Antifragility Initiative: Process Evaluation Year 1 Results

Laura A. Voith, PhD, MSW, Katie Russell, MSSA, Hyunjune Lee, MSW, Meghan Salas-Atwell, PhD

Introduction

University Hospital's Rainbow Babies and Children's Hospital (UH-RBC) Division of Pediatric Surgery conceptualized the "Antifragility Initiative," a holistic trauma-informed hospital-based violence intervention program as an answer to the significant number of violent injury and reinjury cases among children and adolescents who they treat in the emergency department each year. UH-RBC affiliates partnered with researchers from The Center on Trauma and Adversity and The Center on Urban Poverty and Community Development at the Mandel School of Applied Social Sciences to conduct a process and outcome evaluation of this program.

A process evaluation is a critical component of new interventions and is recommended by the Medical Research Council Guidelines (Moore et al., 2015) to clarify the key components, underlying mechanisms, and outcomes in order to enhance the scientific rigor of the development and delivery of complex interventions. The outcomes of this process evaluation will serve as a foundation for program delivery and evaluation.

Research Aims

1. Identify what is being delivered, how it is being delivered, and what are the "active ingredients" to facilitate change in youth outcomes.
2. Examine to what extent the intervention implemented is consistent with the program's underlying theory.

Research Questions

1. What is the program theory of change and key components of the Antifragility Initiative?
2. Do program staff have the appropriate knowledge to implement trauma-informed care?

Methods

Methodology RQ1. Grounded theory guided data collection and analysis. Iterations between data collection and analysis, culminating in a mid-level theory is the signature aspect of this methodology. Given the aim to identify the intervention's underlying theory, this method was deemed appropriate.

Data and Analysis RQ1. Archival documents (e.g., program narratives, proposed assessments) were analyzed using open and axial coding. Results of this analysis informed the development of a semi-structured interview protocol. Key informant interviews (n = 6) were conducted with individuals who contributed to the conceptualization of the program. Interviews lasted approximately 60 minutes and were recorded and transcribed verbatim. A second round of coding was conducted with the interview transcripts, resulting in a provisional theory of change. Finally, a focus group with key informants and new program staff (n = 8) was conducted to validate the proposed theory and to identify how the intervention would be implemented. The final model was refined based on input in the focus group.

Methodology RQ2. A pre-post survey was implemented with hospital staff attending a trauma-informed training hosted by UH-RBC, including staff of the Antifragility Initiative. The survey was voluntary and completed either electronically using personal electronic devices or paper-pencil. Demographic questions were collected, as well as trauma-informed knowledge, attitudes, and confidence using the Attitudes Related to Trauma-Informed Care (ARTIC) Scale and compassion fatigue and secondary trauma using the Professional Quality of Life (ProQOL) Scale.

The ARTIC consists of 45 items that assess employee competence and support of trauma-informed care in the workplace according to five categories: underlying causes of problem behavior, responses to problem behavior and symptoms, on the job behavior, self-efficacy at work, and reactions to the work. The ProQOL includes 30 items that assess for professional compassion fatigue, compassion satisfaction, and burnout.

Sample and Data RQ2. A total of 38 valid responses were recorded for the pre-training survey and 14 valid responses for the post-training survey. Of the 38 pre-training survey respondents, 38 completed the ARTIC and 36 completed the ProQOL. All 14 of the post-survey respondents completed both measures. All valid responses were included in the analysis and reported in the aggregate.

The mean age of respondents was 36 years old. Sixty-six percent of respondents identified as female, 16% as male, and 18% did not provide a gender identity. Approximately 72% of the respondents identified as Caucasian, 10% as African American, and 18% did not provide their race. The professions provided by valid responses (82%) can be found in Table 1. The average number of years in one's profession was 11.16 years, with a mean of 6.99 years at University Hospital.

Results

RQ1. The Antifragility Initiative (AI), a hospital-based violence intervention program, is predicated on the Ecobiodevelopmental framework. This framework asserts that biology and early life experiences set a foundation that informs all subsequent experiences, ultimately impacting life long development. That is, social and physical environments (i.e., eco) characterized by trauma and stress in early life influence an individual's biological predispositions (i.e., bio) and can have a lasting impact on an individual's physical, mental, and behavioral health. Thus, in order to reset the trajectory of youth who are victims of severe violence or gunshot wounds, AI applies a trauma-informed, holistic approach to mitigate the impacts of early life stress and trauma in addition to the acute traumatic exposure (e.g., gunshot wound).

The AI program begins in the Emergency Department where hospital-based social workers are paired with youth 6-15 years old who are victims of severe violence or gunshot wounds, as well as their families, and continues into their homes and communities of enrolled youth for 12 months. Throughout the 12 months, three phases unfold (see Figure 1). In the first phase, the "Initial Recovery and Assessment Zone," youth receive emergency services to promote their physical recovery and a patient-centered approach consisting of a bio-psycho-social-spiritual, trauma-informed assessment to identify appropriate referrals.

Table 1. Professions

Respondent Profession	N (%)
Nurse	21 (42.0)
Medical Doctor	4 (8.0)
Social Worker	3 (6.0)
Paramedic	5 (10.0)
Administrative	4 (8.0)
Pharmacist	1 (2.0)
Child Life Specialist	1 (2.0)
RRT	1 (2.0)
CTA	1 (2.0)

Once the child is ready to exit the hospital, the AI social worker initiates the "Resilience Zone" through referral based services with a focus on establishing safety (a priority principle of trauma-informed care) and social stability. To promote family success, the AI social worker helps youth and families navigate these complex social systems (e.g., health care, social services). A child's safety and social stability promotes a strong foundation for the promotion of physical and mental health, which ultimately fosters resilience and reduces toxic stress among enrolled youth.

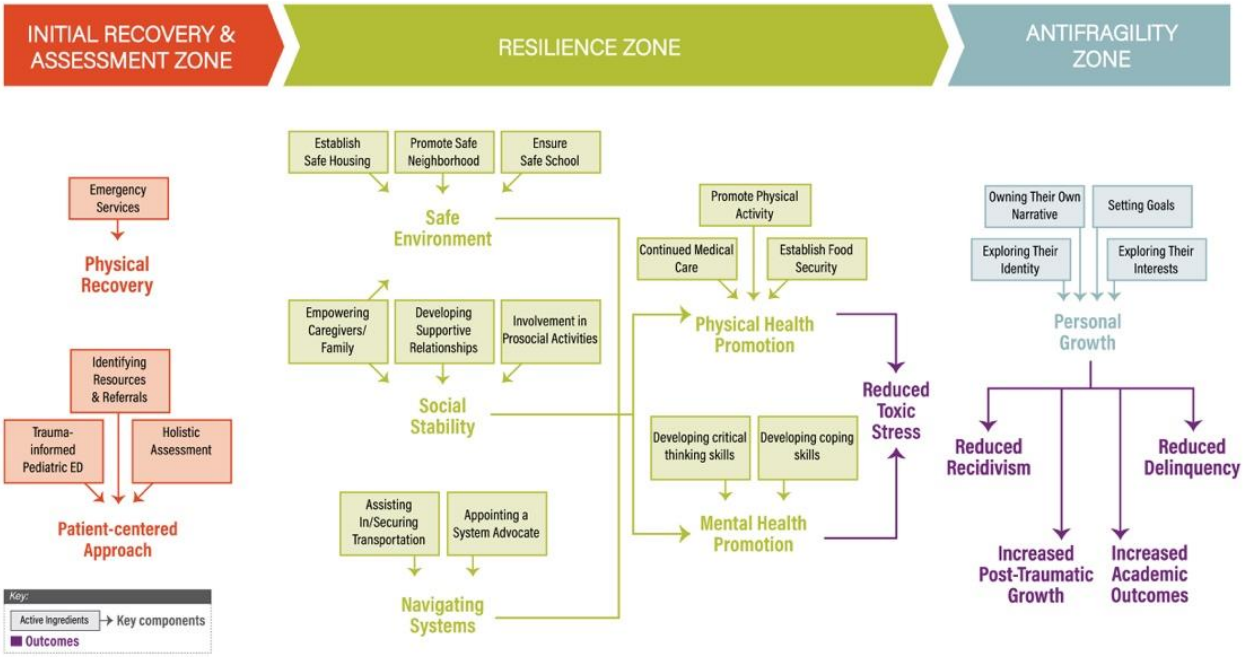

Figure 1. ***Scientific Model of the Antifragility Initiative Program Theory of Change***

In the third phase, the AI social worker will initiate the "Antifragility Zone" by promoting identity exploration, development of prosocial interests, goal-setting, and empowering youth to 'own their narrative' and make meaning from their traumatic experience.

Target long-term (12 months post hospital admission) outcomes include increased post-traumatic growth, improved academic outcomes, and reduced reinjury and juvenile delinquency among enrolled youth.

The program theory of change, including key components ("the what") and underlying mechanisms ("the how"), is visualized in Figure 1. To facilitate community stakeholder engagement, the research team also created an infographic (see Appendix, Figure 2).

RQ2. ARTIC subscale scores ranged from 1-7 with higher scores indicating greater utilization of trauma-informed care. The UH staff scored an average of 5.09, (SD = .87) pre-training and 5.37 (SD = .85) post-training on **trauma-informed care overall**. Staff's highest score post-training was their "**response**," i.e., thinking about trauma responses with kindness, safety and flexibility (M = 5.74, SD = .96). Staff scored above 5.0 on average for "**reactions**," "**on the job behavior**," and "**self-efficacy**." Staff's lowest scores were for "**underlying causes**," that is, understanding behavior symptoms of trauma as adaptations and malleable, even after the training (M = 4.83, SD = 1.13), suggesting an area for further education and training. See Table 2. Notably, the small sample likely underpowered the study and contributed to non-significant differences between pre and post surveys.

ProQOL subscales scores ranged from 10-50. **Compassion satisfaction** scores of 43 and lower are considered to be in the bottom quartile (<25%), indicating that at the time of survey completion, the average respondent did not derive satisfaction from their job and/or did not feel as though they are able to be effective in their role. As for **burnout**, scores of 42 or less are considered to be in the bottom quartile, indicating that at the time of survey completion, the average respondent was experiencing low levels of burnout due to their role. Finally, **secondary traumatic stress** scores of 41 and lower are considered to be in the bottom quartile. Thus, at the time of survey completion, the average respondent was experiencing low levels of secondary traumatic stress from their work at UH.

Conclusions and Recommendations

Most hospital-based violence intervention programs lack a theoretical model with key program components that define the program, hypothesized pathways that explain how change occurs, and theoretically supported long-term outcomes. The Antifragility Initiative has a built a strong foundation from which to launch their programmatic efforts informed by theory and empirical research grounded in the trauma and adversity, resilience, and post-traumatic growth.

It is recommended that the theory of change model resulting from qualitative analysis be used by AI social workers to develop intake and ongoing client forms. For example, social workers should ensure their intake forms assess for safety and social stability and refer appropriately based on client needs.

Table 2. **Survey Results**

	Subscale	Range	Pre-Training		Post-training	
			N	M (SD)	N	M (SD)
ARTIC	Overall	1–7	38	5.09 (0.87)	14	5.37 (0.85)
	Underlying Causes	1–7	38	4.82 (0.72)	14	4.83 (1.13)
	Responses	1–7	38	5.22 (1.02)	14	5.74 (0.96)
	Reactions	1–7	38	5.07 (1.11)	14	5.49 (0.97)
	On the Job Behavior	1–7	38	5.20 (0.98)	14	5.46 (0.95)
	Self-Efficacy	1–7	38	5.12 (1.19)	14	5.31 (0.95)
ProQOL	Compassion Satisfaction	10–50	36	42.39 (5.87)	14	41.14 (9.84)
	Burnout	10–50	36	21.00 (5.86)	14	22.00 (5.64)
	Secondary Traumatic Stress	10–50	36	21.61 (7.24)	14	22.00 (6.52)

*According to statistical analyses, there were no significant differences between the pre- and post-training scores on any of the subscales for either tool.
**All results should be interpreted with caution given the small sample size.

Additionally, the "Antifragility Zone" is considered the defining element of the intervention. We recommend that AI social workers receive training in the promotion of post-traumatic growth and an evidence-based therapeutic intervention to mitigate the effects of trauma, such as "**Storiez"** developed for inner city youth to assist them as they "create, voice, and honor their life narratives" through a variety of mediums.[1]

Results of the survey suggest that UH-RBC staff working in the Emergency Department who attended the training are reasonably well prepared to deliver services using a trauma-informed approach. Though, these findings must be interpreted with caution due to the small sample size. Recommendations include additional training targeting staff's understanding of the underlying causes of trauma on behavior and patient symptoms. Additionally, UH-RBC Emergency Department staff at the training did not report significant levels of burnout or secondary traumatic stress, suggesting adequate organizational support for staff in their role as caregivers. Though, respondents did indicate low compassion satisfaction. Recommendations include a review of practices and policies that may promote or hinder employee effectiveness in their roles, including staff representation in the review and potential policy and practice change efforts.

Finally, this formative research sets the stage for critical next steps to test other important aspects of complex interventions. To advance program rigor and development, we recommend exploring **patient experience** of the AI program; examine the effect of **dosage** on key outcomes; identify program **reach** by exploring the facilitators and barriers to youth's initial and continued involvement in the intervention; and **testing the underlying theory and proposed mechanisms of impact**, such as with short-term outcomes like the experience and effects of social stability on youth's resilience and post-traumatic growth. This formative research will complement and amplify the outcome evaluation.

The Center on Trauma and Adversity

The Center on Trauma and Adversity was established by a group of faculty with expertise in trauma and clinical social work. This research and training center responds to the need for trauma-focused research and the development of social workers who can effectively assess, intervene, and treat people and communities affected by trauma – to help them experience healing, overcome adversity, reduce suffering, and achieve recovery and resilience.

Division of Pediatric Surgery at UH-RBC

The Division of Pediatric Surgery provides 24-hour coverage for elective and emergency general surgical needs of children from birth to 21 years of age.

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[1] storiezguide.com

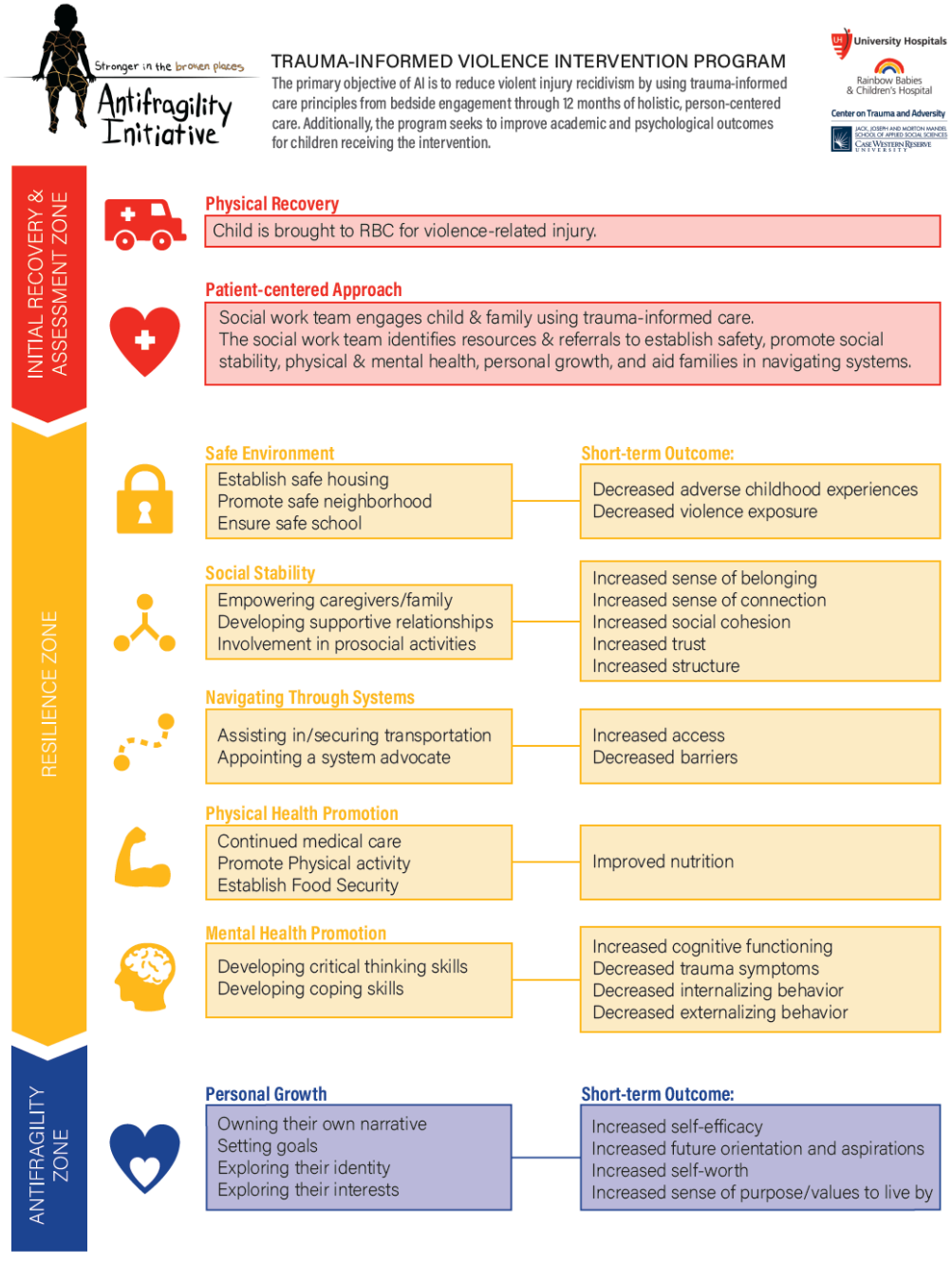

Figure 2. *Infographic representing the Antifragility Initiative Program Theory of Change*