

AYA TYPE 1 DIABETES INTERVENTION ARTICLE SUMMARIES

Albanese-O'Neill, A., Beauchamp, G., Thomas, N., Westen, S. C., Johnson, N., Schatz, D., & Haller, M. J. (2018). Transition Education for Young Adults With Type 1 Diabetes: Pilot Feasibility Study for a Group Telehealth Intervention. *JMIR diabetes*, 3(4), e10909.

Twenty young adult patients, aged 18-25, with Type 1 Diabetes completed five brief videoconference group education sessions focused on transition of care as part of a pilot study. Satisfaction scores were high with seemingly low attrition and the intervention was found to be feasible and acceptable. Scores related to diabetes related distress and self-efficacy trended in the expected directions but fell short of statistical significance. Authors suggest an RCT to more thoroughly assess interventions targeting psychosocial factors and glycemic outcomes and additional measures of diabetes management with a control group.

Christie, D., Thompson, R., Sawtell, M., Allen, E., Cairns, J., Smith, F., ... & Wiggins, M. (2014). Structured, intensive education maximising engagement, motivation and long-term change for children and young people with diabetes: a cluster randomised controlled trial with integral process and economic evaluation-the CASCADE study. *Health Technology Assessment (Winchester, England)*, 18(20), 1.

This RCT of 362 patients with type 1 diabetes, aged 8-16, assessed the feasibility of a clinic based psychoeducational intervention. Outcomes measures included glycemic control (e.g., HbA1C), knowledge, diabetes management routine, clinic attendance, intervention engagement, adjustment, and QOL. No changes in HbA1c were noted at 12 or 24 month follow up. Participants reported higher responsibility, knowledge, and motivation to improve management of diabetes, which appeared to be maintained over follow up period. Further research involving behavior change methods to improve metabolic control is warranted.

Di Bartolo, P., Nicolucci, A., Cherubini, V., Iafusco, D., Scardapane, M., & Rossi, M. C. (2017). Young patients with type 1 diabetes poorly controlled and poorly compliant with self-monitoring of blood glucose: can technology help? Results of the i-NewTrend randomized clinical trial. *Acta diabetologica*, 54(4), 393-402.

An experimental meter and telemedicine system (iBGStar™ + DMAPp) was compared to a traditional glucose meter in an RCT with 168 patients with Type 1 diabetes, aged 14-24, who have elevated HbA1c and poor adherence to SMBG.. No statistically significant differences in HbA1c, SMBG, or QOL were found between groups at any time point. However, participants in both groups who increased from 1 to 2 SMBG tests/day had HbA1c reduction. Future studies should aim to identify ways to effectively leverage telemedicine to increase SMBG.

Ellis, D. A., Carcone, A. I., Slatcher, R., Naar-King, S., Hains, A., Graham, A., & Sibinga, E. (2019). Efficacy of mindfulness-based stress reduction in emerging adults with poorly controlled, type 1 diabetes: A pilot randomized controlled trial. *Pediatric diabetes*, 20(2), 226-234.

This pilot study examined the efficacy of mindfulness-based stress reduction (MCSR), cognitive-behavioral stress management (CBSM), and diabetes support (DS) group for 48 patients (i.e., 16 in each group), aged 16-20, with poorly controlled type 1 diabetes. Participants in the MBSR group

reported decreased stress at end of treatment and 3-month follow up, but not in the CBSM or DS groups. No changes in depression or diabetes-related endpoints were found in the MBSR or CBSM groups. The DS group resulted in decreased depressive symptoms and improved glycemic control via HbA1c. Future studies should consider alternative implementation strategies to increase participation and inclusion of peer support for this age group.

Ellis, D. A., Carcone, A., Slatcher, R., & Sibinga, E. (2018). Feasibility of Mindfulness-Based Stress Reduction for older adolescents and young adults with poorly controlled type 1 diabetes. *Health psychology and behavioral medicine*, 6(1), 1-14.

Acceptability and feasibility of mindfulness-based stress reduction (MBSR) were evaluated with 10 patients with type 1 diabetes, aged 16-20. Participants indicated that they found the intervention helpful for stress reduction but not for diabetes management; however, objective measures of glycemic control (i.e., 7-day BGM) were significantly better a post-test. Authors suggest inclusion of more diabetes management education, this could also help participants link stress reduction with diabetes management. Studies with larger samples are needed to further identify how MBSR may impact stress and diabetes-specific outcomes.

Haas, J., Persson, M., Brorsson, A. L., Toft, E. H., & Olinder, A. L. (2017). Guided self-determination-young versus standard care in the treatment of young females with type 1 diabetes: study protocol for a multicentre randomized controlled trial. *Trials*, 18(1), 562.

A planned, parallel-group multicenter randomized controlled trial that will investigate the effect of guided self-determination on glycemic control, self-management, treatment satisfaction, perceived health and QoL, fewer diabetes-related family conflicts, and improved psychosocial self-efficacy. This manuscript outlines the protocol in place for this project.

Hilliard, M. E., Eshtehardi, S. S., Minard, C. G., Wheat, S., Gunn, S., Sanders, C., ... & Anderson, B. J. (2018). Featured Article: Strengths-Based, Clinic-Integrated Nonrandomized Pilot Intervention to Promote Type 1 Diabetes Adherence and Well-Being. *Journal of pediatric psychology*, 44(1), 5-15.

Acceptability and feasibility of a two session, strengths-based behavioral intervention for 60 patients with type 1 diabetes, aged 12-17, was evaluated. A "Diabetes Strengths Profile" was created based off self- and parent-report responses on assessment forms. The intervention aimed to use the "Diabetes Strengths Profile" to reinforce patient/family strengths and positive self-management behaviors and evaluate preliminary impact on diabetes and emotional outcomes (e.g., adherence, glycemic control, family conflict). Adolescent-reported behavioral and emotional outcomes included improved adherence, family conflict, sense of diabetes burden, and number of strengths, as well as improvement in adolescent-provider relationship. Future studies should consider inclusion of a control group to draw more definitive conclusions about the impact of the intervention.

Laffel, L. M., Vangsness, L., Connell, A., Goebel-Fabbri, A., Butler, D., & Anderson, B. J. (2003). Impact of ambulatory, family-focused teamwork intervention on glycemic control in youth with type 1 diabetes. *The Journal of pediatrics*, 142(4), 409-416.

This RCT compared a family teamwork intervention to standard multidisciplinary care for 105 patients aged 8-17 with type 1 diabetes. Findings indicated a significant difference in glycemic control after 1 year for those in the intervention group, which was attributed to the teamwork-

mediated family involvement in diabetes management tasks. No changes in division of responsibility, conflict, or quality of life were found. Group status and frequency of BGM were the only two significant predictors of glycemic control at the one year mark. Inclusion of the family is key and additional studies investigating family involvement, particularly with patients who have had diabetes for longer duration, is recommended.

Nansel, T. R., Anderson, B. J., Laffel, L. M., Simons-Morton, B. G., Weissberg-Benchell, J., Wysocki, T., ... & Lochrie, A. S. (2009). A multisite trial of a clinic-integrated intervention for promoting family management of pediatric type 1 diabetes: feasibility and design. *Pediatric Diabetes, 10*(2), 105-115.

Feasibility of a multi-site RCT aimed at increasing family involvement in diabetes management including 122 patients, aged 9 to 14.5 years old with type 1 diabetes, was evaluated. Findings suggest feasibility, low attrition rates, appropriate intervention fidelity, and high satisfaction. Clinic flow was not negatively impacted. No significant changes were noted on assessments or diabetes related measures, which was expected given the low dose of intervention. Suggestions and limitations focused on strategies to improve implementation and fidelity across multiple sites.

O'hara, M. C., Hynes, L., O'donnell, M., Nery, N., Byrne, M., Heller, S. R., ... & Irish Type 1 Diabetes Young Adult Study Group. (2017). A systematic review of interventions to improve outcomes for young adults with Type 1 diabetes. *Diabetic Medicine, 34*(6), 753-769.

A systematic review of 18 publications examining interventions for patients aged 15-30 years with type 1 diabetes. Studies were clustered by Health Service Delivery, Group Education and Peer Support, Digital Platforms to Influence Self-care Behaviors, and Diabetes devices. Findings across outcomes were inconsistent with some studies resulting in significant changes in relations to diabetes management, objective measures of diabetic control, and psychosocial outcomes; whereas other studies did not find significant changes. Findings were limited by differences in sample sizes, study design, and study outcomes.

Raymond, J. K., Berget, C. L., Driscoll, K. A., Ketchum, K., Cain, C., & "Fred" Thomas, J. F. (2016). CoYoT1 Clinic: innovative telemedicine care model for young adults with type 1 diabetes. *Diabetes technology & therapeutics, 18*(6), 385-390.

This pilot study investigated the feasibility and acceptability of the Colorado Young Adults with Type 1 Diabetes (CoYoT1) Clinic, which incorporates telemedicine and peer interactions in the clinical care model. Patients were aged 18-25 and completed a routine clinic appointment via web-based videoconferencing, as well as participated in a group appointment with other young adults. Engagement in the CoYoT1 clinic was acceptable to young adult patients, led to reduced lost work time, more frequent clinic visits, and high satisfaction. Providers also found it to be satisfactory and allowed them to engage an otherwise difficult to participate patient population. Given that participants self-selected into the service, a more rigorous study design could help assess if findings would generalize.

Reid, M. W., Krishnan, S., Berget, C., Cain, C., Thomas, J. F., Klingensmith, G. J., & Raymond, J. K. (2018). CoYoT1 clinic: home telemedicine increases young adult engagement in diabetes care. *Diabetes technology & therapeutics, 20*(5), 370-379.

Further investigation of the CoYoT1 Clinic to determine if this innovative model improves engagement, satisfaction, and adherence for patients with type 1 diabetes, aged 18-25. Findings suggest that compared to controls, CoYoT1 patients engaged in care more frequently and experienced significantly fewer decreases in adherence behaviors. No differences in HbA1c were noted between groups of time points, though home telemedicine has significant, positive impacts compared to controls for young adults with type 1 diabetes. Authors note future directions of an RCT with psychosocial variables included.

Rosenberg, A. R., Yi-Frazier, J. P., Eaton, L., Wharton, C., Cochrane, K., Pihoker, C., ... & McCauley, E. (2015). Promoting resilience in stress management: a pilot study of a novel resilience-promoting intervention for adolescents and young adults with serious illness. *Journal of pediatric psychology, 40(9), 992-999.*

Feasibility and acceptability of the Promoting Resilience in Stress Management (PRISM) intervention for patients aged 12-25 with type 1 diabetes (n = 15) or a new diagnosis of cancer was examined. Feasibility of the intervention varied by patient diagnosis, with curriculum flexibility being crucial to success. PRISM was valued by patients and caregivers, and qualitative comments highlighted the importance of teaching stress management, goal-setting, cognitive reframing, and benefit finding to patients with serious medical illness. Future implementations should consider ways to increase parental/family involvement consistently throughout intervention.

Sequeira, P. A., Pyatak, E. A., Weigensberg, M. J., Vigen, C. P., Wood, J. R., Ruelas, V., ... & Peters, A. L. (2015). Let's empower and prepare (LEAP): evaluation of a structured transition program for young adults with type 1 diabetes. *Diabetes Care, 38(8), 1412-1419.*

Efficacy of a structured transition program for young adults with type 1 diabetes, ages 19-25, was evaluated in comparison to treatment as usual (control). Findings suggest that transition programs can improve glycemic control, reduce incidence of hypoglycemia, improve overall well-being, and contribute to increased rates of successful transition to adult care in this population. Effects of the intervention were greatest among young adults with lower SES. A larger randomized trial would be beneficial to better assess between group outcomes.

Spaic, T., Robinson, T., Goldbloom, E., Gallego, P., Hramiak, I., Lawson, M. L., ... & Simone, A. (2019). Closing the Gap: Results of the Multicenter Canadian Randomized Controlled Trial of Structured Transition in Young Adults With Type 1 Diabetes. *Diabetes care, 42(6), 1018-1026.*

An RCT assessing the efficacy of a transition program (compared to standard care) with 205 young adults (aged 17-20) with type 1 diabetes. During the intervention (18 months) those in the treatment arm were more likely to engage in care and reported reduced diabetes distress, lower emotional burden, and higher satisfaction when compared to the control group. However, these findings were not maintained 12 months post-intervention. Authors suggest exploring alternative methods of implementation to broaden applicability and feasibility.

Weigensberg, M. J., Vigen, C., Sequeira, P., Spruijt-Metz, D., Juarez, M., Florindez, D., ... & Pyatak, E. A. (2018). Diabetes Empowerment Council: Integrative Pilot Intervention for Transitioning Young Adults With Type 1 Diabetes. *Global advances in health and medicine, 7, 2164956118761808.*

This study aimed to pilot an integrative intervention, based on self-determination theory, amongst young adults with type 1 diabetes who participated in the 1-year long LEAP study. Participation in the Diabetes Empowerment Council involved 12 sessions (90 minutes each) and highlighted several integrative treatment modalities. The council was well accepted by participants and they noted improvements in self-acceptance, stress, relatedness, and motivation, though some issues with feasibility were identified. Quantitative results support these thoughts with improvements in depression, perceived stress, and well-being. Authors call for a larger RCT to solidify results.