DIETARY INTAKE TRENDS:
BREAKFAST SKIPPING IN US ADULTS BY DIABETES STATUS

Featuring :: Owen Kelly, PhD

TRANSCRIPT

Maura: 19th-century American humorist Josh Billings once offered some solid advice: “Never work before breakfast; if you have to work before breakfast, eat your breakfast first.”

Maura: Smart, right? You’ve heard similar sayings about the importance of breakfast, I’m sure. Moms are famous for reminding us that breakfast is the most important meal of the day. Friends tell us: “Eat breakfast like a king, lunch like a queen and dinner like a pauper,” and so forth.

Maura: But what might a nutrition science expert say—especially as breakfast might relate to a pre- or type 1 or type 2 diabetes diagnosis? I’m Maura Bowen. I’m here with the illustrious Dr Owen Kelly, and we’re podcasting for the Abbott Nutrition Health Institute. It’s November, so we’re shining a light on Diabetes Awareness Month.

Maura: Ok, Dr Kelly, let me properly introduce you. You’re a PhD and a registered nutritionist, plus you’re a research scientist here at Abbott, right? What would you like to tell us about yourself?

Dr. Kelly: Thank you, Maura. I’m Owen Kelly. My original education and background is from Ireland. I moved here to the US to be a post-doctoral fellow in 2004. I got a job at Abbott in 2011, so I’m here at Abbott for 8 years. I started at Abbott supporting real nutrition, and approximately three years ago, I also supported our diabetes nutrition.

Maura: And you’re here today to talk about a study you and a team of fellow researchers recently conducted, is that right?

Dr. Kelly: That’s right. We wanted to determine how dietary intake is affected by breakfast skipping here in the US—both for people with and without diabetes.

Maura: Because from what I can gather from the data, it looks like all our mamas were right: Skipping breakfast won’t do any of us any favors, nutritionally speaking. Are you ready to talk about why this is?

Dr. Kelly: Of course. Mamas are always right but we find this out when we are older.

Maura: I hope my teenagers hear that.

Maura: Before you and your team conducted this study on the role of breakfast in diabetes outcomes, what had been some of the emerging evidence on this topic?

Dr. Kelly: Well, there’s been a lot of emerging evidence over many decades, but: Diabetes is a disease that develops over decades and is usually diagnosed later in life, however, we are seeing individuals getting at diagnosis at much earlier ages now (10.2337/diacare.27.7.1798). For health outcomes, diabetes progression is associated with poor...

Dr. Kelly: But breakfast skipping itself is a nutritional behavior that is generally associated with:
• A poorer diet (10.3390/nu11010175)
• Obesity (10.1016/j.ypmed.2011.08.030; 10.3390/nu11010175)
• Type 2 diabetes (10.3109/07420528.2013.821614; 10.1093/jn/nxy284; 10.1093/jn/nxy194)
• Worse glycemic control (10.3109/07420528.2013.821614)
• Cardio Vascular Disease risk (10.3390/jcdd6030030)

Dr. Kelly: Now, skipping breakfast may also indicate other poor lifestyle behaviours such as smoking and not exercising (PMID:11725527)—and that’s for adults in general. But in younger people, some studies are showing that breakfast skipping increases fast food consumption (10.1016/j.jadohealth.2006.07.001). Some researchers see skipping breakfast in younger people as a marker for the risk of weight gain and metabolic disease later in life (10.3390/nu11020387).

Maura: What prompted your study, then? What were you hoping to accomplish?

Dr. Kelly: Overall, we are interested in nutritional behaviours in people with diabetes. Breakfast skipping seems to be the most common skipped meal so we wanted to study how it affects diet quality as well as energy intake in people with and without diabetes, so we’d have a comparison. We hoped to show that skipping breakfast has a negative impact on diet quality independent of energy intake and to see a difference in those with diabetes.

Maura: Can you tell us a little bit about the method you followed?

Dr. Kelly: We partnered with Dr. Chris Taylor at OSU as he and his team have the expertise to deal with these large data sets from NHANES—NHANES is the National Health and Nutrition Examination Survey. Dr. Taylor has published a lot of studies from NHANES so he was the natural choice. Basically, we accessed the NHANES database, which is free to everybody, provided it with our main criteria—which were data from 2005-2016, age 30+, and the presence of A1c values—and downloaded the selected data, and that was our database.

Dr. Kelly: We had:
• 14,841 people in the nondiabetes group (A1c < 5.7%)
• 5,923 people in the prediabetes group (A1c 5.7-6.4%)
• 2,944 people in the diabetes group (A1c ≥6.5%)

Dr. Kelly: This data was then put into statistical software with some special modifications to handle the NHANES data (especially those weighted population-based estimates) and we began to ask research questions, such as how many people skipped breakfast.

Dr. Kelly: Dr. Taylor would then program the software to see which participants had reported skipping breakfast and these were counted for each A1c category. A similar process happened for each research question we as we went through it, and data was controlled for:
• Age
• Sex
• Race
• Ethnicity
• Marital status
• Percent of federal poverty rate

Maura: Did you face any challenges in your research? What went more smoothly than you expected it to?
Dr. Kelly: Thankfully we did not have any challenges, mainly because Dr. Taylor and his team have a lot of experience with this type of research.

Maura: Looking at the data, do you think there are any limitations to it?

Dr. Kelly: Yes, that’s a good point to clarify. There are limitations with dietary data. The first thing is that we cannot assume cause and effect; it is observational data. NHANES is 24-hour dietary recall data, although the CDC do use robust methods there are still some under- and over-reporting from participants—some might over-report their energy intake and under-report their protein intake. And intake estimates do not represent an individual’s usual intakes—so we can’t say this is their “usual diet”—but they can help identify patterns and potential areas for concern.

Maura: What did you expect to find in the data?

Dr. Kelly: Thinking about all the data, in general that we have, we found what we expected in relation to those with and without diabetes—there were some differences. The differences between those with prediabetes and diabetes were smaller and maybe more varied.

Maura: What did the data actually show?

Dr. Kelly: Overall, we found that dinner was the largest meal of the day and snacks—which is all snacks combined—contributed approximately 25% of the day’s calories in all groups. Also, we found that the diet quality was low in all groups but lower in those with diabetes.

Dr. Kelly: Related to breakfast skipping; we found that for those without diabetes or who had prediabetes, mean intakes of total energy were higher in those who ate breakfast, but for those with diabetes the breakfast skippers consumed more calories.

Dr. Kelly: The daily total intake of carbohydrate was lower in breakfast skippers who did not have diabetes or who had prediabetes, whereas there was no change in total daily carbohydrate for those with diabetes who skipped or ate breakfast.

Dr. Kelly: Daily protein intake was lower in all groups who skipped breakfast.

Dr. Kelly: Across all groups breakfast skippers consumed more energy, added sugars and refined grains from snacks compared to those who reported consuming breakfast.

Dr. Kelly: Therefore, our data suggests that breakfast consumption might result in consuming more calories for those with diabetes but maybe more importantly less protein and more added sugars. For those with prediabetes breakfast skippers had the lowest protein intake and a higher carbohydrate intake compared to those with diabetes. The interesting finding was the relationship between breakfast skipping and snacks — consuming breakfast resulted in less calories, refined grains and added sugars from snacks over the rest of the day. This is important in diabetes as these are high glycemic carbohydrates and can spike blood sugar.

Maura: What surprised you about these findings?

Dr. Kelly: Yes, that is the good thing about research. While we initially thought we would find that skipping breakfast was more common we found that adults (30+ years) with diabetes were most likely to skip lunch, when compared to adults without diabetes. The least amount of people reported skipping snacks.

Maura: Bringing it all home, what learnings from this study can or should clinicians apply to their practice?
**Dr. Kelly:** For clinicians the first thing is the need to improve diet quality for all patient types. Not skipping breakfast, or skipping any meal, could be used in patient education, especially for those with diabetes. Not skipping a meal may help with diet quality and to get all the required nutrients every day. Promoting healthier snacks could also be a way to help educate patients on improving diet quality and could be a way to save calories. We found snacks are a source of refined grains and added sugars.

**Dr. Kelly:** Changing a person’s nutritional behaviours takes small steps, and not skipping breakfast or a meal can be a small step in improving behaviours, as well as replacing poor snacks with better ones. These improved behaviours have the potential to help with managing diabetes.

**Maura:** Considering all this, what makes you feel hopeful about the things your team found?

**Dr. Kelly:** The most hopeful thing is that this research shows that small changes to nutritional habits can count. We hear about many intensive lifestyle programs and different diets, but diabetes is a marathon and not a sprint. So, a small change like not skipping breakfast can potentially help improve the quality of the diet. If someone makes the change to not skip breakfast, then after not skipping breakfast becomes the normal behaviour, a person can try another small step, such as eating one more piece of fruit a day, or walking extra steps. And then, over time, these small positive changes will help to manage diabetes.

**Maura:** Can you think of any additional research that should be done that could be helpful in this space?

**Dr. Kelly:** I am an advocate for more nutritional research in all diseases and conditions. Misinformation is an obstacle in nutritional science, we hear about many food studies in the media; one day coffee is bad, the next day it is good; but the best advice is to talk to your healthcare professional about your diet. Related to our findings it would be interesting to see how not skipping breakfast impacts diet quality in clinical practice, and if it results in a lower calorie daily intake for people with diabetes.

**Maura:** Dr Kelly, thanks so much for your time today. It was a pleasure to have you here on the podcast, and we hope you’ll join us again.

**Dr. Kelly:** Thank you for inviting me, Maura.