

TWIGS: Teams with Intergenerational Support

(Practice-tested)

Summary of Evaluation Methods

Teams with Intergenerational Support (TWIGS) is a 30-lesson curriculum focused on gardening and nutrition that aims to increase children's knowledge and behavior related to healthy eating. TWIGS was pilot-tested from 2001-2002 using a quasi-experimental approach. Three schools from each county were randomly selected into a control group, treatment group 1 (nutrition education only), or treatment group 2 (nutrition and gardening). Out of the 30 lessons, five nutrition lessons (*Nutrient Values, Food Guide Pyramid, Edible Plant Parts, Grains, and Apples*) and five gardening lessons (*Soil Analysis, Seed Parts & Germination, Vegetable Seed Greenhouses, Spices, and Worms*) were pre-selected for instructors to deliver. Then, a pre/post-test consisted of 14 multiple-choice questions on knowledge related to nutrition and fruits and vegetables was administered.

In 2007, Riverside County subsequently conducted a pre/post evaluation using only seven pre-selected lessons: five gardening lessons (*Soil, Speed Magic, Starting with Seeds, Ready, Set, Grow, and Wet and Wonderful*) and two nutrition lessons (*Eat Your Plants* and *Safe and Clean*) delivered over six months. The student self-report pre/post-test consisted of 12 multiple-choice questions assessing five impact indicators: "Nutritional knowledge", "Food selection", "Food preparation and Safety skills", and "Eat a variety of foods" and "Tried in the past week". The lessons and questionnaire were different from the initial 2001-2002 pilot study.

As UC CalFresh county programs adopted the curriculum across the state, additional outcome evaluation data became available. This summary includes outcome evaluation data from UC CalFresh's retrospective Teacher Observation Tool (TOT) collected during FFY 2012-2017 (October 1, 2011 to September 30, 2017). The TOT captures teachers' assessment of changes in their students' behavior (5 items) and their own behaviors and practices (5 items) related to healthy food choices, trying new foods, dairy foods, fruits and vegetables, physical activity, and hand washing. Teachers responded to student items using a five-point Likert scale ("Strongly agree" to "Strongly disagree"). Teachers' own behaviors and practices were collected on a four-point Likert scale with response options for "A lot more often", "Somewhat more often", "About the same as before", and "Not sure/unable to respond".

Evaluation Audience

The 2001-2002 pilot-test evaluated 312 third graders at 18 elementary schools across six counties (Calaveras, Contra Costa, Riverside, San Joaquin, San Luis Obispo, and San Mateo). Then in 2007, TWIGS was evaluated with a sample of 95 students from three elementary and two middle schools in Riverside County, but only 76 students completed both pre- and post-surveys. From 2011-2017, teacher evaluation data came from 22 teachers who completed the retrospective TOT survey observing a total of 561 students from first to sixth grade across nine counties (Amador, Fresno, Riverside, San Francisco, San Joaquin, San Mateo, Shasta, Stanislaus, and Trinity). All of the schools participating in the evaluations were SNAP-Ed eligible with 50% or more of the students receiving free or reduced-price school meals.

Curriculum Audience

TWIGS is a gardening and nutrition curriculum intended for youth (in Kindergarten through 6th grade). In addition, authors indicate that the curriculum can be modified for use with preschoolers and teens.

Summary of Evaluation Results

Using a knowledge score ranging from 0 to 14, the 2001-2002 pilot-test findings showed that the average knowledge score for treatment group 2 (nutrition and gardening) increased from pre to post with a gain of 3.1 (pre-test=5.7; post-test=8.8), while treatment group 1 (nutrition education only) increased with a smaller gain of 1.8 (pre-test=5.8; post-test=7.6), and the control group remained the same with only a slight difference of 0.2 (pre-test=6.5; post-test=6.7). Overall, there were no statistically significant changes in either treatment group from pre to post when compared to the control group.

In 2007, findings from Riverside County showed improvements from pre to post student surveys across all five impact indicators. The results showed students increased their knowledge about plants and nutrition (63%), improved practices in food preparation and safety (34%), increased their ability to select nutritious foods (29%), and improved consumption of a variety of foods (25%). No pre to post statistical significance testing was reported.

In FFY 2012-2017, TOT results indicated that the majority of teachers who delivered TWIGS reported agreeing or strongly agreeing that compared to the beginning of the school year more students: can identify healthy food choices (96%) and are willing to try new foods offered at school (86%). Both of these findings surpass the UC CalFresh SMART Objectives of at least three-quarters ($\geq 75\%$) of teachers reporting improvements in student knowledge and behavior. In addition, teachers reported agreeing or strongly agreeing that compared to the beginning of the school year more students: bring fruit and/or veggies as a snack (77%), choose fruits/veggies in the cafeteria or at class parties (59%), and wash hands before handling food (73%). This demonstrates the efficacy of the curriculum in improving students' ability to identify healthy food choices, try new foods, bring and select fruits and vegetables to eat. Furthermore, more than three-quarters of teachers also perceived changes in their own behaviors and practices (i.e. offer healthy food choices, remind families to bring healthy snacks, encourage students to eat breakfast/be physically active, and make healthier personal food choices) when reflecting back to the beginning of the school year. Additional pre and post behavioral data will be added in subsequent years for grades 4th through 8th.

References

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Johns, M.J., Bersamin, M., Subramaniam, A., and Yao, T. (2005, June). *Nutrition Education Through Gardening – Does It Work?* Acknowledgements: Ganthavorn, C., Cutter, J., Bishop, J., Hampton, K. Neelon, M., Acevedo, M. Research poster presented at the American Association of Family and Consumer Sciences national meeting in Minneapolis, MN.

Unpublished findings from CalFresh Healthy Living, UC State Office. Please contact the State Office at uccalfresh_support@ucdavis.edu for questions. Summary results: [W:\UC CalFresh\FSNEPDrop\01.1 CURRICULA\Curriculum Evidence Summary\TWIGS\TWIGS TOT Results.xlsx](#)



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