



Thriving in adversity: Do life skills programs work for developing world children? A pragmatic randomized controlled trial

David Pearson¹, Fiona Clare Kennedy², Vishal Talreja³, Suchetha Bhat³, Katherine Newman-Taylor¹

¹Psychology Department, University of Southampton, United Kingdom

²Psychology Department, University of Southampton, and GreenWood Mentors, Isle of Wight, United Kingdom

³Dream a Dream Non-Governmental Organization, Bengaluru, India

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The severe adversity experienced by millions of children in the developing world leads to failure to thrive associated with cognitive deficits, emotional management problems, and social impairment. In this pragmatic randomized controlled trial, 909 children (aged 8–15 years) in India with disadvantaged backgrounds took part in a semistructured program involving sports or creative arts activities. The Life Skills Assessment Scale was used to assess the children's life skills before and after taking part in the program. Children who took part in the program showed significant increases in life skills following participation, compared to a control group. This study demonstrates the impact of simple, low-budget programs on cognitive, emotional, and social life skills that are typically delayed by severe adversity. The findings have clear implications for children in other adverse environments, such as conflict zones and settlements for displaced children resulting from war, natural disasters, and emergency events.

Keywords

failure to thrive; stunted growth; children's development; disadvantaged children; socioeconomic status; developing world; life skills program

Even with the rapid increase in the middle classes, millions of children in the developing world experience damaging poverty and adversity, leading to severe disruption to normal development, including failure to thrive and stunted growth (de Onis & Branca, 2016). Regardless of culture or geography, children's physical growth is assessed as normal in a predetermined way by measurement on an appropriate growth chart; *stunted growth* can be defined as a child being at least two standard deviations below the expected median (de Onis & Branca, 2016).

As statutory services are not available for the majority of the children experiencing poverty and adversity, many thousands of nongovernmental organizations (NGOs) run programs designed to ameliorate these effects. Most of the NGOs rely on volunteers, very small budgets, and anecdotal or "common sense" evaluations rather than standardized measures of effectiveness (Sawhill & Williamson, 2001). The impact of these interventions remains unclear.

Literature Review

The Problem

Global levels of child poverty are not known or defined precisely. Estimates suggest that 40–47% of children survive on less than the equivalent of USD 2.00 per day, equating to millions of children living in absolute

poverty globally (Olinto et al., 2013; United Nations International Children's Emergency Fund, 2016; World Bank Group, 2018). The Hunger and Malnutrition Survey estimated that the growth of up to 59% of children under 5 years of age in India was stunted (Naandi Foundation, 2012). Similar figures were reported by the Indian Ministry of Statistics and Program Implication (2012). Although a rapid decline in the number of children with stunted growth had been seen in previous decades, in the National Family Health Survey-4, India (World Bank Group, 2018) it was found that these improvements have stalled. This appears to be a common picture across much of the developing world, with the problem compounded by increasing numbers of displaced children (Save the Children's Resource Centre, 2017; World Bank Group, 2018). Chronic malnutrition among those aged under 5 years, as measured by stunted growth, is estimated to affect 37.0% of children in sub-Saharan Africa (Woldehanna et al., 2017), 47.0% of children in Kenya (Bloss et al., 2004), 31.4% of children in Western Africa, and 38.3% of children in Oceania (United Nations International Children's Emergency Fund, World Health Organization, & World Bank Group, 2017). Similar figures have been reported in the Philippines (Mendez & Adair, 1999) and Zimbabwe (Alderman et al., 2006).

Severe child adversity comes in many forms, including poor nutrition, physical or sexual abuse, living in a war zone, being displaced, being in institutional care, and receiving poor or dysfunctional parenting. The negative effects of climate change have also been recognized as having a greater impact on those with fewer (vs. more) economic resources (Mendelsohn et al., 2006). Daniel et al. (2010) described *child adversity* as "the experience of life events and circumstances which may combine to threaten or challenge healthy development" (p. 105). The weight of empirical evidence now irrefutably links severe adversity (usually caused by poverty) to deficits in child development and long-term mental health issues (see, for brief reviews, Kennedy et al., 2013; Read & Bentall, 2012). In addition to the impact on children's physical growth, the psychological effects of severe adversity in childhood can be grouped as shown in Table 1.

Although many studies have focused on very young children and found associations between stunted growth and poor cognitive, social, and emotional outcomes, these effects can be long-term or even lifelong (Alderman et al., 2006; Brown & Pollitt, 1996; Pollitt et al., 1993; Victora et al., 2008). Hoddinott et al. (2013) found that stunted growth at 72 months predicted deficits in attention and memory, and information-processing problems in reading and nonverbal cognitive skills at 25 years, resulting in "diminished learning capacity and poor school performance" (United Nations International Children's Emergency Fund, 2009, p. 16), and "a lifetime of lost opportunities in education" (Save the Children's Resource Centre, 2017, p. 8). Thus, to minimize long-term adverse effects, interventions are required that target older children and young adults, not just the very young.

Table 1. *Psychological Effects of Severe Childhood Adversity and Failure to Thrive*

	Impact	Key sources
Cognitive impairments	Impairments include memory problems, information processing problems, school performance not reaching capacity	Jaffe (2011) Larson-Nath and Biank (2016) Mackner et al. (1997) Indian Ministry of Statistics and Program Implication (2012) United Nations International Children's Emergency Fund (2009)
Attachment disorder type issues	Adult/child relationship problems, moving rapidly to a younger developmental stage when stressed, inappropriate emotions, interpersonal avoidance, confusing abilities that make it difficult to assess developmental age	American Psychiatric Association (2013) Benoit and Coolbear (2003) Boddy et al. (2000) Pearson (2013)
Emotional issues	Inappropriate and extreme emotions, inability to self-soothe, age-inappropriate behaviors	Drewett et al. (2005) Dykman et al. (2001) Grantham-McGregor et al. (2007) Kennedy et al. (2013)
Mental health	Wide range of symptoms and disorders including anxiety, depression, self-harm, and psychosis	Kessler et al. (2010) Kinderman et al. (2013) Read and Bentall (2012)
Neuropsychological issues	Biological stress systems activate and may not develop as appropriate	De Bellis et al. (2011) Essex et al. (2002) Korzekwa et al. (2009) Van der Vegt et al. (2010) Benítez-Bribiesca et al. (1999)
	Changes in brain structure	Cordero et al. (1993)

Note. Adapted from Pearson et al. (2020).

Symptoms Versus Life Skills

The effects of severe early adversity can be described in terms of symptoms or life skills. This decision point is generally culturally based. Although a simplification, in the Western world, failure to thrive is typically considered symptomatic of a medical or developmental disorder, often diagnosed as organic/nonorganic. By contrast, conceptualizing life skills problems highlights the practical nature of what children need to thrive given the demands of the 21st century. The World Health Organization described *life skills* as “skills that support psychosocial competence or performance (the ability of an individual to deal effectively with demands or challenges of everyday life). It is the ability to maintain a person’s well-being and to show it in adaptable and positive behaviors when interacting with other people, their culture and environment” (cited in Birrell et al., 1997, p. 5). These skills have been categorized by the United Nations International Children’s Emergency Fund (2009) into three areas: cognitive skills, personal skills, and interpersonal skills. Development of each area is essential for self-management, personal development, and the ability to communicate effectively with others. Similar classifications have been described by Ceylan and Gök Çolac (2019), who used the categories of self-awareness (of feelings, values, and strengths), self-management (regulating emotions, stress, and impulses), and social awareness (including empathy).

Nongovernment Organization Responses

More than three million NGOs operate in India, with a large proportion working with underprivileged children; the actual number is not known because of the lack of registration requirements (Mahapatra,

2014). Many programs run by these NGOs aim to ameliorate the impact of early adversity on children's development. However, there is little empirical evidence that these programs are effective. Various interventions are run, including provision of nutrition and physical care, enrichment activities, vocational skills programs, mentoring, and life skills training. *Enrichment programs* are typically semistructured social interventions, commonly involving sports and creative arts activities that enable children to interact with others and to experience and practice life skills in a safe and nonjudgmental setting, with adult facilitators. The programs typically include some discussion about the life skills used during the activity to help children understand and learn to apply these effectively. These programs tend to be low budget (or funding free) and do not require specialist facilitation.

The Current Study

In our pragmatic controlled trial conducted in Bengaluru, India, we used the Life Skills Assessment Scale (LSAS; Kennedy et al., 2014), which is a standardized measure, to assess empirically whether an NGO enrichment program focused on sports and creative arts improved children's life skills. We predicted that participants in the intervention group would show greater improvements in life skills compared with participants in the control group.

Method

Participants

We analyzed data from 1,244 participants who were observed and assessed in the study, comprising 909 children aged between 8 and 15 years who took part in the programs, and 335 children aged between 8 and 15 years who were in the Fun Days control group.

Procedure

Children in the intervention group took part in semistructured enrichment sessions involving sports or creative arts activities at the low-cost or free school that they attended as students. Low-cost and free schools provide basic education accessed by families with a low economic status, including those living in slums. The staff at the schools had previously arranged for their school to partner with the host NGO, but had not yet started the partnership. None of the schools nor any of the children had previously taken part in an enrichment-type program. Sessions took place during school time and ran once per week for 2–3 hours each session. Each child attended 25 weekly sessions as part of the normal school curriculum. Children chose a sports or creative arts program in which to participate until sessions reached their maximum numbers of 20–30 students. Sessions were explicitly socially inclusive, with no separation by gender, religion, or socioeconomic group, and were structured as follows:

- a) Check in and introductions
- b) Short warm-up game or exercises (e.g., singing songs with accompanying actions, yoga stretches)
- c) A sport (football) or creative arts (visual, drama, dancing) activity
- d) Structured discussion and reflection on what was observed and learned during the activity
- e) Wrap-up game incorporating “thank you” and “goodbye”

The control group comprised of children who took part in Fun Day sessions offered by the host NGO to schools or groups of children who are not currently partners for programs. The control group schools were matched for economic, social, and religious profiles with the program group, and both groups were assessed by the same observer/raters. After the final Fun Day sessions, participating schools were offered the opportunity to become partner organizations with the host NGO, with a view to providing regular input. Fun Days included games (e.g., passing balloons to teammates standing in rows, team running exercises) but no debriefing or reflection to consolidate skills.

Observers/raters assessed the children at the start of the session and again after the 25 sessions were complete, about 6 months later. Over a period of 3 weeks, 11 observers attended the first three of each of the sports and creative arts sessions, dividing the groups of children between them. Each observer rated approximately 15 children over three sittings, each lasting 2 hours. Each child's initial LSAS rating was recorded using tablet computers, and this procedure was repeated at the end of the program from weeks 23 to week 25. Children were not necessarily assessed in the same order at the start and the end of the program. Initial scores for the control group were collected during the Fun Days. Again, each observer assessed around 15 individual children at a time. The length of time available to observe each child was comparable for the intervention and control groups, that is, 6 hours at the start and the same time again after 25 weeks.

Table 2. *Gender and Age of Participants by Group*

	Gender		Total	Age (years)	
	Male	Female		M	(SD)
Program	500	409	909	11.33	(1.71)
Sports	243	197	440	11.24	(1.68)
Creative arts	257	212	469	11.41	(1.73)
Control	169	166	335	11.99	(1.61)
Total	669	575	1,244	11.51	(1.79)

Measure

The LSAS (Kennedy et al., 2014) is a five-item, observer-rated, standardized scale designed to assess the life skills of disadvantaged children in the developing world (see Appendix), and it is in widespread use (e.g., Mandigo et al., 2018). In a similar way that simple standardized assessments are currently used to assess child development, each of the five LSAS items assess wider dimensions of life skills:

- a) Interacting with others
- b) Overcoming difficulties and solving problems
- c) Taking initiative
- d) Managing conflict
- e) Understanding and following instructions

The LSAS was initially standardized for three age groups: 8–10 years, 11–13 years, and 14–16 years (Kennedy et al., 2014), and more recently for young adults aged 17–19 years and 20–22 years (Pearson et al., 2020). The LSAS has good interrater reliability ($r = .88, p < .01$), internal consistency reliability ($\alpha = .86$), and test–retest reliability ($r = .86$) for each age group (Kennedy et al., 2014). Each item is assessed using a 5-point Likert type scale: 1 = *does not yet do*, 2 = *does with lots of help*, 3 = *does with some help*, 4 = *does with a little help*, 5 = *does independently*. To encourage the observer to move away from pass/fail type judgement, the rating numbers do not appear on the scoring sheet; instead, these are added after the initial assessment is complete. An overall (average) score for each child is obtained by adding up the scores and dividing by 5. The development and application of the LSAS is covered in detail in Kennedy et al. (2014) and Pearson et al. (2020).

Observers/Raters

All 11 observers/raters (six women and five men) worked for local NGOs. Some had come from disadvantaged backgrounds themselves, and some had attended enrichment programs as children. The observers/raters did not participate in the programs being assessed. All of them attended a brief orientation session regarding the purpose and administration of the LSAS. They were not made aware of the research objective.

Ethical Considerations

An independent steering group considered the study and discussed ethical issues raised. It was decided that all parts of the study, including the control group activities, were comparable to normal organization activities. Fun Day sessions are routinely offered at the schools where the control group's data were collected. Informed consent was obtained from participating partners.

Results

Descriptive Statistics

Table 3 and Figure 1 illustrate the mean LSAS scores at the start and end of the study period for the program and control groups.

Table 3. *Descriptive Statistics for the Life Skills Assessment Scale Scores*

Life Skills Assessment Scale	Program group				Control group			
	Start		End		Start		End	
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>
Interacting with others	2.13	(0.82)	3.84	(0.86)	1.69	(0.70)	1.69	(0.76)
Overcoming difficulties	1.84	(0.80)	3.55	(0.99)	1.65	(0.71)	1.68	(0.72)
Taking initiative	2.01	(0.84)	3.71	(0.96)	1.69	(0.73)	1.63	(0.73)
Managing conflict	1.78	(0.82)	3.48	(1.02)	1.65	(0.73)	1.63	(0.71)
Understanding/following instructions	2.05	(0.85)	3.88	(0.82)	1.81	(0.69)	1.65	(0.74)
Overall average score	1.96	(0.73)	3.69	(0.84)	1.70	(0.67)	1.66	(0.68)

Group Comparisons

We used SPSS version 24 to inspect the distribution of data and calculate descriptive statistics. The data were compared for any initial differences between the two groups using chi-square analysis for gender and *t* tests for age and initial LSAS score. There were no group differences in gender, $\chi^2(1, 1244) = 2.05, p = .15$, although there were slight group differences in both age, $t(1242) = 6.17, p < .001$ (see Table 2), and life skills, $t(1242) = 5.76, p < .001$ (see Table 3) at the start of the study.

A mixed-model analysis of variance (ANOVA) was used to assess the impact of the program, with one within-subjects factor (time: preprogram vs. postprogram) and one between-subjects factor (group: intervention vs. control). Although the LSAS data were not normally distributed, ANOVAs are sufficiently robust to accommodate some deviation from the norm, and so the original analysis plan was retained. The ANOVA results show that there were main effects of group, $F(1, 1242) = 1207.19, p < .001, \eta_p^2 = 0.49$; time, $F(1, 1242) = 563.60, p < .001, \eta_p^2 = 0.31$; and the group \times time interaction, $F(1, 1242) = 616.47, p < .001, \eta_p^2 = 0.33$. Life skills increased considerably over time in the intervention group, $t(908) = 44.21, p < .001$, and did not change in the control group, $t(334) = -0.78, p = .44$ (see Figure 1).

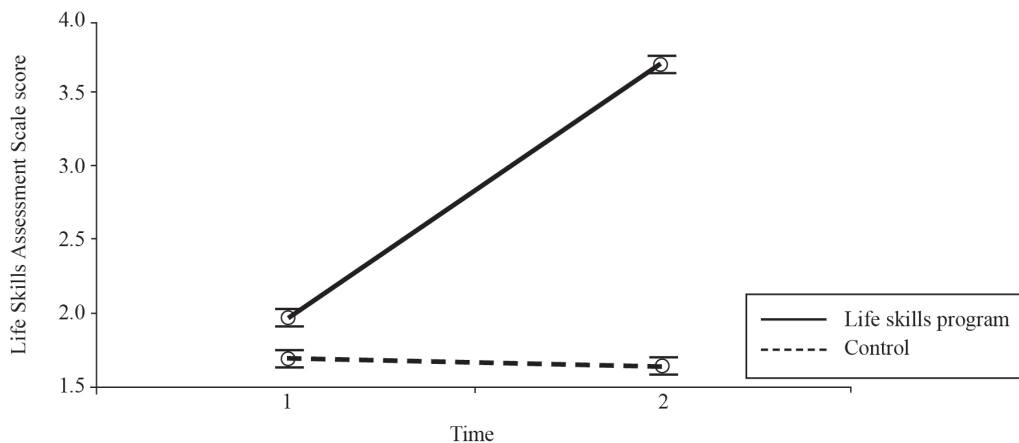


Figure 1. *Mean Life Skills Assessment Scale Scores*

Note. Time 1 = pregroup score; Time 2 = postgroup score. Error bars indicate 95% confidence intervals.

Discussion

The results in this study indicate that participation in an enrichment program for disadvantaged children (aged 8–15 years) in the developing world increased life skills with very large effects. As predicted, there was a significant increase in observer-rated life skills for those attending the enrichment program compared to the control group. These children, because of their socioeconomic status, are vulnerable to the cognitive, emotional, and social development delays associated with early adversity, and have minimal access to statutory services. Such delays can cause long-term if not lifelong deficits in the skills needed to function effectively in everyday life (Alderman et al., 2006; Brown & Pollitt, 1996; Pollitt et al., 1993; Victora et al., 2008). The results in our study indicate that low-budget programs using nonprofessionally trained facilitators can ameliorate such delays. Highly trained professionals and large budgets may not be required to attenuate the devastating effects of severe poverty and adversity that blight the development of millions of children.

Further research is needed to explore whether simple and scalable programs for children aged 5–15 years, and for young adults (cf. Pearson et al., 2021), positively affect participants' wider developmental and mental health issues in the longer term. The structured enrichment program examined in this study had a considerable impact on the life skills of the children who took part. Longitudinal research is currently underway to establish whether these changes are maintained. It will also be important to determine if such programs need to impact on each stage of child development as the catching-up process gets underway. This raises the important question of whether these programs could kick-start aspects of delayed development, or if they simply increase life skills at any given point. The results in our study indicate that delays to cognitive, emotional, and social development as a result of adversity can be at least partly recoverable through simple, low-cost programs. Whether complete recovery is possible is yet to be established.

As our methodology was based on child development norms that are relevant cross-culturally, the results are likely to be generalizable to disadvantaged children across the countries and cultures of the developing world. Simple enrichment interventions based on sports and creative arts activities hold a cross-cultural and non-gender-specific appeal for children. The global pattern of severe adversity is changing rapidly, with increases in climate change, displaced children, refugees, war zones, and other emergencies and natural

disasters. Simple structured programs could prove both effective in addressing the damage to children's development typically seen in these situations, and cost effective as professionally trained staff, infrastructure, or even buildings are not necessarily required.

The key limitation of this study is that we did not have an active control group. This means that we cannot attribute the effects we found to the specific activities offered. Further research is required in which the program is compared with a control group offered at the same frequency and duration of contact. Additionally, assessments were completed during the initial and final sessions of the program rather than immediately before and after the program period, and the children were not necessarily assessed in the same order on these two occasions. Each of these issues could be addressed in future work. The study is also limited by the fact that the two groups differed in age, in that the children in the intervention group were slightly younger than those in the control group, and because the children in the intervention group had slightly higher LSAS scores at the start of the study than the control group. Nevertheless, the analyses show there were large improvements in observer-assessed life skills following the program. Other limitations relate to the study being run in real-world conditions with no dedicated funding. The allocation to group (program or control was not random, and although we sought to ensure that participants and facilitators were unaware of the research details and group allocation, this could not be guaranteed. For these reasons the study was classed as a pragmatic randomized controlled trial (Dal-Ré et al., 2018, which arguably has greater generalizability in the field than does a standard randomized controlled trial (Salive, 2017.

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Appendix: Life Skills Assessment Scale

Please complete this scale while observing, or as soon as possible after observing, the young person. You may need to spend some time observing before you decide. Do not spend too long thinking about each question, just record your impression. For each question, consider age appropriateness (think of actual age, rather than physical appearance).

Put a ✓ in one most relevant box for each question. The blank boxes can be used to note down things you saw that helped you fill in the boxes or for any other comments. You do not always have to fill in the comment boxes.

Name of young person	Gender of young person	Name of assessor
Actual age of young person	How old does the young person look?	Is the young person having difficulty working in a language other than their native language?

Date of assessment	Does not yet do	Does with lots of help	Does with some help	Does with a little help	Does independently
IO. Interacting with others For example, does X interact appropriately with peers, staff, and children of the opposite sex? Does X communicate effectively? Does X show sensitivity to others' needs and feelings?					

Any other comments you would like to make:

DP. Overcoming difficulties and solving problems For example, does X find a way around obstacles that arise? Does X ask for help appropriately? Does X solve problems successfully?					
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Any other comments you would like to make:

TI. Taking initiative For example, does X carry out tasks without being told? Does X show age-appropriate leadership?					
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Any other comments you would like to make:

MC. Managing conflict For example, does X show appropriate assertiveness? Does X resolve disagreements appropriately? Does X accept appropriate correction? Does X do this without using violence or foul language or running away?					
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Any other comments you would like to make:

UI. Understanding and following instructions For example, Does X understand appropriate instructions when given? Does X comply with instructions? Does X ask for clarification when needed?					
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Any other comments you would like to make:

OS. Overall score The overall score is obtained by changing each ✓ into numbers 1 = Does not yet do 2 = Does with lots of help 3 = Does with some help 4 = Does with a little help 5 = Does independently Add all the numbers and put the total in the box on the right, then divide by 5. This is the overall score. Put this in the overall score box	Total	=	Overall score
	<div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto;"></div> 5		<div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto;"></div>

Any other comments you would like to make:

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