nurses understand how to calculate a patient's BMI by using the formula kilograms (patient's weight) divided by meters (patient's height) squared.

For a clinical setting, a healthcare provider should adhere to the following best practices: 1) BMI screening for children ages two and older; 2) counsel patients and their families on healthy eating, physical activity, healthy growth, regardless of the child's current weight, and screen time limitations. Healthy eating encompasses eating breakfast daily, limiting restaurant foods, especially fast foods, eating meals as a family, limiting portion sizes and consumption of sugar-sweetened beverages; 3) establish procedures for

follow-up assessments, counseling, and treatment plans for children who are overweight or obesity; 4) help children achieve physical activity recommendations; and 5) establish policies to avoid weight-bias in clinics.²¹ It is also important for the practitioner to engage the family appropriately by building rapport and introducing the topic of weight in a suitable setting, such as a well-child visit.²³ Identifying previous attempts to change, such as trying to lose weight, changing lifestyles, or changing habits, is a helpful strategy as well.²³ Helping patients to identify barriers to change and important changes that they could make are also key steps to help begin the process of behavior change.²³ There is also a taskforce called the 2010 US Preventative Services Task Force (USPSTF), which recommends that children and adolescents over the age of six should be screened for obesity and that behavioral interventions should be available to those who could benefit from a change in weight.²⁴

For a school setting, a nurse should adhere to the following best practices established by the National Association of School Nurses: 1) conduct BMI assessments in order to identify students who may need further evaluation; 2) assess students for other health risk factors associated with overweight and obesity; 3) refer individuals to appropriate healthcare providers for additional assessment and treatment; 4) develop individualized plans for those with elevated BMIs to create goals for healthier lifestyles; and 5) provide individual counseling and MI to support weight-related behavior change.²⁵

Both clinical nurses and school nurses should follow current recommendations for diet, PA, sleep and screen time when they are making suggestions to patients. Healthy eating habits should be stressed for all children, even those who are not at risk for overweight and obesity.^{20,21,26} Examples of healthy eating habits that are advised include eating foods with low caloric density (fruits, vegetables, whole wheat grains, low-fat dairy, lean meats, fish, and legumes), limiting foods with high caloric density (fried

foods, baked goods, fat-rich meats, sweets, etc.), eating breakfast daily, encouraging family meals, limiting meals eaten at restaurants, and controlling portion sizes.^{21,26} It is generally recognized that children and adolescents should avoid drinking sugar sweetened beverages (SSB) including soda, juice drinks, energy drinks, and sports drinks among others.^{21,26} The Dietary Guidelines for Americans (DGAs) and MyPlate are accessible and understandable ways for Americans to learn the recommendations for dietary consumption.

The DGAs are developed every five years by prestigious researchers in the fields of nutrition, health and medicine who use evidence-based science to curate the most current recommendations for a healthy diet.²⁷ The five guidelines include 1) follow a healthy eating pattern across the lifespan; 2) focus on variety, nutrient density and amount; 3) limit calories from added sugars and saturated fats and reduce sodium intake; 4) shift to healthier food and beverage choices; and 5) support healthy eating patterns for all.²⁷

Americans in general fall short when it comes to eating enough plant-based foods.²⁷ More specifically, children and adolescents do not eat enough fruits, vegetables and whole grains.²⁷ Boys ages 9 to 13 and girls ages 14 to 18 have the lowest vegetable consumption relative to the DGA recommendations.²⁷ Generally, they are consuming one to one and a half vegetable cup-equivalent servings daily, when the guidelines suggest three to four servings daily.²⁷ Children ages one to eight meet the recommendations for fruit consumption for their ages, while those nine to 18 do not.²⁷ Children and adolescents ages nine to 18 consume an average of one cup-equivalent serving of fruit daily, while it is recommended that they eat two to two and a half servings depending upon sex.²⁷ The total intake of grains is close to the recommendations for children and adolescents, but

the intake of refined grains exceeds the DGA guidelines, while the intake of whole grains is not met.²⁷

Many Americans consume too much saturated fat, added sugars and sodium in their diets.²⁷ The current average intake of saturated fats is 11% of calories, and all children and adolescents consume above the recommended intake of saturated fats by about one to two percent of calories.²⁷ A major source of saturated fats in Americans diet comes from mixed dishes food categories, which includes foods such as pizza, tacos, pasta, or hamburgers.²⁷ The other food categories that provide large proportions of saturated fats in American diets are snack foods, sweets, protein and dairy products.²⁷ Added sugars account for more than 13% of calories daily in an ordinary American's diet, which averages to 270 calories.²⁷ Children and adolescents are all consuming more added sugars than is recommended.²⁷ Males and females ages one to three consume about one to two percent of calories higher than is recommended, while those ages nine to 18 consume about seven percent of calories higher.²⁷ The DGAs suggest that people of all ages do not consume more than ten percent of calories as added sugars.²⁷ The average intake for sodium is much higher in males than females, but on average the intake is 3,440 milligrams (mg), which is much higher than the Tolerable Upper Intake Levels (ULs).²⁷ For adults and adolescents ages 14 to 18, the UL is 2,500 mg.²⁷ For those ages nine to 13, the UL is about 2,200 mg, for those ages four to eight, the UL is 2,000 mg, and for those ages one to three the UL is 1,500 mg.²⁷

MyPlate was created by the United States Department of Agriculture (USDA), and it follows the DGAs.²⁸ It is an image of a plate divided into four quadrants that represent the food groups.²⁸ Half of the plate is fruits and vegetables, and the other half is grains and protein.²⁸ The largest portions of the plate are taken up by vegetables and whole grains, and this represents the proportions with which the food groups should be

eaten; vegetables and whole grains should be consumed more often than fruits and proteins.²⁸ The plate provides an understandable, accessible example of ways to eat for everyone and is available in Spanish, referred to as MiPlato, as well.²⁸ MyPlate also provides guidelines for healthy eating that are in congruence with the DGAs.²⁸ It suggests focusing on variety, amount and nutrition, choosing foods and beverages with less saturated fat, sodium and added sugars, starting with small changes to build healthier eating styles, and supporting healthy eating for everyone.²⁸ MyPlate provides practical information to individuals, healthcare professionals, nutrition educators and the food industry to help consumers build a healthy plate.²⁸

In addition to creating healthy eating habits, it is important to also encourage PA. It is beneficial when parents speak with their children about healthy eating habits and physical activity rather than focusing on weight.²⁶ The CDC recommends that children and adolescents do 60 minutes of more of PA daily.²⁹ There are three types of PA that children should incorporate each week, including aerobic, muscle-strengthening, and bone-strengthening.^{21,26,29} Most PA time should be spent doing aerobic activities, which include sports, biking, and dancing, for example.²⁹ The intensity of this PA should be moderate to vigorous, and should be vigorous at least three times weekly.²⁹ Muscle-strengthening and bone-strengthening activities should also be done three times per week.²⁹ Examples of muscle-strengthening exercises are gymnastics or climbing a tree, and bone-strengthening exercises include jumping and running.²⁹

Screen time is another factor that closely relates to sedentary behaviors and poor eating habits. It should be limited to two hours each day unless it is educational.^{21,26} It is helpful to remove televisions, video game consoles, and laptops from children rooms in order to follow this time limit.^{21,26} For infants 18 months and younger, all screens in the

room should be turned off, and for children older than 18 months, it's acceptable to use some media with educational value.³⁰

The last major influence on weight is sleep habits; getting enough sleep is associated with a healthier weight status. Encouraging children to get enough sleep and to have healthy sleeping patterns is also crucial for childhood obesity prevention.^{21,26} Appropriate sleep times vary by age; newborns (0-3 months) should get 14-17 hours of sleep, infants (4-11 months) should get 12-15 hours, toddlers (1-2 years) should get 11-14 hours, preschoolers (3-5 years) should get 10-13 hours, school-aged children (6-13 years) should get 9-11 hours, and teenagers (14-17 years) should get 8-10 hours.³¹

Resources and Referrals

Providing nurses with the proper resources and referrals is essential for effective guidance for patients. Many nutrition-related resources are available for low-income families, but there are also helpful ones available to families of higher income levels. Some examples of programs or services that patients can apply to include the Supplemental Nutrition Assistance Program (SNAP), Supplemental Nutrition Assistance Program-Education (SNAP-Ed), Women, Infants, and Children (WIC), registered dietitians (RDs), though referrals methods may vary by state.³²⁻³⁶ SNAP is an important USDA funded resource for low-income families because it is the largest program in the domestic hunger safety net, providing the most funds compared to any other program.³² Millions of Americans are SNAP recipients who receive varying amounts based upon income level, which translates into spending money at grocery stores and farmers markets.³² When referring patients to SNAP, healthcare professionals should tell them that they can fill out an application online or contact the Department of Health Services (DHS).³⁴ SNAP-Ed is associated with SNAP and provides educational programs to the same population, which aim to educate them about health and nutrition.³³ Examples of

programs include ways to eat healthier foods, why it is important to eat healthy foods, and strategies to eat healthier on a budget.³³ WIC is another program that provides support for low-income pregnant, breastfeeding, and postpartum women and to infants and children up to age five who are found to be at nutritional risk.³⁵ Examples of services they provide include nutrition education, healthcare referrals, supplemental foods, and breastfeeding promotion.³⁵ Healthcare professionals can provide contact information for local WIC offices to patients who may be eligible. There are many offices throughout each state, but the WIC website is helpful for finding a local one.³⁵ RDs are another important resource that can be helpful for those with nutritional problems.³⁶ They specialize in innumerable areas, and examples of workplaces for RDs include hospitals and other healthcare facilities, private practices, community and public health, food and nutrition-related businesses and industries, sports nutrition, universities and medical centers, corporate wellness, supermarkets, and research, among others.³⁶ They are professionally trained to provide counseling, assess nutritional needs, provide nutrition, food, and health advice, help manage chronic diseases, design weight loss programs, and create meal plans in order to help promote healthful lifestyles.³⁶ In order to refer patients to RDs, healthcare professionals can provide them with RD contact information.³⁶ Some insurance companies require a doctor referral for RDs, but nurses can still assist patients by advocating for or acquiring the physician's referral.

Examples of programs and policies that inform nutrition standards include Child and Adult Care Food Program (CACFP), School Breakfast Program (SBP), and National School Lunch Program (NSLP).³⁷⁻³⁹ CACFP provides aid to child and adult care institutions and family or group daycare homes for the provisions of nutrition foods.³⁷ Over 4.2 million children and 130,000 adults receive nutritious meals and snacks each day as part of the day care they receive.³⁷ CACFP contributes to the wellness, healthy

growth, and development of children as well as the health of older adults and chronically impaired disabled people.³⁷ SBP provides cash assistance to states to operate nonprofit breakfast programs in schools and residential childcare institutions.³⁸ NSLP provides nutritionally balanced, low-cost, or free lunches to children in schools each day.³⁹ Resources and referrals are available to nurses in many situations they might come across. They should use resources and referrals when they're not equipped to handle a situation, they feel uncomfortable handling a situation, a situation is out of their scope of practice, or they need additional assistance, among a multitude of other possible situations. It is important to consider is the communication method used to deliver these resources and referrals to patients who need them, and an effective technique can be using MI.

Motivational Interviewing

When targeting obesity prevention at the individual level, establishing or changing health behaviors related to eating, PA, and sleep are important. However, changing health behaviors and establishing new ones can be challenging. MI can be a useful tool for healthcare professionals to encourage patients to change their behaviors.⁴⁰ MI is a client-based method that aids in intrinsic desire to facilitate behavior change through removing ambivalence.⁴⁰ It has generally been a successful tool in facilitating behavior changes, though not specifically with child obesity prevention.⁴¹ MI is a tool that assumes behavior change stems from intrinsic motivation rather than information.⁴² Nurses have not displayed proficiency in MI related to childhood obesity, further demonstrating the need for an educational curriculum to improve their skills.⁴³ One problem that has arisen is that obesity itself is not a behavior, so healthcare providers must target specific behaviors that contribute to obesity in order to effectively utilize MI.⁴² Comprehensive training programs for nurses related to MI have shown that

proficiency is generally low, but programs can help to at least sustain their levels of knowledge.^{43,44} Proficiency levels across indicators, including complex reflections, open questions, and MI adherent behaviors, among others, were between 18.2% and 54.5%.⁴⁴ Although studies that utilize MI and nurses in obesity prevention are sparse, one study was completed using the social cognitive theory and training 17 nurses in MI to prevent childhood obesity in a school setting.⁴⁵ Though results have not been published yet, it is expected that the program will be more successful than standard practice in preventing obesity.⁴⁵ Although nurses require training specific to MI, it has been shown to be a successful tool to facilitate change in pediatrics, as it targets the root of psychological barriers.⁴⁶

MI is a useful tool for nurses to use to prevent childhood overweight and obesity.⁴² There are few studies available regarding PCPs and childhood obesity, but this one focused on RDs using MI as a tool to work with parents of overweight children ages two through eight to lower their BMI scores.⁴⁷ The 42 participants were separated into three groups, which all received different interventions; one received usual care, one received four MI counseling sessions, and one received four MI sessions with their PCP and an additional six MI sessions with an RD.⁴⁷ The study showed that there were significant BMI reductions for intervention groups after a two year period and that MI had an impact on lowering BMI.⁴⁷

There are several different approaches that can be used for counseling patients and their family members about weight and health topics. Using family-based approaches has been found to work because encouraging parents who also have healthy lifestyles are better able to influence their children to follow the same habits.¹⁹ Small group counseling is also a useful tool for obesity prevention.²⁶ Positive body image should be encouraged, while dieting should be discouraged.²⁶ Pregnant mothers should be counseled about

healthy habits to avoid overweight and obesity in their infants' lives.²¹ Providers should promote breastfeeding, smoking cessation especially during pregnancy, and stress the importance of remaining at a healthy weight.²¹

Existing Educational Programs for Nurses

Nurses can help play a role in obesity prevention, but they need additional education, training, and practice opportunities.⁴⁸⁻⁵¹ There are several barriers that nurses face when it comes to aiding in childhood obesity prevention, including lack of knowledge, self-doubt, and the perception that efforts from nurses are ineffective.⁵² It has been shown that most practitioners often do not bring up obesity with patients due to lack of confidence.²³ Despite their lack of self-efficacy and knowledge of the practice, nurses are interested in learning how to assist in childhood obesity prevention.⁴⁹ They are aware of the need for obesity prevention and the appropriate guidelines, but more evaluation for training programs involving relevant education and self-efficacy improvements is necessary as well.^{49,50} Nurses also believe that their college curriculum is lacking a focus on obesity prevention and that they need to gain skills to facilitate weight management.⁴⁸ Several studies have highlighted the fact that there needs to be more extensive nutrition education in the training of all health care providers.⁷ Given the scarcity of available programs, there is a need for additional research to determine which interventions and behavior change techniques would be helpful to nurses.⁵¹

Another study was completed to gain an understanding of current school nurse obesity prevention practices in an elementary school, opinions of school nurse-led programs, as well as nurses' interest in these programs.⁵³ Interviews were conducted with school nurses from varying school districts, and it was found that these nurses provide some obesity prevention, but that they, as well as parents and administrators, would be supportive of additional prevention strategies.⁵³

Despite the clear need for additional educational and self-efficacy programs, there have been some feasibility and program studies in recent years.^{49,54} There was a study that evaluated the feasibility of an obesity prevention program taught to four nurses.⁵⁵ The curriculum was informed by the Social Learning Theory, and the content focused on the 5As model of assess, advise, agree, assist, and arrange.⁵⁵ Topics included calculating and plotting BMI, diet and PA assessment, and goal setting, among others.⁵⁵ The overall goal was to increase participants' knowledge, skills, and self-efficacy regarding obesity prevention strategies.⁵⁵ It was found that brief training that included a three hour workshop can help to equip them with necessary knowledge, and the impact and sustainability of such a program is unknown.⁵⁵ It was found nurses were able to provide nutrition-related advice to patients in 60% of consultations, and that the workshop was able to provide them with valuable obesity prevention resources.⁵⁵

Another study was conducted to evaluate the impact of a nurse directed program.⁵⁴ This program was school-based, involved the families of children, and with PA behaviors and BMI as outcomes.⁵⁴ This randomized controlled trial included 251 children ages 8 through 12 from urban, low-income families.⁵⁴ The program lasted for six weeks, and participants were asked to meet once per week for sessions that involved nutrition education and time for PA.⁵⁴ Anthropometric data and questionnaires were used to determine effectiveness of the intervention.⁵⁴ This study found that school nurses were able to successfully implement a program to significantly increase PA in schools, showing a decrease in screen time, an increase in PA time, and a decrease in BMI.⁵⁴

A more recent study published their design and sample characteristics in 2018.⁵⁶ A trial called Students Nurses and Parents Seeking Healthy Options Together (SNAPSHOT) was led by school nurses and was based in an elementary school.⁵⁶ SNAPSHOT will test the efficacy of a healthy weight management program, which

aimed to reduce weight gain in children who were 8 to 12 years old with a BMI of greater than or equal to 75th percentile.⁵⁶ The trial enrolled 132 child/parents dyads, and these dyads were randomized into either the intervention or control groups.⁵⁶ The intervention group consists of four home visits, along with both child groups and parent groups, while the control group received monthly newsletters regarding healthy lifestyle information.⁵⁶ The primary outcome was child BMI z-score, which was measured at four time points during the trial.⁵⁶ Secondary outcomes included dietary practices such as SSB, high fat food, and fruit and vegetable consumption, sedentary practices such as screen time, and activity practices, such as amount of time spent actively playing.⁵⁶ Assessment tools include 24-hour recalls and use of accelerometers.⁵⁶ The full study has not been published yet, though this report provides information about the development of the trial, recruitment and randomization procedures, assessments, among other topics.⁵⁶ This study acknowledges that there is modest success of clinic-based trials and that alternatives such as this school-based program may have more success in preventing and reducing obesity rates.⁵⁶ Schools are an easy way to reach children and their families on a more widespread level, making it simpler to impact higher volumes of people.⁵⁶

Another problem is that both clinicians and nursing students receive minimal nutrition education as part of their schooling, but there are reasonable ways to make it part of their practices.⁵⁷ These include taking small steps, and using MI to engage patients, and allow them to consider behavior change.⁵⁷ Additionally, nurses can be prepared to work with patients across the lifespan, starting with preconception.⁵⁸ Educating women about the risks of entering pregnancy while they are overweight and obese, advocating for policy changes, such as neighborhood safety to allow for outdoor PA and access to healthy foods, and encouraging breastfeeding during the prenatal period are examples of ways nurses can help.⁵⁸ Another way changes can be made is if nurses

and other healthcare providers collaborate with WIC to combine their efforts against childhood obesity.⁵⁹ Nurses should become more knowledgeable about assessments of obesity and their limitations, the role of genetics, critical periods for obesity to develop, psychological, behavioral, cultural, home, economic, community, and environmental factors that cause obesity, and physiology and pathophysiology of obesity and weight regulation, among other factors.⁶⁰ They should be educated and trained to use best practices for obesity prevention in the workplace.

Providing Curriculum and Assessments

There are few programs available for nurses to help with obesity prevention, and there are limited curriculums to provide education and increase self-efficacy. The gap in research that this study fills is that nursing curriculums do not specifically teach and train nurses about childhood obesity prevention. Given that URI is one of the only state universities in Rhode Island that trains nurses, establishing a curriculum will provide nutrition education to prepare the students to participate in obesity prevention.⁶¹ The present study will show the feasibility and efficacy of the curriculum, as well as what changes can be made to enhance it for future use.

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B. CONSENT FORM

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THINK BIG WE DO™

Consent Form for Participation THE UNIVERSITY OF RHODE ISLAND

You have been invited to take part in a research project described below. The researcher will explain the project to you in detail. You should feel free to ask questions. If you have more questions later, Dr. Alison Tovar: (401) 874-9855, the person mainly responsible for this research project, will discuss them with you. If you decide to participate, you will be asked to sign this form and it will be a record of your agreement to participate. You will be given a copy of this form to keep.

➤ PURPOSE AND BACKGROUND

Most nursing students are not required to take an obesity prevention class as part of their baccalaureate studies. Knowledge about behaviors that lead to obesity including healthy eating, physical activity and sleep, in addition to being trained in motivational interviewing (MI), is important for nurses to aid in the prevention of childhood obesity. The goal of this study is to develop and pilot test a childhood obesity prevention curriculum designed specifically for nursing students' and to assess the impact of the program on students' knowledge, self-efficacy in applying their knowledge, and ability to conduct MI to prevent childhood obesity. We are also interested in assessing students' satisfaction with the program.

You are being asked to participate because you are at least 18 years of age and are an upper level nursing student at the University of Rhode Island. Your input will help us understand the effectiveness of the nutrition and MI curriculum in increasing knowledge, self-efficacy as well as your satisfaction with the curriculum. The MI simulation session will also help us to understand the knowledge you gained from the curriculum.

➤ PROCEDURES

The project will last for a total of four sessions, each session will be two hours long. The first three sessions will consist of attending a class setting where you will be learning the curriculum. During the first and last class, we will ask you to complete a short survey. The last session will be an MI simulation and observation session, and this will last approximately one hour. Altogether, we will be asking you to participate for about nine hours. The sessions will take place during your regular class hours, so you will not be expected to dedicate any additional time to this study outside of class.

The class sessions will be lecture-style lessons. You will also complete case studies, practice MI with other participants, and participate in classroom discussion during these sessions.

The observation session will consist of a simulated situation related to childhood obesity prevention. You will be asked to demonstrate your MI knowledge and skills in this [simulation](#) and we will record the interaction so that we can code the videos afterwards. We will be utilizing a checklist to evaluate your knowledge and skills. Once we code the videos, within three months of the observation, they will be deleted.

The following topics will be covered in the curriculum:

- Overview and introduction to childhood obesity

The University of Rhode Island is an equal opportunity employer committed to community, equity, and diversity and to the principles of affirmative action.

- Social determinants of health and health equity
- Modifiable risk factors
- Clinical recommendations and best practices
- Introduction to MI
- Role of policy and community action
- Understanding resources and referrals
- Summary and conclusion

Survey questions will be asking you about the following topics:

- Knowledge related to nutrition
- Self-efficacy related to nutrition and MI skills
- Satisfaction with the curriculum

Total time commitments for this project will be approximately 10-12 hours, which includes class time in addition to the time it will take to complete the surveys.

➤ RISKS

In the unlikely event that some of the survey questions make you uncomfortable or upset, you are always free to decline to answer or to stop your participation at any time. The video recording may also make you feel uncomfortable but you may stop it any time.

➤ BENEFITS

You will gain knowledge about obesity prevention and MI and learn about tools to help prevent childhood obesity. MI skills are also applicable to a variety of health care situations.

➤ CONFIDENTIALITY

All information about you will be kept confidential. Once you agree to participate, you will be given an ID number that will be used as your identification throughout the study. To protect your confidentiality, you will be asked to use first names only and to not discuss personal identifying information during the sessions.

All names and personal information will be kept in locked files at the University of Rhode Island in Fogarty Hall 119, available only to the principal investigator and appropriate project staff. No one else will have access to your personal information. You can stop participating at any time and you will no longer be contacted. Your name will not be used in any written reports or publications that result from this research. Data will be kept in a locked cabinet for three years after the study is completed (per federal regulations) and then destroyed.

➤ COMPENSATION

Compensation will be provided in the form of class credit. If you choose not to participate, an alternative project will be available for you.

➤ QUESTIONS

If you have any questions or concerns about your participation in this research project, you may contact the Principal Investigator, Dr. Alison Tovar: (401) 874-9855 or alison_tovar@uri.edu or the student investigator, Taylor Berlinsky: (401) 533-2980 or tberlinsky@my.uri.edu at any time.

➤ RIGHT TO QUIT AT ANY TIME

The decision to take part in this study is up to you. You do not have to participate. If you decide to take part in the study, you may quit at any time. If you wish to quit, simply inform the Principal Investigator, Dr. Alison Tovar: (401) 874-9855 or alison_tovar@uri.edu of your decision.

➤ **RIGHTS AND COMPLAINTS**

If you are not satisfied with the way this study is performed, you may discuss your complaints with Dr. Alison Tovar: (401) 874-9855, anonymously, if you choose. In addition, if you have questions about your rights as a research participant, you may contact the office of the Vice President of Research and Economic Development, 70 Lower College Road, Suite 2, University of Rhode Island, Kingston, Rhode Island, telephone: (401) 874-4328.

➤ **CONTACT FOR MORE INFORMATION**

Alison Tovar, PhD
Principal Investigator
University of Rhode Island
Department of Nutrition and Food Sciences
119 Fogarty Hall
Kingston, Rhode Island 02881
Phone: (401) 874-9855
Email: alison_tovar@uri.edu

➤ **DOCUMENTATION OF CONSENT**

I have read this form and decided that I will participate in the project described above. Its general purposes, what I can expect and possible risks have been explained to my satisfaction. I understand I can withdraw myself at any time.

Your signature on this form means that you understand the information and you agree to participate in this study.

Signature of Participant

Signature of Researcher

Typed/Printed Name

Typed/Printed Name

Date

Date

Please sign this consent form and keep one for yourself.

C. PRE-POST SURVEY

The following survey will be used for the study "Effectiveness of Nutrition and Motivational Interviewing Curriculum for Nursing Students: A Pilot Study." Please take your time and answer the questions to the best of your ability. Your participation is appreciated.

Below are questions regarding demographic information. Please select or fill in the answers that apply to you.

Please enter the identification number provided to you by the researchers.

What is your age?

Do you consider yourself Hispanic or Latino? Please select one.

☐ Yes

☐ No

What is your race? Check all that apply.

☐ White

☐ Black or African American

☐ Asian or Pacific Islander

☐ Native American or American Indian

☐ Other

What is your gender?

☐ Male

☐ Female

☐ Other

What year are you in college?

☐ First year (freshman)

☐ Second year (sophomore)

☐ Third year (junior)

☐ Fourth year (senior)

Below are questions regarding your education and training related to nutrition and motivational interviewing. Please answer the questions to the best of your ability. Have you taken any nutrition courses in the past (e.g. NFS 207)? If yes, please list the course title and year completed.

Have you participated in any nutrition-related trainings or workshops in the past? If yes, please list the training or workshop title and year completed.

Have you had any motivational interviewing training or education in the past? If yes, please list the training title and year completed.

Below are questions regarding your knowledge about nutrition. Please select the answers to the best of your ability.

Body mass index (BMI) is a measure of weight adjusted for height, calculated as weight in kilograms divided by the square of height in meters (kg/m²). It is represented in number ranges.

Using this definition, please answer the following questions.

Which of the following defines overweight?*

- ☐ BMI of 15.0-19.9
- ☐ BMI of 20.0-24.9
- ☐ BMI of 25.0-29.9
- ☐ BMI of 30.0-34.9

Which of the following defines obesity class I?*

- ☐ BMI of 15.0-19.9
- ☐ BMI of 20.0-24.9
- ☐ BMI of 25.0-29.9
- ☐ BMI of 30.0-34.9

BMI is calculated the same way for adults and children, but the results are interpreted differently. What is the reasoning behind this?

- ☐ Children are growing and the amount of body fat changes with age
- ☐ The amount of body fat is different for boys and girls as they age
- ☐ a and b
- ☐ None of the above

Below are questions regarding your knowledge about nutrition and motivational interviewing. Please select the answers to the best of your ability.

What percentage of children and adolescents ages 2 to 19 in the United States are overweight or obese?

- ☐ 31.8%

☐ 19.3%

☐ 43.1%

☐ 50.7%

Latino children have the highest rates of obesity when compared to other race and ethnicity groups.

☐ True

☐ False

Why is being overweight a concern?

☐ There is a higher risk of becoming obese

☐ There is a higher risk of developing type 2 diabetes

☐ There is a higher risk of developing heart disease

☐ All of the above

Which of the following is/are an example(s) of environmental risk factors of overweight and obesity?

☐ Limited access to supermarkets that carry healthy foods

☐ Poor diet quality

☐ Limited physical activity

☐ All of the above

Which of the following is not one of the five food groups?

☐ Fruit

☐ Vegetables

- ☐ Meat
- ☐ Protein
- ☐ Dairy
- ☐ Grains

Why are fruits, vegetables and whole grains an important part of a child's diet?

- ☐ They contain vitamins
- ☐ They contain minerals
- ☐ They contain fiber
- ☐ All of the above

What role do genetics play in the development of obesity?

- ☐ Our genes alone are responsible for the obesity epidemic
- ☐ They may predispose someone to become obese, but there are gene-environment interactions that lead to obesity
- ☐ It is possible that the same genes that helped our ancestors survive occasional famines are now being challenged by environments in which food is plentiful year round
- ☐ b and c
- ☐ None of the above

_____ obesity is one of the strongest and most reliable predictors of obesity in children.

- ☐ Infant
- ☐ Adolescent

☐ Maternal

☐ Paternal

Health consequences of childhood obesity include:

☐ Increased risk of heart disease

☐ Increased risk of type 2 diabetes

☐ Increased risk of asthma

☐ Increased risk of obesity as an adult

☐ All of the above

Social determinants of health are known as the range of personal, social, economic and environmental factors that influence health status. Which of the following is true of determinants of health?

☐ They reflect underlying forces that are at work in the subsequent development of disease

☐ Each determinant can usually be traced to specific diseases

☐ One determinant is operating to bring about each disease

☐ If a pathogenic organism can be shown to cause a disease, no other determinants are relevant

_____ are described as areas where residents have inadequate access to nutritious foods. These are often found in low income neighborhoods and communities, and they can also be found in both rural and urban areas.

☐ Food wealth

☐ Food deserts

☐ Food gaps

☐ Food swamps

What is the definition of modifiable risk factors?

☐ Something that increases your chance of getting a disease

☐ Risk factors that can be changed

☐ Risk factors that cannot be changed

☐ None of the above

Which of the following is/are a risk factor(s) for obesity during infancy?

☐ Not breastfeeding

☐ Introduction to solids before the age of 4 months

☐ Exposure to vitamin D

☐ a and b

A life course approach to obesity prevention means that:

☐ Factors may act in the prenatal period into infancy, childhood and beyond to determine risk

☐ Only what occurs in utero determines risk

☐ Only genetics and the prenatal period determine risk

☐ None of the above

There are specific guidelines for medical professionals to follow regarding childhood obesity prevention.

☐ True

☐ False

Motivational interviewing (MI) is a client-centered approach that helps people resolve ambivalent feelings and insecurities to find the internal motivation they need to change their behavior.

☐ True

☐ False

Only trained clinicians or therapists can learn and utilize MI in practice.

☐ True

☐ False

The central components of MI are summarized using the acronym OARS, where "O" is open questions, "A" is affirmation and "R" is reflective listening. What does "S" stand for?

☐ Sympathize

☐ Self reflection

☐ Summarize

☐ Simplify

Which of the following is the largest federal nutrition program?

☐ Supplemental Nutrition Assistance Program (SNAP)

☐ Women Infants and Children (WIC)

☐ School Lunch Program (SLP)

☐ Health and Human Services (HHS)

Federal nutrition programs like SNAP, WIC and CACFP are funded through:

- ☐ National Institute of Health (NIH)
- ☐ Department of Health and Human Services (DHHS)
- ☐ United States Department of Agriculture (USDA)
- ☐ Centers for Disease Control and Prevention (CDC)
- ☐ None of the above

Why are registered dietitians (RDs) a useful resource to refer patients who are at risk for developing obesity?

- ☐ Time is limited in primary care and/or school settings to address obesity prevention, so referrals to RDs are essential
- ☐ RDs are specifically trained to help patients deal with risk factors related to obesity
- ☐ It is not the RN's job to address obesity prevention
- ☐ All of the above

For the following questions, please select the answer that best describes your current confidence.

How confident are you in the knowledge you have related to childhood nutrition?

- ☐ Not at all confident
- ☐ Slightly confident
- ☐ Somewhat confident
- ☐ Very confident
- ☐ Extremely confident

How confident are you in your ability to teach others the nutrition-related knowledge you currently have?

- ☐ Not at all confident
- ☐ Slightly confident
- ☐ Somewhat confident
- ☐ Very confident
- ☐ Extremely confident

How confident are you with applying your MI skills with patients in general practice?

- ☐ Not at all confident
- ☐ Slightly confident
- ☐ Somewhat confident
- ☐ Very confident
- ☐ Extremely confident

How confident are you in applying your MI skills with patients related to childhood obesity?

- ☐ Not at all confident
- ☐ Slightly confident
- ☐ Somewhat confident
- ☐ Very confident
- ☐ Extremely confident

For the following questions, select the answer that best describes your current interest level.

How interested are you in learning more about childhood nutrition?

- ☐ Not at all interested
- ☐ Slightly interested
- ☐ Somewhat interested
- ☐ Very interested
- ☐ Extremely interested

How interested are you in learning more about childhood obesity prevention?

- ☐ Not at all interested
- ☐ Slightly interested
- ☐ Somewhat interested
- ☐ Very interested
- ☐ Extremely interested

How interested are you in learning more about MI?

- ☐ Not at all interested
- ☐ Slightly interested
- ☐ Somewhat interested
- ☐ Very interested
- ☐ Extremely interested

*Questions regarding BMI should have been asked about BMI for children. Future versions of this questionnaire will be revised.

D. SATISFACTION SURVEY

	Level of satisfaction				
	Not at all satisfied	Slightly satisfied	Moderately satisfied	Very satisfied	Extremely satisfied
How would you rate your overall satisfaction with the curriculum?	☐	☐	☐	☐	☐
How satisfied were you with the amount of time spent learning this curriculum?	☐	☐	☐	☐	☐

Select the answer that best describes the amount of time spent on each topic.

	Amount of time spent on topics		
	Too little time	Right amount of time	Too much time
Overview and introduction to childhood obesity	☐	☐	☐
Social determinants of health and health equity in childhood obesity	☐	☐	☐
Modifiable risk factors (pregnancy-adolescence)	☐	☐	☐

Clinical recommendations for childhood obesity prevention/best practices	☐	☐	☐
School recommendations for childhood obesity prevention/best practices	☐	☐	☐
Introduction to motivational interviewing	☐	☐	☐
Understanding resources and referrals	☐	☐	☐
Summary and conclusion	☐	☐	☐
Practicing motivational interviewing	☐	☐	☐

Please type your responses in the text boxes for the following questions.

Do you feel this curriculum has prepared you to effectively incorporate childhood obesity prevention into your practice in the future?

What changes would you make in order for this curriculum to more suitably fit your educational needs?

Do you think this curriculum will be useful for future nursing students? Why or why not?

What did you like most about this curriculum?

What did you like least about this curriculum?

Please type any additional comments about your overall experience below.

E. POST SESSION SATISFACTION SURVEY

Below are questions related to your experience during this class session. Please answer each question to the best of your ability.

Please enter the identification number provided to you by the researchers.

What did you like most about this session?

What did you like least about this session?

What could be improved for next session?

Was enough time spent on each topic? If no, please elaborate.

F. MOTIVATIONAL INTERVIEWING TREATMENT INTEGRITY CODE

Participant #: _____

The University of Rhode Island
Nutrition and Food Sciences Department

Follow-up Appointment – MITI Coding

Coder: _____

Date: _____

Researcher: Use a 20-minute segment of the MI session to code Global Ratings and Behavior Counts. Place an 'X' in the corresponding box and calculate the overall scores for both categories.

Global Ratings					
Scores	1 Low	2	3	4	5 High
Evocation					
Collaboration					
Autonomy/Support					
Direction					
Empathy					

Behavior Counts			
Category		Behavior Counts	Total
Giving Information	Giving general information		
MI Adherent	Asking permission, affirming, emphasizing control, support		
MI Non-Adherent	Advise, confront, direct		
Questions	Closed Questions		
	Open Questions		
Reflections	Simple Reflections		
	Complex Reflections		

Summary Scores	
Formula	Total Score
Global Spirit Rating = (Evocation + Collaboration + Autonomy Support/3)	
Percent Complex Reflection (%CR) = Rc/Total Reflections	
Percent Open Questions (%OC) = OQ/(OQ + CQ)	
Reflection-to-Question Ratio (R:Q) = Total Reflections/(CQ + OQ)	
Percent MI Adherent (% MiA) = MiA /(MiA +MiNa)	

Coding Start Time: _____

Coding Stop Time: _____

First Sentence: _____

G. CASE STUDIES

Case Study One: Best Practices - Clinical Recommendations

Charlie is an 8 year old boy visiting the doctor's office for his annual checkup. His height is 51 inches and his weight is 68 pounds. He was born on April 10, 2010 and his height and weight measurements were taken on September 1, 2018. Charlie and his mother tell you that he does not get a lot of physical activity. At school he has physical education twice weekly for 45 minutes as well as 20 minutes of recess daily. He enjoys watching cartoons and playing video games when he gets home from school every afternoon, and he does not participate in any recreational sports. His favorite food is chicken nuggets and his mother reports that she struggles getting him to eat fruits and vegetables. She is concerned that he weighs too much and asks for your advice regarding keeping him at a healthy weight, increasing his physical activity, and improving his diet.

Please answer the following questions based upon the information presented above.

1. Use the following link to enter Charlie's information to determine his BMI:
<https://nccd.cdc.gov/dnpabmi/Calculator.aspx>
2. Is Charlie's BMI normal for his age? Why or why not?
3. What is a normal BMI for an 8 year old boy?
4. Name some risk factors that Charlie has for becoming overweight or obese.
5. What are best practices or guidelines for clinical childhood obesity prevention?
Are these practices applicable to Charlie's situation?
6. Are there any resources or referrals that you could recommend to Charlie and his mother?

The following links are available to view growth charts:

<https://www.cdc.gov/growthcharts/data/set2/chart-07.pdf>

<https://www.cdc.gov/growthcharts/data/set1clinical/cj411023.pdf>

Case Study Two: Social Determinants of Health

Sandra is a 27 year old Hispanic mother. She is currently pregnant with her second child. She has type 2 diabetes and asthma, and prior to her pregnancy she smoked cigarettes. Her diet is comprised mostly of fast food, frozen dinners, and cheap snacks from the nearby gas station. Some of these foods include sugary cereal, hamburgers, french fries, potato chips, candy and soda. Sandra and her family live close to Burger King, McDonalds and a gas station, but the closest grocery store that carries fresh produce is about an hour's drive away. She participates in limited amounts of physical activity, but for the last month she and her husband have been going for walks around their neighborhood each evening. The neighborhood she lives in has a high crime rate, so they only feel comfortable walking before the sun goes down. She sits indoors all day for work, and the family's income is about \$21,000 annually. Sandra is worried that she and her husband won't be able to provide for their family once their new child is born, and this causes her to lose sleep most nights. In order to remedy some financial stress, she has started working a second job on the weekends and some weeknights.

Please answer the following questions based upon the information presented above.

1. What are some social determinants of health that this family experiences?
2. Based upon Sandra's 24 current diet, how would you rate her nutrition status?
 - a. Excellent
 - b. Good
 - c. Fair
 - d. PoorWhy did you choose this rating?
3. What changes, if any, could Sandra make to her diet?
4. Name some risk factors that will put Sandra's baby at risk of developing obesity.
5. Can you determine at least three modifiable risk factors to which Sandra can make improvements? What changes can she make and what advice would you give her about making these improvements?

Case Study Three:**Role of Healthcare Professional in Prevention and Treatment of Childhood Obesity**

Miss Smith is a school nurse at Park Street Elementary School. She has noticed many children bring snacks such as potato chips, candy or soda to school. The school cafeteria often serves chicken nuggets, hamburgers and hot dogs along with juice drinks and cookies for lunch. She is concerned that students are not eating nutritious snacks and meals, and it worries her that their health could be at risk.

Please answer the following questions based upon the information presented above.

1. What is Miss Smith's role in this situation?
2. What steps could she take to make sure all students have healthy snacks available to them?
3. What steps could she take to make changes to the menu in the cafeteria?
4. Are there any resources Miss Smith can use to ensure that students have a healthy school environment?

H. SP SCRIPT

Nurse: We have about ten minutes to spend together today. What would you like to focus on during our talk?

Mom: My 10 year old son, Ryan, has been gaining weight recently and I'm worried about him.

Nurse: You're worried about your son gaining weight because you want him to be healthy.

Mom: Yes, I'm really worried that he isn't getting enough exercise and has been eating a lot of junk food and I want to make sure I'm doing what I can to help him.

Nurse: It's important to you that your son exercises and eats healthy foods. If it's okay with you, let's start with what he eats.

Mom: Yes, that sounds good.

Nurse: Tell me about a typical meal for your son.

Mom: We have a lot of meals we can put together quickly because we are always in a rush. I have three kids, so there are always activities I have to bring them to, and I just don't have the time to cook. Yesterday was Wednesday, so my twin daughters had dance class and Ryan had basketball practice. When we all got home it was 7:30 and all I had in the house was a frozen pasta dinner. It was spaghetti with alfredo sauce and chicken and broccoli, and we ate together around 8.

Nurse: That sounds like quite a busy evening, but you were able to make time to spend eating as a family, which is important. It seems like time is a barrier for you and your family when it comes to cooking healthy meals.

Mom: Yes, I think the biggest challenge for me is finding the time to cook.

Nurse: It would be great to hear some of your ideas about how you could prepare a quick, healthy meal in the time you do have.

Mom: I think maybe I could find some time on the weekend...

Nurse: It seems as though you're open to making changes to cook on the weekends. Would you like me to suggest some ideas about finding time?

Mom: Yes, that would be fantastic.

Nurse: Would your schedule allow for you to block off an hour or two each Sunday to cook meals incorporating produce and whole grains for the entire week?

Mom: That sounds like a great idea. I think this is something my husband would like to do with me on Sundays. I feel like it would take a lot of stress away during the week if we had meals ready for us when we get home at night.

Nurse: Wonderful! It sounds like you're open to making a change and meal prepping dinner for the whole week each Sunday. This could make you feel less stressed and will give you the ability to provide your family with healthier meals. Ryan will be able to have home cooked meals instead of frozen dinners. Let's write down a plan for you; we can start with what time on Sundays would work best for you.

Mom: I would say 3 pm would be the best time.

Nurse: Okay, so 3 pm is a good time for you. Who do you think could help you with this?

Mom: My husband could either help me cook or take care of the children while I prepare the meals.

Nurse: Alright, so your husband will help you during your cooking time on Sunday. Lastly, what do you think could be some barriers and how will you get around them?

Mom: I think making sure my children are occupied while I'm in the kitchen... but I could have them help me cook so they can learn!

Nurse: Having your children help you cook could be a great learning experience. I've written down this plan and your goal for meal prepping every Sunday. I look forward to meeting with you again and checking in with you next time.

Mom: Thank you so much. I look forward to next time as well.

Nurse: Great, I look forward to hearing about how it goes!

I. SYLLABUS

**University of Rhode Island
College of Nursing
Fall 2018**

Researchers/Faculty:

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General Information:

Class dates, times and location:

- Tuesday, September 18th
- Tuesday, September 25th
- Tuesday, October 2nd
 - From 1 - 3:30 PM at the Warwick Public Library
- Tuesday, November 6th
 - Kingston Campus, room and time TBA

Course Description:

This course aims to provide nursing students with knowledge and strategies related to nutrition and motivational interviewing (MI) to aid in childhood obesity prevention. A description of the topics to be covered are available in Table 1.

Course Goals:

The goals of this course are to increase students' knowledge and self-efficacy related to nutrition and MI and for the students to have positive satisfaction with the curriculum. Childhood obesity prevention is the long term goal for implementing this curriculum.

Student Expectations:

Student expectations are in line with course expectations.

1. Students will be expected to arrive to each class having read all assigned material and have questions prepared for discussion.
2. Computers allowed for note taking only, use of computers for other purposes is not allowed.

Training Description and Overall Goal:

Nurses interact with patients including parents and children during well-child visits and have the ability to counsel them about healthy lifestyles, to model healthful behaviors, and to refer families to community resources. They can also serve as educators, and promoters of healthy lifestyle practices and serve as leaders in community obesity treatment and prevention initiatives. Educating the nursing workforce to help screen,

discuss and provide resources about obesity prevention to families is critical. Therefore, the purpose of this training is to educate senior nursing students on critical topics related to the prevention of childhood obesity. This training is designed to raise awareness of the importance of obesity prevention, provide the necessary tools and skills for students to feel confident in providing information and resources to patients and providing referrals when necessary. In addition, students will learn basic techniques related to motivational interviewing that can be applied in different clinical and school based settings.

Learning Objectives of Training:

Upon successful completion of this course, students will be able to:

1. Apply knowledge to case studies to come up with effective plans to aid in childhood obesity prevention
2. Apply MI skills to simulated and real-life situations

Student Learning Outcomes:

Upon successful completion of this course, students will be able to:

1. Students will be able to define and discuss obesity and its risks, social determinants of health, and modifiable risk factors for childhood obesity.
2. Students will become familiar with best practices for preventing obesity among children.
3. Students will be able to identify situations where as nursing practitioners they can intervene to help prevent childhood obesity and develop an intervention plan.
4. Students will learn about the Dietary Guidelines for Americans and the identify where children are not meeting recommendations.
5. Students will understand the possible role of bias and discrimination when discussing childhood obesity.
6. Students will be able to use motivational interviewing to aid in the prevention of childhood obesity.

Sakai:

There is a Sakai site for this class. The syllabus will be available, and copies of the PowerPoint slides for each lecture will be posted on the site. The slides are only outlines of the material covered, thus it is important that you attend each session. The Sakai site will also include other course resources. It is important to check this site frequently.

Grading:

Grading will be completed per Nursing faculty protocols.

Table 1: Curriculum Outline

Session s	Topic	Objectives	Content
1	Overview and Introduction	<ol style="list-style-type: none">1. Understand what childhood obesity as a disease and the importance of prevention2. Understand the number of children who currently have obesity by sub-groups3. Discuss how nurses can play a role in obesity prevention	<ol style="list-style-type: none">1. Childhood Obesity Definition2. Prevalence overall and by sub-groups (ages, race/ethnicity)3. The importance of good nutrition4. The effects of diet on development, health, mood, sleep5. Preventing early childhood obesity6. Role of Nurses- what do we know?
2	Social Determinants of Health & Health Equity in Childhood Obesity	<ol style="list-style-type: none">1. Understand the role of social determinants of health in obesity development2. Understand the complexity of obesity3. Understand the importance of effective inter-professional collaboration and integration of clinical and community care for obesity.	<ol style="list-style-type: none">1. Social determinants overview- documentary “In sickness and in wealth”2. Determinants of obesity3. Complexity of obesity4. Roles of healthcare professionals in prevention/treatment

3	Modifiable Risk Factors (Pregnancy-Adolescence)	1. Identify the different risk factors and modifiable behaviors that impact obesity development	1. Risk Factors by life stages A. Pregnancy i. Weight gain ii. Nutrition during pregnancy B. Infancy i. Breastfeeding ii. Responsive Feeding iii. Sleep iv. Shaping home environment C. Early childhood i. Shaping habits ii. Nutrition iii. Physical activity iv. Sleep v. Screen time
4	Clinical Recommendations Obesity Prevention Children/Best Practices	1. Define clinical recommendations 2. Understand the role of bias and discrimination in obesity	1. Review best practice clinical recommendations for obesity prevention 2. Discuss bias and discrimination
5	Introduction to Motivational Interviewing	1. Describe the main component of motivational interviewing 2. Be able to practice motivational interviewing	1. What is motivational interviewing? 2. Importance of MI in obesity prevention 3. Key components of MI

6	Role of Policy & Community Action	1. Describe role of nurses in policy and community action 2. Identify ways in which nurses can inform policy and community action	1. Importance of policy in obesity prevention 2. What do we mean by community action?
7	Understanding Resources and Referrals	1. Understand the importance of having resources and referrals	1. When do you refer? 2. What are best resources?
8	Summary/ Conclusion		
	Practicum		
	Practicing MI		

Table 2: Course Schedule

Date	Activities and Topics
September 18th	- Consent forms - Pre-surveys - Topics 1-3
September 25th	- Topics 4-6, MI
October 2nd	- Topics 7-8, MI
November 6th	- MI simulations and evaluations - Post surveys and satisfaction surveys

J. HANDOUTS

Resources and Referrals		
Organization	Description	Contact
SNAP*	SNAP recipients receive a certain amount of benefits, which translate into spending money at grocery stores and farmers markets	<ul style="list-style-type: none"> - Apply online - Contact DHS: 401-462-5300 Website: http://www.dhs.ri.gov/Programs/SNAP/eligibility.php
SNAP-Ed	Provides educational programs that aim to teach people about nutrition and health	
WIC*	Support for low-income pregnant, breastfeeding, and postpartum women, and to infants and children up to age five who are found to be at nutritional risk	<ul style="list-style-type: none"> - Contact local WIC office; there are many throughout the state, find one near you! Website: http://www.health.ri.gov/find/services/detail.php?id=44
Registered Dietitians*	Provide counseling, assess nutritional needs, provide nutrition, health and food advice, help manage chronic diseases, design weight loss programs, create meal plans, etc.	<ul style="list-style-type: none"> - Many throughout the state - Some require MD referral Website: http://www.eatrightri.org/rdn/
CACFP	Provides aid to child and adult care institutions and family or group daycare homes for the provision of nutritious foods	Website: http://www.ride.ri.gov/cnp/NutritionPrograms/ChildandAdultCareFoodProgram.aspx
SBP	Provides cash assistance to states to operate nonprofit breakfast programs in schools and residential childcare institutions	Website: https://www.fns.usda.gov/sbp/school-breakfast-program-sbp
NSLP	Provides nutritionally balanced, low-cost or free lunches to children in schools each day	Website: https://www.fns.usda.gov/nslp/national-school-lunch-program-nslp
*Referral methods may vary by state

Motivational Interviewing Quick Skills Card

OARS Skill Card

OARS			
	Practice	Definition	Examples
O	Open Questions	Questions that start with: <i>Tell me about? Describe for me?</i> <i>How did you? What do you?</i> Encourages person to express their thoughts, feelings, and/or concerns.	Tell me about what you had for dinner last night? What do you think can get in your way of adding more vegetables to your diet?
	Closed Questions	Questions that start with: <i>Did you? Can you? When will you?</i> Answered with 1 to 2 words, like <i>"Yes," "No,"</i> or <i>"Fine."</i>	Did you eat vegetables for dinner? Would it be okay if I gave you information or advice about that?
A	Affirmations	Statements that express appreciation or tell a person that you notice their strengths or positive behaviors/actions.	You care about your health and want to make some changes. You really know a lot already and you ask really great questions.
R	Reflections	Statements that check is you correctly understood what a person said. Statements can be <i>simple</i> (restate what was said) or <i>complex</i> (adds meaning or emotion to what was said)	You want to be healthy, but you're just not sure how to do it. It scares you a little to realize that you are not managing your diet.
S	Summaries	Restates key concepts that a person just told you and shows that you heard and understood correctly.	You know a lot about including healthy proteins in your diet, but you know less about how to add fruits and vegetables.