The Digest

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Research

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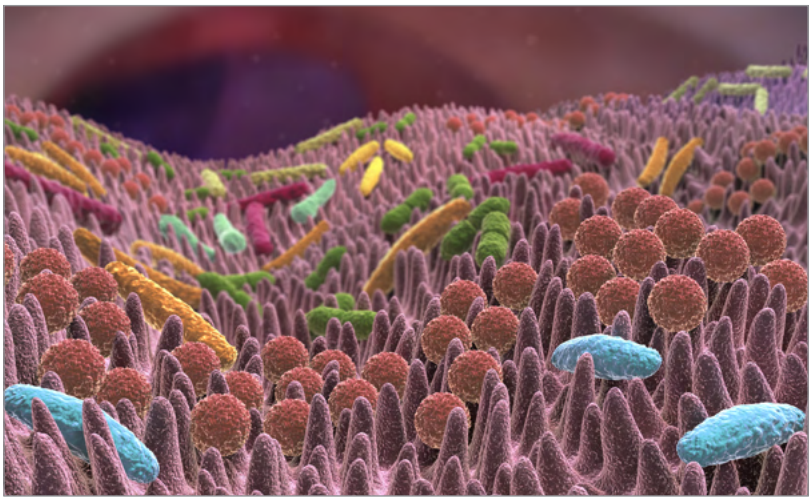
IN THIS ISSUE



Prebiotics and gut microbiota: how they work together to affect metabolic health

Presented by Raylene Reimer, PhD, RD

Professor, Faculty of Kinesiology and Cumming School of Medicine, University of Calgary

On October 26, 2019 the Research Dietetic Practice Group of the Academy of Nutrition and Dietetics hosted a continuing education symposium sponsored by the BENEO-Institute. The Symposium, which was held in Philadelphia, featured a presentation by Dr. Raylene Reimer focusing on prebiotics and metabolic health.

The gut is the most densely colonized ecosystem of the human body. It is no surprise that the gut microbiota is critical to health and disease and that public health interest on this topic is growing. The bacteria that make up our gut microbiota have many functions: they help release energy from foods we can't digest, like fibers; they provide important fuel (short chain fatty acids) for our intestinal cells; they produce certain vitamins for us; and if we have a healthy composition of bacteria in the gut it helps suppress the growth of pathogens and ensures proper digestive function. **One of the most important functions of our gut microbiota is to train our immune system.** This training is especially concentrated in the first year of life when the gut microbiota trains the immune system to be tolerant of its environment and not overreact to develop allergies, asthma, or autoimmune disorders. **When the gut microbiota become disrupted**

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***(dysbiosis)*- for instance when taking antibiotics- they can have a profound effect on metabolic health.** The first disease to be directly linked with dysbiosis was obesity. In the early experiments in this area, researchers showed that colonization of germ-free mice with an 'obese microbiota' resulted in a significantly greater increase in total body fat in the recipient mice than colonization with a 'lean microbiota.'[1] These powerful findings identified the gut microbiota as an additional contributing factor to the pathophysiology of obesity and triggered a massive interest in the gut microbiota in the context of other diseases. As a result of this expanding field of work, we now know that other metabolic diseases such as Type 2 diabetes and non-alcoholic fatty liver disease (NAFLD) also show dysbiotic gut microbiota compared to healthy individuals. Other diseases that have been shown to be associated with dysbiotic gut bacteria are the inflammatory bowel diseases like Crohn's disease and ulcerative colitis. While much of the initial work focused on gut-related disease, eventually research asked whether something that happens in the gut would have any effect on the brain. Indeed this was the case with evidence now showing that individuals with depression, anxiety, autism, or Parkinson's disease have different gut microbiota profiles compared to healthy individuals and that the function of these bacteria may also differ across the various diseases. In addition, there is very exciting research that is going on in the field of immune-mediated diseases like Type 1 diabetes and the gut microbiota.

Diet is probably one of the most important modifiers of the gut bacterial community. A diet high in fiber is a key dietary strategy to promote a diverse and healthy gut microbiota. Bacteria in the gut have numerous genes that allow them to break down fiber and ferment it producing important fermentation byproducts like SCFA (short-chain fatty acids). Acetate, butyrate and propionate are very important energy sources for the intestinal cells (particularly butyrate), but they can also get into the circulation and have effects distant to the intestinal tract. For example, some of them can alter appetite and food intake via the gut-brain axis. Diets low in fiber have been shown to compromise the gut microbiota with consequences for disease development. In particular, a low fiber, high fat/high sugar diet can alter the bacteria in the gut, compromise the intestinal mucus layer, disrupt the tight junctions of the intestinal barrier, and result in a 'leaky gut.' Once the intestinal barrier is compromised, pro-inflammatory compounds like lipopolysaccharides (LPS) can leak into the blood stream, triggering an immune response that results in low-grade inflammation that can affect multiple body organs. [2 3]

Groundbreaking research showed that it's important for every generation to eat fiber: **'If you want your children, grandchildren, great grandchildren to be healthy, YOU need to eat lots of dietary fiber' stated Reimer.** Researchers showed that bacterial species can become extinct over generations if fiber is not consumed in sufficient quantities.[4] The negative changes in the gut microbiota can be reversed within one generation but once the negative microbial profiles are passed on to subsequent generations, it becomes exceedingly difficult to restore the diversity of bacteria that was lost because of the low fiber diet. "We should be concerned when certain gut bacteria becomes extinct" explained Reimer. Considering that rates of metabolic disease and obesity are increasing generation after generation, we need to consider that a low fiber diet could be playing an important role here. Furthermore, just as fiber is a 'gut-microbiota friendly food,' there are many other foods or ingredients in our food supply that are 'gut-microbiota unfriendly foods' (i.e. high fat, high sugar diet, certain artificial sweeteners and dietary emulsifiers). As the science continues to develop, it is clear that diet has a profound effect on individual gut microbiota and identifying foods that are beneficial and detrimental will likely be an important aspect of future personalized nutrition.

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Prebiotics and Probiotics can be used as a potential therapeutic to modify our gut microbiota for obesity management. Prebiotics are selectively utilized by beneficial bacteria to promote a health benefit to the host and they can be found in foods like garlic, onions, asparagus and especially rich in chicory root. While it is important to eat foods that naturally contain prebiotics, to achieve a sufficient dose to treat a specific condition or disease or in research settings, prebiotics are often given in supplement form. It could be quite challenging to get people to eat enough garlic and onions to provide a relevant dose of prebiotics to counteract the metabolic disturbances that are already present in a certain disease. Probiotics are more readily recognized by consumers as beneficial and are found in foods like yogurt, fermented foods and beverages, and supplements. Some intriguing research showed that whether or not individuals received a benefit from a probiotic depended on their baseline microbiota profile. There is also indication for the existence of 'responders and non-responders' to probiotics and prebiotics, which may suggest that in the future we could tailor treatments depending on what a person's microbiota profile is. **An important question then emerges, if we want to use prebiotics, probiotics or fecal microbiota transplant to manage obesity, what does the microbiota have to overcome and correct?**

Obesity creates a 'new biology' that hinders weight loss and maintenance and challenges an attempt to establish a 'new' healthy gut microbiota community. Research showed that in individuals who had significant weight loss (considered 10% of initial body weight in this study)- their appetite/satiety hormone profile was disturbed even when examined a whole year after achieving the weight loss- making the body act is if it was starving. These biological barriers are very difficult to overcome and emphasize that sheer will power alone is not sufficient to help these individuals maintain their weight loss.[5] In addition, skeletal muscle efficiency has been shown to increase in individuals with obesity who lose significant weight, meaning that they in fact burn 20-25% less energy during low intensity exercise than they did prior to the weight loss.[6] This can be very discouraging for individuals trying to lose weight. The exercise that was done before losing weight now burns less energy, meaning the person will have to exercise longer or harder and *further reduce their caloric intake* to continue to lose weight or maintain a weight goal.

These are just two examples of the complex new physiology that obesity creates in the body that the gut microbiota has to overcome to help individuals manage their body weight.

So what can prebiotics do to reverse this 'new biology' that has developed as a consequence of obesity?

In one study, 21 g of prebiotic oligofructose a day stopped weight gain in adults.[7] The study showed a significant difference in body weight; the placebo group gained weight but the prebiotic group lost 2.4 lb over 12 weeks. Importantly, most of the weight lost was fat and especially trunk fat which can be metabolically dangerous. When considering just the numbers on the scale, the weight loss was not substantial, but the researchers were interested to know if there were any other metabolic benefits. One benefit the researchers saw was a reduction in the low-grade inflammation that is common in obesity. Serum lipopolysaccharide (LPS) in the prebiotic group was significantly reduced compared to placebo.

Two other diseases with metabolic origins for which the gut microbiota has become of interest are NAFLD and osteoarthritis. For NAFLD- there is currently no treatment aside from weight loss so looking into prebiotics as a way to reverse the fat that accumulates in the liver and affects inflammation is very relevant.[8] In the case of osteoarthritis, research with prebiotics and functional tests (walking, standing up from a chair) is ongoing, and there is some early indication that individuals who take a prebiotic have improvement in these tests.[10]

In adulthood it's tough to treat obesity, and treatment should probably start earlier in life with pediatrics. In a recent study in children, 7-12 year olds with obesity were given 8g of oligofructose-enriched inulin for 4 months.[11]

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The group that received the prebiotics had a slower rate of weight gain, and importantly the reduction in weight was coming from a loss of body fat which is clinically critical for these children. Compared to expected weight gain in children of this age, the children that were given the placebo would have nearly tripled the expected weight gain whereas those taking the prebiotic had normalized weight gain. Other outcomes in the children who got the prebiotic were reports of feeling fuller and reduced energy intake of about 113 kcal in a breakfast buffet. In addition, observations were made that the children who took the prebiotic had higher levels of the good bacteria *Bifidobacteria*.[12]

Is it possible to go even earlier in the lifespan? We know that mom's gut microbiota has a very important role in 'seeding' the gut microbiota of the offspring. There are many important factors that affect an infant's gut microbiota development including breast milk and especially the human milk oligosaccharide (HMO) content in breast milk which act as the first prebiotics we consume as infants. Feeding with breastmilk or infant formula will result in very different gut microbiota development for the offspring.

Birth mode is also an important factor and infants born by a caesarean section have a very different initial colonization compared to vaginal birth. Certain countries have high rates of C-sections (e.g. up to 85% of all births in certain hospitals in parts of Brazil), and mounting research shows an increased risk for chronic inflammatory conditions such as obesity, asthma, type 1 diabetes and Celiac disease.

Another disruptor of the gut microbiota is antibiotic use and studies show that prenatal exposure to antibiotics can increase the risk of obesity by 84% in children in one study. Postnatal use of antibiotics (during the first year of life) also increases the risk of obesity and asthma which are both associated with lower abundance of *bifidobacteria* in the neonatal gut.[13]

Looking forward to ways in which we can mitigate the risk associated with these disruptors, new research in rats shows that co-administering prebiotics with antibiotics to the mother during pregnancy can attenuate obesity risk in the offspring suggesting that beneficially altering the gut microbiota may be able to reduce some of the potential negative effects that these gut-microbiota disruptors might have.[14,15]

In conclusion, what can health care professionals look for or ask clients and patients? Some examples are: "*What types of fiber sources are you consuming (refined versus whole grain breads, pastas, etc.)?*" "*Are you consuming foods that contain healthy bacteria or those that promote the growth of healthy bacteria (prebiotics)?*" For young families, encouraging breast feeding is so important for the development gut microbiota…

Research over the past two decades has shown us the gut microbiota is integrally involved in metabolic diseases and obesity risk. Our public health perspective really has to shift to one that includes more promotion and attention to establishing a healthy gut microbiota as early in life as possible. It is possible that dietary guidelines may also evolve in the future to specifically emphasize foods and dietary patterns that optimize our gut microbiota. Long-term, the opportunities to eventually develop personalized prescriptions that optimally modulate the gut microbiota and tailor treatments to a person's existing microbiota are truly exciting prospects.

October 26, 2019 Philadelphia, PA.
Loews Philadelphia Hotel Downtown

Organized by:

The BENEO-Institute in collaboration with the Research Dietetic Practice Group of the Academy of Nutrition and Dietetics. For more information please go to www.dietaryfiber.org. Email: denisse.colindres@beneo.com

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A Letter from the RDPG Chair

Maria Morgan-Bathke

Dear Research DPG Membership:

Welcome to the 2021-2022 Academy year! It is a pleasure and an honor to serve as your chair for the upcoming year. I would like to start this note by thanking our past chair, Nancy Emenaker, for setting us up for a great year. I would also like to welcome all of our incoming executive committee members: Mary Lesser (Chair Elect), Andrea Arikawa (Secretary), Marqui Benavides (Policy and Advocacy Leader), Emily Heying (Membership Liaison), Eliza Short (Student Representative), Claudia Follette (Diversity Liaison), Erin McKinley (Mentorship Chair), Jingyi Wang (Editor-in-Chief) and Jennifer Ross (Website Master).

I'd like to thank our outstanding team of continuing members: Pao Ying Hsaio (Treasurer), Kim Beals (HOD Delegate), Heidi Silver (Council on Research Liaison), Andrea Lobene (ACEND Liaison) Sandra Gomez-Perez (Historian), Leila Shinn (Membership Coordinator), and Inés Anchondo (CPE Administrator).

The Research DPG would not be what it is without all of our committee leaders: Nominating Phil Karl, Awards Gigi Kwok-Hinsley and Kelsey McLimans, Fundraising Lauri Byerly, Social Networking Kevin Klatt and Webinar Linda Fergus and Tracey Ledoux.

As we look ahead to the coming year for the Research DPG, some highlights will include:

- A virtual member meeting during FNCE (keep an eye out for an invite!)
- Engagement and development of a Diversity Committee to support us in becoming more diverse, equitable, and inclusive for all members and to provide resources to researchers
- Exploration on avenues to expand membership benefits

I know that the year ahead will continue to have challenges as we continue to combat the pandemic, but I think we also have many opportunities to expand our research initiatives, and I look forward to working together to continue to achieve the goals of the Research DPG.

I want to thank all of our members for all the work you do to advance our profession everyday; let's work together to make this a great year!

Best wishes for a productive 2021!

Mentoring Undergraduate Dietetic Students in Nutrition Research: A Small Cohort Experience

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Introduction to Mentoring

Mentoring opportunities are not exclusive to academia; however, university settings are prime occasions for faculty to mentor students, formally and informally. Mentors are those who "provide guidance and counsel to someone who has less experience."[1] A recent study identified professors or instructors as those most likely to be undergraduate dietetic mentors.[2] Faculty are often interested in mentoring students; however, mentoring opportunities outside of the classroom can be limited due to time constraints and workloads of both professors and students.[3] Characteristics of effective mentors have been described as supportive, non-judgmental, reassuring, providing expertise while being honest and exuding trust, while effective mentees have been characterized as organized, self-directed, reflective, and accepting of feedback.[4]

Mentoring In Dietetics Research

There are many benefits for students and faculty who experience a mentored research project. For the student, mentoring is a collaborative process that can help to expand overall research abilities, further develop professionalism (e.g. communication, time-management, organizational skills), boost self-efficacy, and increase self-sufficiency. Additionally, the mentoring process provides students an opportunity to acquire or improve skills especially in research methods or design, managing data, and critical thinking. Working with a seasoned or early career nutrition research mentor can help students to "more fully understand the dietetics field and develop the skills they will need as a professional."[5]

Mentorship is rich with rewards for faculty, too. Some faculty may feel that "students are not prepared for research" which would not be surprising if students have not previously participated in any type of formalized research project.[3] Mentoring can certainly support students in that preparedness which is especially valuable if they are considering post-baccalaureate opportunities (e.g. dietetic internship, graduate school, etc.) requiring some type of scholarly endeavor. Faculty members can undoubtedly experience professional growth through the mentoring process especially in how they are able to build trust and rapport, offer feedback, and develop project-specific capabilities in students.[1] Additionally, mentoring activities have been shown to cultivate faculty members' listening skills, provide them an opportunity to share their personal experiences (successes and failures), and learn to manage research tasks including setting project benchmarks.[5] These very attributes are some of the important considerations that students seek out in effective mentor-mentee relationships.

A core knowledge requirement from the Accreditation Council for Education in Nutrition and Dietetics (ACEND) is for undergraduate students to participate in learning activities that include exposure to research methodology and interpretation of scientific literature. Specifically, the Dietetic Programs in Dietetics (DPD) standards state in "Standard 3: Curriculum and Learning Activities" that students should have an understanding of "research methodology and interpretation of research literature and integration of research principles into evidence-based practice."[6] In order to explore a potential intersection of dietetic standards and mentoring, the following research project was conducted with the purposes of 1) providing feedback to a faculty member new to the research mentorship process, and 2) to provide an understanding of mentored student research experiences.

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Mentored Undergraduate Research: A Small Cohort Experience

Undergraduate students enrolled in a DPD program at a private university were invited, through in-class and word-of-mouth recruitment, to participate alongside a nutrition faculty member in a mentored research project focusing on child care food insecurity prevalence. Interested students were presented with a consent form, either accepting or declining participation in the mentored sessions. The project was approved by the university's Institutional Review Board (IRB) prior to any data collection or recruitment.

Undergraduate students did not receive any academic credit for participating in the mentored research project, nor were they enrolled in any nutrition research course. All research mentoring meetings were voluntary and held in-person except the last eight meetings which were conducted virtually due to COVID-19 social distancing precautions. There was no funding allocated or spent on the research project.

Research session meeting times and schedules were determined based on input from the students who were interested in attending. Bi-weekly sessions were typically scheduled to last 45 minutes to one hour, excluding holiday breaks. Communication channels were via email, in-person meetings and various electronic platforms (e.g. Zoom, Google Meet, etc.). A research timeline was created at the beginning of the research process in order to guide the students and project forward. Tasks needing to be accomplished at the following meeting were identified and then divided up amongst the students. At the next scheduled meeting, progress towards the tasks were shared with the group, and new tasks were then created for the subsequent meeting(s). Long and short-term goals were also identified so students could anticipate what would be coming down the research timeline.

After each mentored research session, students completed an 8-question evaluation form providing feedback on their experience. The evaluation form included four demographic questions and four additional questions evaluating the amount of time spent the previous week in preparation for the research meeting, how much time was spent within the session itself, overall rating of the research session experience, and identification of the area(s) with which the faculty mentor helped during the session.

Data analysis of the project included descriptive statistics on the completed student evaluations during the 11-month project. Reliability analysis was conducted on 5 out of 8 survey questions based on comparisons between the students and faculty member data. The JMP® data analysis software was utilized for statistical analysis.[7]

Results of the Small Cohort Experience

Five dietetic students initially expressed interest in being a part of the child care research project and mentoring sessions. Two undergraduate students dropped out after the first few weeks due to time and class commitments. Three total students participated in the research project during its 11-month timeframe and only their data was used for analysis. Additionally, each of the participating students identified as female and all had a declared dietetics major. None of the participants had previously been involved in a mentored research project. Of the three participating students, two were seniors and one was a sophomore at the time of the project.

A total of 22 mentoring sessions were conducted between September 2019 and August 2020. There were a variety of research topics covered during the sessions including literature review, application for and approval of the IRB, survey compilation, identification and utilization of subject matter experts, survey validation efforts, securing the sample population, distribution of the survey, data analysis and evaluation, manuscript compilation, and submission of the manuscript to a peer-reviewed journal. All students names appeared in alphabetical order on the manuscript behind the faculty member's name as the first author.

Attendance at the research sessions ranged from one to three students with an average attendance of 2.5 students. Data analysis revealed the average amount of time spent during in-person meetings was 44.17 minutes (SD 10.04) with a range of 20 to 75 minutes. The average amount of time spent on outside project work was 59.82 minutes (SD 33.62) with a range of 15 to 120 minutes. Total student time spent on the entire project was 5615 minutes, with a breakdown of 2385 minutes spent in the mentoring session and 3230 minutes spent on the project outside of the mentoring session meetings.

The average rating for all of the research session experiences was 4.85 (SD .36) on a 5-point scale of excellent (5), good (4), average (3) fair (2), or poor (1). The average rating before the COVID-19 pandemic with in-person research sessions was 4.91 (SD .28) for 14 sessions. The average rating of the eight sessions after the shift to virtual sessions was 4.74 (SD .45).

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Based on student response, the mentored areas reported most helpful included Understanding the Research Process (93%), Scholarly Writing (64%), Critical Thinking (58%), Professionalism (55%), and Confidence in Research Skills (47%) (Figure 1). The least helpful topics were Sharing Experiences (20%), Time Management (16%), Addressing Personal Issues (2%) and Networking (0%).

One student reported an "Other" (2%) benefit as "How to Conduct (a) Survey" (Figure 2).

Reliability analysis results showed that the amount of time spent in the research project had the most variability. The Cronbach's alpha score for the in-person research meeting times (17 sessions) was .836 indicating a high level of internal consistency in time reporting between faculty and students.

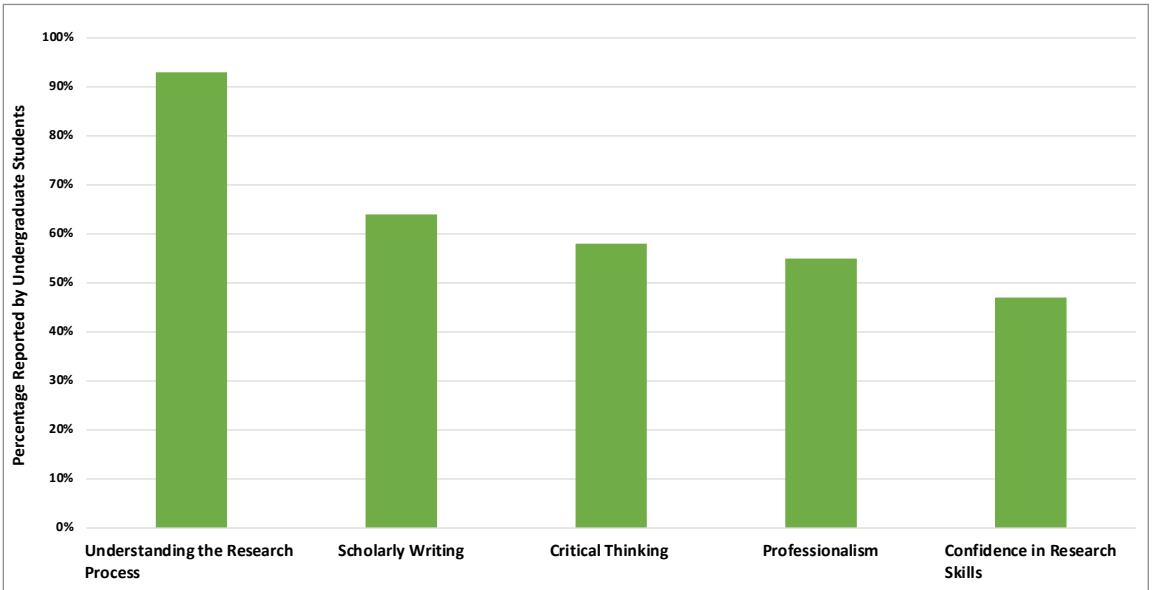

Figure 1. Research Mentoring Session Topics Reported Most Helpful by Undergraduate Dietetic Students (N = 22 sessions)

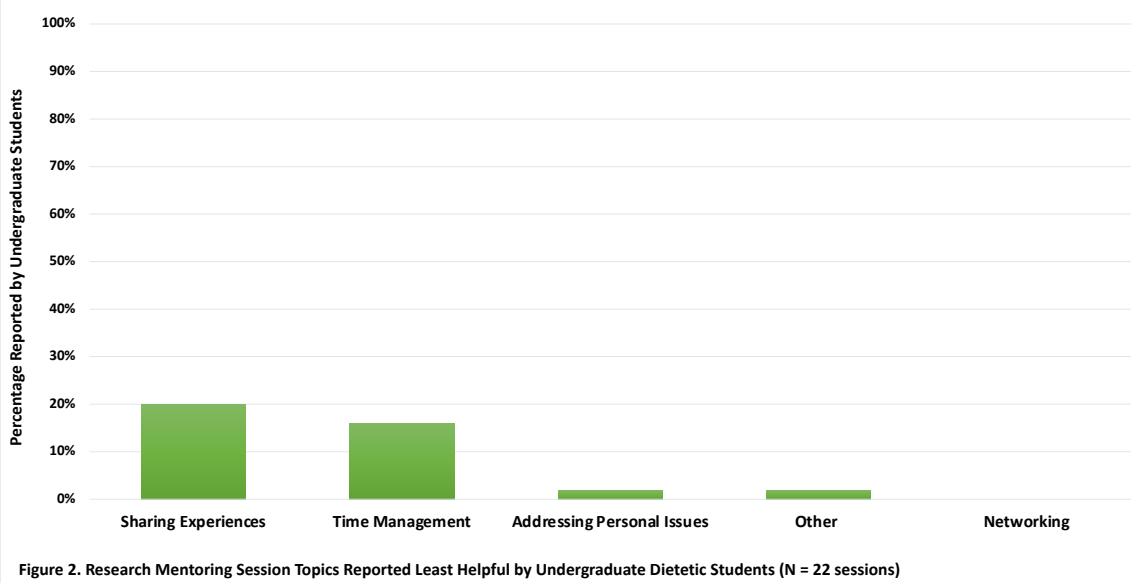

Figure 2. Research Mentoring Session Topics Reported Least Helpful by Undergraduate Dietetic Students (N = 22 sessions)

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Discussion of the Experience

Limitations of the research included self-reported participant data, use of a non-validated survey tool, and a small sample size which makes generalization difficult. While the sample size was small for identification of any statistically significant findings, three students was a manageable cohort for a faculty to be able to personally mentor. In the past, dietetic mentoring projects have aligned mentor/mentee groups into pairs which gives some precedence for small groups.[5]

Key lessons of the mentoring project were vast since this was an initial experience for this faculty member to mentor undergraduate students. Ultimately this process validated that essential features of the mentored student research experience should include the ability for students to take a role in designing some aspect of the project as well as allowing them to work independently, having the ability to grow towards mastery of the research process, feeling some ownership of the project, and having an opportunity for oral or written communication.[8]

Tips and Tools for Mentoring Undergraduate Students

When contemplating a student mentored research experience, consider these six strategies to help boost success:

Establish Ground Rules: Prior to conducting mentoring sessions, it is important to establish ground rules concerning participation in the research project, acceptable communication channels (and frequencies), as well as anticipated time commitments.[1] It is recommended that mentoring relationships have defined communication expectations which include meeting frequency and duration as well as an overarching timeline with defined outcomes.[9] Establishing these ground rules at the beginning of the project can help avoid misunderstandings later in the process.

Prepare for Success: Consider the skills students will need in order to successfully complete the research project: which computer or technology abilities are needed, what organizational skills are essential, will editing or writing proficiency be required, and so forth. It may be helpful to complete a needs assessment

at the beginning of the mentoring relationships in order to see where knowledge or skills gaps may be. Also, practice the "learning from anyone" recommendation by inviting other researchers or experts to group meetings which can foster an inclusive learning environment and close any learning deficiencies that have been previously identified.[9]

Clarify the End Goal: It is crucial to establish what the end point of the research project will be (e.g. poster presentation, manuscript submission, etc). If a journal submission is desired, then early discussions should take place surrounding the authorship of the manuscript and what is required to meet any specific journal requirements. Some journals now stipulate required elements for a manuscript submission (e.g. naming who is responsible for the conception and design of the project, who will perform the data analysis, who will be responsible for editing the manuscript, etc.) which helps in establishing roles and expectations from the start.

Flesh out the Format: Conducting mentored research can be achieved in several ways. A faculty member can mentor students through a project already underway or students can bring their own research ideas and have the faculty member mentor them on their particular project. In either instance, routine (e.g. weekly or bi-weekly) research meetings or check-ins should be scheduled in order to keep communication channels open, establish project benchmarks, and address any issues that may arise.

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Focus on Feedback: Consider what the feedback channels will be for the project. Discussions held early on can help to clarify what and how the students regard feedback and how it may be best received. Remember to "offer positive reinforcement" along with a balance of constructive feedback throughout the process.[9] In all communications it is vital to for mentors to "demonstrate professionalism and confidentiality in (all) interactions."[5]

Cultivate Resilience: Faculty members should strive to emulate attributes of resilience during the research process since setbacks are inevitable. For example, if the sample population is lower than expected, results aren't as anticipated, or journal acceptance is declined, these situations may feel like setbacks; however, they can be viewed as opportunities for students to learn "tolerance for obstacles faced in the research process" and how to set new project goals.[8] At the time of this article; one journal had rejected the research manuscript, thus it was re-formatted and submitted to another journal where acceptance is now pending.

Looking Ahead: Future Research and Collaboration Opportunities

As educators and researchers it is essential to support the process needed for successful mentorship of dietetic students in research. The Research Dietetic Practice Group (DPG) has already created student mentoring opportunities available for members of the Academy of Nutrition and Dietetics and DPG. The DPG mentorship program identifies experienced researchers who are then "matched with graduate students and early career researchers based on personal goals and research interests" allowing them to gain a new perspective from other professionals and institutions.[10] As nutrition practitioners, it is important to raise awareness about the availability of these and other resources which "may help connect interested students with mentoring opportunities."[2]

In summary, mentorship has been described as a component of "lifelong learning" for both the dietetics practitioner and the student.[9] Faculty mentors can be the perfect guide to foster these collaborative relationships and support students who overwhelmingly indicate they are interested in having a mentor.[2] Looking forward, dietetic mentoring relationships are valuable and worthy endeavors that call for continued research. Insights gained from these investigations can grow our understanding of what makes mentoring relationships beneficial to both parties.

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Group versus Individual Education and Their Effect on Knowledge and Self-Efficacy in Bariatric Patients: A Pilot Study

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ABSTRACT

Objective: To determine the feasibility of conducting a study comparing nutrition knowledge and self-efficacy for weight loss behaviors before bariatric surgery in patients receiving group eduation (GE) versus individual nutrition education (IE) and examine differences in scores between groups (IE vs. GE).

Methods: A quasi-experimental, pre-test post-test feasibility pilot study (n=12) with a six-month nutrition education program. Self-efficacy was assessed by Weight Efficacy Lifestyle Short-Form (WEL-SF), nutrition knowledge by General Nutrition Knowledge Questionnaire (GNKQ) and Eating after Bariatric Surgery Questionnaire (EABS). Wilcoxon Signed Rank tests determined differences between pre- and post-scores.

Results: EABS scores improved from baseline to post-visit (p= .034). Pre- and post-WEL-SF scores improved for all patients (n=19, p= .008) but remained significant only for IE group (n=9, p= .018). The IE group had significantly higher post GNKQ scores (p= .042).

Conclusion: An overall increase in GNKQ, EABS, and WEL-SF scores were observed in all patients. The IE group had significantly higher nutrition knowledge and self-efficacy scores at follow-up compared to GE group.

Practice Implications: There might be a need to redesign GE sessions to promote deeper learning and larger gains in self-efficacy when health insurance carriers require this form of patient education in lieu of IE.

INTRODUCTION

Over one-third of adults in the United States are obese, and this disease is responsible for the second highest cause of death each year due to the increased risk for chronic diseases. [1] There are many ways to treat obesity, such as calorie restriction, exercise, and behavioral change. However, these therapies are not always successful. In 1992, the National Institute of Health (NIH) determined that morbidly obese patients failed to lose an acceptable amount of weight long-term with behavioral modification and/or drug therapy [2]. Bariatric surgery has been shown to be a beneficial therapy, achieving effects such as prolonged weight loss and a decrease in co-morbidities. [2] Bariatric surgery can improve the risk of cardiovascular disease, some forms of cancer, and mortality. [2] The most common bariatric surgeries include sleeve gastrectomy and laparoscopic Roux-en-Y gastric bypass. [3]

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In the state of Illinois, a formal evaluation by an RD is necessary prior to surgery clearance. Nutrition education from an RD is a standard of care in bariatric surgery practice guidelines [4]. Based on insurance guidelines, patients may attend group or individual RD education sessions; however it remains unclear if both types of education are effective in increasing knowledge and self-efficacy in patients preparing for bariatric surgery. Patients with a BMI of 40 kg/m^2 or patients with a BMI of 35 kg/m^2 with one or more comorbidities are eligible for bariatric surgery [5]. While pre-operative insurance requirements vary with each insurance company, Illinois Medicaid requires six consecutive months of participation in a supervised weight loss program [5]. Patients must demonstrate the ability to comply with treatment recommendations and the ability to partake in long-term follow-up before receiving clearance for surgery. Physicians and clinical practitioners ultimately reserve the right to provide final clearance for surgery [5].

The American Society for Metabolic and Bariatric Surgery (ASMBS) Clinical Practice Guidelines for Management of the Bariatric Surgery recommend bariatric patients undergo a clinical evaluation by an RD to determine whether the patient is able to incorporate nutritional and behavioral changes pre- and post-bariatric surgery [4]. Furthermore, the ASMBS recommends preoperative and postoperative education and management by an RD [4].

Medical nutrition therapy recommendations should be individualized to the patient based on age, gender, and weight. In an randomized clinical trial, by Sarwer et al., regular postoperative dietary counseling by an RD was associated with greater weight loss at 4 and 24 months compared with the control group [6]. Unfortunately, many patients regain weight within 2-10 years after bariatric surgery [2]. In a longitudinal study with 700 participants, weight regain was seen in 50% of patients within 2 years post-surgery [7]. For the best weight loss outcomes, it is suggested that patients must have an appropriate understanding of behavior changes needed related to nutrition and physical activity to ensure better long-term outcomes. Thus, patients must have the appropriate knowledge and self-confidence to make an impactful lifestyle change [8]. However, there is little evidence showing which education method pre-surgery contribute to the best post-surgery outcomes. Thus, the purpose of this study was twofold: first, to determine the feasibility of conducting a study comparing nutrition knowledge and self-efficacy for weight loss behaviors before bariatric surgery in patients receiving group education (GE) versus individual nutrition education (IE) and second, to examine differences in nutrition and self-efficacy scores between two education groups (IE vs. GE).

2. METHODS

Study Sample and Procedure

A quasi-experimental, pre-test post-test design pilot study was conducted **(Figure 1)**. A sample of convenience was used for this pilot study and recruited from the Center for Weight Loss and Bariatric Surgery at Rush University Medical Center (RUMC) in Chicago, Illinois. Study participants were invited to participate if they were adhering to an interdisciplinary bariatric surgery pre-operative process requiring 1 to 6 months of RD visits. The first group participated in monthly pre-bariatric surgery group education (GE) classes according to health insurance requirements over a six-month period. The individual education (IE) group underwent a minimum of one individualized counseling session; the number of visits required was based on the RD's clinical judgment of patients' knowledge of bariatric surgery and adherence to the post-operative diet pattern. Patients were eligible if they were greater than 18 years of age and English speaking and were scheduled to receive bariatric surgery within the next six months. Patients who had previous bariatric surgery were excluded due to the likelihood of them previously receiving some form of education. Potential participants meeting eligibility criteria were scheduled for a visit with an RD during which the study was explained and patients were evaluated for interest and given an opportunity to ask questions. Participants received oral and written information about the study prior to informed consent.

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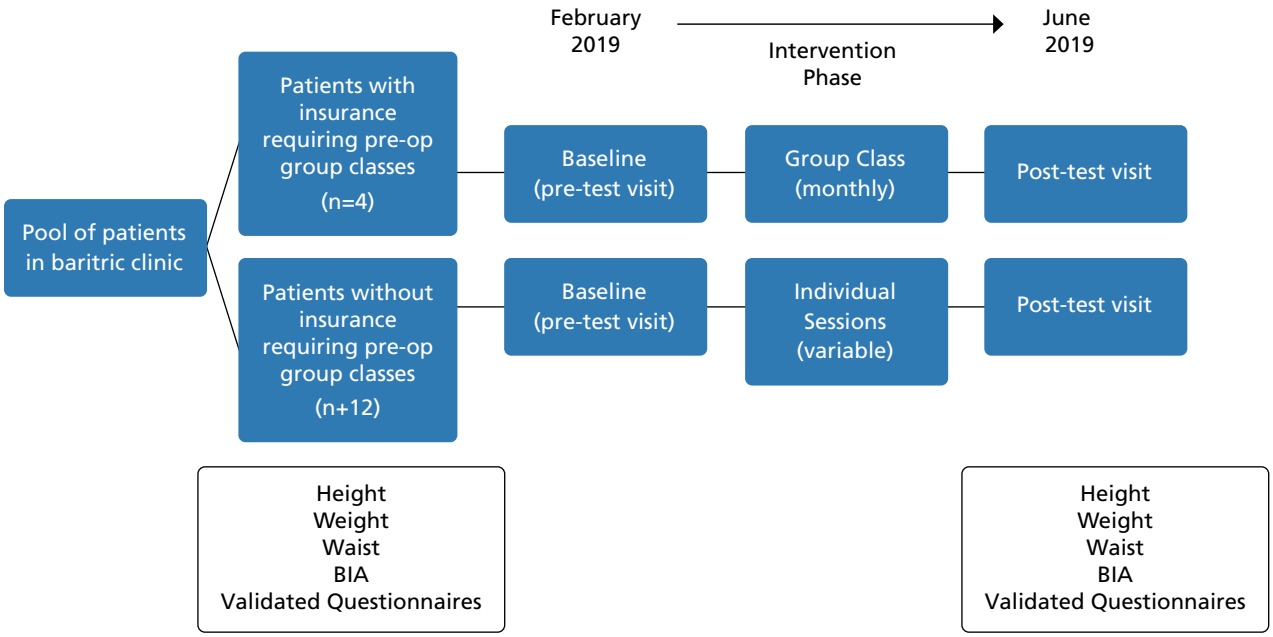

Figure 1. *S tudy design and data collection sequence*

This pilot study complied with human subject research and ethical guidelines and was reviewed and approved by the Rush University Institutional Review Board (ORA 18101902). All subjects' rights were protected in compliance with the Health Information Portability and Accountability Act specifications.

Nutrition Education and Assessment Schedule

Patients with insurance requiring GE received an individual baseline assessment (pre-test), four consecutive monthly GE sessions, and a final individual appointment (post-test) prior to surgery (Figure 1). Patients without a group education requirement completed an individual baseline assessment (pre-test) and individualized number of monthly IE sessions prior to surgery (Figure 1). Nutritional topics presented during the intervention to the two groups were based on data generated from anonymous surveys completed by RDs and post-bariatric surgery patients prior to the start of the pilot study. The nutritional topics generated by the survey results, topics rated essential or highly essential by ≥ 50% of the participants, were: nutritional consequences following each type of surgery, differences between the types of bariatric surgery, macronutrient requirements, and portion sizes.

Demographics and Anthropometric Measurements

Information regarding gender, self-reported race, educational status, employment, and family income were collected at the pre-test visit. Height (cm), weight (kg), and waist circumference (cm) were collected at pre- and post-test visits using standardized methods by trained research personnel. Height, weight, BMI, basal metabolic rate (BMR), fat percentage, fat mass (lb.), fat free mass (lb.) and total body water (lb.) were measured using the Tanita Body Composition Analyzer TBF-310 clinic scale (Tanita Corporation of America, Inc, 2015, USA). Waist and hip measurements were measured using a Myotape Body Tape Measure (AccuFitness LLC, Denver, CO, USA) at the horizontal plane of the umbilicus for waist and at the widest point of the hip. Average waist and hip circumferences were calculated using two measurements for each site. Measurements with an error of .5 cm were repeated for a third time. A Cohen's kappa of >.80 indicated strong agreement and adequate training on taking anthropometric measures [9, 10]. Inter-rater reliability using Cohen's kappa was calculated at .92 for hip and waist measurements among research staff. Measurements were taken to the nearest .5 cm.

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Questionnaires

Validated questionnaires were completed at the individual baseline assessment (pre-test visit) prior to their assigned educational programs and again at their final individual assessment (post-test visit) (Figure 1).

Weight Efficacy Lifestyle-Short Form

Self-efficacy was measured using the Weight Efficacy Lifestyle (WEL) questionnaire, originally developed by Clark et al to determine how confidently a patient is able to resist overeating in difficult situations [11]. There are five components to the WEL: Negative Emotions, Availability, Social Pressure, Physical Discomfort, and Positive Activities. The original questionnaire had a total of 20 items. In this study, the WEL short-form (WEL-SF), [12] was used which has a total of eight items; each item is rated using a scale from 0 to 10 with 0 indicating "not confident at all that I can resist overeating;" a score of 10 indicates the opposite, "very confident that I can resist overeating." The WEL-SF has a maximum score of 80 points where higher scores indicate highest confidence for controlling eating behaviors.

General Nutrition Knowledge Questionnaire

The General Nutrition Knowledge Questionnaire (GNKQ), developed by Jones et al [13], is a validated general nutrition questionnaire for use in adults. The questionnaire has a maximum score of 60 points and measures four areas of nutrition knowledge: MyPlate and Dietary Guidelines for Americans (DGA), Nutrient Content of Foods, Everyday Food Choices, and Diet and Disease Relationships. Higher scores indicate higher nutrition knowledge.

Eating After Bariatric Surgery Questionnaire

Taube – Schiff et al developed the Eating After Bariatric Surgery questionnaire (EABS) for a population of bariatric patients from the Toronto Western Hospital Bariatric Surgery Program [14]. This 12-question instrument was designed to test the most important aspects of post-surgery nutrition. The questionnaire assessed participants' knowledge about diet phases, nutrition complications, vitamin and mineral requirements, protein requirements, portion sizes, and fluid requirements after bariatric surgery. Patients receive one point for each answer for correct answers and are deducted .5 points for each incorrect answer. The second section of the EABS includes three fill-in the blank questions whereby patients are given 5 points for each correct answer and 0 points for each incorrect answer. The third and final section consists of two short answer questions in which 5 points are given for each correct answer. A total score is calculated and can range from 0 to 89, with higher scores indicating greater knowledge of bariatric nutrition.

Data Analysis

Study data were collected and managed using REDCap electronic data capture tools available at RUMC [15, 16]. REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails and export procedures; 3) automated export procedures for downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources. Statistical analyses were conducted using SPSS (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp). Categorical variables were analyzed using frequency distribution presented as n (%) and continuous variables presented as median (interquartile range, IQR) or means (standard deviation, SD) based on normality. Normality was determined by visual inspection and Kolmogorov – Smirnoff test. Comparison between knowledge pre-education versus knowledge post-education was determined using Wilcoxon Signed Rank test. Statistical significance was determined by a p-value < .05.

3. RESULTS

A total of 19 participants were recruited for this study **(Table 1)**, and 12 participants (8 IE participants and 4 GE participants) completed the entire study (63% completion rate). The total contact time for the GE group was six sessions and was variable for the IE group (average number of sessions = 4). The sample was largely female **(Table 1)** with a median age of 36 years (33, 41). The study sample was predominantly African American (47.4%, n=9). Most of our sample participated in IE (78%, n=15) compared to GE (21.1%,

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n=4). Low recruitment numbers for the GE were largely due to changes in the Illinois Medicaid program during the recruitment phase requiring Illinois Medicaid recipients to undergo bariatric surgery at a centralized public hospital. Patients enrolled in the County Care Health Plan (Medicaid subsidiary) were to be seen solely at John H. Stroger, Jr. Hospital (Chicago, IL). Many patients at the time were covered by County Care Health Plan resulting in lack of follow up at RUMC. A low completion rate was primarily due to patients opting out of the surgery process (n=7) and thus unable to complete the pilot study.

Table 1 *Demographic characteristics of the sample*

Characteristic	Total Sample n=19) n (%)
Gender	
Male	1 (5.3)
Female	18 (94.7)
Race Ethnicity	
White	5 (26.3)
African American	9 (47.4)
Hispanic or Latino	4 (21.1)
Other	1 (5.3)
Educational Status	
Finished high school or have GED	3 (15.8)
Some college	4 (21.2)
Associate degree	3 (15.8)
Bachelor's degree	4 (21.2)
Postgraduate degree	2 (10.5)
Vocational or technical training	3 (15.8)
Occupational Status	
Employed	12 (63.2)
Unemployed	4 (21.1)
Disabled	2 (10.5)
Homemaker	1 (5.3)
Household Annual Income	
$0-$19,999	4 (21.1)
$20,000-$59,999	5 (26.3)
$60,000-$79,000	4 (21.1)
$80,000-$99,999	1 (5.3)
$100,000 or more	5 (26.3)
Bariatric Education Type	
Individual	15 (78.0)
Group	4 (21.1)

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Table 2 summarizes pre- and post-education anthropometric characteristics of the sample. There were no significant differences between pre- and post-education for any anthropometric data. While not significant, the median BMI notably decreased from 47.6 (39.7, 50.3) kg/m^2 to 43.9 (39.4, 47.8) kg/m^2 (p=.799). There was also a notable reduction in median waist circumference and hip circumferences between pre- and post-visits.

Table 2 *Anthropometric characteristics at pre- and post-test study visits*

Anthropometrics	Pre-Test (n=19)	Post-Test (n=12)	p-value
Weight (kg)	117 (106.0, 136.1)	113.4 (99.5, 132.3)	.790
BMI (kg/m2)	47.6 (39.7, 50.3)	43.9 (39.4, 47.8)	.799
Waist Circumference (cm)	126.3 (113.7, 138.5)	120.7 (106.7, 134.6)	.260
Hip Circumference (cm)	137.2 (128.3, 143.8)	129.5 (127.0, 138.4)	.263
BMR (kcal)	1879.0 (1812.0, 2139.0)	1889.0 (1730.0, 2106.0)	.646
Fat Percent (%)	51.1 (49.7, 55.1)	51.4 (48.0, 52.6)	.155
Fat Mass (kg)	56.4 (52.0, 75.7)	55.2 (48.2, 72.7)	.541
Fat Free Mass (kg)	57.4 (52.6, 64.1)	54.5 (51.8, 61.4)	.386
Total Body Water (lb)	40.1 (37.3, 47.0)	38.6 (36.8, 45.0)	.256

BMI=body mass index; BMR=basal metabolic rate. Significance set at $p < .05$.

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As shown in **Table 3** at baseline, the total sample (n=19) had a median WEL-SF score of 57 (47.0, 63.0). After stratification by group, participants in the IE group had a lower median score of 54 (47, 59) at pre-visit and a higher score (72 (65, 77) at post-test assessment (p=.018).

No significant difference was seen in pre- compared to post-test scores in WEL-SF for GE participants (p=.180); however, self-efficacy scores did increase. At pre-test wnts in EABS scores, however median scores did increase in both groups.

Table 3. *Comparison of questionnaire scores at pre- vs post-test study visits of pilot study sample*

	Individual Education		P-value	Group Education		P-value	P-value [a]	P-value [b]
	Pre-Test (n=15)	Post-Test (n=8)		Pre-Test (n=4)	Post-Test (n=4)			
WEL-SF	54 (47, 59)	72 (65, 77)	.018*	72 (47, 80)	76 (72, 80)	.180	.124	.109
GNKQ	33 (26, 36)	38 (28, 46)	.042*	33 (23, 40)	35 (25, 46)	.273	.885	.683
EABS	33 (21, 42)	38 (24, 52)	.123	26 (22, 36)	38 (38, 39)	.144	.411	1.00

Questionnaires: WEL-SF=Weight Efficacy Lifestyle short form; GNKQ=General nutrition knowledge questionnaire; EABS=Eating after Bariatric Surgery. Data presented as medians and interquartile range (IQR). *P < .05 is significant. [a]Pre-test score for individual education vs Pre-test score of group education; [b]Post-test score for individual education vs post-test score for group. Data missing for 1 subject at pre-test visit in individual education; 7 patients no longer receiving surgery dropped from individual education.

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Figure 2 shows a comparison of pre- and post-scores for the three questionnaires for sample and by group type for sample completing the study pre-bariatric surgery. Significant differences were observed in WEL and the GNKQ scores within the individual education (IE) group between their pre- and post-study visits (*p<.05). Overall, gains in post-surgery nutrition knowledge were observed for the total sample pre-bariatric surgery as measured by the EABS questionnaire.

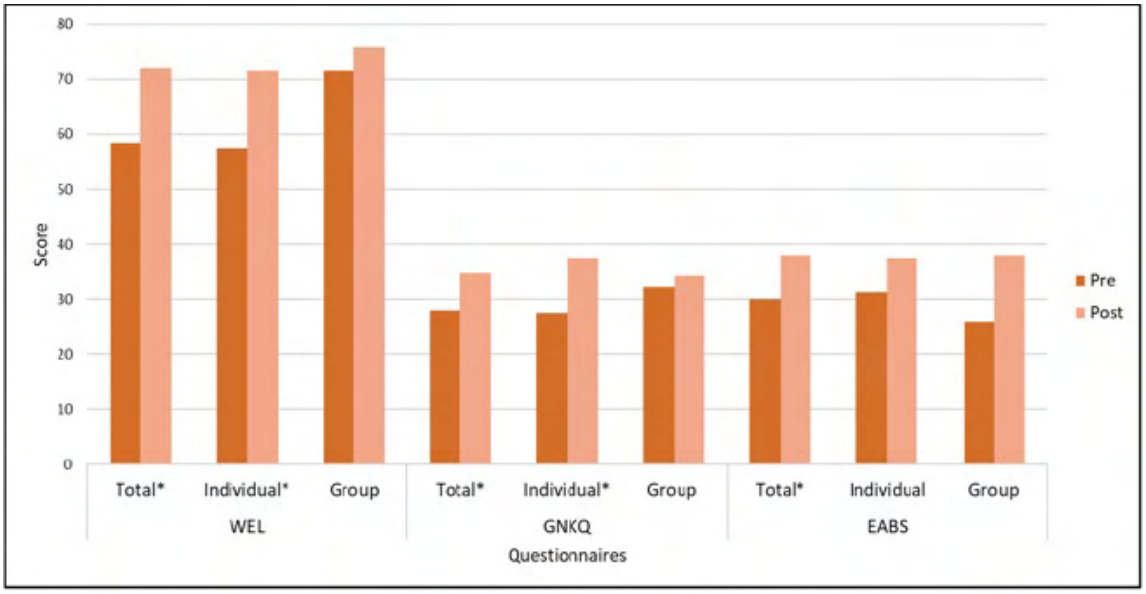

Figure 2. Comparison of pre- and post-test questionnaire scores for sample completing study pre-bariatric surgery. Significant differences were observed in Weight Efficacy Lifestyle – Short Form (WEL) and the General Nutrition Knowledge Questionnaire (GNKQ) scores within the individual education (IE) group between their pre- and post-study visits (*p< .05). No significant differences were observed between pre- vs. post-study visits for patients in group education (GE). For the total sample, gains in knowledge for post-surgery nutrition using the Eating After Bariatric Surgery Questionnaire (EABS) were observed between pre- and post-study visits.

4. DISCUSSION

4.1 Discussion

The major finding of this pilot study was that overall general nutrition knowledge and self-efficacy increased from the baseline (pre-visit) to the last clinic appointment (post-visit) prior to bariatric surgery for study participants in both groups, but significantly only in those participants exposed to the IE approach. To our knowledge, this is the first study to examine the effect of nutrition education on patients' self-efficacy prior to undergoing bariatric surgery. Research has shown that weight loss after bariatric surgery is associated with increased eating self-efficacy using the WEL questionnaire [17]. Studies have also shown the importance of comprehensive pre-operative education in improving weight loss outcomes [8, 18]; however little is known about the best approach, group vs. individual, for teaching bariatric patients. This study was specifically designed to determine the feasibility of conducting a study to evaluate changes in knowledge and self-efficacy before bariatric surgery using two different commonly used approaches: IE versus GE.

As previously described, some insurance companies require a six-month education requirement while other companies only require an initial RD assessment. The six-month diet requirement is often completed in a group setting with the first and last appointments as an individual RD appointment. Insurance companies leave the number of appointments the patient will need before surgical clearance to the RD's discretion. Given

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these varying insurance requirements for bariatric patients in Illinois, it is interesting to observe differences in gained knowledge and self-efficacy between these two different approaches. We found patients receiving IE had significantly higher general knowledge and self-efficacy between pre- and post – visits compared to patients in GE despite undergoing fewer visits. This could potentially be due to the uneven distribution of the groups. The IE group had twice as many patients as the GE group. Nonetheless, for the total sample, we observed significant differences between pre- and post-visits in eating self-efficacy, general nutrition, and bariatric nutrition underscoring the important role of RD education and support pre-operatively.

A barrier encountered early in the study impacted researchers' ability to recruit GE participants. Patients under a large Chicago-based Medicaid managed health care plan (CountyCare) required patients to receive bariatric care at different institution. These changes led to a shortages in the pool of Medicaid patients, who require six months of pre-operative visits. This impacted our ability to enroll patients in this study, subsequently resulting in a smaller group of patients in the GE. Another potential reason for the differences seen between GE and IE participants could be the topics covered during the two educational approaches. The GE was designed to cover four specific bariatric-related topics based on a RD and post-bariatric patient surveys with some group discussions on goal settings and peer support. The IE covered similar topics however, there was potentially more time for individual goal setting and personalized nutrition. Therefore, this could be a reason for the significant increases seen in self-efficacy and general nutrition in the patients receiving IE compared to those in GE.

A strength of this study is that it is filling a gap in the literature in attempting to determine which pre-surgical education approach is best for patients preparing for bariatric surgery. Despite this strength, this study has several limitations. This study utilized a sample of convenience and was possibly underpowered due to unexpected barriers in recruitment and patient dropout at the beginning of the pilot study. A post-hoc sample size estimation based on the differences in WEL-SF scores revealed a required sample of 50 participants per group confirming the need for a larger study to confirm these findings. This study focused on nutrition education before bariatric surgery, and thus we did not follow patients after bariatric surgery. An important future study would be to follow patients forward into the post-surgical weight loss phase to evaluate the effect of pre-surgical GE versus IE on post-surgical outcomes including weight loss and complications. Additionally, the EABS was developed in Canada where there are differences in standards of care regarding diet advancement and recommended foods for bariatric patients.[19, 20] Therefore, another important study is to align the EABS questionnaire to standards of bariatric nutrition care in the United States and then test for validity in a diverse population of bariatric patients as this may result in catching changes in nutrition and bariatric knowledge that could have been missed due to the nuances between standards of care.

4.2. Conclusion

Changes to the health insurance landscape with lower number of participants requiring GE presented unforeseen recruitment challenges that need to be addressed in planning for a larger scale study. Overall, this pilot study demonstrated that GNKQ and WEL-SF increased in all subjects despite different teaching approaches. However, significant differences were only observed in the IE group for GNKQ and WEL-SF scores.

4.3 Implications for practice

While results may have been influenced by an unevenly distributed sample, there might also be a need to redesign GE sessions to promote deeper learning and larger gains in self-efficacy when health insurance carriers require this form of patient education in lieu of IE. Nonetheless, this preliminary data is useful in developing a primary understanding of how bariatric patients learn best with emphasis on the benefits of personalized education (i.e., IE group). Ultimately, the knowledge and self-efficacy gained before surgery may impact success after bariatric surgery as demonstrated by some available albeit limited existing evidence. Long-term studies are needed to determine the short- and long-term weight loss impacts of implementing IE vs GE approaches according to health insurance requirements in the pre-surgical bariatric setting.

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A Note from HOD Delegate

Kim Beals, PhD, RD, CSSD, LDN

HOD Delegate, 2020-present

As I begin my second year as the RDPG Delegate, it is a priority to engage members in the important issues that the House of Delegate (HOD) will be discussing this year. There will be timely "town hall" meetings led by delegates to give members the opportunity to familiarize themselves with the issues and time to discuss and provide input on HOD critical issues. At FNCE this year, the HOD had a virtual booth and we encouraged members to "stop by" for a meet and greet and another opportunity to share viewpoints. Increasing exposure and improving communication helps the HOD be the voice of members on important professional issues. I look forward to meeting more of the RDPG members this coming year.

Over the summer, the Academy Board of Directors (BOD) proposed changes to the Academy bylaws that would transfer the ability to amend bylaws from the HOD to Board of Directors (Motion-Article XV Amendments: Methods and notice for the Academy Bylaws). A total of 1,939 Academy members responded with their comments and suggestions during the Member Comment Period via an online survey. The majority of members (80%) were opposed to moving the responsibility of amending the bylaws from the HOD to the BOD. The HOD had several weeks to review member comments and discuss the bylaw motion. In early Sept, the HOD voted to oppose this motion allowing the HOD to retain the authority to vote on future bylaw amendments.

In mid-September, the HOD met virtually to begin discussions on the best way to transform to meet the future needs of Academy members and the profession. There was much discussion, and many great ideas were generated (see the Workbook Summary). Here is a an overview of common themes that emerged during the meeting. Several common themes emerged from the 2-day meeting.

What Delegates Can Do:

- Focus on constituent outreach through specific Affiliate/DPG/MIG/At Large channels
- Engage in bidirectional communications with constituent's so that more members voices are heard.
- Recruit diverse members to enrich the HOD Think Tank
- Explore the latest technology to increase member engagement and communications

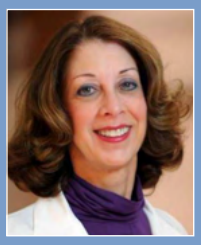
What the HOD Can Do:

- Engage in focused Critical Issues dialogues through the lens of Inclusion, Diversity, Equity and Access (IDEA)
- Create smaller groups to simultaneously work on multiple Critical Issues
- Engage Subject Matter Experts (SMEs) in Critical Issues dialogues.
- Streamline the process for members to submit Critical Issues to the profession
- Reevaluate the composition of the HOD and structure of the HOD meetings to best accomplish the goals.

What can Academy Members Do:

- Identify and communicate to delegates critical issues facing the profession
- Watch for opportunities to be involved as SMEs for critical issues
- View the Critical Issues and Updates page of the Academy website to review and submit a Critical Issue
- Review the Fall HOD Meeting materials.

It is an honor to serve as the RDPG delegate on the Academy's HOD. I welcome your questions, comments, or input, please feel free to contact me using the contact information provided in this newsletter. I truly look forward to this opportunity to work with you and represent your voice and ideas in the important work ahead!



Research DPG Member Spotlight

Heidi J. Silver, R.D., M.S., Ph.D.

Research Professor of Medicine in the Division of Gastroenterology, Hepatology and Nutrition and Director of the Vanderbilt Diet, Body Composition, and Human Metabolism Core Lab

Institution: Vanderbilt University Medical Center

1. **Please provide a brief description of your current position.**
   I am a Research Professor at the Vanderbilt University Medical Center where I function as an independent investigator, a research mentor and collaborator, and a preceptor for medical student research. I rose from assistant to associate to full research professor in a highly competitive academic medicine environment where I have been the only PhD, R.D. employed for the past 17½ years. As a principal investigator, I have been awarded over $8 million of grant funding for nutrition and dietetics research projects. I was the recipient of the Academy of Nutrition and Dietetics 2020 Excellence in Research Practice Award.

2. **How did you get to where you are now?**
   I returned to school for my PhD. in Nutrition after several years working as the chief nutrition support dietitian at the University of Miami / Jackson Memorial Medical Center. Experiencing gaps in the evidence base for nutrition and other healthcare practices drove me to pursue a PhD and become a translational researcher; my primary goal continues to be contributing evidence to improve the quality and efficacy of nutrition care. To acquire the knowledge and training for being a translational researcher, I engaged a team of physicians to participate in my doctoral dissertation development as a means of complementing the expertise from my nutrition faculty mentors. My doctoral research identified gaps in the training required for managing home tube feeding and led to publishing a home tube feeding skills checklist tool that has been translated into several languages and used internationally. Further describing the daily management of long-term nutrition support, I uncovered differences in the lived experience of adults and children depen-dent on home TPN. For adults, the greatest challenge was resisting temptation to eat restricted foods, but for children it was overcoming fear of eating unrestricted foods. Upon completing my PhD, I was hired as an assistant professor at the National Resource Center on Nutrition and Aging at Florida International University. In this position, my research led to conven-ing two national Issue Panels to provide guidance on applying the Dietary Reference Intakes to Older Americans Act meals programs. I also provided testimony on multiple occasions to the Department of Health and Human Services about the need to expand medical nutrition therapy coverage for older adults. Two years after taking this position, I was recruited to Vanderbilt. One of the first things I recognized in this academic medicine environment was a mismatch between the intent to include nutrition-related components in study protocols and the lack of qualifications of other scientist and physician investigators to apply valid and reliable nutrition-related methodology. Thus, I founded the Vanderbilt Diet, Body Composition, and Human Metabolism Research Core. This Core operates on a fee-for-service business model common in basic science labs. Since its inception, I have been committed to employing RDs/RDNs in this Core and providing the training and mentoring for them to perform scien-tifically validated diet assessment, body composition and metabolic measurements for other investiga-tor teams. This experience has enabled many RDs/RDNs to advance their occupational roles to become research coordinators and analysts.

3. **Please summarize your current research.**

   My research trajectory and design of diet and nutrition interventions has traversed the spectrum of malnutrition from persons with severe underweight to those with morbid obesity. Earlier research in older adults identified that decline in physical performance was directly related to changes in body composition, and that the decline in lean body mass and altered resting energy expenditure was more related to radiation treatment than chemotherapy in cancer patients, thereby identifying the optimal time for nutrition intervention. It also led to work in Long Term Care (LTC), where I noticed that the majority of LTC residents today are not underweight, but rather overweight, and suffer from sarcopenic obesity. Building on this background, I participated in the development of improved imaging protocols to assess changes in body composition and have applied these tools in persons with obesity and cardiometabolic disease. I then designed a novel diet that is balanced in the types of fat and investigated

Continued on page 26

its effects on weight loss, body composition, inflammation, and vascular function. In doing so, I have become more focused on the differences in response to diet interventions by sex, race, and ethnicity. More recent work is targeting the role of sex and race not just in response to intervention but also sex and race differences in mediators of chronic disease, including body composition differences, particularly with regard to the presence of sarcopenia and myosteatosis in the state of obesity. I am currently funded to conduct three clinical trials: one is a randomized trial of 4 diets differing in the type and amount of carbohydrate in Veterans with obesity and at risk for diabetes, one is a randomized trial comparing two snack-based diet interventions in millennials at risk for metabolic syndrome, and one is a longitudinal cohort study comparing the development of obesity and ectopic lipid deposition in Veterans with HIV who do or do not have diabetes.

4. **How did you become involved/interested in your current line of research?**

   Please see above

5. **What advice would you give to a young researcher for developing a successful line of research?**

   First, never be afraid to question or think "outside the box." Second, go out of your way to initiate new contacts and establish collaborations with other disciplines. Third, be flexible and open-minded and able to adjust your research focus. Finally, volunteer to be on committees in national organizations.

6. **What are your career goals?**

   My current research goal is to contribute published evidence and create awareness as much as possible on: a) differences in response to interventions by sex and race/ethnicity in order to enable design of more precision nutrition treatments and practices; and b) the existence of sarcopenic obesity as a form of malnutrition and its role in disease risk and adverse outcomes.

7. **How has your affiliation with the Academy impacted your career progression?**

   Being a member and volunteering for various activities has provided a venue to develop leadership skills, to participate in unique professional endeavors, and to impact the future of the profession.

8. **If someone were to ask you to explain why research is important to the field of dietetics, what would you say?**

   The practice of dietetics is built on a foundation of nutrition research – it is essential to, and drives, the continued evolution of the field.

Letter from the Editor

Jingyi Wang, MPH, RD
Editor-in-Chief, The Digest

Dear Research DPG Members,

I am the new Editor-in-Chief for our newsletter, *The Digest*. I am excited for this opportunity to serve the members of the Research DPG and the readership of *The Digest* from this position.

It is a pleasure to present you the Fall 2021 issue of *The Digest* on which our team has diligently worked on for the last several months. This edition includes a wide range of topics which I hope that you will enjoy. We also feature spotlight member Heidi Silver, Ph.D., M.S., R.D.

We are currently seeking research articles from researchers working in the area of nutrition and dietetics as well as nutrition students/ dietetics interns. If you or any RDPG member(s) you know do not have research findings to publish but would like to write an article or series of articles on a particular topic (e.g., research methodology or literature review), please let us know.

If you have any questions, feedback, and/or referrals for authors or article topics, please submit them to digesteditor@researchdpg.org. I look forward to hearing from you!

Sincerely,
Jingyi Wang, MPH, RD
Editor-in-Chief

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