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✓ **Study Aim:** Determine whether Building Resilience for Healthy Kids yields an equitable increase in resilience for racial and ethnic minority youth

## ABSTRACT

Although suicide is a leading cause of mortality among racial and ethnic minority youth, limited data exists regarding the impact of school-based mental health interventions on these populations, specifically. A single-arm pragmatic trial design was utilized to evaluate the equity of outcomes of the universal, school-based mental health coaching intervention, Building Resilience for Healthy Kids. All sixth-grade students at an urban public middle school in Colorado Springs, Colorado were invited to participate. Students attended six weekly 1:1 sessions with a trained health coach discussing goal setting and other resilience strategies. 285 students (86%) participated with 252 (88%) completing both pre- and post-intervention surveys. Students were a mean age of 11.4 years with 55% identifying as girls, 69% as White, 13% as a racial minority, and 18% as Hispanic. While Hispanic participants demonstrated significantly lower scores for baseline measures of self-efficacy, no significant differences by race and ethnicity for self-efficacy remained at the post-intervention survey. In addition, racial minority students exhibited significantly greater improvements in personal and total resilience compared to White and Hispanic students, controlling for baseline scores. Overall, our data together suggests that Building Resilience for Healthy Kids may represent an equitable and accessible option for improving youth mental health.

## BACKGROUND

- Suicide is a **major preventable cause of death** among youth, particularly age **10-14 years old**<sup>1,2</sup>
- Risk factors include **low self-esteem, loneliness, relational conflicts, mood/anxiety disorders**<sup>3-7</sup>
- **Resilience**, i.e., exhibiting positive adaptation when faced with adversity, may represent a protective process<sup>8-10</sup>
- Certain racial and ethnic minority populations are particularly at risk for suicidal thoughts and behaviors, including youth identifying as **Native American, Black, and Hispanic**<sup>1,11</sup>
- **School-based mental health interventions** offer potential for bolstering youth resilience and thereby decreasing psychological distress<sup>10,12-14</sup>
- However, few studies evaluating existing school-based mental health programs have examined intervention outcomes specifically among racial and ethnic minorities
- **Hypothesis:** Based on the individualized nature of the intervention, we expected that Healthy Kids would yield an equitable increase in resilience for youth identifying as a minority race or ethnicity.

## METHODS

- **Program Design:**
  - Building Resilience for Healthy Kids (“**Healthy Kids**”) – **universal, school-based, resilience-focused program**<sup>15</sup>
  - Series of **1:1 sessions** with pairs of **health coaches** and **sixth-grade students**
  - Seven 15-minute sessions in total, including an **initial rapport-building session** and then **six intervention sessions** incorporating motivational interviewing techniques, personalized goal setting, and strategies for improving resilience
- **Study Design**
  - **Single-arm pragmatic trial, Jan-March 2020**
  - Urban public middle school in Colorado Springs
  - Online surveys, **pre- and post-intervention**
- **Key Measures**
  - **Resilience** – Child and Youth Resilience Measure using Rasch analysis
  - **Self-efficacy** – Self-Efficacy Questionnaire for Children
  - **Grit** – Grit Scale
  - **Academic pressure** – Educational Stress Scale for Adolescents
  - **Anxiety/Depression symptoms** – PROMIS Pediatric Anxiety and Depressive Symptoms Scales

## RESULTS

**Table 1. Demographic characteristics of students**

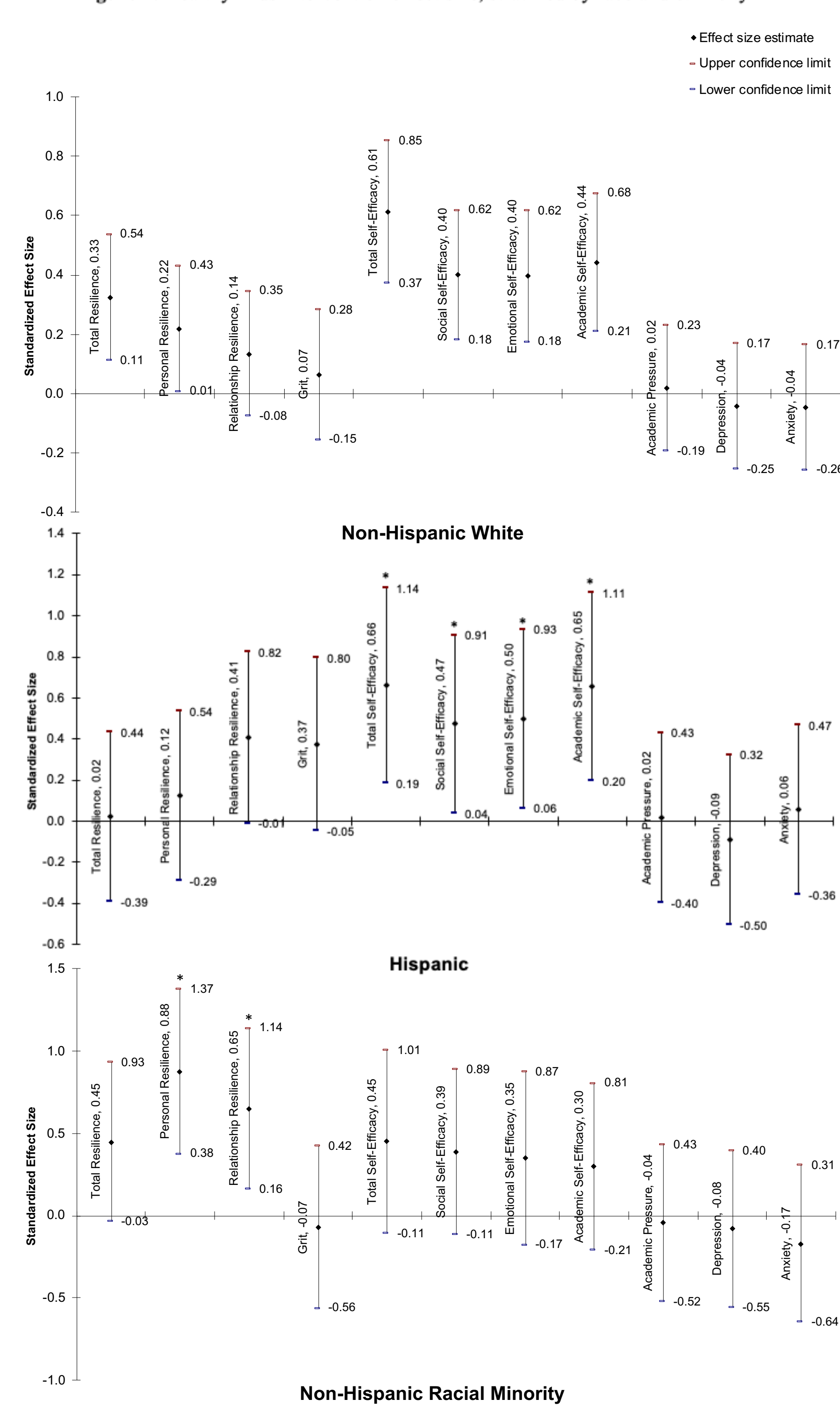
|                                  | N=252      |
|----------------------------------|------------|
| <b>Gender</b>                    |            |
| Boys                             | 114 (45%)  |
| Girls                            | 138 (55%)  |
| <b>Age (years)</b>               | 11.4 ± 0.5 |
| <b>Race/Ethnicity</b>            |            |
| Non-Hispanic White               | 173 (69%)  |
| Non-Hispanic Racial Minority     | 34 (13%)   |
| Black                            | 11 (32%)   |
| Native Hawaiian/Pacific Islander | 4 (12%)    |
| Asian                            | 12 (35%)   |
| American Indian                  | 2 (6%)     |
| More than one race               | 5 (15%)    |
| Hispanic                         | 45 (18%)   |

**Table 2. Mental health characteristics of students, stratified by race and ethnicity**

|                          | White<br>n=173  | Racial Minority<br>n=34 | Hispanic<br>n=45 | p-value      |
|--------------------------|-----------------|-------------------------|------------------|--------------|
| <b>Pre-Intervention</b>  |                 |                         |                  |              |
| <b>Resilience</b>        |                 |                         |                  |              |
| Personal                 | 75 ± 6.8        | 77 ± 5.7                | 77 ± 7.7         | 0.10         |
| Relationship             | 44 ± 4.5        | 43 ± 5.1                | 44 ± 4.2         | 0.33         |
| Academic                 | 32 ± 3.2        | 31 ± 3.4                | 32 ± 2.6         | 0.42         |
| <b>Grit</b>              | 3 ± 0.5         | 3 ± 0.5                 | 3 ± 0.4          | 0.47         |
| <b>Self-Efficacy</b>     |                 |                         |                  |              |
| Social                   | <b>82 ± 15</b>  | <b>83 ± 15</b>          | <b>72 ± 15</b>   | <b>0.001</b> |
| Emotional                | <b>28 ± 5.7</b> | <b>28 ± 6.2</b>         | <b>25 ± 6.2</b>  | <b>0.004</b> |
| Academic                 | <b>26 ± 5.8</b> | <b>26 ± 5.7</b>         | <b>23 ± 6.0</b>  | <b>0.01</b>  |
| <b>Academic Pressure</b> | 40 ± 14         | 43 ± 13                 | 45 ± 13          | 0.07         |
| <b>Mood Symptoms</b>     |                 |                         |                  |              |
| Depression               | 15 ± 8.4        | 15 ± 7.5                | 18 ± 9.5         | 0.19         |
| Anxiety                  | 18 ± 7.9        | 18 ± 7.7                | 19 ± 8.6         | 0.88         |
| <b>Post-Intervention</b> |                 |                         |                  |              |
| <b>Resilience</b>        |                 |                         |                  |              |
| Personal                 | 77 ± 6.9        | 80 ± 7.0                | 77 ± 6.0         | 0.06         |
| Relationship             | <b>45 ± 4.4</b> | <b>47 ± 4.5</b>         | <b>44 ± 4.7</b>  | <b>0.03</b>  |
| Academic                 | 33 ± 3.2        | 33 ± 2.9                | 33 ± 2.2         | 0.27         |
| <b>Grit</b>              | 3 ± 0.5         | 3 ± 0.5                 | 3 ± 0.4          | 0.51         |
| <b>Self-Efficacy</b>     |                 |                         |                  |              |
| Social                   | 92 ± 17         | 90 ± 18                 | 84 ± 21          | 0.07         |
| Emotional                | 31 ± 6.2        | 31 ± 5.3                | 28 ± 7.2         | 0.08         |
| Academic                 | 28 ± 6.6        | 28 ± 7.1                | 26 ± 8.2         | 0.29         |
| Academic                 | 31 ± 6.3        | 30 ± 7.2                | 29 ± 6.6         | 0.22         |
| <b>Academic Pressure</b> | 40 ± 13         | 43 ± 13                 | 45 ± 15          | 0.10         |
| <b>Mood Symptoms</b>     |                 |                         |                  |              |
| Depression               | 15 ± 8.0        | 14 ± 7.2                | 17 ± 9.2         | 0.28         |
| Anxiety                  | 18 ± 7.7        | 17 ± 7.6                | 19 ± 8.9         | 0.33         |

Bold text indicates significant values, as determined by one-way ANOVA; alpha set at 0.05. Values are included as: avg ± stdev

**Figure 1. Healthy Kids intervention effect size, stratified by race and ethnicity**



**Table 3. Linear regression of mental health characteristics, stratified by race and ethnicity**

|                          | White<br>n=173 | Racial Minority<br>n=34 | p-value     | Hispanic<br>n=45 | p-value | Racial Minority<br>(Ref: Hispanic)<br>n=34 | p-value     |
|--------------------------|----------------|-------------------------|-------------|------------------|---------|--|-------------|
| <b>Resilience</b>        |                |                         |             |                  |         |  |             |
| Personal                 | Ref            | <b>2.9 (0.3, 5.5)</b>   | <b>0.03</b> | -0.4 (-2.6, 1.9) | 0.74    | <b>3.2 (0.3, 6.2)</b>                      | <b>0.03</b> |
| Relationship             | Ref            | <b>2.2 (0.6, 3.8)</b>   | <b>0.01</b> | -0.5 (-2.0, 0.9) | 0.49    | <b>2.9 (0.8, 4.9)</b>                      | <b>0.01</b> |
| Academic                 | Ref            | 1.1 (0.0, 2.2)          | 0.06        | 0.3 (-0.6, 1.3)  | 0.50    | 0.7 (-0.5, 1.9)                            | 0.23        |
| <b>Grit</b>              | Ref            | -0.1 (-0.2, 0.1)        | 0.29        | 0.1 (-0.3, 0.2)  | 0.12    | -0.2 (-0.3, 0.0)                           | 0.08        |
| <b>Self-Efficacy</b>     |                |                         |             |                  |         |  |             |
| Social                   | Ref            | -0.7 (-6.6, 5.3)        | 0.83        | -0.1 (-5.5, 5.3) | 0.98    | -0.7 (-9.8, 8.4)                           | 0.88        |
| Emotional                | Ref            | 0.3 (-1.8, 2.3)         | 0.79        | 0.3 (-1.3, 1.9)  | 0.67    | 0.3 (-2.0, 2.6)                            | 0.81        |
| Academic                 | Ref            | 0.5 (-1.3, 2.3)         | 0.59        | 0.3 (-1.5, 2.1)  | 0.76    | -0.1 (-3.2, 3.0)                           | 0.96        |
| Academic                 | Ref            | -1.2 (-3.1, 0.6)        | 0.19        | 0.1 (-1.6, 1.9)  | 0.88    | -1.7 (-4.4, 1.1)                           | 0.23        |
| <b>Academic Pressure</b> | Ref            | 0.1 (-3.2, 3.3)         | 0.97        | 1.4 (-1.9, 4.6)  | 0.41    | -1.2 (-5.9, 3.5)                           | 0.61        |
| <b>Mood Symptoms</b>     |                |                         |             |                  |         |  |             |
| Depression               | Ref            | -0.3 (-2.2, 1.6)        | 0.76        | 0.3 (-1.6, 2.2)  | 0.77    | -0.8 (-3.6, 2.1)                           | 0.61        |
| Anxiety                  | Ref            | -1.0 (-3.0, 1.0)        | 0.32        | 1.1 (-1.0, 3.1)  | 0.30    | -2.1 (-5.1, 0.9)                           | 0.17        |

Bold text indicates significant values, as determined by linear regression controlling for baseline scores; alpha set at 0.05. Values are included as: β (95% CI).

## DISCUSSION

- **Conclusion:** Healthy Kids represents a potentially **equitable intervention option for improving youth resilience and self-efficacy**.
- Significantly greater improvements in resilience among adolescents identifying as Black, Native Hawaiian/Pacific Islander, Asian, American Indian, or more than one race compared to those identifying as non-Hispanic White or Hispanic, despite similar baseline scores
- Improved self-efficacy among all students post-intervention with no detected differences by race and ethnicity, despite significantly higher levels of each type of self-efficacy at baseline among non-Hispanic racial minority and White students compared to Hispanic students
- Potential explanation for these results is the **highly individualized nature** of the intervention, which allowed for students' unique and varying needs to be met
- **Strengths** – **asset-based individualized approach**
- **Limitations** – relatively **small sample size** requiring **oversimplified racial and ethnic groupings** for further analyses. No significant differences for the key measures were seen in preliminary analyses between those individual subgroups subsequently included into the larger “non-Hispanic racial minority” group; however, such a grouping does not adequately acknowledge the robust and heterogenous cultures belonging to individual racial/ethnic minority populations.
- **Future directions** – **randomized controlled trials with larger and ideally more diverse populations**, assessment of these key measures across other **identity components** (e.g., sex, gender identity, sexual orientation), evaluation of long-term benefits through **subsequent interval assessments**

## REFERENCES

1. Web-based Fatal Injury Data Visualization Tool. Retrieved from <https://wisqars-viz.edc.gov:8006/explore-data/home>
2. Nock, M. K., Green, J. G., Hwang, I., McLaughlin, K. A., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2013). Prevalence, Correlates, and Treatment of Lifetime Suicidal Behavior Among Adolescents. *JAMA Psychiatry*, 70(3), 300. doi:10.1001/2013.jamapsychiatry.55
3. Cha, C. B., Franz, P. J., M. Guzmán, E., Glenn, C. R., Kleiman, E. M., & Nock, M. K. (2018). Annual Research Review: Suicide Among Youth – Epidemiology, (Potential) Etiology, and Treatment. *Journal of Child Psychology and Psychiatry*, 59(4), 460-482. doi:10.1111/jcpp.12831
4. Burke, T. A., Connolly, S. L., Hamilton, J. L., Stange, J. P., Abramson, L. Y., & Alloy, L. B. (2016). Cognitive Risk and Protective Factors for Suicidal Ideation: A Two-Year Longitudinal Study in Adolescence. *Journal of Abnormal Child Psychology*, 44(6), 1145-1160. doi:10.1007/s10802-015-0104-x
5. Gallagher, M., Prinstein, M. J., Simon, V., & Spirito, A. (2014). Social Anxiety Symptoms and Suicidal Ideation in a Clinical Sample of Early Adolescents: Examining Loneliness and Social Support as Longitudinal Mediators. *Journal of Abnormal Child Psychology*, 42(6), 871-883. doi:10.1007/s10802-013-9844-7
6. Zyro, M., Pawlowska, B., Potembska, E., Dreher, P., & Kapka-Skrzypczak, L. (2019). Prevalence and selected risk factors of suicidal ideation, suicidal tendencies and suicide attempts in young people aged 13–19 years. *Annals of Agricultural and Environmental Medicine*, 26(2), 329-336. doi:10.26444/aem/93817
7. Séguin, M., Renaud, J., Lesage, A., Robert, M., & Turecki, G. (2011). Youth and young adult suicide: A study of life trajectory. *Journal of Psychiatric Research*, 45(7), 863-870. doi:10.1016/j.jpsychires.2011.05.005
8. Felver, J. C., Clawson, A. J., Morton, M. L., Briar-Kennedy, E., Janaek, P., & DiFlorio, R. A. (2019). School-based mindfulness intervention supports adolescent resilience: A randomized controlled pilot study. *International Journal of School & Educational Psychology*, 7(sup1), 111-122. doi:10.1080/21683603.2018.1461722
9. Hornor, G. (2017). Resilience. *Journal of Pediatric Health Care*, 31(3), 384-390. doi:10.1016/j.pedhc.2016.09.005
10. Lee, T. Y., Cheung, C. K., & Kwong, W. M. (2012). Resilience as a Positive Youth Development Construct: A Conceptual Review. *The Scientific World Journal*, 2012, 1-9. doi:10.1100/2012/390450
11. Ivey-Stephenson, A. Z., Demissie, Z., Crosby, A. E., Stone, D. M., Gaylor, E., Wilkins, N., ... Brown, M. (2020). Suicidal Ideation and Behaviors Among High School Students – Youth Risk Behavior Survey, United States, 2019. *MMWR Supplements*, 69(1), 47-55. doi:10.15585/mmwr.su6901a6
12. Kupermince, G. P., Chan, W. Y., Hale, K. E., Joseph, H. L., & Delbosco, C. A. (2020). The Role of School-based Group Mentoring in Promoting Resilience among Vulnerable High School Students. *American Journal of Community Psychology*, 65(1-2), 136-148. doi:10.1002/ajcp.12347
13. Seligman, M. E. P., Ernst, R. M., Gillham, J., Reivich, K., & Linkins, M. (2009). Positive education: positive psychology and classroom interventions. *Oxford Review of Education*, 25(3), 293-311. doi:10.1080/03054980902934563
14. Dray, J., Bowman, J., Campbell, E., Freund, M., Wolfenden, L., Hodder, R. K., ... Wiggers, J. (2017). Systematic Review of Universal Resilience-Focused Interventions Targeting Child and Adolescent Mental Health in the School Setting. *Journal of the American Academy of Child & Adolescent Psychiatry*, 56(10), 813-824. doi:10.1016/j.jaac.2017.07.780
15. Lee, J. A., Heberlein, E., Pyle, E., Caughlan, T., Rahaman, D., Sabin, M., & Kaar, J. L. (2020). Evaluation of a Resiliency Focused Health Coaching Intervention for Middle School Students: Building Resilience for Healthy Kids Program. *American Journal of Health Promotion*, 089011712095915. doi:10.1177/0890117120959152