

standard nutrition education on dimensions of psychological health and well-being. **METHODS/STUDY POPULATION:** This is an exploratory analysis of the SPICE UP MyPlate Pilot Study, a randomized clinical trial investigating the effects of a novel 12-week culinary-focused nutrition education intervention on diet quality relative to standard nutrition education in healthy adults aged 31–59 years. The intervention included eight modules focused on flavorful healthy eating. The control group received a printed MyPlate resource about healthy eating. Psychological health and well-being outcomes included depression and anxiety symptoms, perceived stress, loneliness, and psychological well-being. Linear mixed models will be used for analysis. **RESULTS/ANTICIPATED RESULTS:** Data collection for the SPICE UP MyPlate Pilot Study is ongoing at the time of this writing and will be completed in December 2025. All baseline visits have been completed, and 55 participants have been randomized. At baseline, the sample is predominately female (76% female; 24% male) and White (91% White; 5% Asian; 4% African American) with a mean age of 46 ± 8 years and a mean BMI of 27.2 ± 6.39 kg/m². Results of this analysis are anticipated to show the preliminary effectiveness of culinary-focused nutrition education compared to standard nutrition education on 1) depression and anxiety symptoms, 2) perceived stress, 3) loneliness, and 4) psychological well-being. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Poor diet quality and poor psychological health are independent risk factors for leading causes of death. Understanding the effectiveness of culinary-focused nutrition education for improving diet quality and psychological health is important for developing population-level interventions that meaningfully reduce disease risk.

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Bioengineered ear constructs incorporating decellularized costal cartilage demonstrate improved *in vitro* morphological stability for future clinical translation*

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OBJECTIVES/GOALS: We aim to develop new tissue-engineered ear tissue that more closely mimics native elastic cartilage and maintains its topographic form for reconstructive auricular surgery. By integrating decellularized cartilage (DCM) into chondrocyte-seeded collagen matrices, we seek to improve structural stability to support future clinical translation. **METHODS/STUDY POPULATION:** Bovine auricular chondrocytes were isolated via enzymatic digestion, expanded to passage 3, and encapsulated at 25 million cells/mL into four construct formulations composed of 1% type I collagen mixed with varying amounts of DCM: (1) 100% collagen, (2) 70% collagen + 30% DCM, (3) 40% collagen + 60% DCM, and (4) 10% collagen + 90% DCM. DCM was prepared by zesting ovine rib cartilage into

~0.5 mm³ flakes, followed by chemical and enzymatic decellularization. Constructs were packed into 3D-printed scaffolds and cultured for 0, 1, or 2 months. At each timepoint, constructs were assessed for gross volume, volume retention (normalized to baseline), and angle at the dome–base interface as a geometric surrogate for shape retention. Histology evaluated cell distribution and cartilage-specific matrix deposition. **RESULTS/ANTICIPATED RESULTS:** At baseline, volumes were comparable across groups. By 1 and 2 months, constructs with higher DCM content yielded significantly greater volume retention. At 2 months, mean retention in the 90% DCM group was $94.0\% \pm 6.2\%$, compared to $64.7\% \pm 4.1\%$ in 30% DCM ($p < 0.01$) and $74.7\% \pm 5.9\%$ in 0% DCM ($p < 0.05$). Angle analysis likewise showed that higher DCM preserved sharper dome–base curvature. Mean angle change at 2 months was $3.0^\circ \pm 3.6^\circ$ in 90% DCM versus $17.6^\circ \pm 5.7^\circ$ (70% DCM, $p < 0.01$), $16.3^\circ \pm 5.7^\circ$ (30% DCM, $p < 0.05$), and $21.6^\circ \pm 8.1^\circ$ (0% DCM, $p < 0.001$). In all groups, histology confirmed chondrocyte viability, and inclusion of DCM did not hinder cell distribution in collagen. These findings suggest DCM reinforces construct stability, and we anticipate similar volume and shape retention in upcoming *in vivo* rat studies. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Incorporating DCM improves *in vitro* form retention in bioengineered ear cartilage without impeding cell viability, suggesting DCM can act as an internal rebar to resist contraction and preserve geometry. By continuing to advance this construct translationally, next *in vivo*, we aim to enable its eventual use in clinical ear reconstruction.

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Themes shaping type 2 diabetes self-management among Latino/Hispanic adults: A qualitative digital storytelling study

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OBJECTIVES/GOALS: To address the disparity in type 2 diabetes within the Latino community, we utilized digital story telling narrative-based videos created by and for individuals with lived experiences. **METHODS/STUDY POPULATION:** We utilized digital story telling narrative-based videos created by and for individuals with lived experiences. The targeted population is the Latino community. **RESULTS/ANTICIPATED RESULTS:** Our qualitative results were discordant with the quantitative findings. Rather than four distinct patterns based on self-efficacy and HbA1c levels, we found five common themes across the groups: (1) trauma shapes readiness for change; (2) caregiving responsibilities can hinder self-management; (3) persistence is key to long-term T2D control; (4) social support is essential; and (5) self-advocacy and a desire for knowledge drive success. These results highlight the multifaceted challenges Latino/Hispanic individuals face in managing type 2 diabetes, where overlapping social and cultural factors influence both self-efficacy and health outcomes. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Interventions for Latino/Hispanic communities should