Arizona Center for Rural Health
State Office of Rural Health Webinar Series

Partners:

THE UNIVERSITY OF ARIZONA
MEL & ENID ZUCKERMAN COLLEGE OF PUBLIC HEALTH
Center for Rural Health

Webinar notes:

Audience is muted during the presentation.

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Please fill out the post-webinar survey.

Webinar is being recorded.

A link to the recording will be posted on:
AzCRH www.crh.arizona.edu

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Carlie Felion, MSN, APRN, FNP-BC, PMHNP-BC, BC-ADM
and
Vanessa Da Silva, PhD, RD

The Impact of Diabetes Prevention Program Participation Among Individuals and Their Family Members: A Mixed-Methods Study

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The Impact of Diabetes Prevention Program Participation Among Individuals and Their Family Members: A Mixed-Methods Study

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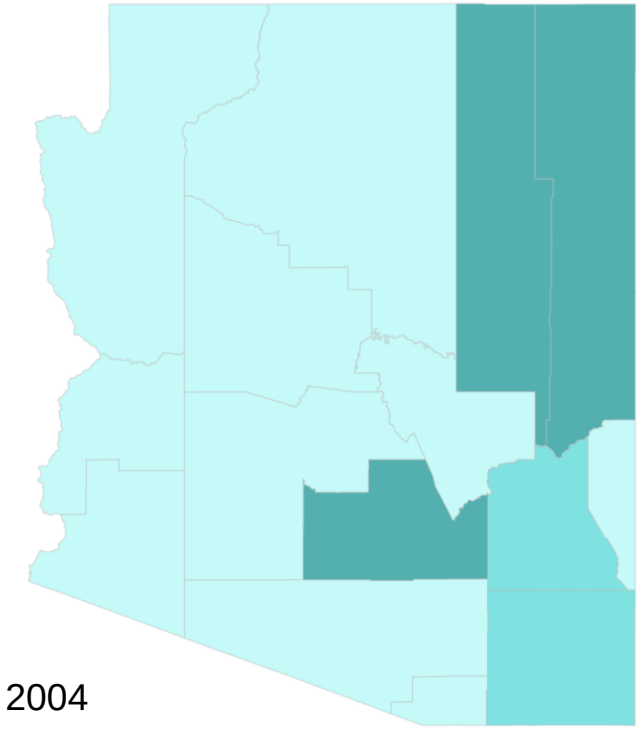
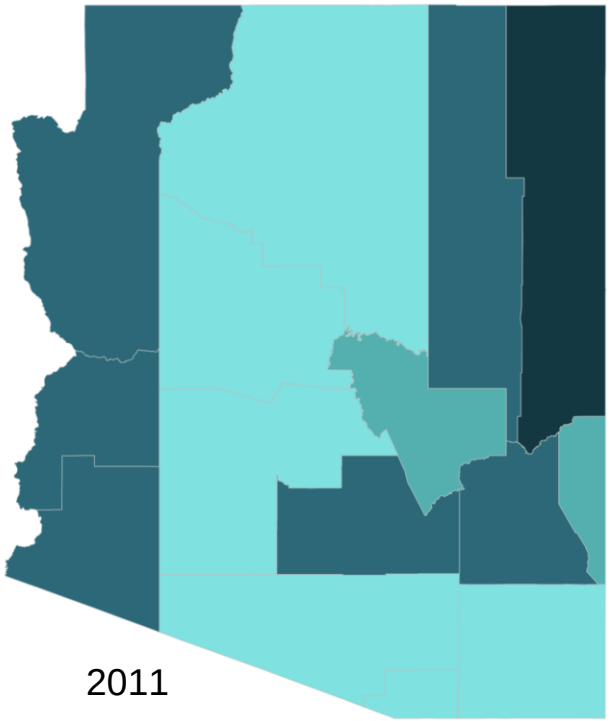
Background

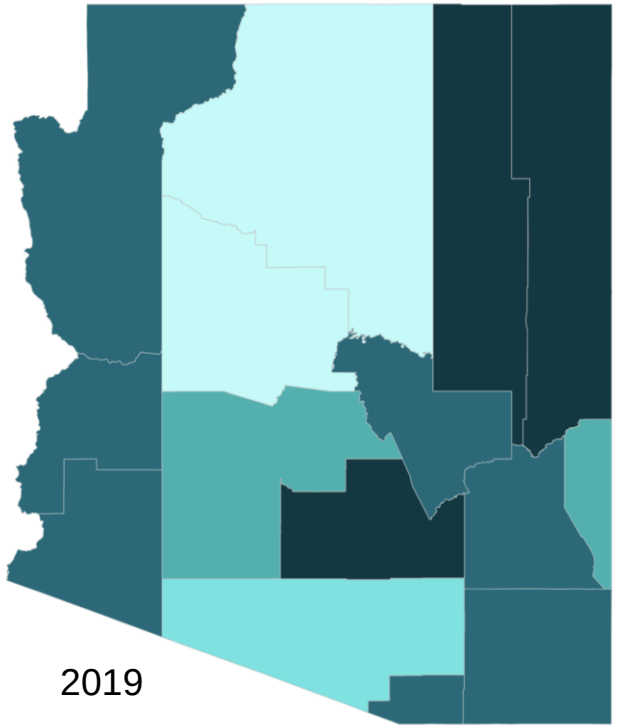
Diagnosed Diabetes in Arizona 2004-2019



2004



2011



2019

5.1 - 6.8 | 6.9 - 7.8 | 7.9 - 8.8 | 8.9 - 10.4 | 10.5 - 13.1 | No Data | Suppressed

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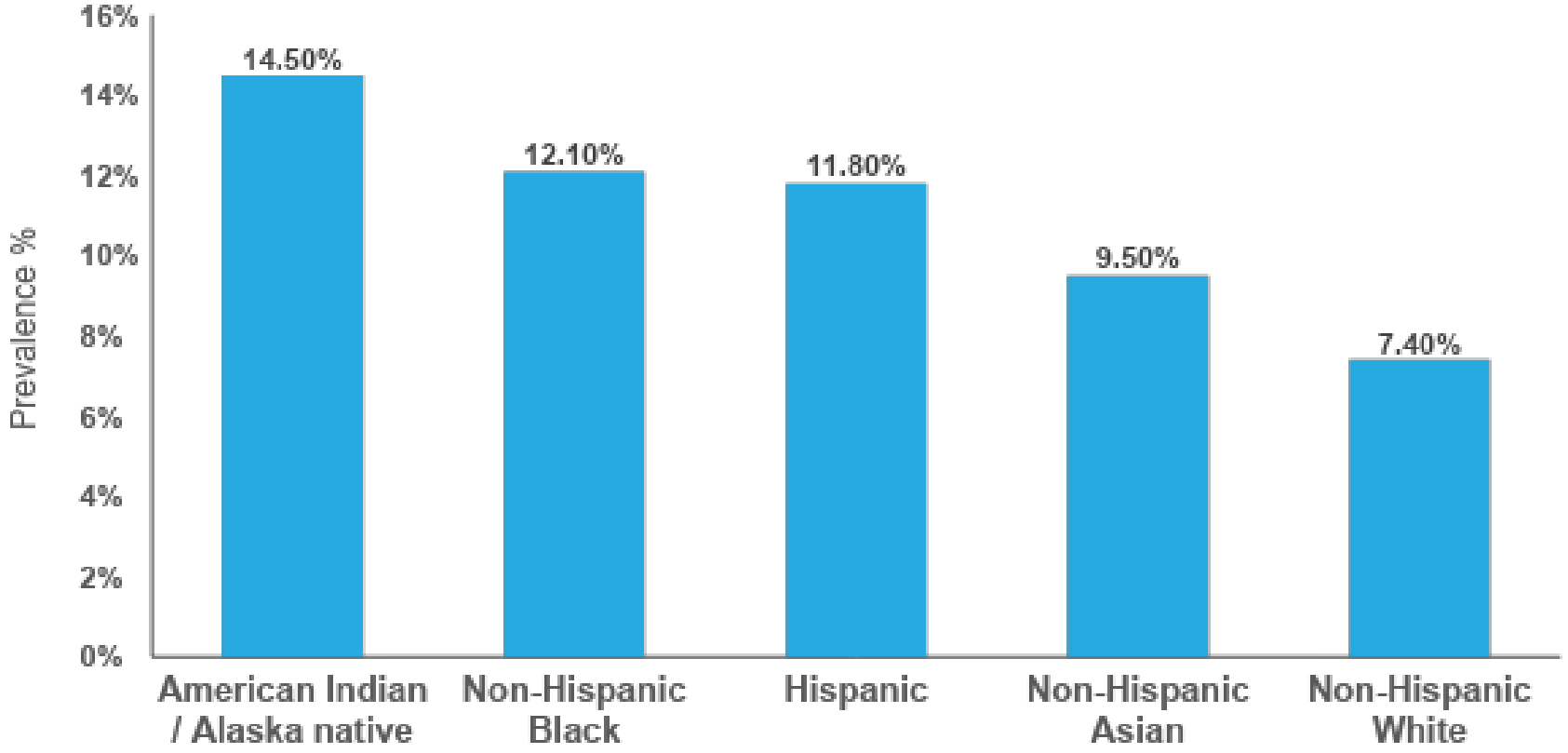
Diabetes By Race/Ethnicity

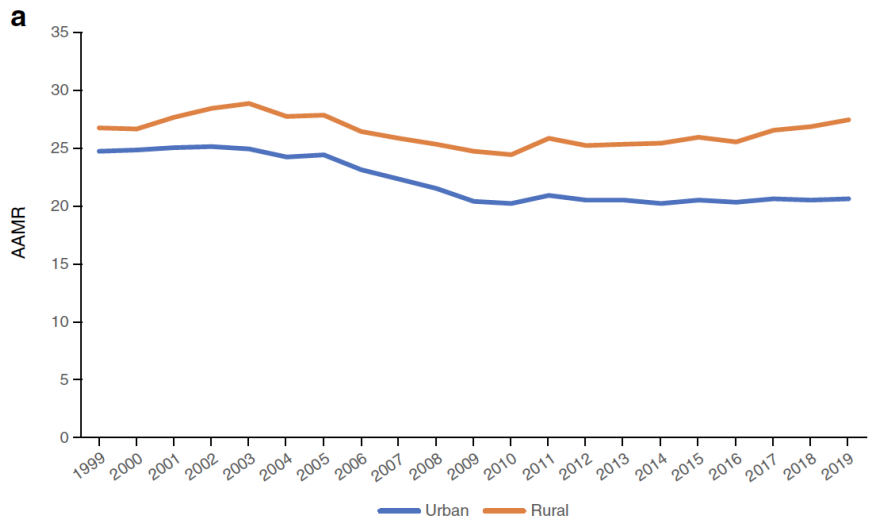
Rates of diagnosed diabetes in U.S. adults aged 18 years or older by race/ethnicity, 2018–2019



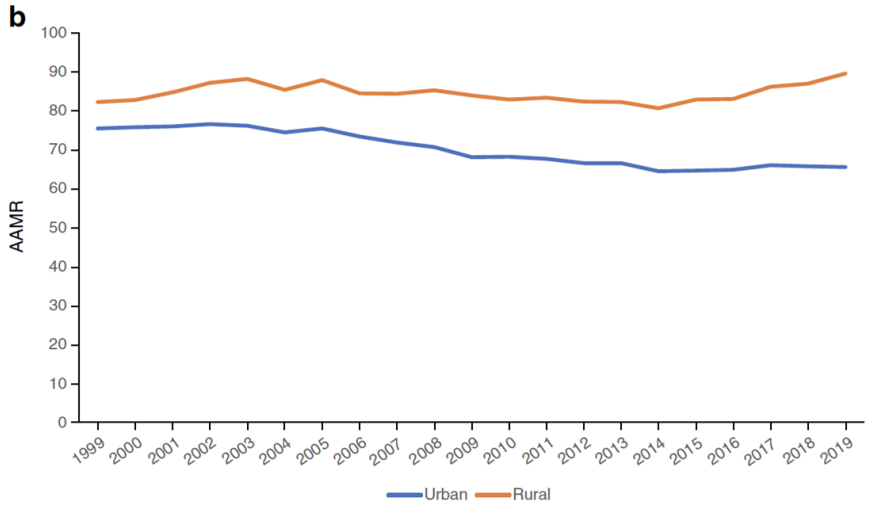
Diabetes Mortality by Urbanization Status

Trends in age-adjusted diabetes-related mortality in the USA 1999–2019, stratified by urbanization status, per 100,000 population.

Diabetes as the underlying cause of death



Diabetes as a contributing cause of death



2022, Diabetologia

Prediabetes Increases Risk of:

- Type 2 Diabetes
- Cardiovascular disease
- Stroke

1 out of 3 adults

are estimated to have prediabetes

96 MILLION ADULTS

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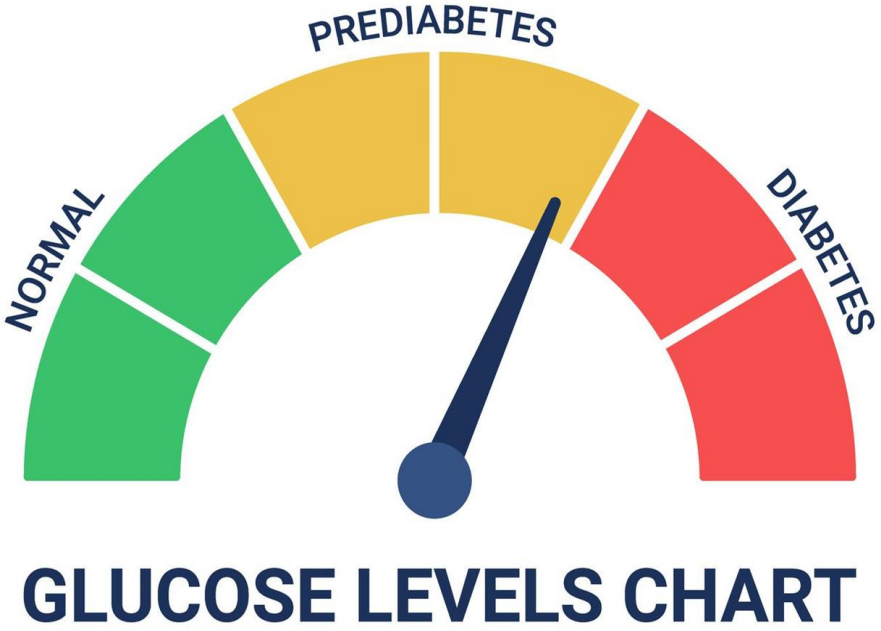
What is Prediabetes?

Higher than average blood sugars

- Aka “borderline diabetes” or “impaired glucose tolerance”
- Not high enough to be diagnosed as diabetes
- No symptoms
- May lead to type 2 diabetes
- Lifestyle changes help reduce risk of developing T2D



Clinical Diagnosis

	Fasting Blood Glucose	Hemoglobin A1c	Random Blood Glucose
Normal Blood Sugar	60 – 100 mg/dL	Below 5.7%	n/a
Prediabetes	100– 125 mg/dL	5.7 – 6.4%	n/a
Diabetes	126 mg/dL and up	6.5% or above	Over 200 mg/dL

Who should get screened for prediabetes & diabetes?

EVERYONE 35 years and older!*

***earlier, if you have multiple risk factors**

Quick screening

1. How old are you?

Write your score in the boxes below

Younger than 40 years (0 points) 40–49 years (1 point)
50–59 years (2 points) 60 years or older (3 points)

2. Are you a man or a woman?

Man (1 point) Woman (0 points)

3. If you are a woman, have you ever been diagnosed with gestational diabetes?

Yes (1 point) No (0 points)

4. Do you have a mother, father, sister, or brother with diabetes?

Yes (1 point) No (0 points)

5. Have you ever been diagnosed with high blood pressure?

Yes (1 point) No (0 points)

6. Are you physically active?

Yes (0 points) No (1 point)

7. What is your weight category?

(See chart at right)

If you scored 5 or higher

You are at increased risk for having prediabetes and are at high risk for type 2 diabetes. Talk to your doctor to see if additional testing is needed.

Total score:

Height	Weight (lbs.)		
4'10"	119-142	143-190	191+
4'11"	124-147	148-197	198+
5'0"	128-152	153-203	204+
5'1"	132-157	158-210	211+
5'2"	136-163	164-217	218+
5'3"	141-168	169-224	225+
5'4"	145-173	174-231	232+
5'5"	150-179	180-239	240+
5'6"	155-185	186-246	247+
5'7"	159-190	191-254	255+
5'8"	164-196	197-261	262+
5'9"	169-202	203-269	270+
5'10"	174-208	209-277	278+
5'11"	179-214	215-285	286+
6'0"	184-220	221-293	294+
6'1"	189-226	227-301	302+
6'2"	194-232	233-310	311+
6'3"	200-239	240-318	319+
6'4"	205-245	246-327	328+
	1 Point	2 Points	3 Points
	You weigh less than the 1 Point column (0 points)		

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What Helps People Prevent Diabetes?

Early diagnosis of prediabetes is KEY

- Healthy eating
- Physical activity
- Weight loss (if done in a healthful way)
- Medication (depending on your other risk factors -- talk to your doctor)

The National Diabetes Prevention Program addresses the top three!

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The New England
Journal of Medicine

VOLUME 346 FEBRUARY 7, 2002 NUMBER 6

REDUCTION IN THE INCIDENCE OF TYPE 2 DIABETES WITH LIFESTYLE INTERVENTION OR METFORMIN

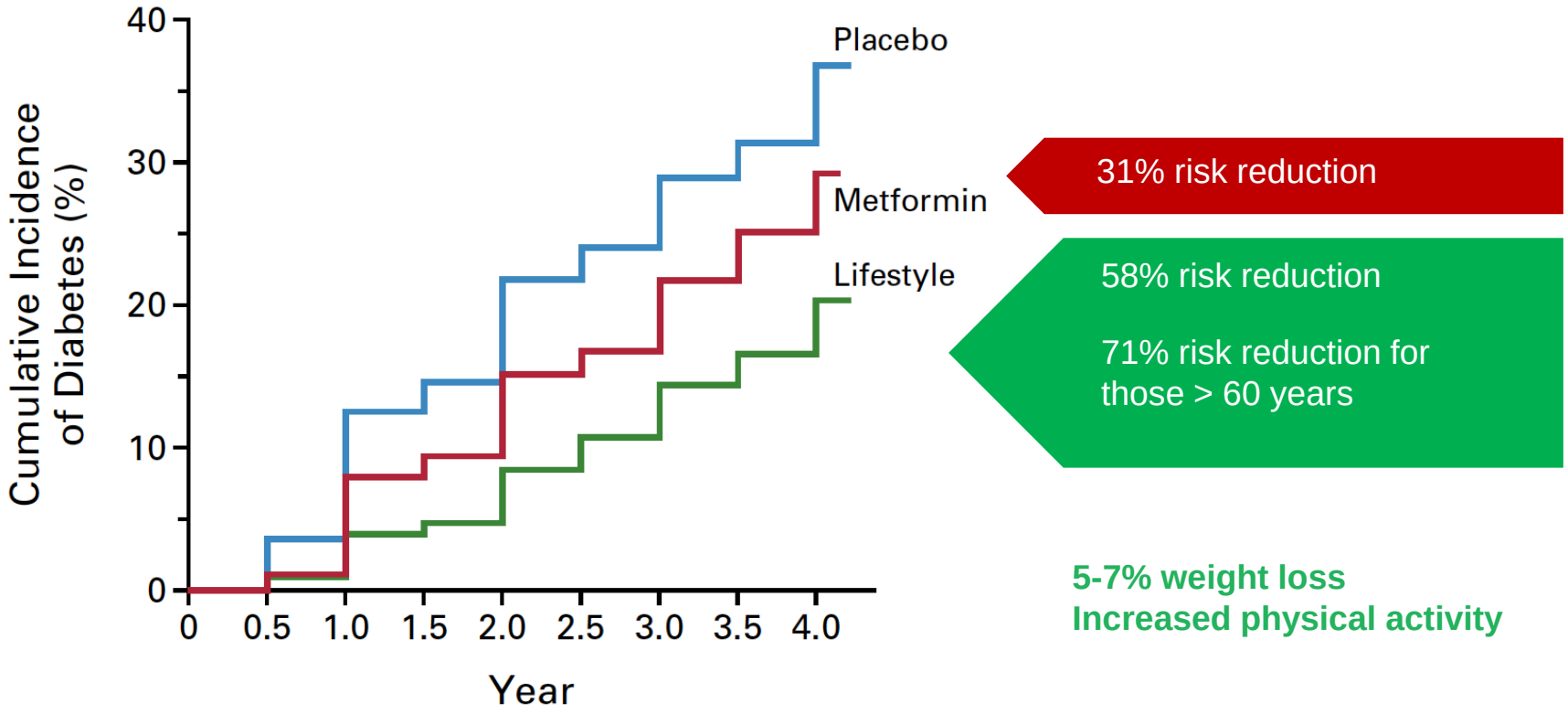
DIABETES PREVENTION PROGRAM RESEARCH GROUP*

Study population: adults >25y, clinical prediabetes, BMI >24

Standard lifestyle recommendations + Metformin (850 mg BID)	Standard lifestyle recommendations + Placebo (BID)	Intensive program of lifestyle modification

DIABETES PREVENTION PROGRAM: THE EVIDENCE

Cumulative Incidence of Diabetes According to Study Group



Diabetes Prevention Program Research Group.
N Engl J Med 2002

National Diabetes Prevention Program (DPP) Lifestyle Change Program

CDC-Approved Curriculur

Evidence and practice-based material focused on healthy lifestyle choices

Group Support

Emphasis on group support and group problem-solving over the course of the year.

Lifestyle Coach

Trained individual that serves as group facilitator over the course of the year

Medicare Reimbursement

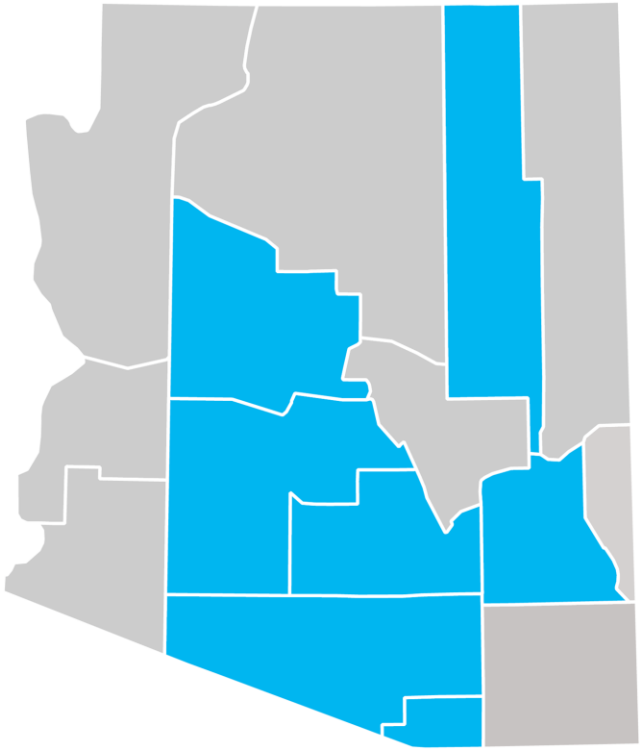
Medicare, Medicaid (certain states), and some private insurance plans.

University of Arizona Cooperative Extension Diabetes Prevention Program

Target audience: people with prediabetes or at high risk for diabetes

- Statewide
  - In person (selected counties, see map)
  - Remotely over Zoom
- Classes in English or Spanish
- 12 month program, 26 sessions

FREE of charge for eligible participants!



Counties where our DPP educators can deliver in-person classes

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Who Can Participate in the Diabetes Prevention Program?

- ≥**18** years old
- Body mass index **≥25**, (≥23 if Asian)
- No previous diagnosis of type 1 or type 2 diabetes

High risk of diabetes as determined by:

- A blood test result within the past year of:
  - ✓ Hemoglobin A1C: **5.7%–6.4%; OR**
  - ✓ Fasting plasma glucose: **100–125 mg/dL; OR**
  - ✓ Two-hour plasma glucose (after a 75 gm glucose load): **140–199 mg/dL**

  OR: A history of **gestational diabetes**
- **OR:** A high score on a risk test

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Sample Program Schedule

Class Title	Date & Time	Class Title	Date & Time
Introduction to the program	12/14/21 6:00 PM	Get Back on Track	4/26/22 6:00 PM
Get active to prevent T2	12/21/21 6:00 PM	Get Support	5/10/22 6:00 PM
Track your activity	12/28/21 6:00 PM	Stay Motivated to Prevent T2	5/24/22 6:00 PM
Eat well to prevent T2	1/4/21 6:00 PM	When Weight Loss Stalls	6/7/22 6:00 PM
Track your food	1/11/22 6:00 PM	Take a Movement Break	6/21/22 6:00 PM
Get more active	1/18/22 6:00 PM	Keep Your Heart Healthy	7/5/21 6:00 PM
Energy In, Energy Out	1/25/22 6:00 PM	Shop and Cook to Prevent Type 2	7/19/22 6:00 PM
Eating to Support Your Health Goals	2/1/22 6:00 PM	Find Time for Physical Activity	8/2/22 6:00 PM
Manage Stress	2/15/22 6:00 PM	Get Enough Sleep	8/16/22 6:00 PM
Eat Well Away from Home	3/1/22 6:00 PM	Stay Active Away from Home	8/30/22 6:00 PM
Manage Triggers	3/15/22 6:00 PM	More About Type 2	9/27/22 6:00 PM
Stay Active to Prevent Type 2	3/29/22 6:00 PM	More About Carbs	10/25/22 6:00 PM
Take Charge of Your Thoughts	4/12/22 6:00 PM	Prevent T2 for life	11/22/22 6:00 PM

Goals for Participants

Participants will aim to:

- Lose at least 5% of starting weight
- Get at least 150 minutes of moderate physical activity each week
- **Lower HbA1c by 0.2%**

They will do so by:

- Tracking their food intake and physical activity
- Making small, achievable changes over time
- Getting support from other participants and from their lifestyle coach

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Participant Success

- Lost 19 lbs (and another 10 lb since the program ended!)
- No longer needed knee surgery
- Whole family became healthier!

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What is the impact of the DPP lifestyle change program beyond the primary outcome?

“My joint pain and inflammation are virtually gone.”

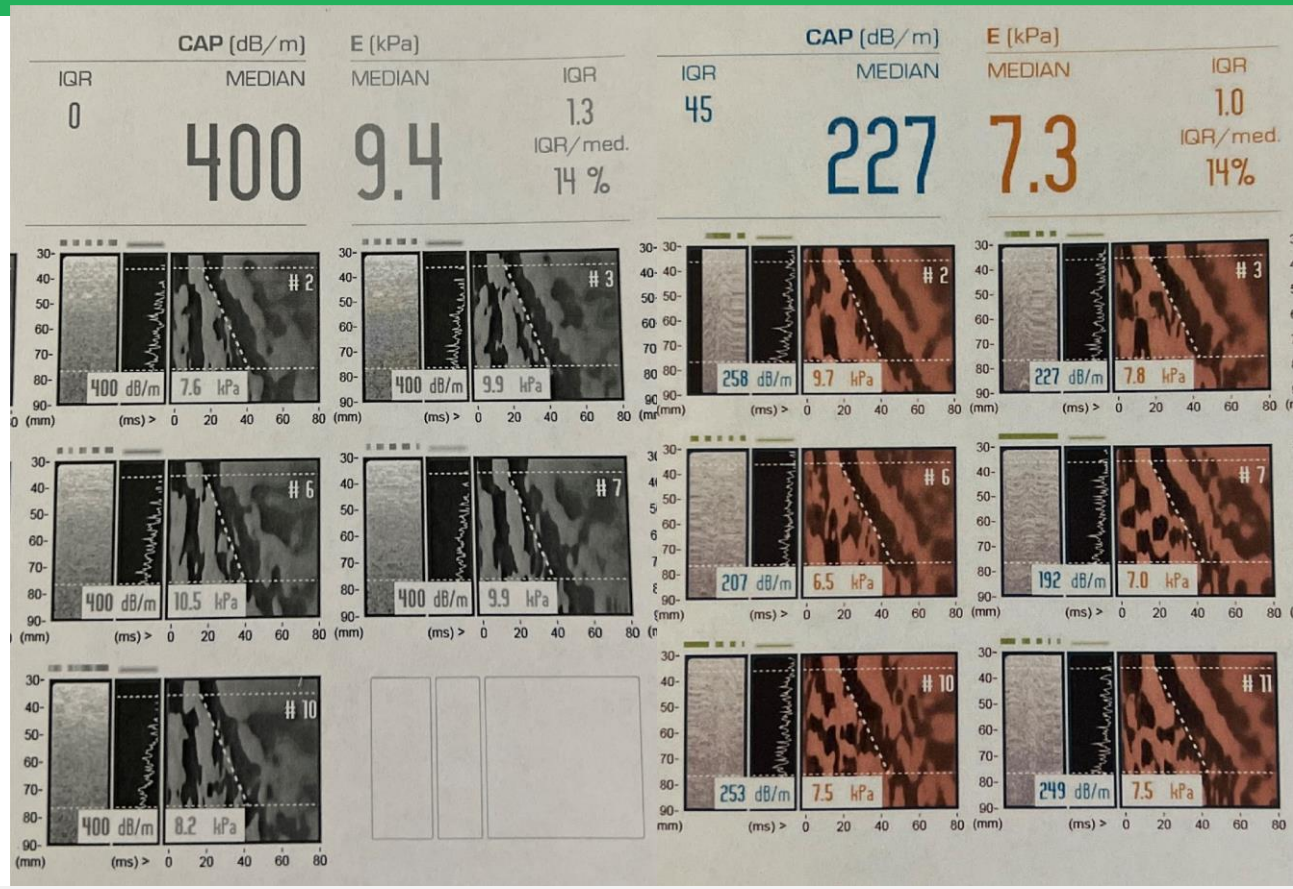
“This program was the best thing that I've done in a long time…And I no longer have to take the prediabetes medication my doctor had prescribed”

“My cholesterol is lower!”

Improvement in Fatty Liver

"Just wanted to share this with you. Maybe it could help someone else along the way. Change is possible!

The first liver scan is at my highest weight, 225 lbs and my weight on the second scan, is most likely around 170 lbs. It's gone from really high fatty levels to almost normal."



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The Study

Description of Study

Small mixed-methods cross-sectional descriptive study funded by a $2000 grant from the Cooperative Extension

Research Questions

1) Explore whether participation in the Diabetes Prevention Program has health benefits beyond the primary outcome of weight loss for the individual.

1) Does an individual's participation in the Diabetes Prevention Program impact health behaviors or outcomes for non-participating household members?

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Methods

Setting: State of Arizona

Sample: N=56 adults with prediabetes who completed the year-long DPP

Inclusion Criteria: Adults 18+, English speakers

Exclusion Criteria: non-English speaking

Intervention: 1 year-long CDC-approved DPP curriculum delivered in-person or online

Measure: 24-item Qualtrics survey sent to DPP completers via email, 6 semi-structured interviews conducted via Zoom

Primary Outcome: Weight Loss

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Methods

Data Analysis:

- Quantitative data analyzed using descriptive statistics (Excel)
- Qualitative data was inductively and deductively analyzed using using NVIVO software
- Qualitative findings reviewed and agreed upon by 2 researchers

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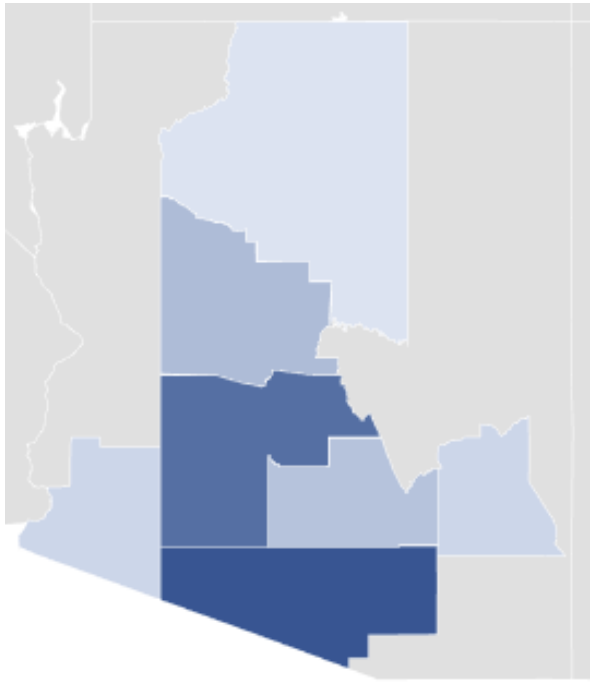
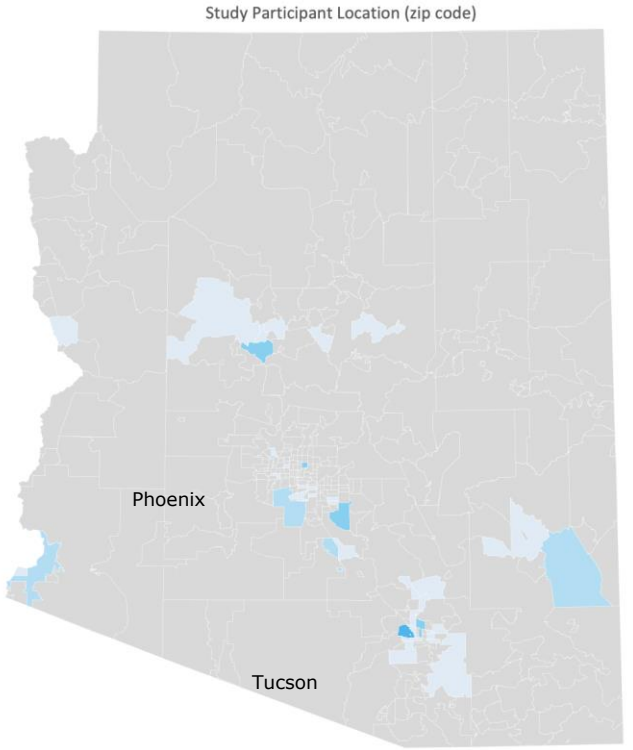
Sample Characteristics

Total (n)	56
female	49
male	7
Age, y, mean (range)	61.7 (33 - 79)
Ethnicity (%)	
Hispanic	15%
Non-Hispanic	83%
NR	2%
Race (%)	
White	78%
Asian	9%
American Indian/Pacific Islander	6%
African American	6%
NR	2%





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Household Members

14 lived alone

25 lived with spouse/partner

1 lived with spouse/partner and another person

8 lived with spouse/partner and their adult children

3 lived with spouse/partner and their minor children

3 lived with their adult children

2 lived with another person (roommate, etc)

Results

Perceived Support from Household Members

Spouse/partner	34 (60.7%)
Adult child(ren)	10 (17.8%)
Minor child(ren)	2 (3.5%)

Benefits to Household Members

55.3%

HHMs made healthy changes!

- **64.8% spouses/partners**
- **36.3% adult children**
- **100% minor children**

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Weight Loss

4 participants did not lose weight

18 lost 1-5 pounds

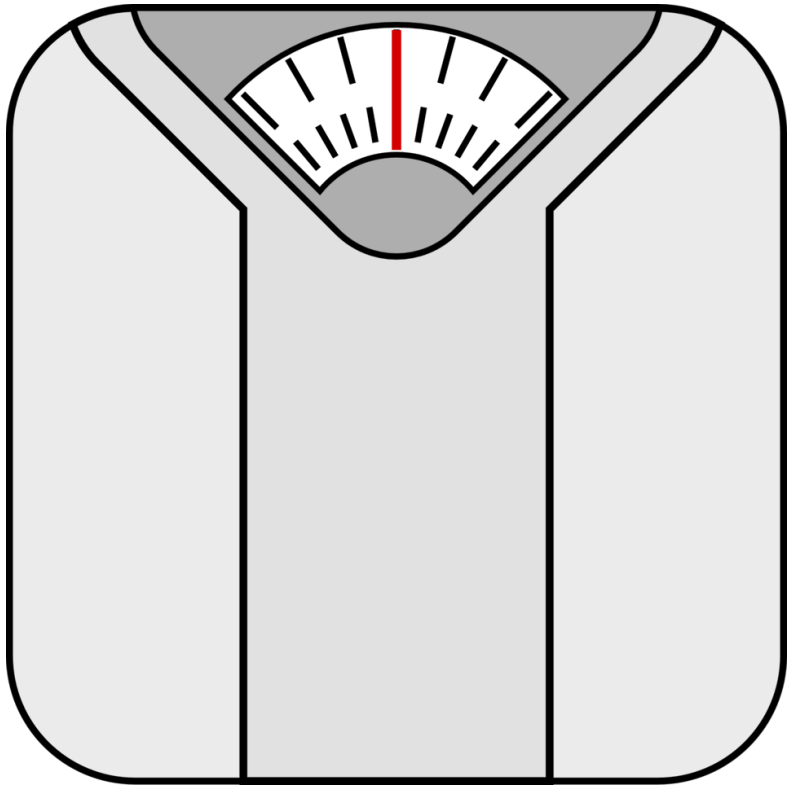
16 lost 6-10 pounds

18 lost over 10 pounds

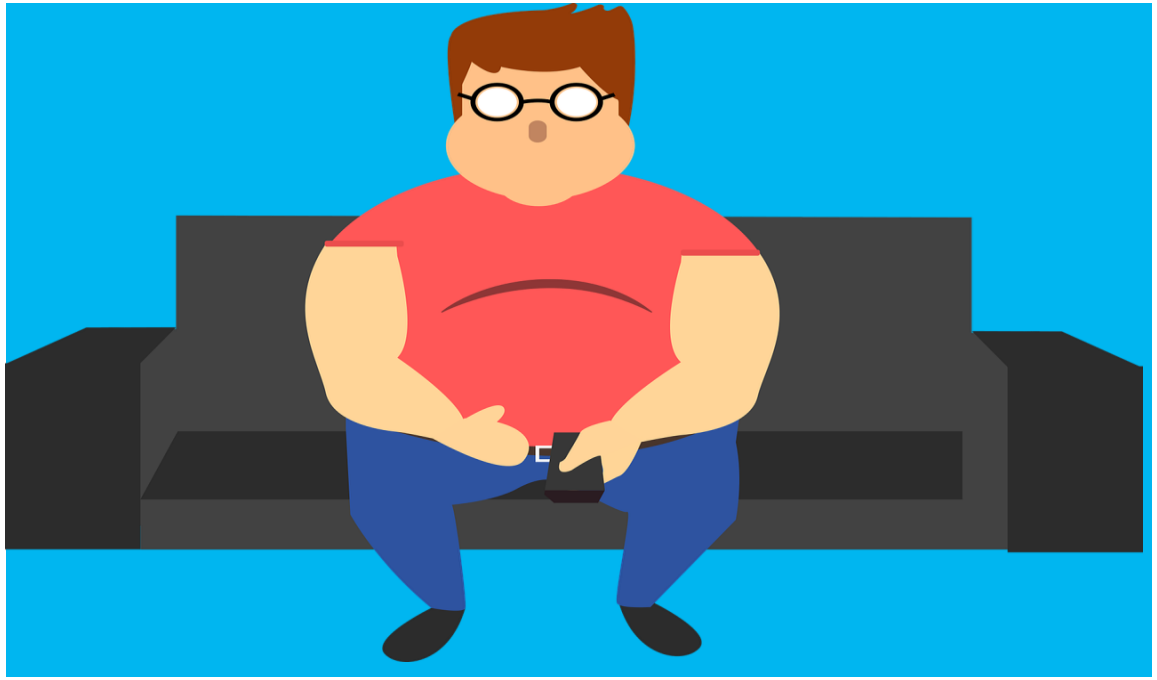
16 non-participating HHMs also lost weight

Family Support and Weight Loss Success

- 0 lbs - 50% felt HHMs were supportive
- 1-5 lbs- 66.6% felt supported
- 6-10 lbs- 81.2% felt supported
- > 10 lbs- 61% felt supported



Less Sedentary Behavior



87.5% Participants

38% Household Members

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Ate More Fruit & Vegetables

85.7% Participants

47.6% HHMs

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Ate Smaller Portions

Participants

75%

Household members

40.5%

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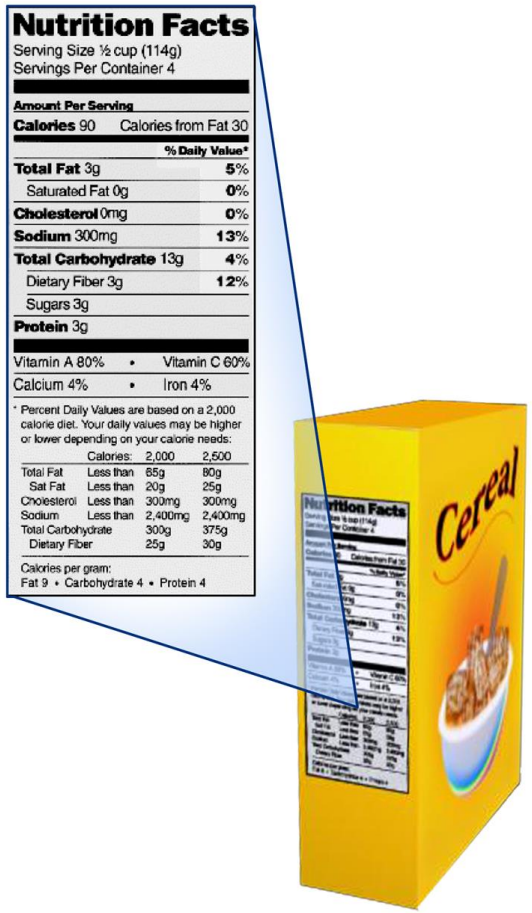
Read Food Labels

Participants

80.4%



Food Label

Household Members

28.6%

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Prioritized Sleep

Participants

57.1%

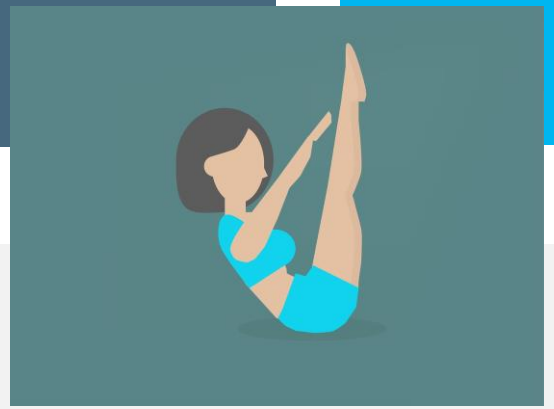
Household Members

26.2%

More Intentional Physical Activity

Participants

83.9%



Household Members

35.7 %

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Drank Less Alcohol

Participant	Household Member
17.9%	4.8%

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Health Behavior Changes

Health Behavior	Participant	Household Member
Changed Shopping Habits	60.7 %	19 %
Changed Cooking Style	55.3 %	26.2 %
Chose Lower Calorie Foods	75 %	28.6 %

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Health Behavior Changes

	Participant	Household Member
Improved Medication Adherence	26.8%	16.6%
Better Adherence to CPAP/Devices	17.9%	7.1%
Made/Kept Medical Appointments	44.6%	18.2%
Got Help for Medical/Mental Health	26.8%	14.3%

Health Improvements

	Participant	Household Member
Lower Blood Pressure	33.9%	9.5%
Lower Cholesterol	28.6%	9.5%
Lower Blood Sugar	60.7%	26.2%
Decreased Joint Pain	30.4%	2.4%
More Energy	57.1%	28.6%
Took Less Medications	8.9%	4.7%
Better Sleep	41.1%	14.3%

PsychoSocial Health Improvements

	Participant	Household Member
Better Mood	53.6%	19%
Decreased Stress	35.7%	14.3%
Increased Self-Confidence	48.2%	11.9%
Stronger Social Support	25%	4.7%

Other Improvements

Enjoying more healthy, plant-based foods

Less dry skin

Decreased neuropathy symptoms

Made new friends

Allowed participants to prioritize self-care

Qualitative Concepts/Themes

- Motivation to Participation
- Program Strengths/Benefits
- Changes in Cognitions/Health Behaviors
- Relationships with Program Educators
- Helpful Content
- Camaraderie and Peer Support
- Outcomes/Results/NSVs

Motivation to Participate

Improve Health

Reduce joint pain related to excess weight

Enable a safer surgical procedure (knee joint replacement)

Excess weight interfered with ability to participate fully in desired activities (ex. kneeling to pray at church)

Family member was going to get participant a wheelchair and hire a helper so she could visit a theme park

Intrigued by the programs ability to reduce diabetes and help with weight loss. Husband was intrigued. 10% does not seem like that much, but was surprised to learn it could make a big impact

Program Strengths/Benefits

- Close to home/ Location Convenient/ Convenient Time
- Online class was appreciated- younger adults, with little kids, etc, not living nearby, long commutes, etc
- Small group of peers with similar health issues- were welcoming, casual, “felt like talking to group of friends”, and they “helped each other out”
- Opportunity for socialization, decreased loneliness
- Resources were perceived as helpful (especially food/activity logs)
- Materials/lessons easy to understand
- Lots of ‘reality checks’ regarding portion sizes, food types, effects of grazing

Other Cognitive/Behavior Changes

Being patient and trusting the process

Follow the plan

Make better choices

Eat, then wait 20 minutes. If still hungry, then go back for a little more

Not succumbing to sabotage

Made healthy modifications to favorite foods (adding veggies to lo mein, etc.)

Other Reported Behavior Changes

- Using a standing desk, doing squats during the day, walking dog, walking at work

- Used little tricks to eat better- eating a few fries, then the burger, and by the time they

  came back to the fries they were cold and unappetizing

- Meal Planning- if leftovers are planned for lunch, family members likely

  to go back for seconds

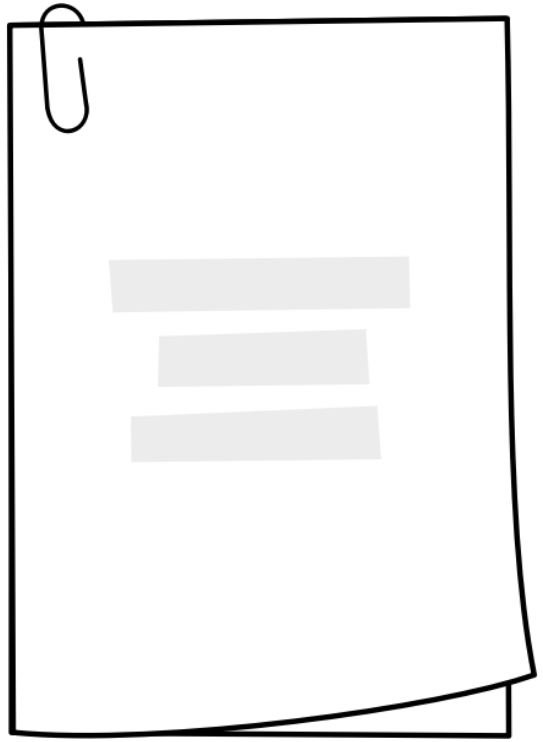
- Packing a lunch (avoiding temptations from fast food, convenience stores)

Relationships with Leaders

- Kind, compassionate, charismatic, and non-judgmental program leaders
- Held them accountable
- Encouraged realistic expectations ("not thinking you will lose 11 pounds in one a week")
- Provided encouragement, reminded them of what worked for them in the past
- Were invested in their success but did not force anything on them
- Helped them personalize their program
- Did not promise that once weight loss occurred, "everything would be good"

Helpful Content

- Opened eyes to new possibilities/ways of living and eating
- Eat fiber first, cut portions, level up, healthy alternatives
- How to shop for and cook healthy meals
- How to make exercise happen
- How to avoid slippery slopes
- Enjoyed the flyers- learned something new from each
- How to incorporate what they learned into real-life
- Anticipate and plan for busy days, traveling, etc.
- Striving for progress, not perfection

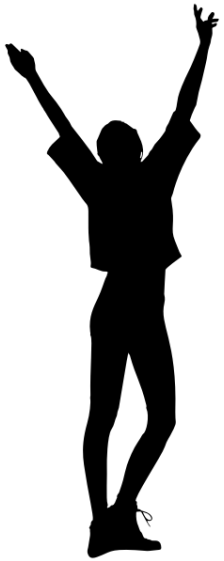


Peer Support

- **Helped to see others had similar issues and struggles**
- **Could learn from each other, take notes**
- **Eye opening to see others who had disabilities doing what they could even though it was hard for them to exercise**
- **Being the youngest in the program and seeing how older people were working on their health motivated and inspired them**

Outcomes/Non-Scale Victories

- Better equipped to deal with life stressors
- Better caregivers and role models for family
- Increased self-acceptance, self-esteem, self-efficacy, self-compassion, and empowerment
- Less perceived social stigma
- Less frequent office visits, avoided surgery (less healthcare costs)



Outcomes/Non-Scale Victories

Spent less on food

Less environmental impact (less meat)

Had a healthy pregnancy, less edema, less weight gain

Felt joy about fitting into clothes they hadn’t worn in years

Family members and friends who were concerned for her health were now excited for her

Easier to get up and play with kids, enjoy doing fun things

Memorable Quotes

"The program taught me the skills needed to be active, choose food wisely, and focus on my health"

"The program was very educational. I appreciated the support of class members, and it prompted me to research nutritional ways to lower blood sugars and achieve weight loss"

"The program has made a big difference in my life!"

"There is no one else in my household, but I have taught other family members about what I learned in the program. It was very informative and taught me lifelong lessons."

Memorable Quote

" When I joined the program,I was concerned that it would be more of the same. People always assume that fat girls don't know about dieting, but actually, we know more than anyone because we have been dieting off and on our whole lives.

Something I appreciated about the program is that it wasn't just teaching things I already knew. It was also about learning how to make small, gradual, positive changes, and learning to forgive yourself when you get off track"

Key Points

- Positive feedback and praise from HCP was perceived as rewarding
- People trust their family members and friends, and perceive them as a reliable source of health information and behavioral models
- Individual participation in the DPP can have a positive impact on the health and health behaviors of both participants and non-participating household members

Questions?

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