

# Lessons from implementing diabetes prevention initiatives among youth

## *The Tribal Turning Point Program Trial*



**Katherine A Sauder**  
Assistant Professor of  
Pediatric Nutrition



**Debra Yazzie**  
Professional Research  
Assistant



**Kendralyn Begay**  
Professional Research  
Assistant



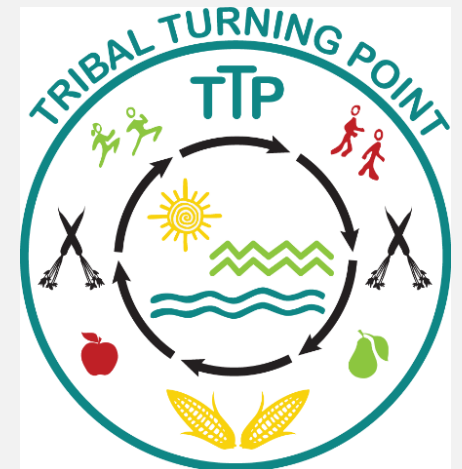
**Deidra Goldtooth**  
Professional Research  
Assistant



**Lifecourse Epidemiology of  
Adiposity & Diabetes (LEAD) Center**

# Overview

- Rationale for reducing diabetes risks in Native youth
- Program development with Native partners
- Pilot study insights
- Randomized controlled trial (on-going)
  - » Successes and challenges in program delivery
  - » Impact of COVID-19



# Rationale for reducing diabetes risks

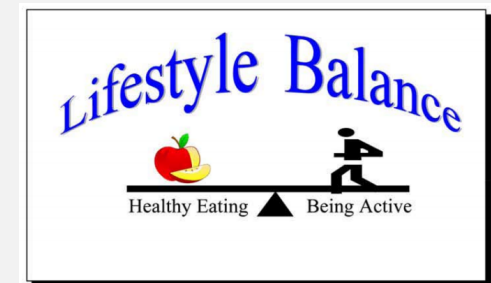
- Diabetes and obesity major problems in Native youth
  - » 30% of American Indian youth are obese, vs 17% for all 2-19 year olds<sup>1,2</sup>
  - » Highest incidence and prevalence of type 2 diabetes among all racial/ethnic groups<sup>3,4</sup>
  
- Existing prevention efforts: school-based approaches
  - » Strength: alter environment and education for many simultaneously
  - » Weakness: limited caregiver involvement and personalized contact, content
  - » Effective at improving knowledge, attitudes, behaviors....but not diabetes/obesity measures

1. Styne et al. J Public Health Manag Pract 2010  
2. Ogden et al. JAMA 2014

3. Dabelea et al. JAMA 2007  
4. Dabelea et al. JAMA 2014

## Program development

- Goal: culturally-appropriate, multi-component intervention to reduce type 2 diabetes risk in AI youth
- Prompted by Cherokee Choices in 2008, with help from UNC-Chapel Hill
- 10 classes with active learning stations, individual MI counseling



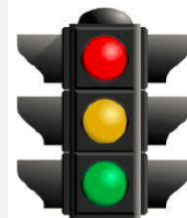
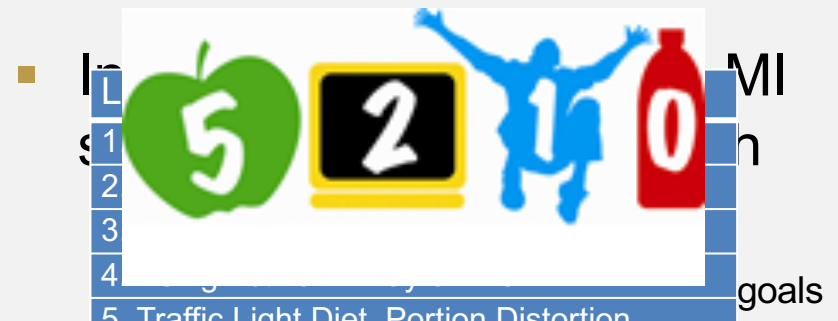


# Program development

- Reviewed program with Navajo focus groups
  - » Assess appropriateness of Cherokee materials
  - » Identify local resources for healthy living
  - » Strategies for keeping youth engaged in the program
  
- Developed common curriculum with tribe-specific materials
  - » Language, tribal customs, local foods and activities
  - » Original DPP content, but age-appropriate

# Tribal Turning Point overview

- Delivered by trained health coach
- Active Learning group classes
  - » Physical activity, interactive learning, culture, group meal
  - » Goals: 5-2-1-0 (stop light diet for food)
  - » Kids “Work-Out”



## **RED= lichí'**

**Whoa** foods - high in fat and calories. Eat rarely. STOP and THINK before we eat these foods.

## **YELLOW= litso**

**Slow** foods - have nutrients but have a little more fat and calories than go foods. Eat sometimes and/or in a smaller amount.

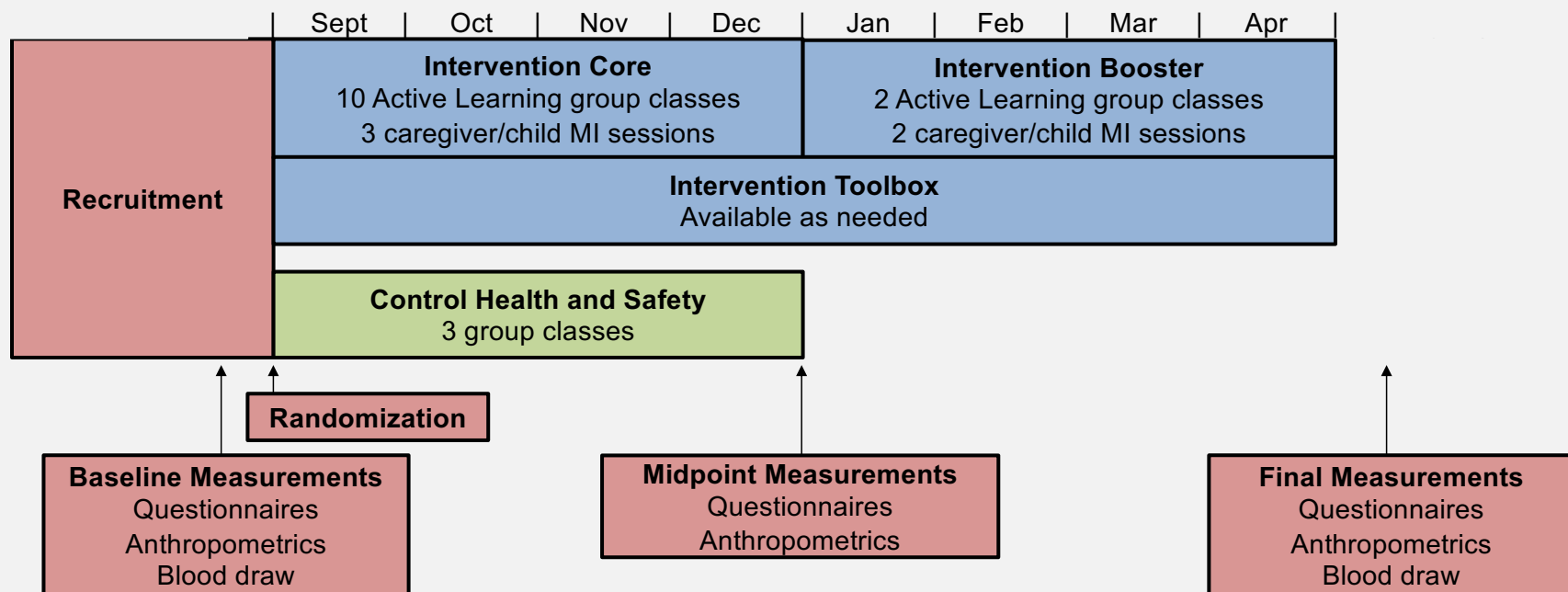
## **GREEN= dootl'izh**

**Go** foods - low in fat and calories and packed full of vitamins, minerals & fiber. Eat every day.



Pilot study approved by IRBs at  
CU-Denver, UNC, Cherokee, Navajo

# Pilot study timeline (2014-2015)



# Participants

- Two communities: Navajo Nation, Eastern Band Cherokee
- Recruited youth through existing relationships in communities
  - » Aged 7-10 years
  - » Tribal members
  - » Overweight or obese (BMI  $\geq$ 85<sup>th</sup> percentile)
  - » At least 1 parent/primary caregiver willing to actively participate
  - » Exclusions: type 2 diabetes, other serious health conditions, plans to move
- Enrolled up to 2 youth/family → randomized families

# Participant characteristics

	Intervention n (%)	Control n (%)	P
Participants (n)	29	33	
Families (n)	26	26	
Child age (years)	9.3 (1.0)	9.1 (1.1)	0.51
Male (n, %)	13 (45%)	19 (58%)	0.32
Parents with more than HS education (n, %)	27 (93%)	31 (94%)	0.30
Household income $\geq$ \$50,000/year (n, %)	9 (31%)	11 (33%)	0.84
BMI	26.4 (4.7)	26.1 (4.5)	0.82
Obesity (BMI $\geq$ 95 <sup>th</sup> percentile) (n)	24 (83%)	30 (91%)	0.34
Waist circumference (cm)	83.1 (12.0)	85.9 (13.1)	0.39
Fasting insulin (uU/mL)	20.8 (19.9)	15.5 (10.5)	0.22
HbA1c (%)	5.2 (0.3)	5.3 (0.3)	0.22
Systolic blood pressure (mmHg)	101.6 (11.1)	99.3 (7.8)	0.39
Diastolic blood pressure (mmHg)	58.0 (6.0)	61.1 (6.7)	0.06



# Pilot results: attendance, retention

		Intervention	Overall
		(n=29)	(n=62)
<b>Attendance</b>			
<b>Core Curriculum</b>			
Active learning group classes	88%		
Caregiver/child MI sessions	87%		
<b>Booster</b>			
Active learning group classes	69%		
Caregiver/child MI sessions	76%		
<b>Overall</b>		84%	
		Control	
		(n=33)	
<b>Attendance</b>			
Group classes	54%		



# Pilot results: obesity & cardiometabolic

	Intervention			Control			Treatment effect	
	Final - Baseline			Final - Baseline			Unadjusted	Adjusted*
	Mean	(SE)	p	Mean	(SE)	p	p	p
BMI	0.3	(0.2)	0.13	1.0	(0.2)	0.0001	0.02	0.08
BMI z score	-0.17	(0.06)	0.001	0.01	(0.05)	0.82	0.02	0.049
Decrease in BMI z-score (n)	21 (72%)			14 (42%)			0.02	0.02
Waist circumference (cm)	1.2	(0.7)	0.09	3.7	(0.7)	0.0001	0.01	0.01
Fasting insulin (uU/mL)	0.8	(1.8)	0.67	1.3	(1.7)	0.45	0.83	0.48
HbA1c (%)	0.0	(0.0)	0.59	-0.1	(0.0)	0.07	0.39	0.83
HOMA-IR	0.3	(0.5)	0.59	0.5	(0.4)	0.29	0.73	0.57
Systolic BP (mmHg)	-1.9	(1.4)	0.18	-1.7	(1.3)	0.22	0.91	0.73
Diastolic BP (mmHg)	0.6	(1.2)	0.62	-2.4	(1.2)	0.05	0.09	0.51

\*Adjusted for age, sex, tribe, baseline measurements

# Pilot results: behavioral measures

	Intervention			Control		Treatment effect		
	Final - Baseline			Final - Baseline		Unadjusted	Adjusted*	
	Mean	(SE)	p	Mean	(SE)	p	p	
PACER (laps)	1.8	(0.7)	0.01	1.9	(0.6)	0.004	0.87	0.69
MVPA (30 min blocks)	4.2	(1.2)	0.001	6.1	(1.2)	0.0001	0.29	0.14
Screen time (30 min blocks)	-0.6	(1.9)	0.77	-0.9	(1.9)	0.64	0.91	0.42
PA self-efficacy	0.1	(0.5)	0.79	0.7	(0.4)	0.14	0.40	0.65
Dietary self-efficacy	1.6	(1.0)	0.12	0.6	(1.0)	0.58	0.46	0.48

\*Adjusted for age, sex, tribe, baseline measurements





# Pilot results: acceptability

- Qualitative surveys and interviews
  - » Favorite parts: Kids Work-Out, cooking demonstrations
  - » Parts not liked: none
  - » Would encourage others to join in the future, participate again themselves



## Impact on the youth

“What did you learn from Tribal Turning Point? Share your story. How do you use what you learned in your life?”

*“We want our family to change how they eat because they might get diabetes. We tell them, but they still eat fast food. We tell them again, and they started to eat fruits for a while and went back to fast food again. We are not going to give up – we will keep on trying!”*

<https://vimeo.com/172611694>

Created with  
Healthy Native Communities Partnership

Funded by CAIANH (P30 DK092923) pilot grant (Sauder)

 Lifecourse Epidemiology of  
Adiposity & Diabetes (LEAD) Center

# Dissemination-Celebration



Funded by CAIANH (P30 DK092923) pilot grant (Sauder)

## Next steps...

- Pilot study was promising, but program needs more work
  - » Change in obesity measures was small, clinical or long-term significance unknown
  - » Pilot study done on rural reservation, unknown if program will work in urban settings
  - » Need to understand best practices for implementation before disseminating the program
  
- Ultimate goal: program that is effective and feasible to deliver in different Native settings

# Current clinical trial



## 3-site clinical trial

Target n=300

Similar design as pilot

+3 MI sessions

+24m follow-up

+Qualitative interviews

# Current clinical trial - status

- Hired and trained local staff to implement protocol
- Pre-COVID
  - » Enrolled 175 children across 4 cohorts
  - » Completed 12m data collection in 2 cohorts
- Mid-COVID
  - » Rapid transition to remote program delivery
  - » No-contact data collection
  - » Virtual recruitment for remote program delivery

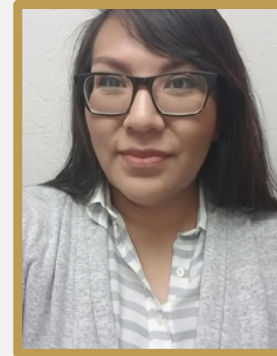
# Front line perspective



**Debra Yazzie**  
Professional Research  
Assistant



**Kendralyn Begay**  
Professional Research  
Assistant

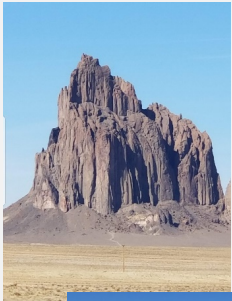


**Deidra Goldtooth**  
Professional Research  
Assistant



# Debra Yazzie – Navajo Nation

- Shiprock (TseBiTah-"Rock with Wings")



Farming



neeshjiizhi)



Kneel  
Down  
Bread





# Successes on Navajo Nation

- Number of participants enrolled: 104
  - » Classes held in local chapter house
  - » Some classes held outside
  - » Class held in conjunction with other local events such as “Just Move It”
  - » Recruitment for T.T.P. at JMI.
  - » Participants often stepped outside their comfort zone.
  - » Positive comments and great suggestions



# Challenges on Navajo Nation

## ■ Recruitment/Retention challenges:



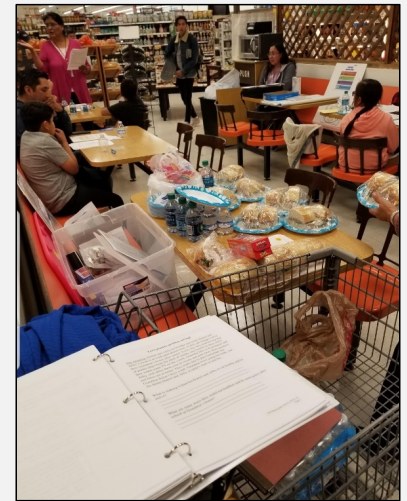
- Parent availability and timing of recruitment
- Recruiting in the local schools
- Parent recontacting or reconnecting
- Single parent/Grandparent caretaker
- Moving in and out of the community
- Transportation challenges



# Lessons learned for future programs

<https://photos.app.goo.gl/nK51GtqgndmDpip68>

- Be innovative
- Patience
- Having compassion
- Be flexible
- Have a back-up plan for the back-up plan



# Kendralyn Begay – Navajo Nation



## Successes on Navajo Nation

- Families who have stopped the sugary drinks and started drinking just water or infused water
- A family who lives without electricity and access to fresh fruits or vegetables, yet they continue to strive for a healthier lifestyle with what they have
  - » *For instance, having just canned vegetables instead of fresh vegetables*
- A family who learned about home exercises, healthier meals, and certain health tips, has not only benefit the child but the entire family
  - » *As far as lowering A1c numbers*



# Challenges on Navajo Nation

- ❑ A barrier we had the most was the weather
  - ✓ Class would end up being cancelled
  - ✓ The roads weren't drivable because it would be too muddy.
- ❑ We had certain families who wanted to be in one group more than the other



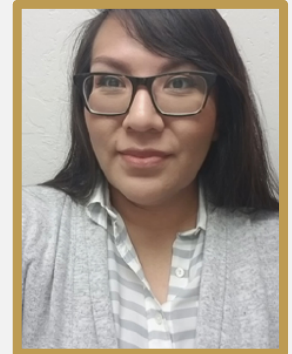
## Lessons learned for future programs

- Having back-up facility when there's a school closure or a sudden change within the school
- Look for more programs or different activities children can use at home
- Look for better resources to help the one-on-one sessions
  - » *Example: when parents are stressed, how can we help them?*





## Deidra Goldtooth – Phoenix





# Successes in Phoenix

- Strengthening Community Partnerships
- Retention Rate
- Family & Friends are Welcome
- Diverse Tribal Representation
- Cultural Exchange



# Challenges in Phoenix

- Recruitment
- Other Competing Activities and Programs
- COVID-19



# Lessons learned for future programs

- Classroom Location
- Strong Support System
- Program Adaptability
  - » Age appropriate
  - » Circumstantial Adaptation (COVID-19)
- Importance of Community Partnerships



## Overall successes

- Secured 10 years of funding
- Empowering community by hiring and training local staff
- Excellent pilot study results
- Strong interest from the communities
- Engaging program that youth and parents enjoy

## Overall challenges

- Recruiting into \*randomized\* study
- Sustained attendance
  - » Many life changes in this period
  - » Low resource community often needs assistance
- COVID
  - » In-person activities restricted
  - » Family routines disrupted



## Closing

- Enlightening journey thus far, much more work to be done
- Overwhelmingly positive support from community partners
- If successful, program can be broadly disseminated



# Acknowledgements

## U of Colorado

Dana Dabelea  
Melanie Aspaas  
Joel Begay  
Kendralyn Begay  
Paula Begay  
Deidra Goldtooth  
Richard Hamman  
Christy Hockett  
Melissa Johnson

John Kittelson  
Spero Manson  
Shawna Nelson  
Danielle Ostendorf  
Noy Phimphasone-  
Brady  
Rachel Steinberg  
Lisa Testaverde  
Debra Yazzie

## Navajo

Jeff Powell  
Roz Barber  
Maria Cassidy-Begay  
Carol Percy  
Janelia Smiley

## NIDDK Phoenix

Madhumita Sinha  
William Knowler  
Mary Hoskin

## Cherokee

Robin Bailey Callahan  
Sheena Kanott Lambert  
Rose James  
Cherokee IRB

## U of North Carolina

Elizabeth Mayer-Davis  
Beth Jenks  
Lisa Letourneau  
Joan Thomas  
Victor Zhong

## U of Miami

Alan Delamater

## **Funding**

R01 DK115434 (Co-PIs Dabelea and Sauder)  
R34 DK096403 (Mayer-Davis and Dabelea)  
P30 DK56350 (UNC Nutrition Obesity Research Center)  
P30 DK092923 (UCD Centers for American Indian and Alaskan Native Health)

