

The Impact of Social Determinants of Health on Type 2 Diabetes in Indigenous Communities

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**CENTER FOR
INDIGENOUS HEALTH**

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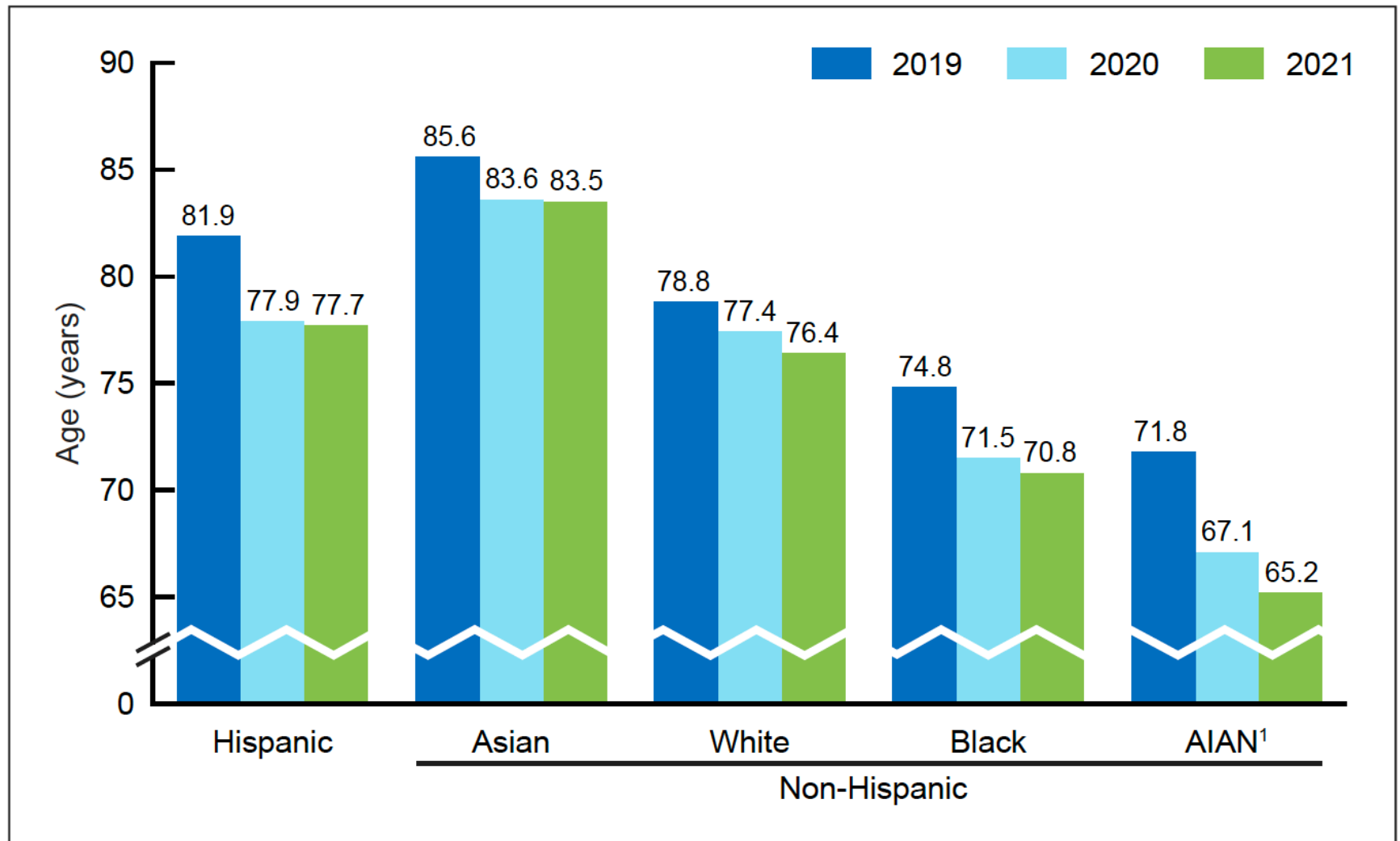


Boozhoo from Duluth, MN

Overview of Our Time

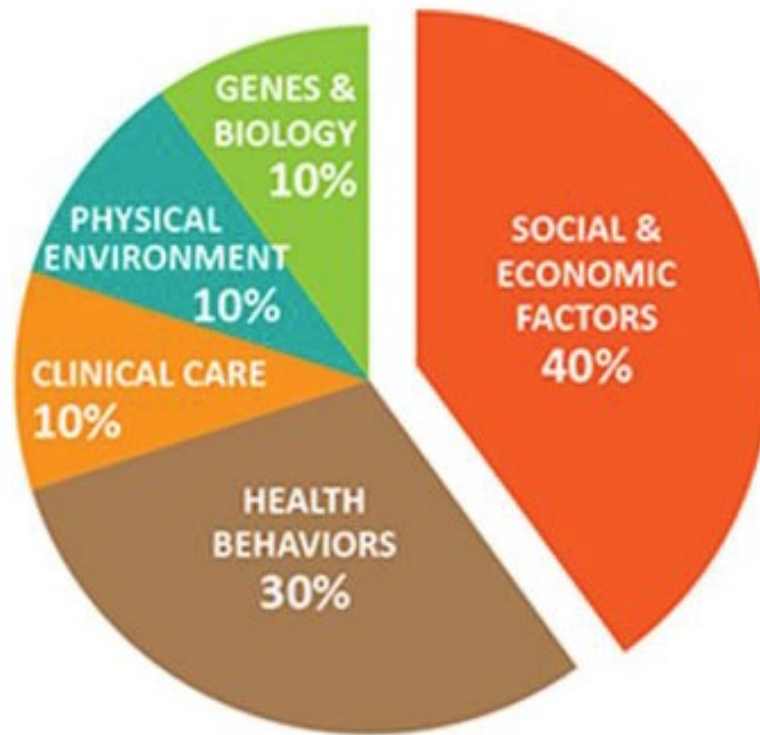
- 1) Overview: Social Determinants of Health (SDH) & Indigenous SDH
- 2) SDH & Type 2 Diabetes: Lessons from Community-Based Participatory Research (CBPR)
- 3) Application: *Together Overcoming Diabetes*

Figure 2. Life expectancy at birth, by Hispanic origin and race: United States, 2019–2021



Yet, this was not always the case. . .

Such inequities are rooted in experiences of colonization and marginalization including disproportionate exposure to stressors, disruption of Indigenous families and food systems, and attacks on cultural practices and community values.



DETERMINANTS OF HEALTH

SDH & Indigenous SDH



NIMHD Minority Health and Health Disparities Research Framework

Adapted to reflect historic and socio-cultural influences for American Indian and Alaska Native Nations

Spero M. Manson, Ph.D., University of Colorado Denver's Anschutz Medical Center

Domains of Influence	Levels of Influence			
	Individual	Interpersonal	Community	Societal
Biological	Biological Vulnerability and Mechanisms <i>Metabolic Syndrome</i>	Caregiver-Child Interaction <i>Out-of-Indian Home Adoption</i> <i>Grandparent / Child Rearing</i> Family Microbiome	Community Illness Exposure <i>Exxon Valdez Oil Spill</i> <i>Gold King Mine Waste Water Spill</i> Herd Immunity	Sanitation Immunization Pathogen Exposure <i>Uranium and Coal Mining</i>
Behavioral	Health Behaviors <i>External Locus of Control</i> <i>Drug Preferences</i> Coping Strategies <i>Resilience</i> <i>Spirituality</i> <i>Community-mindedness</i>	Family Functioning <i>Extended Family</i> School / Work Functioning	Community Functioning <i>Collective Resilience</i> <i>Cultural Forms of Social Control</i> <i>Language Revitalization</i>	Policies and Laws <i>Termination and Relocation 1953</i> <i>Indian Self-Determination & Education Assistance Act 1975</i> <i>American Indian Religious Freedom Act 1978</i>
Physical/ Built Environment	Personal Environment <i>Subsistence Activities</i>	Household Environment <i>HUD Housing Clusters</i> School / Work Environment <i>Boarding School Education</i>	Community Environment <i>Natural Resources</i> Community Resources <i>Gaming</i> <i>Tribal Commercial Enterprise</i>	Societal Structure <i>Matrilineal, Patrilineal, & Bilateral Systems of Descent and Jural Authority</i>
Sociocultural Environment	Sociodemographics <i>Per Capita Payments</i> Limited English Cultural Identity Response to Discrimination <i>Historical Trauma</i>	Social Networks Family / Peer Norms <i>Traditional Men's / Women's Societies</i> Interpersonal Discrimination <i>Stereotyped Threat</i> <i>Racial Prejudice</i>	Community Norms <i>Progressives and Traditionalists</i> <i>Alcohol Prohibition</i> Local Structural Discrimination <i>Border town Economics</i>	Societal Norms <i>Hollywood Indian</i> <i>Firewater Myth</i> Societal Structural Discrimination <i>Sports Mascots</i>
Healthcare System	Insurance Coverage Health Literacy Treatment Preferences	Patient-Clinician Relationship <i>Implicit Bias</i> Medical Decision-Making <i>Cultural Construction of Health</i>	Availability of Health Services <i>Direct, Contracted, and Compacted Services</i> Safety Net Services	Quality of Care Healthcare Policies <i>Reimbursement of Tribal Healing Ceremonies</i> <i>Indian Health Care Reauthorization Act</i>
Health Outcomes	Individual Health	Family/Organizational Health	Community Health	Population Health



Fundamental Determinants of AIAN Health Inequities

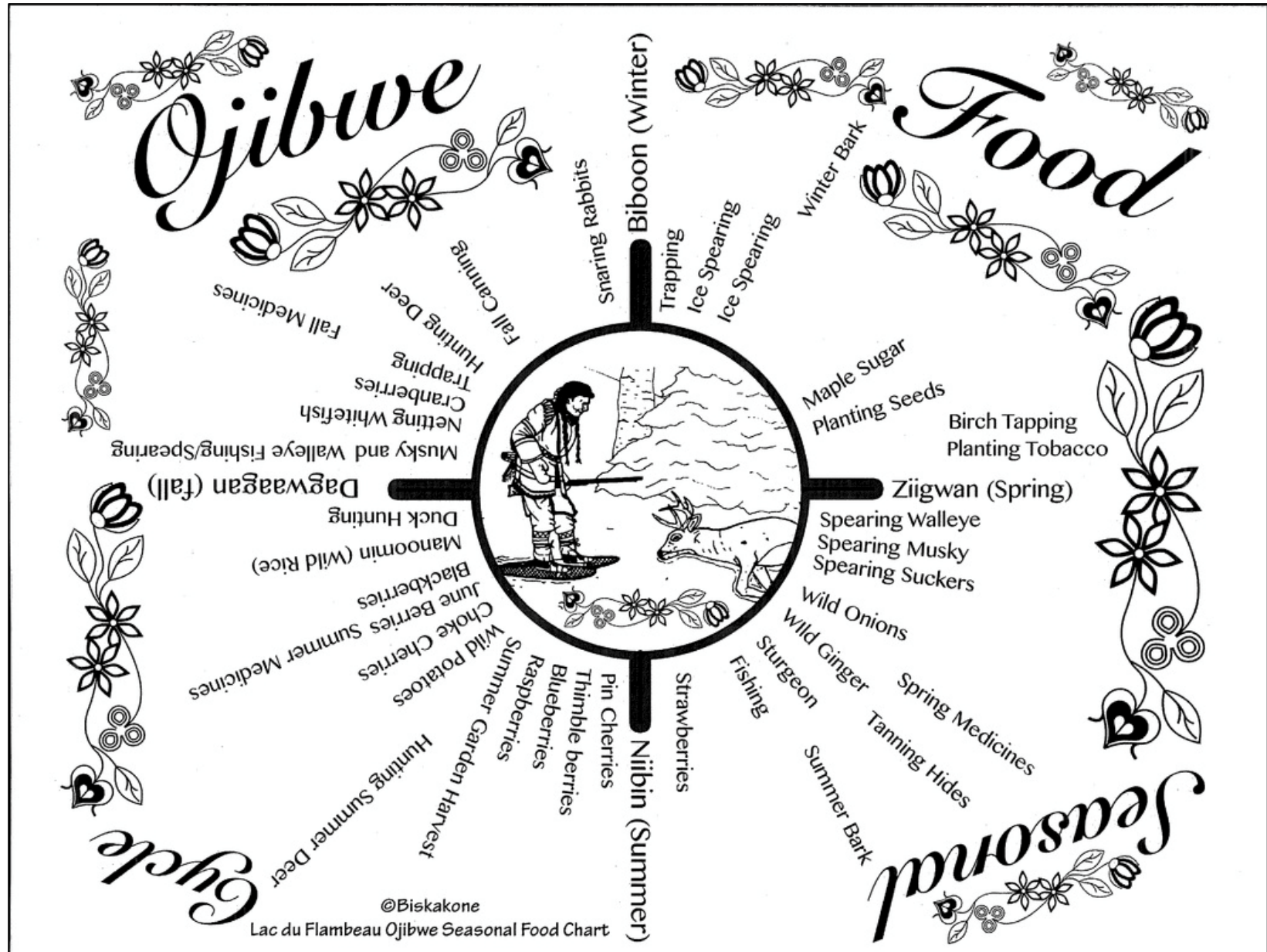
Historical Trauma

Pathways from Historical Trauma (HT) to Social, Mental Health, Physical Health, and Cultural Disruption

- HT as an Etiological Agent: Lived Experience, Survivor Impacts
- HT as a Catalyst for Intergenerational Transmission
- HT as an Anchor for Ongoing Marginalized Status(es)
 - HT Related Stressors
 - Structural Racism → Policy, Funding, Practice
 - Historical Oppression & Contemporary Issues

Historical Trauma & Oppression - Obesity & Food Systems

Catastrophic Nutrition (and activity) Transitions



Historical Trauma & Oppression - Obesity & Food Systems

Catastrophic Nutrition (and activity) Transitions

Modern “Western” Lifestyle



“That’s why we got it really bad now. .
.the way our ancestors ate. Now the
way we eat, with all this processed
food.”

“Trying to tell the people (at
ceremony/feast) that you cant handle
cake, you cant handle that much food,
you can’t eat this, you can’t eat that.
And then they feel like "oh, well
you're not participating, or you're not
really being involved with it.”

“You go to the nutritionist, she tells you what you’re supposed to eat, and especially
up in (our village), we can’t have those foods all the time. We go to (town) to buy our
groceries, and we might buy our fruits and vegetables, but they don’t last for two
weeks until the next payday. We can’t follow the right diet, because we can’t get the
right foods.”



Type 2 Diabetes (T2D) Mellitus

- American Indian (AI) communities have the highest premature mortality in the nation
- Type 2 Diabetes (T2D) is a significant contributor to this inequity
 - Als over 2x more likely to be diagnosed with T2D than other Americans
 - Als aged 10 – 19 years = 9x more likely
 - T2D a leading cause of death for Als

Stress & Diabetes Mellitus

This we know: that diabetes is sometimes caused in man by mental anxiety. . . (H. Maudsley, 1899)

. . .the transient or intermittent glycosuria (type 2 diabetes) met with in stout overfeeders, or in persons who have undergone a severe mental strain, is very amenable to treatment. (W. Osler, 1892)

But if the degenerate, or the depraved nervous liquor doth continually flow into the blood, it produces sometimes the unbloody dysentery, such as we have already described, sometimes the diabetes. . .(T. Willis, 1679)

Project Details

Phase 1: Year 1

Qualitative

Focus Groups (FG)

FG #1
General
Stress
Discussion

FG #2
Review
Survey
Measures

**Participants Selected by
Convenience Sampling**

Phase 2: Years 2-5

Quantitative

**All Participants will be
asked to consent to 3
things:**

1

Survey:
Completed
with
Interviewers

2

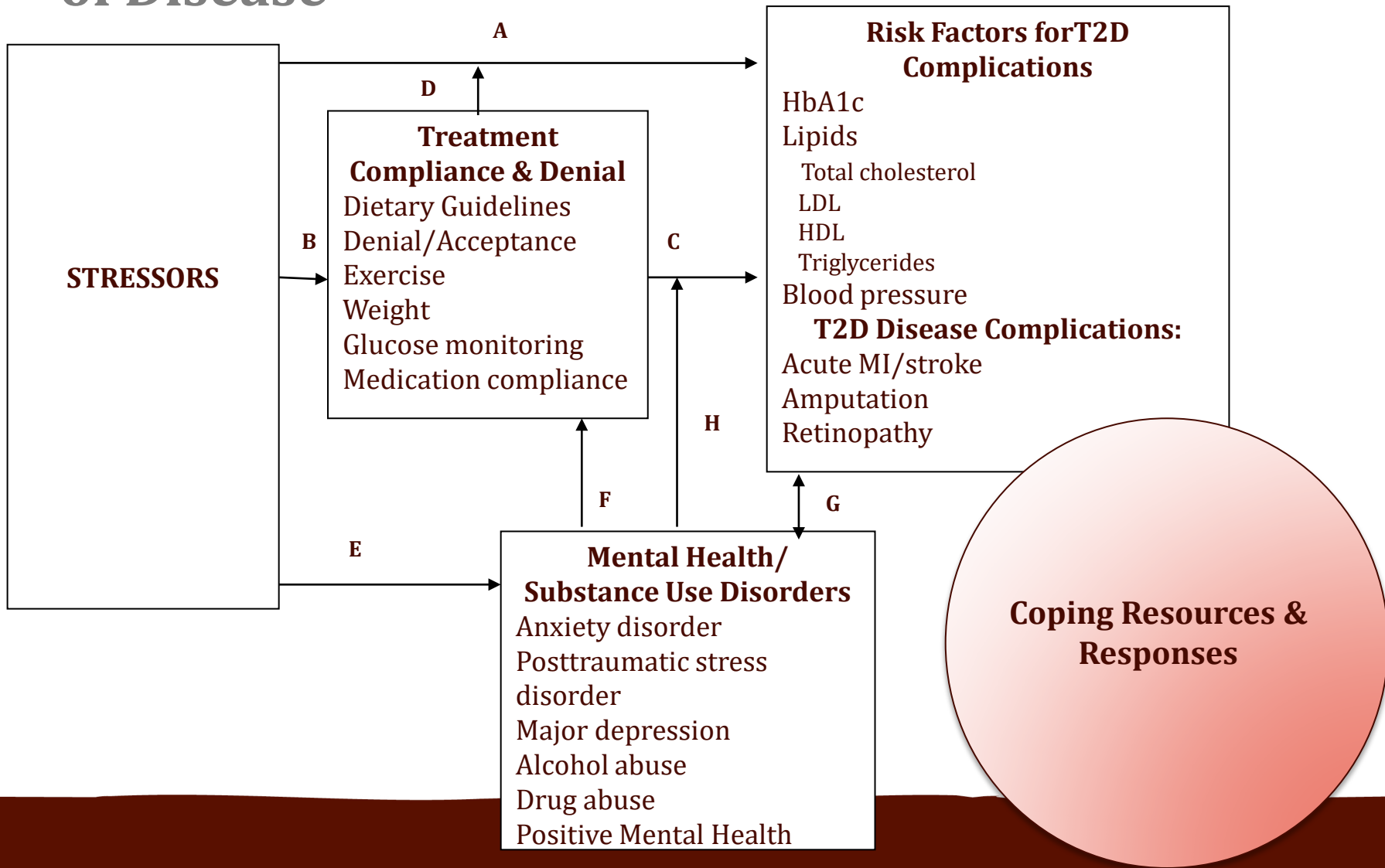
**Chart
Reviews:**
Completed
by Clinic
Staff

3

**Salivary
Cortisol:**
Saliva
Collected by
Participant @
Home

**Participants Selected from Clinic
Records, Probability Sample**

Conceptual Model: A Stress Process Model of Disease

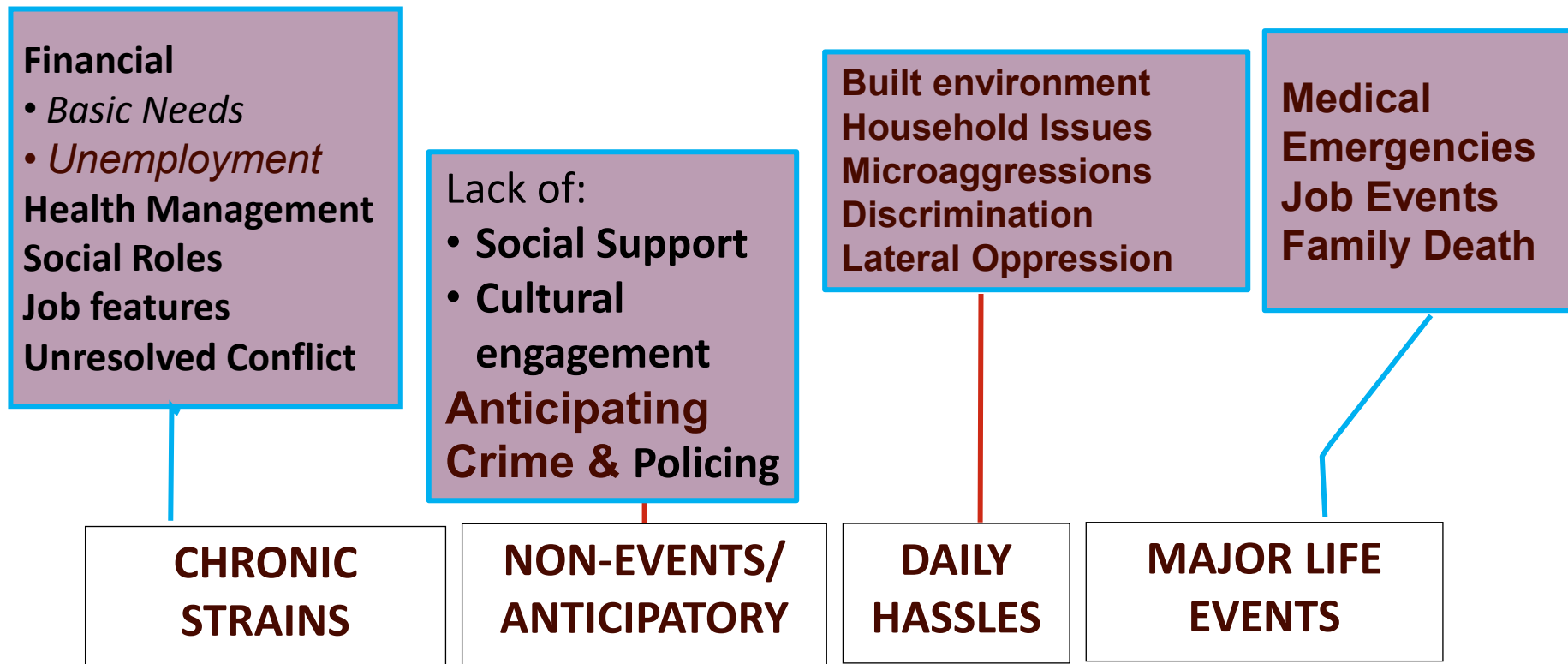


Indigenized (Anishinaabe) Study Model



What were sources of stress for study participants?

Elm, J. H., Walls, M. L., & Aronson, B. D. (2019). Sources of stress among Midwest American Indian adults with type 2 diabetes. *American Indian and Alaska native mental health research (Online)*, 26(1), 33.



Colonization, Poverty & Genocide were viewed as factors underlying the above stressors.

Diabetes-related Stress

- Diabetes Distress Screener; Fisher et al., 2005
- Possible range 1 to 6 with higher scores for more diabetes-related emotional distress
- Mean 2.57, S.D. 1.39

Family Criticism

- Family Emotional Involvement and Criticism Scale; Shields et al., 1994
- Possible range 0 to 3 with higher scores for more family criticism
- Mean 1.04, S.D. 0.44

Daily Hassles

- Survey of Recent Life Experiences; Kohn & Macdonald, 1992
- Possible range 0 to 24 with higher scores for more daily hassles
- Mean 6.02, S.D. 3.44

Microaggressions

- Walters, 2008
- Possible range 0 to 2 with higher scores for more micro-aggressions
- Mean 0.70, S.D. 0.48

Financial Events

- Negative Financial Events; Dohrenwend et al., 1978
- Possible range 0 to 9 with higher scores for more events
- Mean 1.63, S.D. 1.48

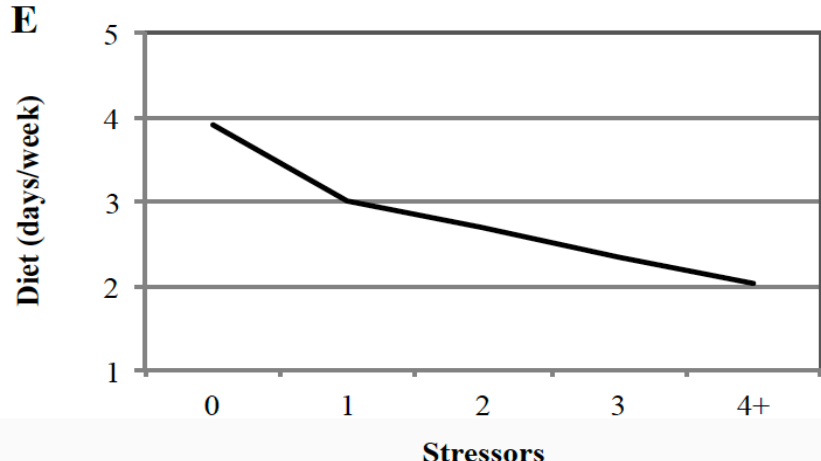
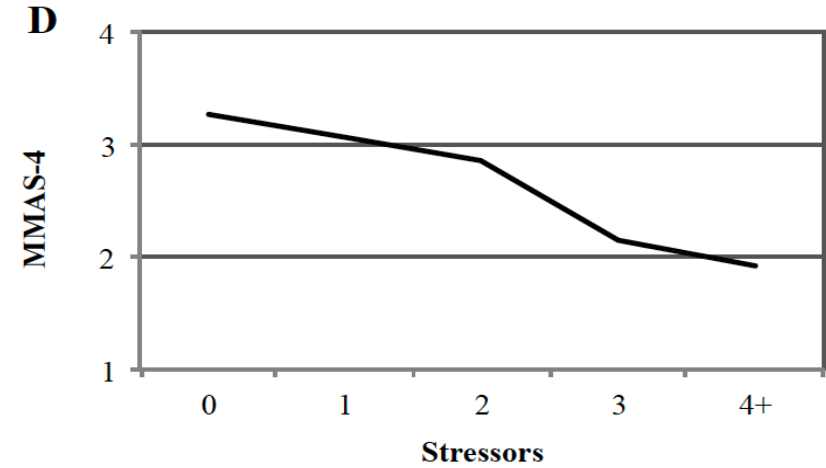
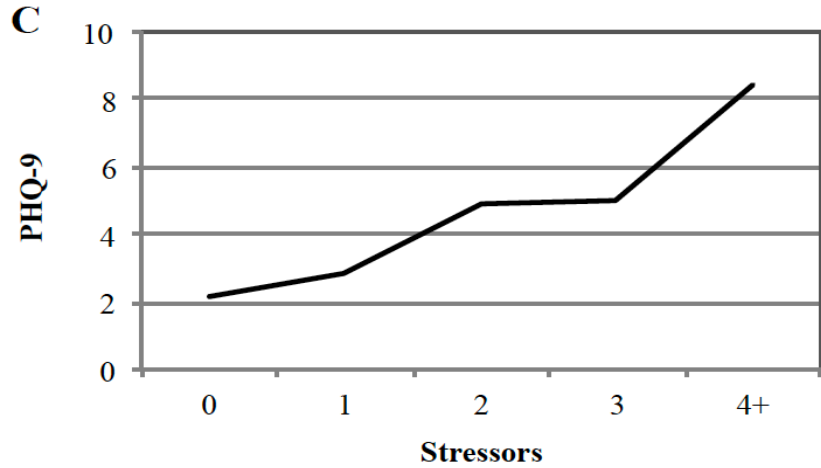
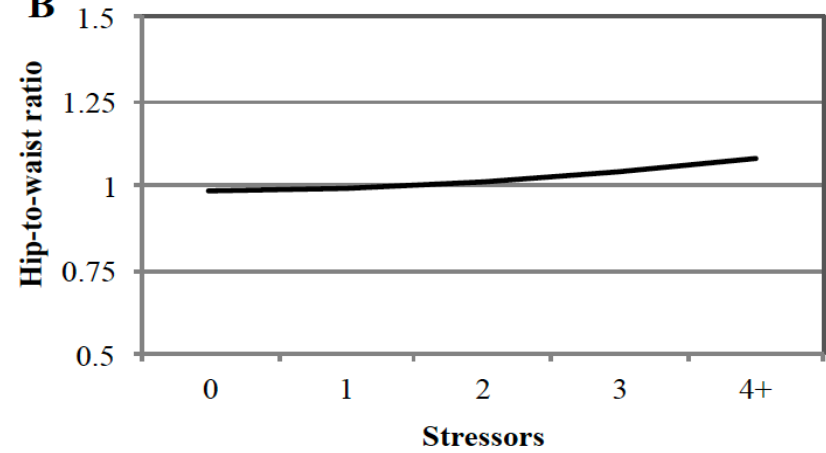
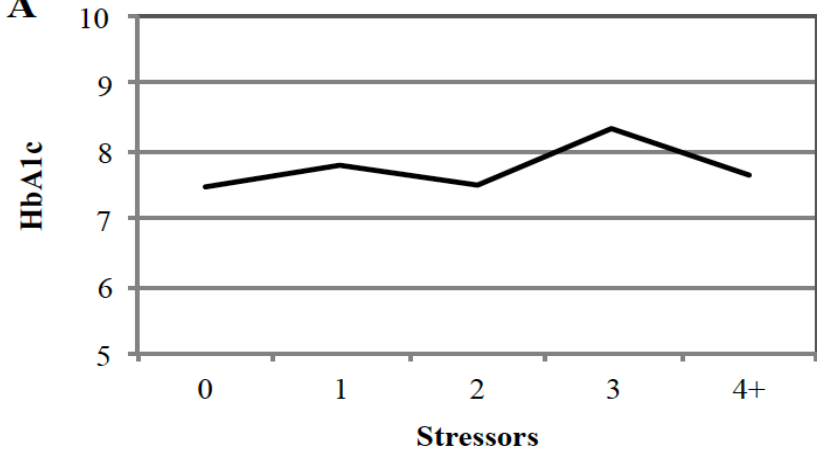
Life Events Checklist

- Possible range 0 to 14 with higher scores for more events
- Mean 5.07, S.D. 3.12



Continuous

Discrete



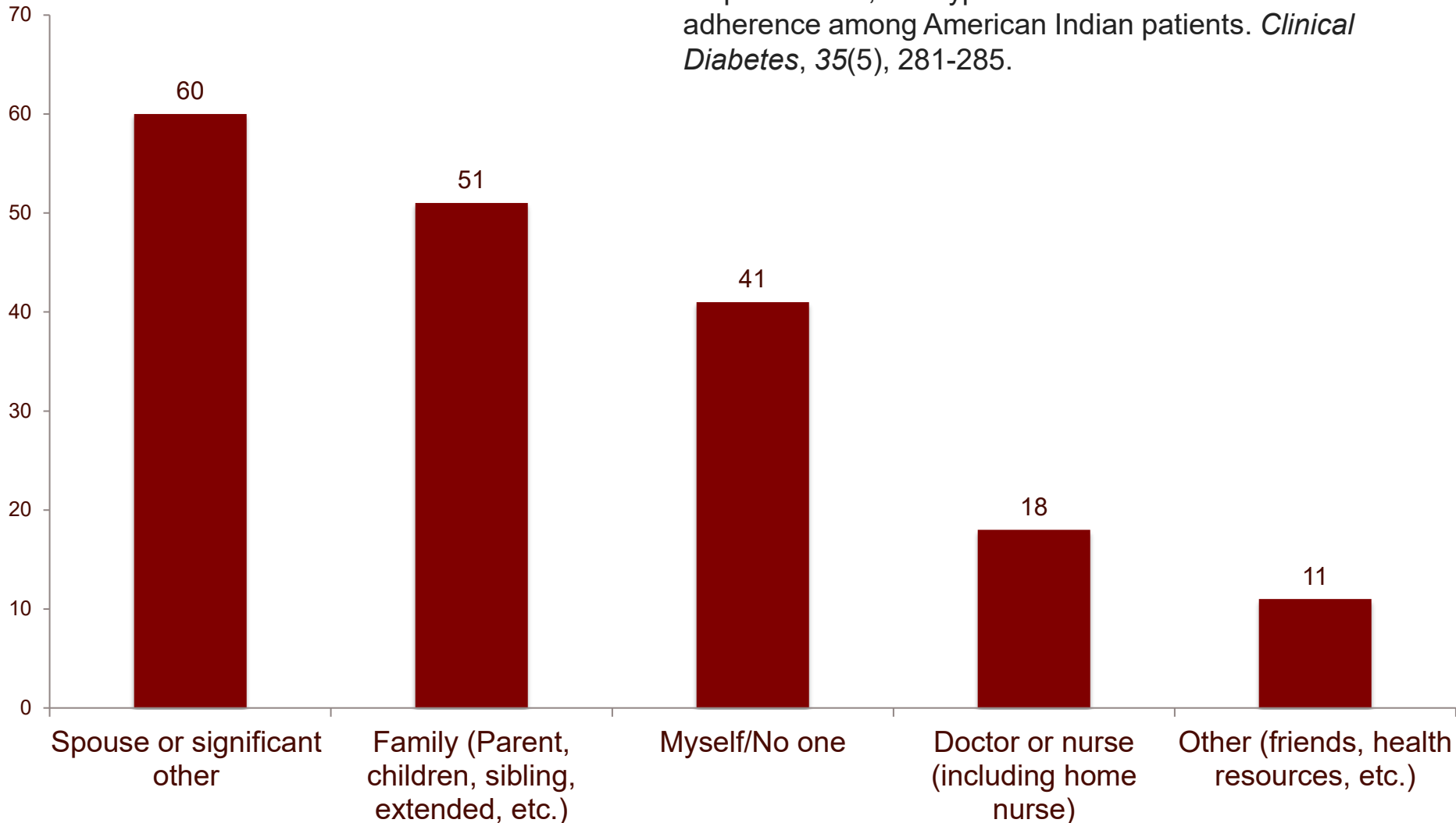
Note: X-axis displays the count in above average exposure to stressors. Box A: A1c. Box B: Waist-to-hip ratio. Box C: Patient Health Questionnaire 9-item depressive symptoms scale. Box D: 4-item Morisky Medication Adherence Scale. Box E: Average days/week following a healthy diet plan.

Coping

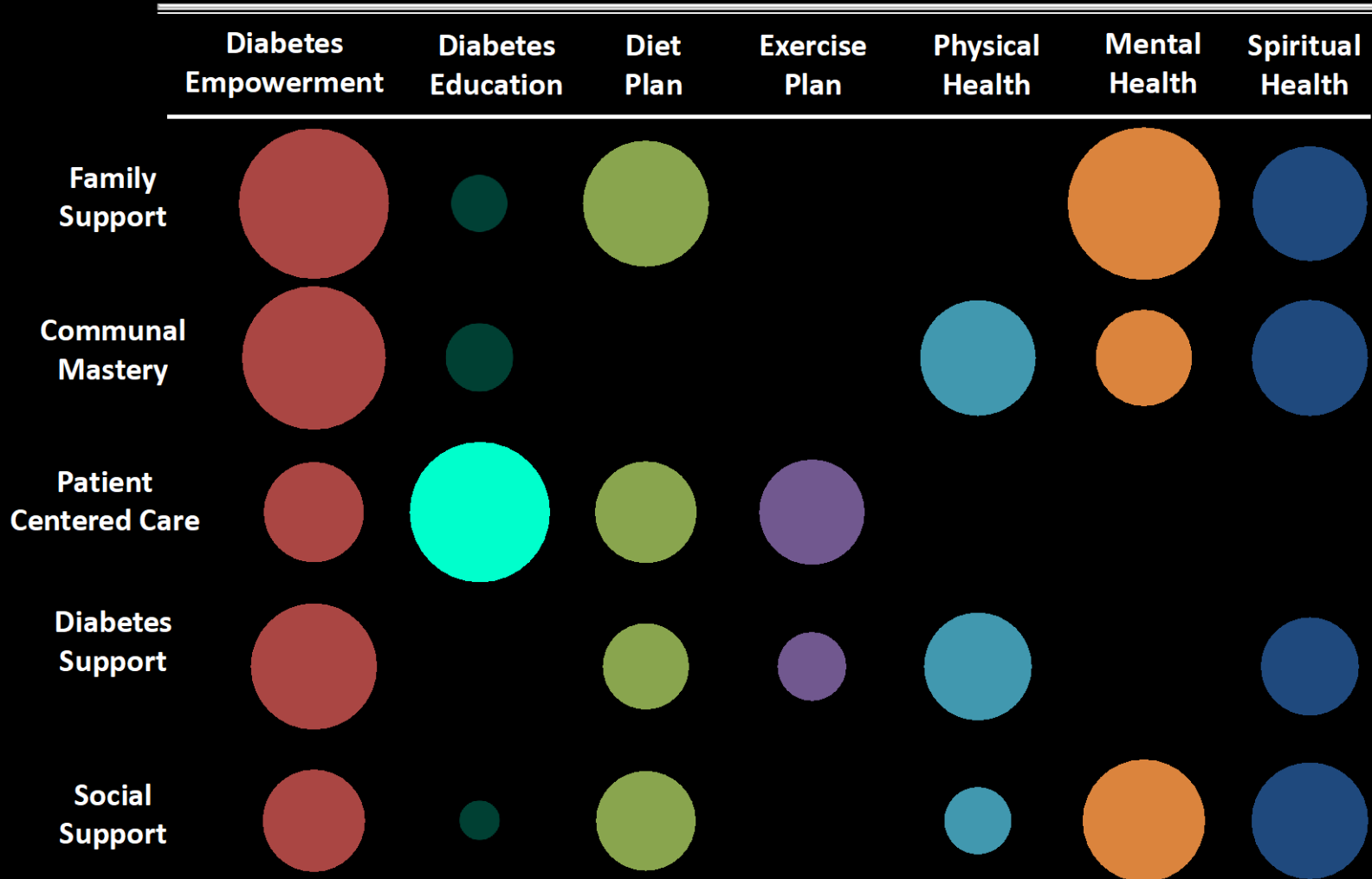
- Today, our focus is on ***Coping Resources*** or the things available to people to help them cope with stress.

Who Supports Participants the Most (Wave 1)?

Ratner, N. L., Davis, E. B., Lhotka, L. L., Wille, S. M., & Walls, M. L. (2017). Patient-centered care, diabetes empowerment, and type 2 diabetes medication adherence among American Indian patients. *Clinical Diabetes*, 35(5), 281-285.



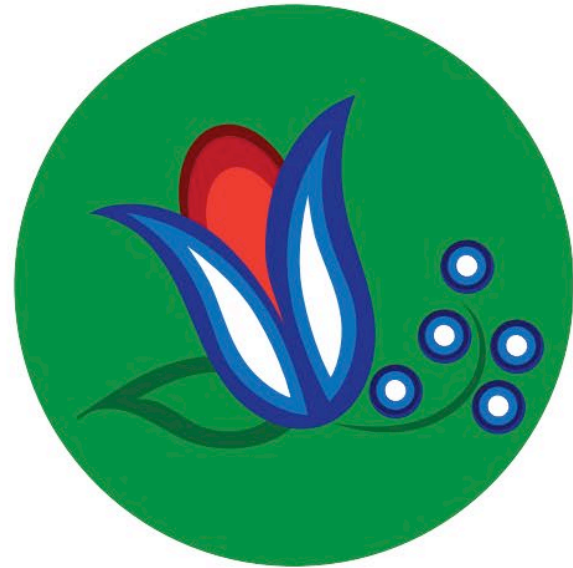
Results of OLS Regression Analyses: Standardized Coefficient Effect Sizes Adjusted for Age, Gender, and Income



Stress-Buffering & Mediating Effects: Culture & Community

- Communal Mastery Mediates the Negative Impact of Food Money Shortage on Diabetes Empowerment
- Diabetes Support Mediates the Harmful Impacts of Role Strains on Diet & Diabetes Empowerment
- Cultural Spiritual Activities & Social Support Moderate Associations b/w ACEs and Physical & Mental Health

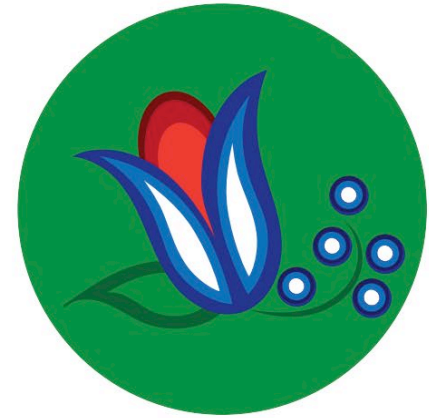




Translating these Findings into Programming: Together Overcoming Diabetes (TOD)

Niwii-shaagoojitoomin izhi-maamawi

This project is supported by a grant from the National Institutes of Health: DK091250



The goal of this research is to evaluate the impact of a culturally tailored, intergenerational, home-based type 2 diabetes intervention for American Indian adult diabetes-related, holistic health outcomes including HbA1c, mental health, social cohesion, etc. We will also evaluate the impact of the program on enrolled adult's children (aged 10-16 years) in terms of diabetes risk and protective factors.

The program is delivered by Family Health Coaches and evaluated by Independent Evaluators.

Intervention Curriculum: Delivered by home visitors called **Family Health Coaches**



Additional acknowledgements

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- National Institutes of Health (R01DA13580, R01 MH67281, Whitbeck, PI; and R21 MH0525, R01 DA039912, DK091250, Walls, PI). The contents of this presentation do not represent the official views of the NIH.