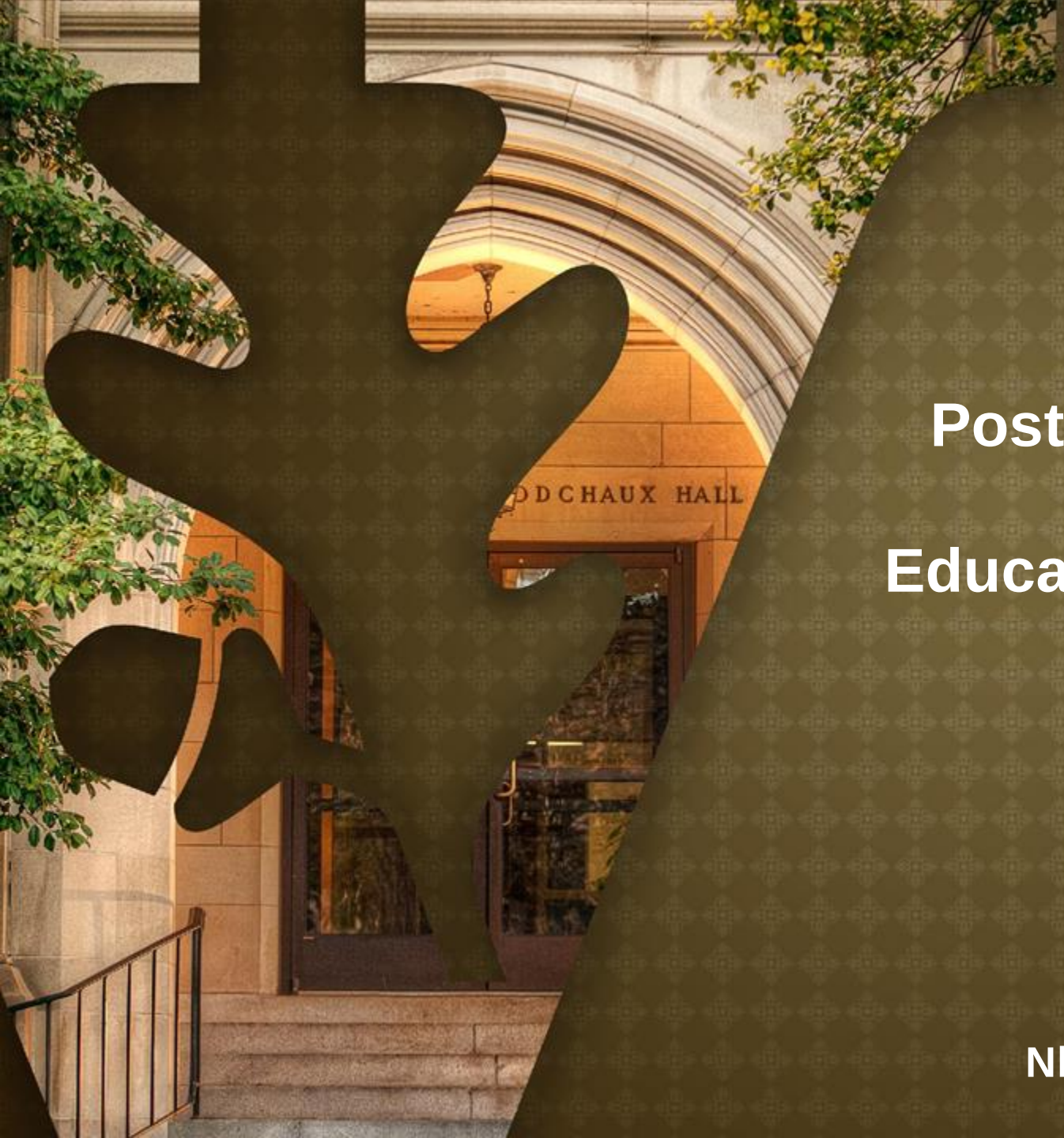
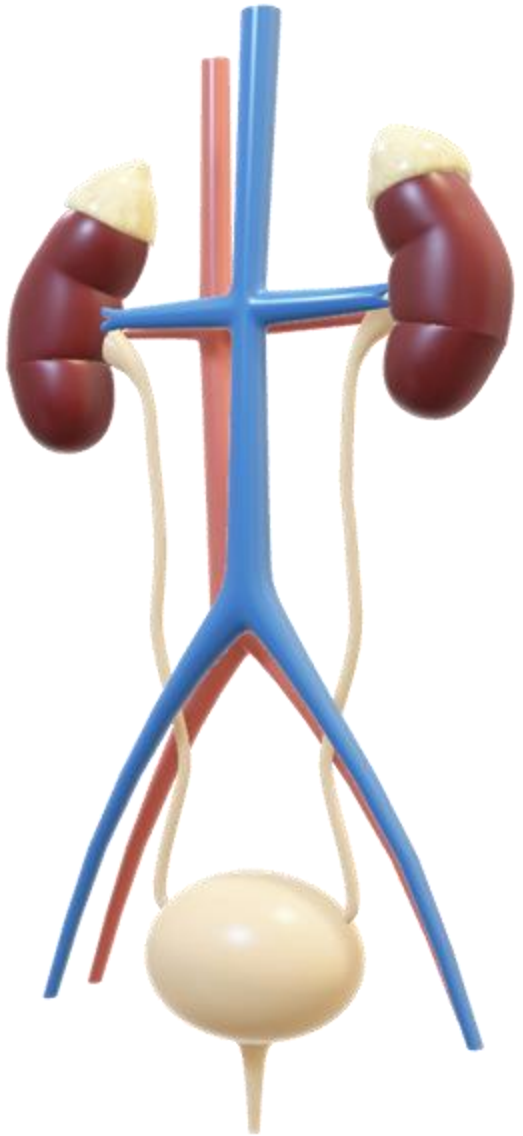


Post Kidney Transplant Diabetes Education and Evaluation Positively Impacts Outcomes

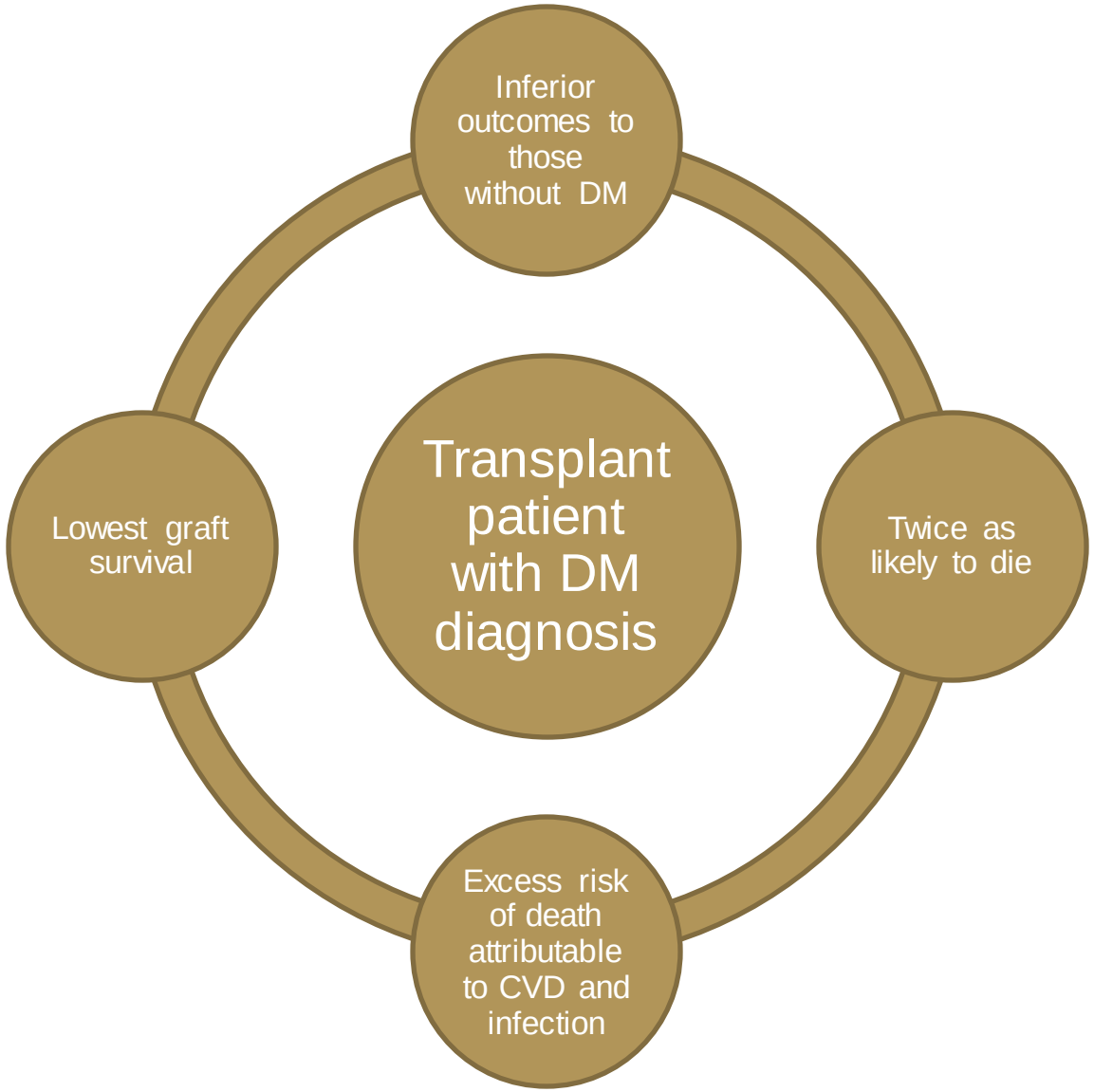
Nhan Dinh MSN, CNP, AGACNP-BC

Introduction

- Diabetes Mellitus (DM)
  - Leading cause of End Stage Kidney Disease (ESKD)
  - One-third of all patients initiating renal replacement therapy (RRT) worldwide (dialysis and kidney transplantation) (Roglic & World Health Organization, 2016)
  - Ongoing upward trend of nearly 40% of listed candidates in the U.S (Hart et al., 2020)
- However,
  - 422 millions adults living with DM worldwide (Roglic & World Health Organization, 2016)
  - Depression, anxiety, and distress have been frequently associated with poor outcomes (Aikens, 2012; Anderson et al., 2001; Fisher et al., 2012; Li et al., 2008; Niemcryk et al., 1990)
  - Diabetes distress' prevalence was reported to be up to 45% in those with the diagnosis of type 1 DM and 36% with type 2 DM (Hagger et al., 2016; Perrin et al., 2017)
  - Total direct and indirect estimated costs of diagnosed DM was $327 billion in 2017(CDC, 2020)



Introduction cont.



Well-controlled DM and/or efforts toward achieving glycemic targets after transplant is crucial to optimize outcomes

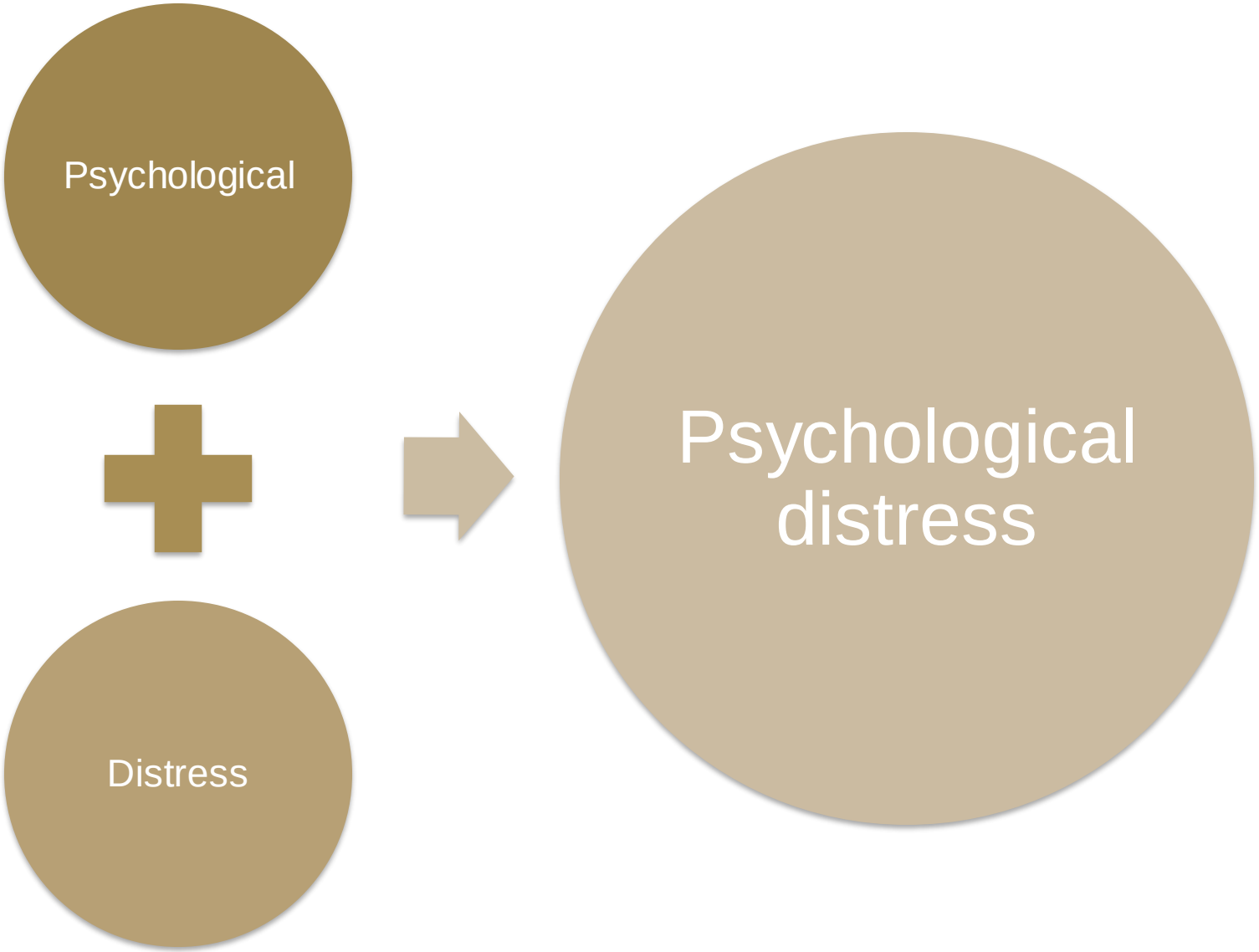
Problem Statement

- At University of New Mexico Hospital (UNMH), January 1st, 2020 - March 1st, 2021:
  - 52 patients received kidney transplant
  - 21 patients (40.1%) had diagnosis of DM as cause of ESKD.
  - The mean HbA1c was 7.57% (SD 1.2)
  - The mean HbA1c in those not met ADA and AACE goal was 8.1% (SD 0.9)
- However, there is no transplant-adapted patient education regarding DM management for post-transplant patients available

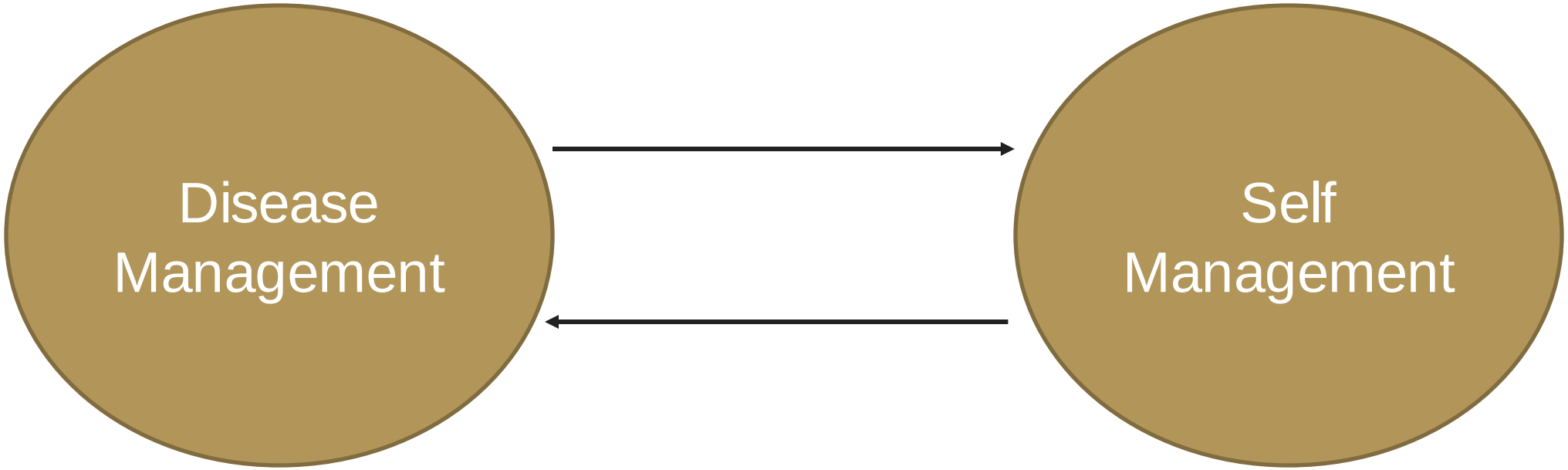
Purpose and Objectives

- PICOT question:
  - In post-kidney/renal transplant patients (<1-year post-transplant) with ESKD secondary to DM (P), does a tailored diabetic transplant education program (I) impact disease management of DM and distress level (O) over a three-month period (T)?
- Objectives:
  1. Implementation of a tailored diabetic education program based on evidence-based guidelines
  2. Increase the number of post-transplant patients with ESKD secondary to DM who receive tailored diabetic education over a 12-week period
  3. Evaluate the impact of intervention on disease management over a 12-week period
  4. Evaluate the impact of intervention on diabetes distress over a 12-week period

Concepts



Concepts cont.



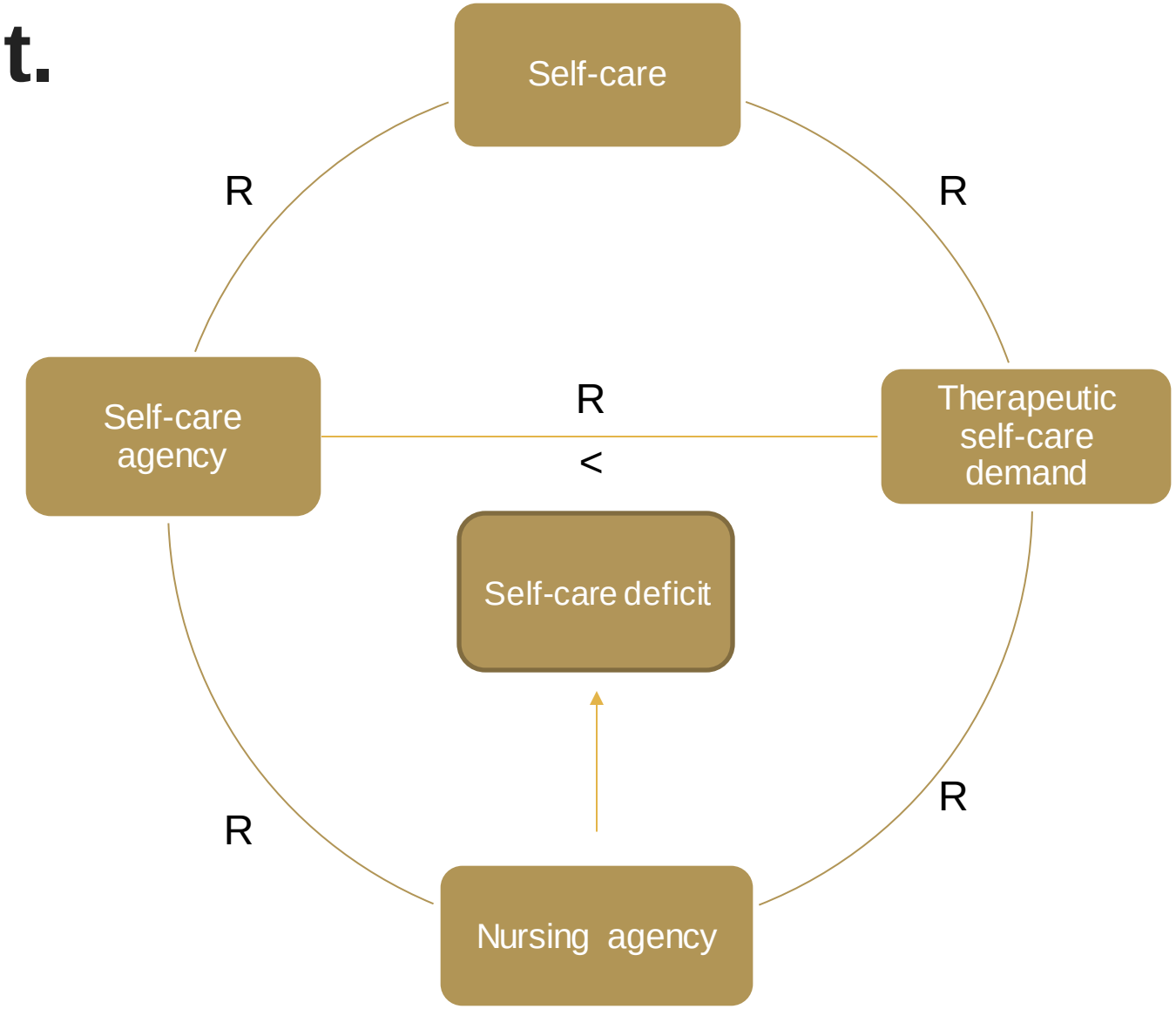
Theory

- Self Care Deficit Nursing Theory (SCDNT)
  - An answer to when and why people require nursing health service.
  - Individuals may be unable to carry out self-care due to limitations (due to health, internal and external factors).
  - Clear specifications for nurse and patient roles.
- Per Orem (1987), self-care deficit exist due to
  - Current inadequacy of self-care agency
  - Predicted for future as changes in:
    - Self-care agency/dependent care agency
    - Therapeutic self-care demand/dependent care demand

Methods

- **Project Design**
  - Quality improvement
    - To develop and implement an interactive educational program on DM and evaluate if the educational program had an impact on
      - Psychological distress
      - Glycemic control
- **Setting**
  - UNMH Adult Transplant Services
    - The longest running kidney transplant program in New Mexico.
    - Patient population: 16+ of age or older
    - Staff for Post transplant clinic includes: 1 NP, 1 Pharmacist, 1 Dietician, 1 Medical Assistant, 1 Office clerk and 1 Transplant coordinator.

Theory cont.


Self-care
R
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Self-care agency
R
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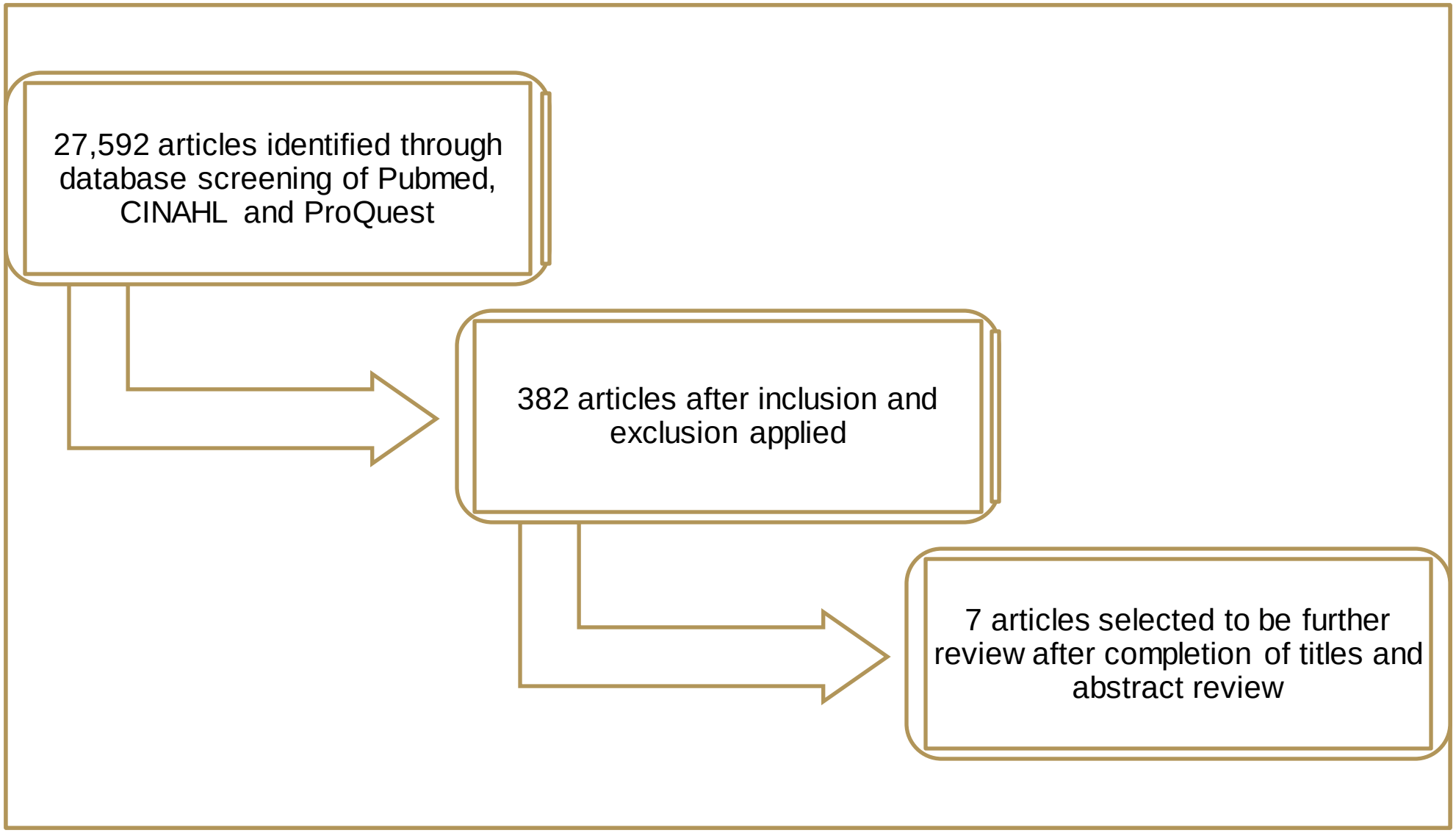
Therapeutic self-care demand
Self-care deficit
R
R
Nursing agency

Synthesis of the Evidence: Evidence Search

- PICOT question:
  - In post-kidney/renal transplant patients (<1-year post-transplant) with ESKD secondary to DM (P), does a tailored diabetic transplant education program (I) impact disease management of DM and distress level (O) over a three-month period (T)?
- Literature review:
  - Pubmed, CINAHL, and ProQuest databases.
  - The key words used were “tailored diabetic education”, “outcomes”, “diabetic related distress” and/or “psychological distress”.
  - Articles that were published within the past 5 years.
  - Inclusion: available in full text and peer-reviewed, English language, classified as meta-analysis, randomized controlled trial, or systematic review.

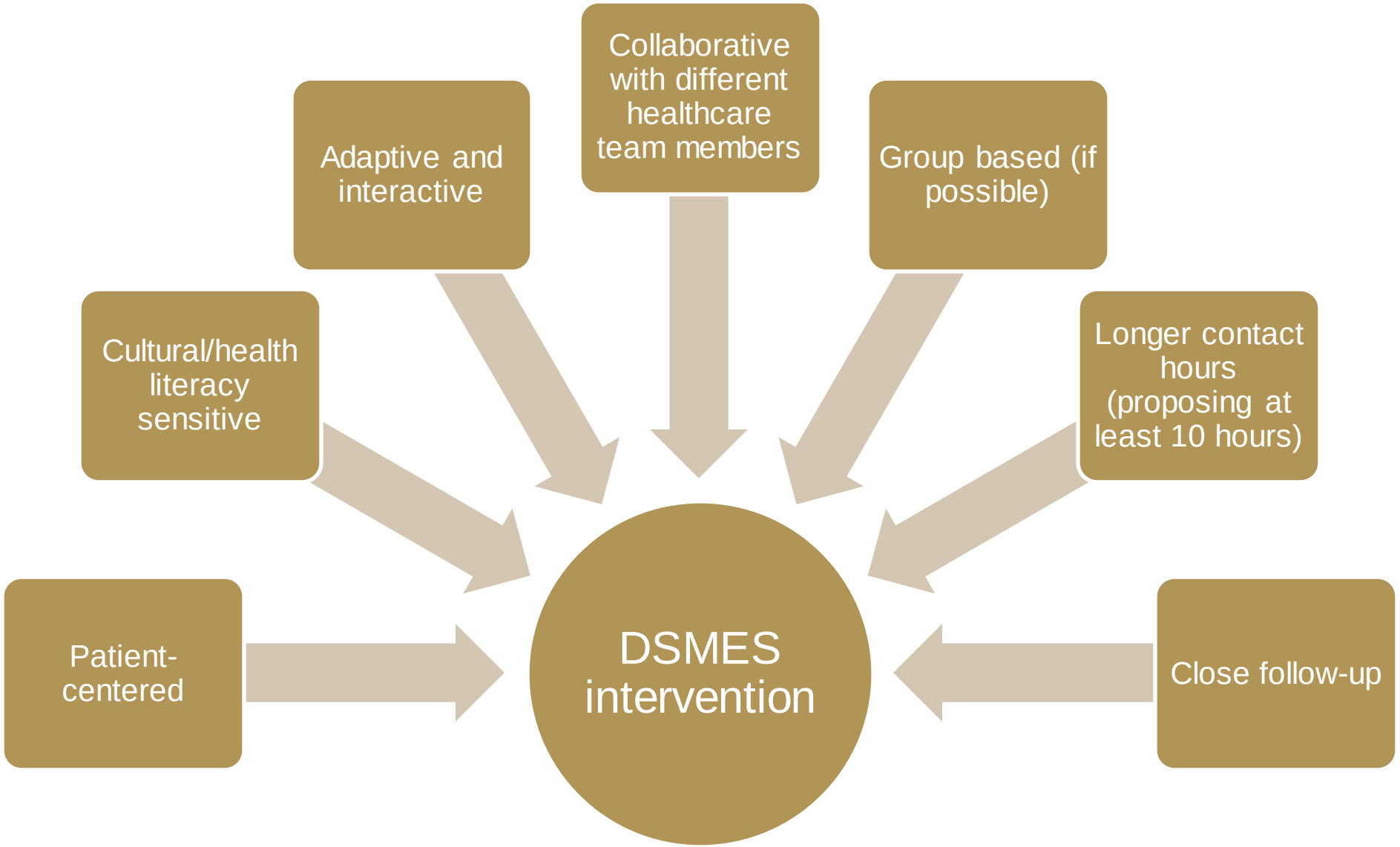
Synthesis of the Evidence: Evidence Search



Synthesis of the Evidence

- Quality of evidence
  - High, level I
- Common themes
  - Diabetic education such as DSMES is one of the essential elements of comprehensive diabetes medical care, along with medical nutrition therapy (Beck et al., 2017; Powers et al., 2020)
    - improving health outcomes
    - quality of life
    - cost effectiveness
  - Positive impact long term primary outcome including glycemic control (HbA1c)
  - Positive impact in the secondary outcomes (BMI, lipid panel, and/or other metabolic indicators)
  - Positive impact in psychological outcomes (disease-related distress, self-efficacy, and knowledge)

Synthesis of the Evidence cont.



Methods cont.

- **Participants**
  - Sampling
    - Kidney transplant recipients ≥ 18 years old transplanted at UNMH one year ago or less
    - Has a diagnosis of DM as the cause of ESKD
    - Must be able to read and write in English or Spanish.
  - Exclusion criteria
    - Kidney transplant recipients < 18 years old
    - Previous and/or current non-kidney transplants
    - Transplants performed outside of UNMH
    - Primary graft non-function
    - No laboratory data after transplant discharge
    - Patients with active malignancy
    - Unable to read and write in English or Spanish.
  - Recruitment
    - Convenience sampling
    - Adult kidney transplant patients who present for routine post-transplant follow-up care

Methods

- **Plan for Implementation**
  - Identify potential participants
  - Obtain verbal consent
  - Administer DDS screening tool and capture HbA1c value (pre-intervention)
  - Provide written education tool
  - Provide diabetic education based on content outline
  - Administer DDS screening tool and capture HbA1c value (post-intervention)

Methods cont.

DDS1.1

DDS

DIRECTIONS: Living with diabetes can sometimes be tough. There may be many problems and hassles concerning diabetes and they can vary greatly in severity. Problems may range from minor hassles to major life difficulties. Listed below are 17 potential problem areas that people with diabetes may experience. Consider the degree to which each of the 17 items may have distressed or bothered you DURING THE PAST MONTH and circle the appropriate number.

Please note that we are asking you to indicate the degree to which each item may be bothering you in your life, NOT whether the item is merely true for you. If you feel that a particular item is not a bother or a problem for you, you would circle "1". If it is very bothersome to you, you might circle "6".

	Not a Problem	A Slight Problem	A Moderate Problem	Somewhat Serious Problem	A Serious Problem	A Very Serious Problem
1. Feeling that diabetes is taking up too much of my mental and physical energy every day.	1	2	3	4	5	6
2. Feeling that my doctor doesn't know enough about diabetes and diabetes care.	1	2	3	4	5	6
3. Not feeling confident in my day-to-day ability to manage diabetes.	1	2	3	4	5	6
4. Feeling angry, scared and/or depressed when I think about living with diabetes.	1	2	3	4	5	6
5. Feeling that my doctor doesn't give me clear enough directions on how to manage my diabetes.	1	2	3	4	5	6
6. Feeling that I am not testing my blood sugars frequently enough.	1	2	3	4	5	6
7. Feeling that I will end up with serious long-term complications, no matter what I do.	1	2	3	4	5	6
8. Feeling that I am often failing with my diabetes routine.	1	2	3	4	5	6

DDS-17 survey

	Not a Problem	A Slight Problem	A Moderate Problem	Somewhat Serious Problem	A Serious Problem	A Very Serious Problem
9. Feeling that friends or family are not supportive enough of self-care efforts (e.g. planning activities that conflict with my schedule, encouraging me to eat the "wrong" foods).	1	2	3	4	5	6
10. Feeling that diabetes controls my life.	1	2	3	4	5	6
11. Feeling that my doctor doesn't take my concerns seriously enough.	1	2	3	4	5	6
12. Feeling that I am not sticking closely enough to a good meal plan.	1	2	3	4	5	6
13. Feeling that friends or family don't appreciate how difficult living with diabetes can be.	1	2	3	4	5	6
14. Feeling overwhelmed by the demands of living with diabetes.	1	2	3	4	5	6
15. Feeling that I don't have a doctor who I can see regularly enough about my diabetes.	1	2	3	4	5	6
16. Not feeling motivated to keep up my diabetes self management.	1	2	3	4	5	6
17. Feeling that friends or family don't give me the emotional support that I would like.	1	2	3	4	5	6

ere

Methods cont.

Taking Care of Diabetes after Kidney Transplantation

Blood sugar may be higher after kidney transplant. Here are some tips to help control blood sugars after transplant.

Be Active
- Exercise at least 30 minutes every day.

Take Medications
- Take all medications as directed.

Monitor
- Check blood sugars 3-4 times per day. Keep a log of blood sugar readings. Be sure to write down any low blood sugars and the time of day. This information is helpful for the transplant team to adjust certain medications used to manage high blood sugars.
- Blood sugar goals:
  - Before meals upon waking: less than 130
  - 1-2 hours after eating a meal: less than 180
- If blood sugar is less than 75 or greater than 400, please notify Transplant Coordinator.

Eat healthy
- Drink plenty of water: 64 oz. or 2L per day.
- Eat more vegetables
  - Examples: broccoli, carrots, cauliflower, green beans, asparagus, Brussels sprouts, cucumbers
- Avoid sugary drinks (Coke, Pepsi, sweet tea, lemonade, cranberry juice)
- Have two to three servings of carbohydrate foods (30-45 grams carbs) at each meal, one serving (15 grams) for snacks.
  - Carbohydrate foods are starchy foods like bread, potatoes, noodles, cereal, rice, beans, corn, peas; fruit; and milk and yogurt.
- Have nuts, some low-fat cheese, or Greek yogurt to help raise phosphorus levels after transplant.

Healthy Coping
- Taking care of a new transplant kidney and diabetes can be overwhelming. The UNMH Transplant team Social Worker and a Psychologist are available to help assist patients who may be feeling overwhelmed.

Problem Solving
- Blood sugars can be affected by medications, food, activity, stress, and illness. Feel free to reach out to the Dietitian or Diabetes Pharmacist for help with high blood sugars or low blood sugars.

Reducing Risk
- High blood sugars can damage the transplanted kidney and make it harder to recover after surgery. The UNMH Transplant Team is here to ensure each transplant kidney has a successful outcome. Do not hesitant to reach out to the Transplant team for any assistance or help!

English Version

Control de la diabetes después de un trasplante de riñón

Los niveles de azúcar en la sangre pueden estar más elevados después de un trasplante de riñón. Aquí hay algunos consejos para ayudar a controlar los niveles de azúcar después del trasplante.

Mantenerse activo
- Haga ejercicio por lo menos 30 minutos cada día.

Tomar los medicamentos
- Tome todos los medicamentos de acuerdo con las indicaciones.

Observar
- Revise su nivel de azúcar en la sangre de 3 a 4 veces al día. Mantenga un registro de las lecturas de los niveles de azúcar. Asegúrese de escribir cualquier nivel bajo de azúcar en la sangre y la hora del día. Esta información es útil para el equipo de trasplante para ajustarle ciertos medicamentos que se usan para controlar los niveles elevados de azúcar.
- Objetivos para el nivel de azúcar en la sangre:
  - Antes de comer al despertar: menos de 130
  - 1 a 2 horas después de haber comido: menos de 180
- Si su azúcar es menos de 75 o más de 400, por favor notifique a su coordinadora de trasplante

Comer saludablemente
- Beba mucha agua: 64 onzas o 2L por día.
- Coma más verduras
  - Por ejemplo: broccoli, zanahorias, coliflor, ejotes, espárragos, coles de Bruselas, pepinos
- Evite las bebidas azucaradas (Coke, Pepsi, té dulce, limonada, jugo de arándano)
- Consuma de dos a tres porciones de alimentos ricos en carbohidratos (30 a 45 gramos de carbohidratos) en cada comida, y una porción (15 gramos) para los refrigerios.
  - Los alimentos ricos en carbohidratos son alimentos con almidón como el pan, las papas, los tallarines, el cereal, el arroz, los frijoles, el maíz, los chícharos; fruta; y leche y yogur.
- Consuma nueces, algunos quesos bajos en grasa, o yogur griego para ayudar a aumentar los niveles de fósforo después del trasplante.

Adaptación saludable
- Cuidar de un nuevo riñón trasplantado y controlar la diabetes puede ser abrumador. El trabajador social del equipo de Trasplante de UNMH y un psicólogo están disponibles para ayudar a los pacientes que se puedan estar sintiendo abrumados.

Solución de problemas
- Los niveles de azúcar en la sangre pueden verse afectados por medicamentos, alimentos, actividad, estrés, enfermedad. Siéntase con la libertad de comunicarse con el nutriólogo o el farmacéutico de la diabetes para solicitar ayuda con los niveles elevados de azúcar o los niveles bajos de azúcar.

Reducir el riesgo
- Los niveles elevados de azúcar pueden dañar el riñón trasplantado y hacer que su recuperación después de la operación sea más difícil. El equipo de Trasplante de UNMH está aquí para asegurarse que cada riñón trasplantado tenga un resultado exitoso.
- ¡No dude en comunicarse con el equipo de Trasplante para solicitar asistencia o ayuda!

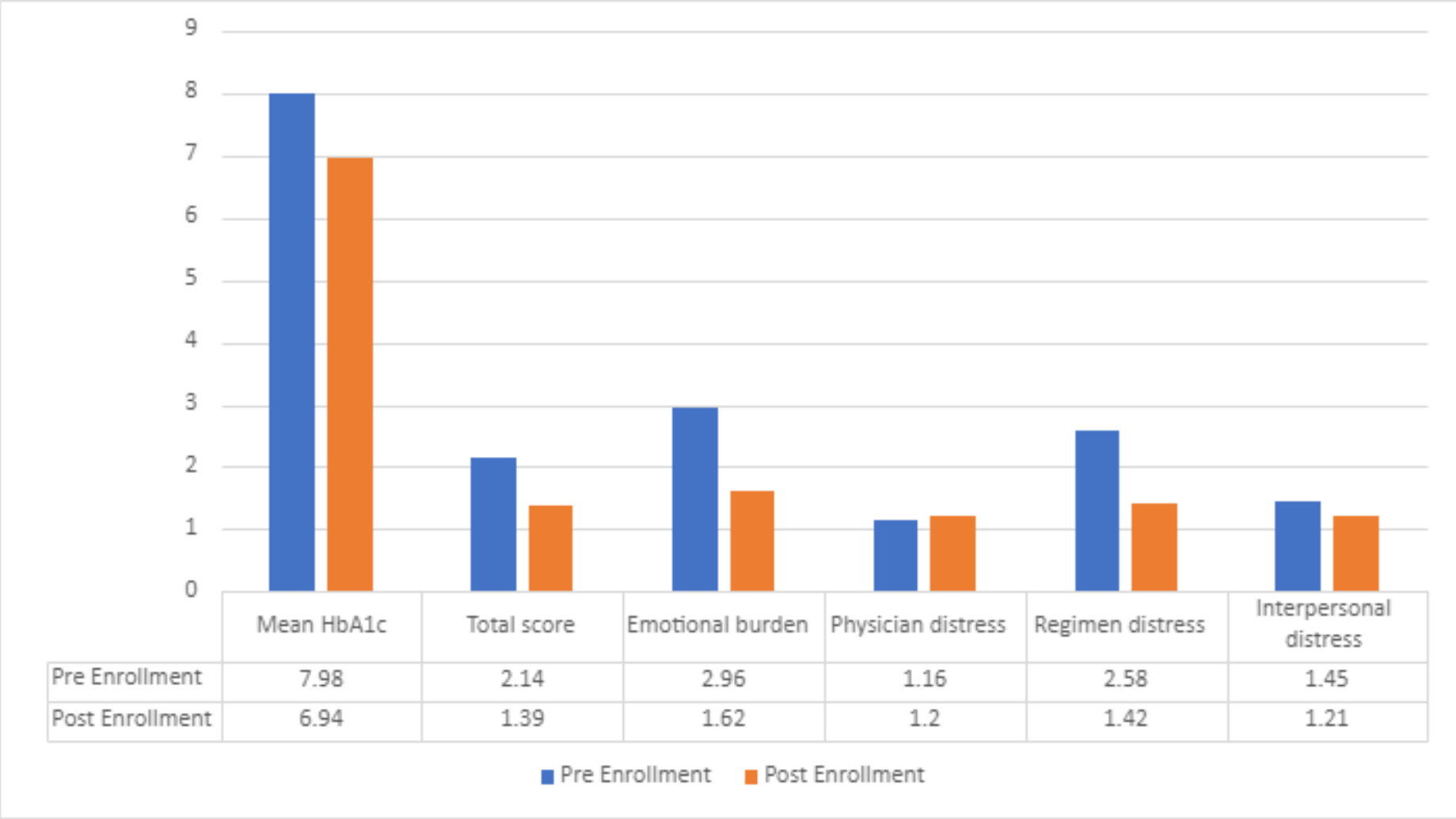
Spanish Version

Results

Baseline characteristic

	Total (N = 11)	CI (95%)
Mean age at transplant, years ±SD	63.9 (12.23)	8.22
Gender, male n (%)	9 (81.8)	
Race, n (%)		
American Indian/Alaska Native	6 (54.5)	
Hispanic/Latino	3(45.3)	
White/Anglo	1 (0.1)	
African American	1 (0.1)	
Ethnicity, n (%)		
Not of Hispanic or Latino origin	7 (63.6)	
Hispanic or Latino origin	4 (36.4)	
Duration of transplant (days), IQR	224 (80-288)	78.81
Total education time (hours), IQR	2.5 (2.5-2.75)	0.33

Results



	Mean HbA1c	Total score	Emotional burden	Physician distress	Regimen distress	Interpersonal distress
Pre Enrollment	7.98	2.14	2.96	1.16	2.58	1.45
Post Enrollment	6.94	1.39	1.62	1.2	1.42	1.21

Implications for Practice

- In post-kidney transplant patients (<1-year post-transplant) with ESKD secondary to DM, a tailored diabetic transplant education program has a positive impact on disease management of DM and distress level over a three-month period.

  - Reduction observed in:
    - HbA1c
    - Total distress score
    - Emotional burden
    - Regimen distress
    - Interpersonal distress.

Implications for Practice

- Strength
  - The intervention was evidence-based.
  - Patient's safety was prioritized.
  - The median time of the education was 2.5 hours
  - The needs of the regional demographics was served.
- Limitations
  - Small sample size.
  - Center specific.
  - HbA1c as an indicator of glycemic control.
  - Unclear on which component had the most impact studied outcomes.

Conclusion

- A multidisciplinary approach is required for post-transplant recipients, especially in DM management.
- Participation in a tailored, multidisciplinary diabetic education had shown to improve glycemic control and mitigate the psychological distress in kidney transplant patients with DM comorbidity.
- Potential for further education on disease process would positively impact outcomes in transplant patient with DM.

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