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Effects of the PCYC Catalyst outdoor adventure intervention program on youths' life skills, mental health, and delinquent behaviour

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This study used mixed methods to examine the effects of an Australian outdoor adventure intervention on youth-at-risks' life effectiveness, mental health, and behavioural functioning. The sample consisted of 53 adolescents who completed a Catalyst program conducted by the Queensland Police-Citizens Youth Welfare Association, a non-profit organisation, in Queensland, Australia. The program involved 15 programming days over a 10–12-week period. There were small to moderate short- and longer-term improvements in life effectiveness, psychological well-being, and several aspects of behavioural conduct. There were no positive longer-term impacts on psychological distress and some aspects of behaviour. Thematic analysis of 14 participant interviews identified six major themes: overcoming challenging backgrounds, contending with adversity, personal development, social development, motivation to work for change, and a more optimistic outlook on the future. Further research utilising a comparison group, multiple sources of data, and a larger sample could help to qualify results and increase generalisability.

Keywords: adolescents; intervention; adventure therapy; outdoor adventure interventions; mixed methods; program evaluation

Introduction

Ensuring young people get the best possible start in life is central to the health, social inclusion, and productivity agendas of the Australian Government (Australian Institute of Health and Welfare [AIHW], 2008). In undergoing the critical transition from childhood to adulthood, young people face threats and dangers from themselves, others, and society at large (Kelly, 2000). Thus, there is a cultural need to protect, monitor, contain, and sustain young people (Sharland, 2006). Of particular concern are youth who are at-risk of manifesting negative life trajectories with regard to their psychological well-being, education and career, and/or civic or social contributions.

Risk-taking is a healthy and desirable component of young people's lives and development. Taking risks is intrinsically linked to identity formation, and ideally supports the growth of an integrated sense of self, self-esteem, and self-regulation (Sharland, 2006). Young people are also increasingly expected to become the architects of their own lives (Crime Prevention Victoria & Australian Institute of Family Studies, 2003). This increasing independence, however, brings many challenges and risks of negative, as well as positive, developmental outcomes. As adolescence is a critical period for the emergence and entrenchment of cognitive and behavioural patterns, positive experiences during this period help to enable a young person to achieve and maintain a

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healthy and productive life (Cunneen & White, 2011). However, negative experiences can put individuals on problematic pathways which, for some, persist into adulthood and involve considerable costs for individuals, families, and the community (Crime Prevention Victoria & Australian Institute of Family Studies, 2002).

Risks encountered by young people can be individual, family, school-based, life-events, and societal (Crime Prevention Victoria & Australian Institute of Family Studies, 2002). The more proximal the risk factor, the greater its influence (Walker & Shinn, 2002). In addition, the onset, frequency, persistence, and duration of risks matter; the more risks one is exposed to, and the longer the exposure, the greater the potential negative impact upon the individual's well-being (Welsh & Farrington, 2010). Risks often overlap, so the presence of one risk can make the occurrence of another risk more likely. An individual's degree of exposure to risk for negative outcomes can be categorised as typical, with no elevated concern of risk for negative outcomes; elevated risk status for negative outcomes; or life-course-persistent risk of negative outcomes (Walker & Shinn, 2002).

Negative psychosocial developmental outcomes can become internalised (e.g., anxiety and depression) or externalised (e.g., aggression, violence, delinquency, school failure and dropout, sexual harassment, unsafe sexual practices, dangerous driving, and substance abuse). Internalised and externalised problems are both associated with higher rates of injury among young people and, in the longer-term, a range of health conditions and associated risk factors (e.g., mental health disorders, chronic and communicable diseases, and overweight and obesity) which may emerge and continue into adulthood (AIHW, 2008). The problems that youth-at-risk experience are clearly evident in poorer health, education, and crime statistics (Australian Institute of Criminology, 2013; AIHW, 2012; COAG Reform Council, 2013) and may continue into adulthood (AIHW, 2008).

Youth-at-risk intervention programs

A wide variety of intervention programs are designed and implemented in efforts to decrease the likelihood of youth-at-risk developing negative life trajectories. Intervention programs can be characterised by the point at which they engage in an individual's development (Chan et al., 2004; Weissberg, Kumpfer, & Seligman, 2003; Williams, Holmbeck, & Greenley, 2002):

1. Primary prevention programs aim to enhance protective factors and keep minor problems and difficulties from emerging. They target the whole population and also specific groups who may be vulnerable.
2. Secondary prevention programs aim to counteract or stop harm from exposure to known risk factors. They target individuals with early warning signs of developing negative life trajectories and aim to help support the individual towards a positive life trajectory.
3. Tertiary prevention programs aim to reduce, rather than reverse, harm among the most severely at-risk individuals who have established problems. They also aim to minimise the potential for future problems and their consequences.

Earlier prevention strategies are generally preferred over those which are implemented after problems have become entrenched (Crime Prevention Victoria & Australian Institute of Family Studies, 2002). Early prevention is an efficacious and cost-effective approach to promoting positive development and preventing potential problems for youth exposed to negative risk factors (Commonwealth of Australia, 1999; Walker & Shinn, 2002). Prevention programs use a wide range of models and techniques, variously aimed at

promoting functional and productive patterns of thinking, feeling, or behaving (Cunneen & White, 2011), including cognitive-behavioural therapies, family-based therapies, justice-system interventions, residential treatment programs, and adventure-based programs.

Cognitive-behavioural therapy has been widely used for individual and group treatment of youth with mental health issues, social behaviour problems, and comorbid conditions (Kendall, 2012). Cognitive-behavioural therapy aims to increase positive behaviours and thoughts, decrease negative behaviours and thoughts, and improve interpersonal skills (Szigethy, Weisz, & Findling, 2012). Cognitive-behavioural therapy techniques include identification and modification of maladaptive thoughts and behaviours, skill building, anger management, rehearsal, role taking, and contingent reinforcement (Van Bilsen, 2013). Meta-analytic reviews of cognitive-behavioural therapy for youth have found effectiveness in reducing anxiety (standardised mean difference [d] = 0.98; 44% reduction; 30 studies; James, James, Cowdrey, Soler, & Choke, 2013), criminal offending (d = 0.84; 39% reduction; 58 studies; Landenberger & Lipsey, 2005), anger (d = 0.67; 32% reduction; 40 studies; Sukhodolsky, Kassinove, & Gorman, 2004), antisocial behaviour (d = 0.48; 23% reduction; 30 studies; Bennett & Gibbons, 2000), substance abuse (d = 0.45; 22% reduction; 17 studies; Waldron & Turner, 2008), and depression (d = 0.34; 17% reduction; 31 studies; Weisz, McCarty, & Valeri, 2006).

Family-based interventions assume that juvenile antisocial behaviour is developed and maintained through maladaptive family interactions, structures, and patterns (Tarolla, Wagner, Rabinowitz, & Tubman, 2002). Family-based therapies aim to improve parenting skills (e.g., child/parent communication patterns and skills, behavioural contracting, specification of rules, and positive reinforcement), as well as youth social, coping, and regulation skills (Greenberg & Lippold, 2013). Additionally, they seek to address problems in the broader family system, as well as youth interactions in other domains (e.g., peer and school settings) (Henggeler & Sheidow, 2012). Family-based interventions are associated with reductions in adolescent substance use, delinquency, recidivism, associations with deviant peers, and with improvements in educational outcomes and family functioning (Liddle, Rowe, Dakof, Ungaro, & Henderson, 2004; Waldron & Turner, 2008). A meta-analysis of the effectiveness of family-based crime prevention programs reported small significant short-term reductions for offending outcomes (d = 0.22; 11% reduction; 40 studies) and delinquency outcomes (d = 0.32; 16% reduction; 19 studies), and a small non-significant short-term reduction for antisocial behaviour outcomes (d = 0.20; 10% reduction; 27 studies; Farrington & Welsh, 2003).

Multi-systemic therapy is an intensive, family-focused and community-based intervention for families of adolescents with social, emotional, and behavioural problems. It uses a combination of empirically based treatments (e.g., cognitive-behavioural therapy, behavioural parent training, and functional family therapy) to address multiple variables (e.g., family, school, and peer groups) that have been identified as factors in juvenile and antisocial behaviour (Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009). Multi-systemic therapy aims to reduce adolescent criminal activity and antisocial behaviour by empowering youth and their parents with the skills and resources needed to independently address difficulties and manage their complex environmental and social problems (Littell, Popa, & Burnee, 2005). Multi-systemic therapy has a relatively strong research base, with program effects including long-term reductions in rearrest, severity of crimes committed, reduced risk of out-of-home placement, and improvement in academic outcomes (Henggeler & Sheidow, 2012). A meta-analysis of the effectiveness of multi-systemic therapy reported a moderate significant short-term reduction in antisocial behaviour and psychiatric symptoms (d = 0.55; 27% reduction; 11 studies; Curtis, Ronan, & Borduin, 2004).

Juvenile court systems have implemented several systems to reduce youth delinquency and reoffending, including restorative justice, adolescent diversion programs, and changes in adjudication and sentencing (Cunneen & White, 2011). Restorative justice aims to increase the involvement of criminal offenders with the victims of their crime and the greater community through the voluntarily meeting of the offender with the victim to discuss the crime and to decide ways to repair the harm (Rodriguez, 2007; Strang, 2001). Meta-analytic reviews of restorative justice for youth have reported small reductions in recidivism ($d = 0.34$; 17% reduction; 15 studies; Bradshaw, Roseborough, & Umbreit, 2006; $d = 0.14$; 7% change; 22 studies; Latimer, Dowden, & Muise, 2005). Adolescent diversion programs divert youth from the juvenile justice system and instead refer them to community-based services. A meta-analysis of the effectiveness of adolescent diversion programs reported a small, non-significant, short-term reduction in recidivism ($d = 0.10$; 5% reduction; 28 studies; Schwalbe, Gearing, MacKenzie, Brewer, & Ibrahim, 2012).

Residential treatment programs are for youth who have medium to high emotional and behavioural support needs. They provide stays of varying periods in a non-family setting, from a few weeks to several months (Brady, 2002). Residential treatment programs range in degree of restrictiveness from treatment foster care and community-based group homes through to psychiatric hospitals (McCurdy & McIntyre, 2004). Residential treatment programs provide short-term housing as well as development of skills, support, and activities necessary for recovery. Together with specialised therapeutic treatment, these needs are addressed through intensive supervision and group work in a highly structured environment (Knorth, Harder, Zandberg, & Kendrick, 2008). They are often family-focused and can include vocational education and training. Reviews of the outcomes of residential treatment programs suggest that they improve functioning for many, but not all, youth (Frensch & Cameron, 2002; Hair, 2005). However, gains made by youth during treatment are not easily maintained and tend to dissipate over time (Frensch & Cameron, 2002). Post-discharge changes depend on family involvement, community support, and aftercare services (Hair, 2005). A meta-analysis of the effectiveness of residential treatment programs reported moderate significant short-term reduction in internalising problem behaviour ($d = 0.45$; 22% reduction; 7 studies) and externalising problem behaviour ($d = 0.60$; 29% reduction; 5 studies; Knorth et al., 2008).

Outdoor adventure interventions (OAI) generally combine small groups, nature-contact, adventure-based activities, and eclectic therapeutic processes to create opportunities for change in participants, with the purpose of supporting an individual (or family) to move towards greater health and well-being (Pryor, 2009). OAIs in Australia take many forms (e.g., day programs, multi-day expeditions, centre-based programs, and journey-based programs), operate in a range of settings (e.g., urban and rural), and utilise diverse and innovative practices (e.g., narrative therapy and nature therapy) to achieve a variety of outcomes (e.g., psychosocial development and therapeutic treatment) with a range of client groups (e.g., youth-at-risk and people recovering from drug abuse). OAIs range from one-day activities to week-long residential camps and multi-week outdoor expeditions. Programs also often involve lead-in and follow-up components. A growing body of research indicates that OAIs can result in short- and long-term therapeutic change (e.g., Bowen & Neill, 2013a; Pryor, 2009). A meta-analysis of OAIs reported moderate significant positive short-term change in psychological, behavioural, emotional, and interpersonal domains for 10–17-year-old participants ($g = 0.44$; 21% reduction; 95% confidence interval [CI] [0.38, 0.50]; 148 studies; Bowen & Neill, 2013b).

In theory, OAIs can provide a holistic integration of physical, mental, emotional, behavioural, social, cultural, spiritual, and environmental experiences for participants

which enhances personal growth and strengthens connections to others and community (Pryor, Carpenter, & Townsend, 2005; Pryor & Field, 2007). Three important outcome categories which have received attention in OAI literature are life effectiveness (capacity to adapt, survive, and thrive), mental health (psychological state and level of mental functioning), and delinquent behaviour (capability of a person to act within and adjust to their environment; e.g., Neill, 2008; Schell, Cotton, & Luxmoore, 2012; Tucker, Zelov, & Young, 2011). Bowen and Neill's (2013b) meta-analysis for these outcome categories for 10–17-year olds indicated significant positive small to moderate short-term increases in life effectiveness (0.37), mental health (0.46), and behavioural functioning (0.39).

The present study

Youth prevention programs that utilise innovative and non-traditional approaches, such as OAIs, often do so in isolation and with limited knowledge about how to maximise their effects. A critical task for program developers, and for advancing the field as a whole, is effective use of research and evaluation (Gray & Neill, 2012).

This study aimed to evaluate the effects of an Australian OAI for youth-at-risk on their life effectiveness, mental health, and behavioural functioning. It was hypothesised that participating in a Police-Citizens Youth Club (PCYC) Catalyst youth development program would be associated with a significant short-term improvement in life effectiveness, mental health, and behavioural functioning and longer-term maintenance of the gains. An additional aim of this study was to explore participants' backgrounds, experience of the program, and perceptions of program effects in order to better understand the processes involved in treatment outcomes.

Method

Participants

There were 53 adolescents (16 females (30%) and 37 males (70%)) who completed one of six PCYC Bornhoffen Catalyst intervention programs between 2012 and 2013. Thirty six participants completed pre- and post-surveys. Participant ages ranged from 13 to 16 years ($M = 14.0$; $SD = 0.7$). Follow-up data were obtained from 29 participants (9 females (31%) and 20 males (69%)) from five schools whose ages ranged from 13 to 15 years ($M = 13.9$; $SD = 0.7$). The most common reason for missing long-term data was that the participant was no longer a student at the high school. Qualitative data were obtained from 14 participants (7 females (50%) and 7 males (50%)) from two schools whose ages ranged from 13 to 14 years ($M = 13.7$; $SD = 0.5$).

The intervention

The Catalyst program was developed and provided by PCYC Bornhoffen, one of 55 PCYCs in Queensland, Australia. The PCYCs are operated by the Queensland Police-Citizens Youth Welfare Association, a non-profit youth development organisation, which partners with the Queensland Police Service to improve communities through youth development.

Catalyst is an OAI for young people (aged 13–16 years) who are considered to be at risk of adverse outcomes in their educational, vocational, and life-course pathways. The program aims to help young people to make positive life choices, experience a meaningful life, make a positive contribution to their community, and assist in the transition into young adulthood. The intervention program applies early intervention strategies to support

individuals, families, and communities. Catalyst programs aimed to serve as a ‘catalyst’, that is, the start of a process to help a young person to improve his or her current life trajectory (PCYC Bornhoffen Adventure Development, 2011). The Catalyst program partnered with state high schools and other regional PCYCs in Queensland and had funding support from various corporate and state government sources.

The Catalyst program utilised an Adventure Based Counselling (Schoel & Maizell, 2002; Schoel, Prouty, & Radcliffe, 1988) and experiential learning approach during 15 programming days over a 10–12-week period. The main program components were a three-day, two-night Lead-in, a nine-day outdoor adventure Expedition, and three separate Follow-up days. In addition, as a part of the partnership with schools, teachers were required to conduct eight additional hours of mentoring per participant (before, during, and after the Catalyst program).

Catalyst programs were conducted with groups of approximately 10 participants selected by a state high school and/or partner agency. Groups were typically lead by two PCYC Bornhoffen facilitators who had training and expertise in conducting a broad range of outdoor adventure activities, youth work skills (such as counselling), and group facilitation and management skills. The facilitators were accompanied by two teachers or caseworkers from the partner agency who help to provide skills, such as behaviour management, that are important in working with youth-at-risk.

Materials

Three self-report questionnaires were completed by participants on up to three occasions: pre-program (Time 1; T1), post-program (Time 2; T2), and a 6–12-month Follow-up (Time 3; T3). Semi-structured interviews were conducted during the final stages of the Expedition component of the program.

Youth at Risk Program Evaluation Tool (YARPET)

An adapted version of the Youth at Risk Program Evaluation Tool (YARPET; Neill, 2007) was used as a self-report measure of life effectiveness skills that were targeted by the Catalyst program. The adapted YARPET consisted of 30 items to measure 10 subscales (each with 3 items): Emotional Resilience, Goal Setting, Healthy Risk-taking, Locus of Control, Self-Awareness, Self-Esteem, Self-Confidence, Communication Skills, Community Engagement, and Cooperative Teamwork. Participants rated themselves on each item using an eight-point Likert scale which ranged from 1 (False; not like me) to 8 (True; like me). Thus, higher scores indicated higher self-perceived life effectiveness.

General Well-Being (GWB)

An adapted version of the General Well-Being (GWB; Heubeck & Neill, 2000; Veit & Ware, 1983) was used to measure youth participants’ mental health. The adapted GWB consisted of 10 items designed to measure Psychological Distress (5 items) and Psychological Well-Being (5 items). Participants rated themselves on each item using an eight-point Likert scale, ranging from 1 (False; not like me) to 8 (True; like me). Psychological Distress items were reverse-scored so that higher scores indicated better mental health.

Adolescent Behavioural Conduct – Self Report (ABC-SR)

An adapted version of the Adolescent Behavioural Conduct – Self-Report (ABC-SR; Mak, 1993) was administered to youth participants to assess their behavioural conduct. Using a seven-point frequency scale ranging from 0 (Never) to 6+ (6 times or more), youth participants rated how often they engaged in eight types of behaviours over the past six months (Cheating, Drug use, Wagging, Fighting, Vehicles, Stealing, Harming, and Vandalising). Overall behavioural conduct scores were computed as the total number of delinquency acts that each youth participant reported. Scores ranged from 0 to 48 with higher scores indicating more behaviour conduct problems. Participants also rated the change in their behavioural conduct over the previous six months on a five-point Likert scale from 1 (Got a lot worse) to 5 (Improved a lot).

Semi-structured interviews

Semi-structured interviews with youth participants were conducted towards the end of the Expedition. The interviews aimed to explore the impact of the program on participants' life effectiveness, mental health, and behavioural functioning. Interviews began by asking participants about how they became involved in the Catalyst program, their experience of different parts of the program (Lead-in, Expedition, Follow-up), perceived effects of the program, and the perceived value of the program, including suggestions for improvement.

Procedure

This study utilised a purposive convergent parallel mixed-methods sampling design whereby quantitative data were obtained from all youth participants, while approximately one-third of the youth participants were selected to generate data for the qualitative strand of the study (Teddlie & Yu, 2007). In this approach, quantitative and qualitative data are collected at approximately the same time, analysed independently, prioritised equally, and the results are merged during the overall interpretation (Creswell & Plano Clark, 2011).

Mixed-methods research draws on the respective strengths and perspectives of quantitative and qualitative data (Östlund, Kidd, Wengström, & Rowa-Dewar, 2011). Each type of data provides a different representation of the world and their integration broadens the scope of perspectives that can be investigated in attempting to address the research questions (Tashakkori & Teddlie, 2003). Both quantitative and qualitative knowledge are important for understanding the change processes in psychotherapeutic interventions (Hanson, Creswell, Clark, Petska, & Creswell, 2005). The combination of qualitative and quantitative findings produces an overall or negotiated account in which the findings are forged, which is not possible by using a singular approach (Bryman, 2007). Thus, employing both approaches enhances the integrity of findings and provides a better understanding of a research problem than might be possible with use of either methodological approach alone (Palinkas, Horwitz, Chamberlain, Hurlburt, & Landsverk, 2011).

Short-term (T1 to T2) and longer-term (T1 to T3) changes in youth participants' life effectiveness, mental health, and behavioural conduct were investigated using descriptive statistics and standardised mean effect sizes (ESs (Hedges' *g*) with 95% CIs. Comprehensive Meta-Analysis Version 2 software (Borenstein, Hedges, Higgins, & Rothstein, 2005) was used to calculate ESs and CIs. If the CI excludes the null value of zero, then the mean ES is considered to be statistically significant (Ellis, 2010).

The semi-structured interview transcripts with 14 youth participants from two schools were analysed using an inductive thematic analysis. NVivo 10 software (QSR, 2012) was used to follow guidelines outlined by Braun and Clarke (2006): become familiar with the data (transcribe data, read and re-read the data, and take note of initial ideas or patterns); generate initial codes (systematically code interesting features of the data and collate data relevant to each code); search for themes (organise initial codes into themes and gather all data relevant to each potential theme); review themes (verify that the themes fit both the coded extracts as well as the entire data set and generate a thematic ‘map’ of the analysis); define and name themes (refine each theme and generate definitions and names for each theme); and produce the report (selection of exemplary examples and relate them back to the research question and literature). Researcher reflection and insight from field notes were also integrated throughout the process, adding further depth to the analysis (Gray, 2004).

The University of Canberra Human Research Ethics Committee provided ethical approval for conducting the study. All youth participants and their parents provided informed consent to participate in the study. The questionnaires were administered with standardised instructions prior to the first (T1; YARPET, GWB, and ABC-SR), and following the final (T2; YARPET and GWB), sessions of the program. Additional assistance and/or verbal administration was provided when required (e.g., due to poor attention or literacy skills). On average, it took 15–25 minutes to complete the self-report questionnaires on each occasion. Follow-up questionnaires were administered 6–12 months after the completion of the program (T3; YARPET, GWB, and ABC-SR) by sending the questionnaires to the coordinating teacher at the participants’ high schools.

Semi-structured interviews were conducted by the researchers with selected program participants following the final session of the Expedition. Effort was made to select a purposeful sample of youth participants with the goal of trying to achieve a balance with regard to gender and age. Interviews with youth participants lasted between 10 and 40 minutes.

Results

Longitudinal changes based on youth self-reports

Table 1 provides descriptive statistics and ESs for short-term changes, along with comparative age-based benchmarks from Bowen and Neill’s (2013b) meta-analysis of adventure therapy programs. Table 2 provides descriptive statistics and ESs for Catalyst youth participants’ longer-term changes along with comparative aged-based benchmarks from Bowen and Neill (2013b).

Life effectiveness skills

The average short-term (T1 to T2) ES for life effectiveness was small and positive ($g = 0.17$, $N = 38$). ESs for all 10 dimensions of life effectiveness were positive (see Table 1) and ranged between 0.02 (Self-Awareness) and 0.30 (Communication Skills). The average short-term ES of 0.17 is akin to 57% of participants in Catalyst programs exceeding the life skills of an equivalent group who do not participate. Examination of ESs for individual participants indicated that 60% reported higher life effectiveness.

The average longer-term (T1 to T3) ES was small to moderate and positive ($ES = 0.29$, $N = 29$) and slightly larger than the short-term ES (see Table 2). The long-term improvements were positive for all 10 dimensions of life effectiveness ranged

Table 1. Descriptive statistics, ESs and CIs for T1 and T2 life skills and mental health factors ($N = 36$).

Constructs	Lead-in (Pre; T1)		Follow-up (Post; T2)			Short-term Catalyst CI			Short-term BM CI			Benchmark category
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>ST</i> _{ES}	<i>ST</i> _{0.025}	<i>ST</i> _{0.975}	<i>ST</i> <i>BM</i> _{ES}	<i>ST</i> <i>BM</i> _{0.025}	<i>ST</i> <i>BM</i> _{0.975}		
Life effectiveness skills												
Emotional Resilience	5.22	1.53	5.42	1.17	0.14	-.18	0.46	0.46	0.37	0.54	0.54	Clinical
Goal Setting	6.22	1.63	6.39	1.48	0.11	-.21	0.43	0.46	0.37	0.54	0.54	Clinical
Healthy Risk-Taking	5.24	1.60	5.37	1.51	0.08	-.24	0.40	0.46	0.37	0.54	0.54	Clinical
Locus of Control	6.02	1.58	6.30	1.17	0.19	-.13	0.52	0.41	0.34	0.47	0.47	Self-Concept
Self-Awareness	6.38	1.45	6.41	1.45	0.02	-.30	0.34	0.41	0.32	0.49	0.49	Social Development
Self-Esteem	5.37	1.41	5.77	1.25	0.29	-.03	0.62	0.39	0.29	0.50	0.50	Behaviour
Self-Confidence	5.65	1.55	5.85	1.33	0.13	-.19	0.46	0.41	0.34	0.47	0.47	Self-Concept
Communication Skills	5.48	1.26	5.85	1.14	0.30	-.03	0.63	0.41	0.34	0.47	0.47	Self-Concept
Community Engagement	5.55	1.59	5.85	1.33	0.20	-.12	0.52	0.41	0.32	0.49	0.49	Social Development
Cooperative Teamwork	5.50	1.53	5.83	1.49	0.21	-.11	0.54	0.41	0.32	0.49	0.49	Social Development
Overall					0.17	.07	0.27	0.44	0.38	0.50	0.50	Total
Mental health												
Psychological Distress	5.38	1.82	4.82	1.50	-0.33	-.65	0.00	0.46	0.37	0.54	0.54	Clinical
Psychological Well-Being	5.47	1.71	5.60	1.73	0.07	-.25	0.39	0.46	0.37	0.54	0.54	Clinical
Overall					-0.12	-.52	0.27	0.46	0.37	0.54	0.54	Clinical

Note: *M* = mean; *SD* = standard deviation; *ST* = short-term; *ES* = effect size (Hedges' *g*); *CI* = confidence interval; *BM* = benchmark (10–17-year olds; obtained from Bowen & Neill, 2013b). An increase over time signifies improvement.

Table 2. Descriptive statistics, ESs and CIs for T1 and T3 life skills (N = 29), mental health (N = 28), and behavioural conduct factors (N = 27).

Constructs	Lead-in (Pre; T1)		Long-term (FU; T3)		Long-term Catalyst CI		Long-term BM CI		Benchmark category		
	M	SD	M	SD	LT _{0.025}	LT _{0.975}	LT BM _{ES}	LT BM _{0.025}		LT BM _{0.975}	
					LT _{ES}						
Life effectiveness skills											
Emotional Resilience	4.81	1.66	5.24	1.58	0.26	-0.10	1.19	0.49	0.40	0.57	Clinical
Goal Setting	5.85	1.69	5.91	1.95	0.03	-0.32	0.92	0.49	0.40	0.57	Clinical
Healthy Risk-Taking	4.56	1.50	5.31	1.34	0.51	0.13	1.45	0.49	0.40	0.57	Clinical
Locus of Control	5.80	1.74	5.97	1.40	0.10	-0.25	0.99	0.44	0.37	0.50	Self-Concept
Self-Awareness	6.20	1.56	6.37	1.40	0.11	-0.24	0.97	0.44	0.35	0.52	Social Development
Self-Esteem	4.93	1.41	5.55	1.32	0.44	0.07	1.36	0.42	0.32	0.53	Behaviour
Self-Confidence	5.25	1.69	5.94	1.27	0.44	0.07	1.35	0.44	0.37	0.50	Self-Concept
Communication Skills	5.02	1.35	5.92	1.02	0.72	0.32	1.64	0.44	0.37	0.50	Self-Concept
Community Engagement	5.56	1.68	5.60	1.34	0.03	-0.33	0.93	0.44	0.35	0.52	Social Development
Cooperative Teamwork	5.41	1.56	5.90	1.30	0.33	-0.03	1.23	0.44	0.35	0.52	Social Development
Overall					0.29	0.15	0.43	0.47	0.41	0.53	Total
Mental health											
Psychological Distress	5.47	1.76	5.29	1.83	-0.10	-0.46	0.26	0.49	0.40	0.57	Clinical
Psychological Well-Being	4.55	1.53	5.96	1.33	0.95	0.51	1.39	0.49	0.40	0.57	Clinical
Overall					0.42	-0.61	1.45	0.49	0.40	0.57	Clinical
Behavioural Conduct											
Cheating	1.33	1.33	1.63	1.64	0.19	-0.56	0.18	0.42	0.32	0.53	Behaviour
Drug Use	1.19	1.82	1.96	2.10	0.38	-0.76	0.00	0.42	0.32	0.53	Behaviour
Wagging	2.22	2.00	2.30	2.38	0.04	-0.40	0.33	0.42	0.32	0.53	Behaviour
Fighting	2.26	1.81	1.45	1.45	-0.47	0.09	0.86	0.42	0.32	0.53	Behaviour
Vehicles	1.11	1.99	1.41	2.14	0.14	-0.51	0.23	0.42	0.32	0.53	Behaviour
Stealing	1.04	1.95	0.44	1.31	-0.34	-0.04	0.72	0.42	0.32	0.53	Behaviour
Harming	2.41	2.19	1.04	1.56	-0.68	0.27	1.09	0.42	0.32	0.53	Behaviour
Vandalising	0.93	1.57	0.52	1.31	-0.27	-0.10	0.65	0.42	0.32	0.53	Behaviour
Overall					-0.12	-0.13	0.37	0.42	0.32	0.53	Behaviour

Note: M = mean; SD = standard deviation; FU = follow-up; ES = effect size (Hedges' g); CI = confidence interval; BM = benchmark (10–17-year olds; obtained from Bowen & Neill, 2013b) – as the overall Post-program to Follow-up effect size was 0.03 (Bowen & Neill, 2013a), this has been added to the Short-Term benchmarks). An increase over time signifies improvement except for Behavioural Conduct.

between 0.03 (Goal Setting) and 0.72 (Communication Skills). An average long-term ES of 0.29 is akin to 61% of participants in Catalyst programs exceeding the life skills of an equivalent group who do not participate. Examination of ESs for individual participants indicated that 62% reported higher life effectiveness

Mental health

Youth participants reported a small to moderate heightening of Psychological Distress (ES = -0.33 ; a 16% change) during the program and a very small improvement in Psychological Well-Being (ES = 0.07 ; a 4% change; $N = 36$; see Table 1). When these two aspects of mental health were combined, there was an average short-term ES of -0.12 which is akin to a 5% worsening in mental health. Examination of ESs for individual participants indicated that 65% reported lower overall mental health at the end of the program.

The longer-term effects (see Table 2; $N = 28$) indicated a very small negative change in Psychological Distress (ES = -0.10 ; a 5% change) and a large improvement in Psychological Well-Being (ES = 0.95 ; a 43% change), with an overall average ES for mental health of 0.42 which is akin to 66% of participants in Catalyst programs exceeding the mental health of an equivalent group who do not participate. Examination of ESs for individual participants indicated that 79% reported higher mental health.

Adolescent behavioural conduct

Adolescent behavioural conduct was assessed at T1 (Pre-program) and T3 (Follow-up) ($N = 27$). At T1, there was an average of 12.5 self-reported behavioural conduct issues over the previous six months (~ 2 incidents per month). The most commonly reported behavioural conduct issues were Harming ($M = 2.41$), Fighting ($M = 2.26$), and Wagging ($M = 2.22$) which were reported as occurring, on average, more than twice over the previous six months. These behaviours were followed in frequency of occurrence by Cheating ($M = 1.33$), Drug Use ($M = 1.19$), Vehicles ($M = 1.11$), Stealing ($M = 1.04$), and Vandalising ($M = 0.93$), which participants reported engaging in, on average, once over the previous six months. This represented a collective total of 337 self-reported behavioural incidents by the 27 participants in the previous six months.

In the six-month period prior to the Follow-up assessment (T3), participants reported fewer behavioural conduct incidents (average of 10.7 incidents per month compared to 12.5 at T1; an overall reduction of 49 incidents per 6 months). There were substantial reductions in the reported frequency of Harming (ES = -0.68), Fighting (-0.47), Stealing (-0.34), Vandalising (-0.27), small increases in Cheating (0.19), Vehicles (0.14), and Wagging (0.04), and a small to moderate increase in the self-reported frequency of one behaviour (Drug Use; 0.38).

The overall adolescent behavioural conduct longer-term ES was -0.12 . Examination of ESs for individual participants indicated that 71% reported fewer behavioural conduct problems. When asked at T3 (Follow-up), 11% of participants indicated that their behaviour had 'improved a lot', 47% indicated that their behaviour had 'improved a bit', 21% indicated that their behaviour was 'about the same', and 13% indicated that their behaviour 'got a lot worse'.

Participants' backgrounds, program experience and perceptions of the program effects

Thematic analysis of interviews with 14 youth participants identified six major themes: overcoming challenging backgrounds, contending with adversity, personal development,

social development, motivation to work for change, and more optimistic outlook on the future. Pattern and descriptive codes used for each theme are presented in Table 3 with supportive transcript excerpts to illustrate each theme.

Overcoming challenging backgrounds

Youths almost universally reported experiencing one or more risk factors, most commonly family problems, social problems with peers, behavioural conduct problems at school, and psychological issues including depression and suicidality. For example, a 13-year-old female stated that:

I have a lot of trouble at school ... I suffer from depression and low self-esteem. I get bullied a lot ... (threatened to get bashed and stuff like that) ... I self-harmed in grade seven ... Me and my Dad don't have a very good relationship. We always fight, and we hit each other.

Towards the end of the Expedition, this participant reported that:

[I've learnt] that ... even though it's hard, I can still do it ... It's helped with my self-esteem ... it's helped with my confidence as well. I reckon it's kind of made me a bit of a stronger person ... I'm just learning to control my emotions a bit more. It's kind of helped me with like being able just to think ... just think about things properly ... I've learnt to keep my mouth shut and just be calm ... I seem a bit happier ... [I've learnt] that if I put my mind to something I can do it.

From most, if not all, participants, a clear outcome from participating in the Catalyst program was that they had taken steps towards their overcoming challenging backgrounds.

Contending with adversity

Youth participants faced multiple physical, mental, emotional, and social challenges during the program which caused distress, conflict, and crisis. Although youth participants looked forward to the Expedition, they described the Expedition hiking as the most difficult component (particularly hiking uphill with heavy packs). They also reported that their capacity for teamwork was challenged due to group conflict during the Expedition. One participant summed up the difficulties which most participants expressed experiencing:

[The program] was hard ... Like doing all the walking, and, oh, like physical and mental stuff – like trying to get along with these people here, and not going off at them. Not getting angry and shitty all the time ... I hate not having showers and walking like over heaps and heaps of mountains. And like where you have to get to a certain place before you can camp – like you can't just camp anywhere. So if something bad happens, we're stuck there ... So we're going to be walking in the dark, and we're going to be all tired ... Because you can't just sleep anywhere on these tracks. (13-year-old female)

Personal development

The difficulties which youth participants faced during the program appeared to serve as a catalyst for significant personal change. Youths developed more positive thinking, particularly self-belief, courage, and self-control, including increased capacity to manage emotions and persistence in overcoming problems. For example, a 14-year-old male commented that:

[The program] has had an effect on my behaviour. It's showed me ... different ways of resolving things. And doing those. It's fixing them up, instead of going on ... in a negative way of doing it, there's always a positive way of fixing things.

Table 3. Thematic analysis pattern and descriptive codes for interviews with Catalyst program participants about their backgrounds, program experience, and program effects ($N = 14$).

Pattern codes	Descriptive codes	Examples from transcripts
Overcoming challenging background	Extreme circumstances	'People say that I won't finish school, but I'm going to finish school'.
	Multiple risk factors	'I can let go of the past. Yeah. And I still forgive my Mum after what she's done'. 'When I got back, I felt so calm ... I can let go of the past ... I am going to say it was really fun and life-changing ... it will probably make me a better person'.
Contending with adversity	Distress	'It's my first time going away from home (crying) ... I've never like slept out, or gone to anyone's house, or gone away from home ... [I've been] getting upset and all that all the time'.
	Crisis	'The caving. That was a bit of a challenge for me. I don't particularly like going in dark places that are like closed-in and dark ... Just a bit of a challenge for me'.
	Difficulty	'I just didn't like the hiking. [It was] the hardest thing I've done in my life'.
	Challenge	
Personal development	Conflict	
	Resilience	'Realising that it's hard but I can still do it – was good'.
	Self-belief	'You can do pretty much whatever you want as long as you set your mind to it'.
Social development	Self-confidence	'[I've learnt] there is always another solution. You can always control your emotions by just changing your attitude'.
	Self-control	'[The long-lasting effect if the program is] probably just the courage I've built up in myself'.
	Self-esteem	'Since we've been out here I haven't really had any suicidal thoughts. I've been able to think and just breathe'.
	Social skills	'[I've started] talking to people better. Like, respecting them'.
Social development	Communication	'I've learned that if I speak to them nicely they'll speak back to me nicer'.
	Cooperative	'[I've learned] to trust these people here'
	Teamwork	
	Relationships	'[I've learnt] how to work as a team'. '[I've learnt] don't go spreading shit [rumours]'. '[The program helped me to see] how good it is to walk with people instead of alone and stuff'. 'I'm [now] talking up a bit more. I'm listening to other people's opinions and all that'. 'I wasn't very good at talking to people, but kinda gotten better'.
Motivation to work for change	Try harder	'I learnt to try my hardest'.
	Have a go	'I'll try and help Mum more, clean the house, cook, less sickies, go to school more, go to class ... [be] happy, change my attitude'.
	Make an effort	'[I'll] try harder at school ... try and go somewhere, like try and do something with my life'.

(Continued)

Table 3. (Continued)

Pattern codes	Descriptive codes	Examples from transcripts
More optimistic outlook on the future	New beginnings	'I might just be positive all the time ... Just give it a go and all that'. 'It's [the program] actually helped me realise what's actually ... what life actually means, and what it's meant for. We're not going to just stay at home and sit somewhere in the corner where we'll be safe – we're actually meant to be getting out and exploring – pushing our comfort zone'.
	Goal setting	'[My future looks] bright ... because I finish things now. I don't just do halfway and then stop. I keep going. It makes me think that I can actually do it'.
	Hope	

A 13-year-old female commented that:

[The program] helped me a little bit with my depression. Like, I don't know – it's made me more calm, not so stressed out ... It's helped me see that I don't need to be doing that stuff [self-harming]. Because self-harming's not really doing anything – just putting scars on my body, really ... because I don't want to be doing it anymore ... since we've been out here I haven't really had any suicidal thoughts. I've been able to think, and just breathe. And just, yeah have all this open space.

Social development

The adversity which youth participants faced throughout the program also appeared to serve as a catalyst for significant social change. Participants reported a range of social challenges, including getting along with other participants, dealing with group conflict and having to work as a team. Youths reported developing positive relationships with staff and generally at least one peer, if not several, during the program. Youths developed greater trust and respect for others, communication and cooperative teamwork skills, and gained social insight (e.g., learned about the benefits of asking for, receiving, and giving support). For example, a 14-year-old male commented that:

Normally I would have told them to go away in a rude way. Or tell them to leave me alone in a different way. And stuff like that – instead of being nice to them. Now I've learned that everybody has different types of ways on how deal with people. So I just speak to them pretty much more nicely. And they probably speak back to me nicer.

A 13-year-old male commented that:

I'd still like to work more on getting along with other people ... It's easier. Like, if you need to do something, it's easier to get along with them than not get along with them ... Like when we're hiking, it's easier to share among the group than just take it and try doing it by yourself ... When you want to get a fire going – I like doing it, but it's even funner when you have other people as well. And easier.

Motivation to work for change

An almost unanimous outcome stemming from youths' participation in the program was the realisation that an intentional effort was required to improve health and well-being. Phrases like 'I'll try harder at ...' and 'give it a go' were commonly expressed by youths

when reflecting on the effect the program had on them and their goals for the future. For example, a 14-year-old male commented that:

Normally I go through life passing up things and not giving things a go. But now I've just learned to give them a go, and I will see what happens . . . It's better to go do it and then fail, than just walk away and not having a go at it and finding out if you can or not do it. You usually don't know if you're going to be good at something unless you give it a go.

A 14-year-old male commented that:

It's actually helped me realise . . . what life actually means, and what it's meant for. We're not going to just stay at home and sit somewhere in the corner where we'll be safe. We're actually meant to be getting out and exploring, pushing our comfort zone.

More optimistic outlook on the future

By the end of the Expedition, the youth participants looked forward more positively to their futures, felt better about themselves, felt more resilient and courageous, and appeared to genuinely believe that their lives at home and school would be improved. For example, a 14-year-old male commented that:

[I want to] get along with people, help Mum more, change [my] attitude . . . less anger . . . [I] won't be going to jail for bashing people . . . I want to do something that I really like doing.

A 13-year-old female commented that:

[My future looks] good . . . because I've set myself up. Like might try harder in school, and I've decided where I want to be, where I want to go, and what I have to do to get there.

Discussion

It is important to identify treatment strategies which can enhance young people's protective capacities and decrease the odds that they will follow a risky developmental course. The PCYC Catalyst program uses challenging, adventure-based activities in a supportive group environment based on the Adventure Based Counselling model. Its aim was to effect positive change in the lives of youths at risk of adverse outcomes in their educational, vocational, and life-course pathways. Youth participant survey and interview responses indicated that the intervention had a positive effect on several areas of life effectiveness, mental health, and behavioural functioning. The quantitative results indicated mostly small to moderate positive changes, while qualitative findings indicated that youths took steps towards overcoming challenging backgrounds, contended with adversity, experienced significant personal and social development, were motivated to work for change, and developed a more optimistic outlook on the future.

Catalyst program participants reported small to moderate, positive, short- and longer-term impacts on life effectiveness skills. For mental health, participants reported large longer-term improvements in their psychological well-being, with little longer-term effects on psychological distress. There also appeared to be longer-term reductions in some problematic behaviours (particularly Harming, Fighting, Stealing, and Vandalism) although there were increases in some behaviours (Cheating, Vehicles, Wagging, and Drug Use).

It was clear from the quantitative data that youth participants reported that their life effectiveness skills increased, with positive changes in all 10 personal and social life skills, and an overall ES of 0.17 which is similar to outcomes for outdoor education programs with high school-aged participants (0.21; Hattie, Marsh, Neill, & Richards, 1997) but is

lower than for adventure therapy programs with similar aged participants (0.41; Bowen & Neill, 2013a). The small short-term improvements in life skills were sustained in the longer-term and continued to improve (0.29). Longer-term life skills subscale effects were all positive and ranged from a very small to strong effect, with 4 out of the 10 ESs (communication skills (0.72), healthy risk taking (0.51), self-esteem (0.44) and self-confidence (0.44)) at or above the age-based benchmarks suggested by Bowen and Neill (2013b).

In the short-term, participants reported more psychological distress during the Expedition than in the period prior to the Expedition, probably due to the physical and psychologically challenging nature of the Expedition. Previous outdoor education research has also found a temporary increase in psychological distress during the program (Neill & Heubeck, 1995). This short-term heightening of psychological distress, however, was largely temporary, with little evidence for longer-term changes in the level of psychological distress (−0.10). Participants reported little short-term change in psychological well-being (0.07). However, participants reported strong positive change in psychological well-being in the longer term (0.95). Thus, participants reported notable longer-term improvements in their psychological well-being and little to no change in their psychological distress.

Overall, there was a reduction in the number of behavioural conduct incidents reported for the six-month period prior to T3 (Follow-up; average of 10.7 incidents per month compared to 12.5 at T1; an overall reduction of 49 incidents per six months). Nonetheless, there was mixed evidence about the effectiveness of the Catalyst program as an intervention for behaviour problems. There was a small, positive, non-significant long-term effect, indicating a slight reduction in problematic behaviours. This finding is lower than Bowen and Neill's (2013b) long-term meta-analytic aged-based Behaviour benchmark for 10–17-year olds. There were substantial reductions in the frequency of Harming, Fighting, Stealing, and Vandalising. The effects for Harming, Fighting, and Stealing were within the age-based benchmarks recommended by Bowen and Neill (2013a; between 0.30 and 0.50). However, there were small increases in Cheating, Vehicles, and Wagging, and a small to moderate increase in the self-reported frequency of Drug Use. These effects were lower than comparable benchmarks.

In summary, the effects of the Catalyst program were mostly positive and ranged in size from small to moderate, and are comparable to the effects of family-based interventions, and restorative justice and adolescent diversion programs. However, for the most part, the effects of the Catalyst program are not as strong as for cognitive-behavioural therapies, multi-systemic therapy, and residential treatment programs. There are several noteworthy differences between OAIs and more traditional forms of psychotherapy, including group-versus individual-focus, duration of treatment, and quantity of therapeutic contact.

Interviews provided additional insight into the participants' backgrounds, program experience, and perceptions of the program effects. By the end of the Expedition, youths reported taking steps towards overcoming challenging backgrounds, contending with adversity, significant personal and social development, motivation to work for change, and a more optimistic outlook on the future. Participants entering into the Catalyst program were typically experiencing one or more individual, family, school-based, life-events, and/or societal risk factors, and that the program helped them to take steps towards overcoming these challenging background circumstances. Participant interviews also revealed that youths faced multiple physical, mental, emotional, and social challenges during the program, which produced distress, conflict, and crisis. However, the adversity and group conflict appeared to serve as a catalyst for significant personal development (particularly

in thinking more positively, believing in oneself, and perseverance) and social development (improved communication skills, greater tolerance and respecting of others, and new and improved friendships). Participants also reported increased motivation to work for change and the development of greater resilience, capacity to manage emotions, and persistence in overcoming difficulties. Overall, youths reported looking forward more positively to their futures and appeared to genuinely believe that their lives at home and school would be improved.

Overall, this study found small, positive overall improvements in Catalyst participants' life effectiveness skills which were sustained, and even continued to improve, in the longer-term. There were notable longer-term improvements in psychological well-being and little to no longer-term change in psychological distress. There was mixed evidence about the effectiveness of the program as an intervention for behavioural problems. While youths reported reductions in some problematic behaviours (particularly Harming, Fighting, Stealing, and Vandalism), they also reported increases of some behaviours (Cheating, Vehicles, Wagging, and Drug Use). For the most part, the qualitative data regarding the effects of the Catalyst program were consistent with the quantitative data. Youths reported that their involvement in the program created some distress, and developed their resilience, and personal and social skills, enhanced their motivation to work for change, and helped them to become more optimistic about the future.

Strengths, limitations, and implications for practice and research

There were several strengths of this study. Multi-dimensional outcome measures were used to assess short- and longer-term changes in youth development areas which were targeted as program goals. Additionally, comparisons with age-based meta-analytic benchmarks were used to help assess the effects of the Catalyst program. The use of semi-structured interviews allowed further exploration of the participant outcomes and the contributing factors. Such comparisons are recommended for future adventure-based intervention research. Limitations of this study include the use of a non-experimental research design, participant attrition, small sample size, and reliance on self-reported data. Thus, the results of this study should be interpreted with caution.

Despite the promise of the Catalyst program and adventure-based interventions, more in-depth and rigorous program evaluation could be considered. In this study, there was no control or comparison group and participants were not randomly assigned to treatment conditions. Therefore, conclusions about causality are unable to be made. Inclusion of a comparison group could be used in future, if practical, and could help to more rigorously assess the effectiveness of such interventions. Other possible research designs could include clinical trials of adventure-based interventions tailored to homogenous client groups (e.g., of depressed or conduct disordered adolescents) and cross-over designs with conventional treatments. It also remains unclear whether and how program effects vary by client characteristics. It may be beneficial for future research to investigate the relative benefits of adventure-based interventions for different client types, presenting problems, and the impact of other notable participant characteristics or individual differences.

In longitudinal research, participant attrition is inevitable. The current study is no exception, with 55% of participants completing all measures at each time point. Participant attrition, combined with the small sample size, limits the statistical power of the current study. Future research with a larger sample size would improve statistical power.

This study focused on youth participant self-reported quantitative and qualitative data. Future adventure-based intervention evaluation studies could triangulate self-reported

data using additional data sources such as from observer ratings and interviews. Collation of other existing data, such as school attendance and behaviour records, may also be helpful.

Conclusion

This study contributes to the growing body of literature about the effects of adventure-based interventions for youth-at-risk, with a particular emphasis on life effectiveness, mental health, and behavioural conduct. Catalyst intervention participants reported small positive changes in life effectiveness, a large long-term improvement in psychological well-being, and some improvements in particular aspects of delinquent behaviour (e.g., Harming, Fighting, Stealing, and Vandalism). There was no positive longer-term impact on psychological distress and some aspects of behaviour. Six major themes emerged from interviews with youth participants: overcoming challenging backgrounds, contending with adversity, personal development, social development, motivation to work for change, and optimistic future outlook. Together, the quantitative and qualitative results support the conclusion that this program may offer a viable alternative or adjunct treatment approach to more traditional psychotherapeutic approaches for youth at-risk.

This study highlights the potential of the PCYC Bornhoffen Catalyst program to help young people who are at risk of adverse outcomes in their educational, vocational, and life-course pathways. The findings indicated that OAI such as the Catalyst program can have a meaningful impact on youth-at-risk's life effectiveness, mental health, and behavioural functioning. The Catalyst program provides an alternative prevention and intervention model for youth-at-risk that is not based on traditional or mainstream models. More in-depth investigation using a comparison group, multiple data sources, and a larger sample could help to better understand what works and what could be improved.

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