

Effectiveness of Functional Family Therapy in a Non-Western Context: Findings from a Randomized-Controlled Evaluation of Youth Offenders in Singapore

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This study is the first to evaluate Functional Family Therapy (FFT) in a non-Western culture. The effectiveness of FFT was examined in relation to three proximal outcomes relevant to youth offender rehabilitation: (i) mental well-being, (ii) family functioning, and (iii) probation completion. 120 youth probationers ($M_{age} = 16.2$, $SD = 1.33$) were randomly assigned to receive either standard probation services—Treatment-As-Usual (TAU; $n = 57$)—or FFT in addition to TAU (FFT; $n = 63$). Data on psychometric measures of mental well-being and family functioning were obtained at (i) preprogram, (ii) postprogram, and (iii) at the end of probation. Probation completion data were obtained from casefile records. Mean mental well-being scores of the FFT group improved from pre- to post-treatment, and gains were maintained at follow-up. However, there was a nonsignificant trend for the FFT group showing higher rates of reliable change and clinical recovery on the mental well-being scale. There were no group differences in family functioning scores over time. However, there was a significant trend for the FFT group showing higher rates of reliable change and clinical recovery on the family functioning scale. Probation completion rates were 88.9% and 70.2% for the FFT and TAU groups, respectively. Youth in the FFT group were significantly more likely to complete probation successfully. The results support FFT's effectiveness in Singaporean youth offenders. At a broader level, the study findings support the cross-cultural effectiveness of FFT in, and transportability to, a non-Western culture.

Keywords: Program Evaluation; Functional Family Therapy; At-Risk Youth; Juvenile Justice

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Mental Well-Being, Family Functioning, and Youth Offending

Youth offending is a major public health concern around the world owing to its multi-dimensional impact on societies. The needs of youth offenders often extend beyond risk factors associated with their offending behavior. In particular, the high prevalence of mental health problems among youth offenders is a challenge shared by many developed societies (Kang, Wood, Loudon & Ricks, 2018; Kinner et al., 2014). Apart from being linked with criminal behavior (Penner, Roesch, & Viljoen, 2011), untreated mental health problems can affect youth detrimentally in other important ways—such as physical health, school performance, and relationships with peers and family (World Health Organization, 2019).

Dysfunctional patterns of family functioning have been consistently identified as important risk factors in the development and maintenance of a myriad of offending behaviors and mental health problems in youth (Farrington, 2010; Hoeve et al., 2009). This also holds true in Singapore, where poorer family functioning has been found to be predictive of recidivism among community-based youth offenders (Chng et al., 2016; Chu et al., 2015). Conversely, there is strong evidence that restoring healthy levels of family functioning may serve as a buffer against future offending. Meta-analytic studies have consistently found family-based interventions to be effective in reducing the recurrence of youth offending behavior (Baldwin et al., 2012; Dopp, Borduin, White & Kuppens, 2017). These findings have highlighted the potential utility of evidence-based family interventions in the holistic rehabilitation of youth offenders.

Functional Family Therapy

One such intervention that has been recognized by authoritative reviews (Carr, 2014; Henggeler & Sheidow, 2012) to be effective in treating high-risk, justice-involved youth is Functional Family Therapy (FFT; Alexander, Waldron, Robbins & Neeb, 2013; Sexton, 2010). FFT is a brief, family-based program that aims to ameliorate behavioral and emotional problems in youth through restoring healthy patterns of interaction within their families. FFT is an integrative model, deriving its core elements primarily from systems therapy and cognitive-behavioral therapy (Alexander & Sexton, 2002). The model hypothesizes that problem behaviors displayed by youth are a result of dysfunctional patterns of interaction within the family unit (Sexton & Alexander, 2003). Consequently, restoring adaptive levels of family functioning would lead to a reduction in these problem behaviors (Alexander et al., 2013; Sexton, 2010). At present, FFT has been implemented in over 300 sites spanning 11 countries (Robbins et al., 2016).

Since the conceptualization of the FFT clinical model over 40 years ago, a slew of evaluation studies has ensued. The body of evidence on FFT generally supports its utility in mitigating youth recidivism (see Robbins, Alexander, Turner, & Hollimon, 2016, for a review). Several meta-analyses on randomized and nonrandomized evaluations of FFT have yielded convergent findings demonstrating the program's efficacy and effectiveness in reducing criminal and delinquent behavior (Aos et al., 2011; Baldwin et al., 2012; Hartnett, Carr, Hamilton, & O'Reilly, 2017). Furthermore, FFT has been found to be more cost-effective than alternative interventions in achieving these outcomes (Aos et al., 2011; Gottfredson et al., 2018; Jones, Bumbarger, Greenberg, Greenwood, & Kyler, 2008).

While the amount of evidence on FFT is substantial, two issues warrant further empirical inquiry. The first is whether FFT can achieve similar outcomes in cultures different from the one in which the program's clinical model was developed. At present, majority of FFT sites are situated in the United States. Hence, it is not surprising that most research on FFT has originated from US-based sites. Some research has shown that FFT can be effective among youth from cultural minorities within the United States (Darnell &

Schuler, 2015). Nonetheless, whether the same results can be achieved when FFT is transported to and implemented in a different country and culture has not been extensively studied. Furthermore, existing studies have mostly used recidivism rates as the key outcome measure. Few research has looked into the program's utility in relation to other clinically important outcomes.

A few recent evaluations have examined the effectiveness of FFT (i) outside the United States and (ii) in relation to outcomes other than recidivism. Studies in Ireland (Graham, Carr, Rooney, Sexton & Wilson Satterfield, 2014), New Zealand (Heywood & Fergusson, 2016), and Denmark (Vardanian, Scavenius, Granski & Chacko, 2019) all reported significant reductions in youth behavioral problems. However, the findings from these evaluations were limited by the absence of a comparison group. Another Irish study employed an RCT with a wait-list control group and found FFT to be effective in improving mental health and family adjustment (Hartnett, Carr, & Sexton, 2016). Nonetheless, the authors expressed that having a prospective "treatment-as-usual" comparison group would have strengthened the study (Hartnett, Carr, & Sexton, 2016). The most recent non-US evaluation utilizing an experimental design was conducted in the United Kingdom (Humayun et al., 2017). This RCT compared FFT alongside a prospective "Treatment-as-usual (TAU)" comparison group. The study found no group differences in relation to offending behaviors and family functioning (Humayun et al., 2017). Taken together, findings pertaining to FFT's effectiveness outside the United States are mixed. More international research is therefore needed to establish the cross-cultural effectiveness of FFT.

The Present Study: Aims and Hypotheses

This study sought to examine the effectiveness of FFT on mental well-being, family functioning, and probation completion rates of youth offenders placed on community probation in Singapore. This is the first RCT to examine the effectiveness of FFT in a non-Western culture. Currently, there is a need for family-based intervention for youth offenders in Singapore (Gan, Zhou, Hoo, Chong & Chu, 2018) but research examining the cross-cultural effectiveness of evidence-based family therapies is scant. Understanding whether such programs can be delivered with fidelity and yield positive outcomes in a different culture carries significant implications for clinical practice. This study is also one of only a few RCTs to be conducted independently of FFT's program developers. Finally, this evaluation is focused on more proximal outcomes that have not been as extensively studied compared to recidivism, but are nonetheless relevant to youth offender rehabilitation, specifically: (i) mental well-being, (ii) family functioning, and (iii) probation completion rates. The following hypotheses were tested:

- (1) Youth receiving FFT will exhibit greater improvements in mental well-being than those receiving TAU.
- (2) Youth receiving FFT will exhibit greater improvements in family functioning than those receiving TAU.
- (3) Youth receiving FFT will be more likely to complete their probation order successfully than those receiving TAU.

METHOD

Participants

Participants were 120 youth offenders, aged 13–18 years, who had been placed on community-based probation. All youth commenced their probation orders between December 2014 and March 2018. Participants' mean age at the time of starting probation was

16.2 years ($SD = 1.33$). Most youth were male (89.2%). Majority resided in government-subsidized public housing (90%), and close to half came from low-income families that were eligible for government-funded social assistance (45.8%). The mean length of court-mandated probation orders was 606 days ($Mdn = 549$, $SD = 119$, range = 364–913).

Procedure and Design

Approval to conduct this study was granted by a Research Ethics Committee within the Ministry of Social and Family Development, Singapore (MSF).

Youth who had recently been sentenced to probation were screened for eligibility using the following inclusion criteria: (i) a baseline risk severity of “Moderate” or higher on both the *Family Circumstances/Parenting* domain and *Total Risk* on the YLS/CMI 2.0, using locally derived norms (Chu et al., 2015), (ii) at least 8 months remaining on their probation order, and (iii) had a stable living arrangement with their caregiver(s). Youth were excluded if they were already receiving services, or presented with any of the following: low intellectual functioning, active psychotic symptoms, high risk of suicidal or self-injurious behaviors, or sexualized behaviors.

Informed consent was obtained from caregivers or legal guardians of eligible youth who assented to study participation. Participants were then randomly assigned to one of two treatment groups—“Treatment-As-Usual” only (TAU), and FFT with Treatment-As-Usual (FFT)—using an online random number generator. Participants were blind to treatment group allocation. Youth in the FFT group received FFT as their first program, in addition to standard probation services. In comparison, those in the TAU group received standard probation services, attending programs addressing offense- or family-related needs, as prescribed by their probation officers. Participants were invited to complete self-report questionnaires at three time-points throughout their probation order: Time 1 (baseline), Time 2 (after the first program), and Time 3 (end of probation). A CONSORT diagram (Schulz, Altman & Moher, 2010) summarizing inclusion, randomization, and participant flow through the study is presented in Figure 1.

FFT Therapists and Model Fidelity

The team of FFT therapists, inclusive of the site supervisor, comprised of five psychologists and two social workers. All therapists possessed bachelor- or postgraduate-level professional qualifications and had at least 2 years’ experience working with youth and families prior to being trained in FFT. The team underwent a three-phase training and implementation protocol prescribed by FFT LLC (2019).

Data for assessing program fidelity were collected and stored in the FFT Client Services System (CSS)—an online database provided by the FFT LLC. Therapists were expected to regularly update case notes, session notes, and other program-related information on the CSS. Extraction of these data was done by an FFT LLC consultant in the first year of implementation, and by the site supervisor from the second year onwards. Every therapist was rated approximately eight times over a four-month period and these ratings were aggregated to derive a Global Therapist Rating (GTR) for every therapist three times a year. The GTR consists of two components: (i) *Dissemination Adherence*, which assesses how closely a therapist adheres to prescribed delivery protocols—such as timeliness of documentation, and appropriate pacing of sessions—and (ii) *Fidelity*, which gauges a therapist’s skill in applying the FFT model to a client’s unique context, and in imparting the right skills at the appropriate time during treatment. Developer-prescribed cutoff scores were used to determine whether levels of dissemination adherence and fidelity were sufficient.

Detailed information relating to therapist selection, training, supervision, and performance assessment has previously been documented (Gan et al., 2018).

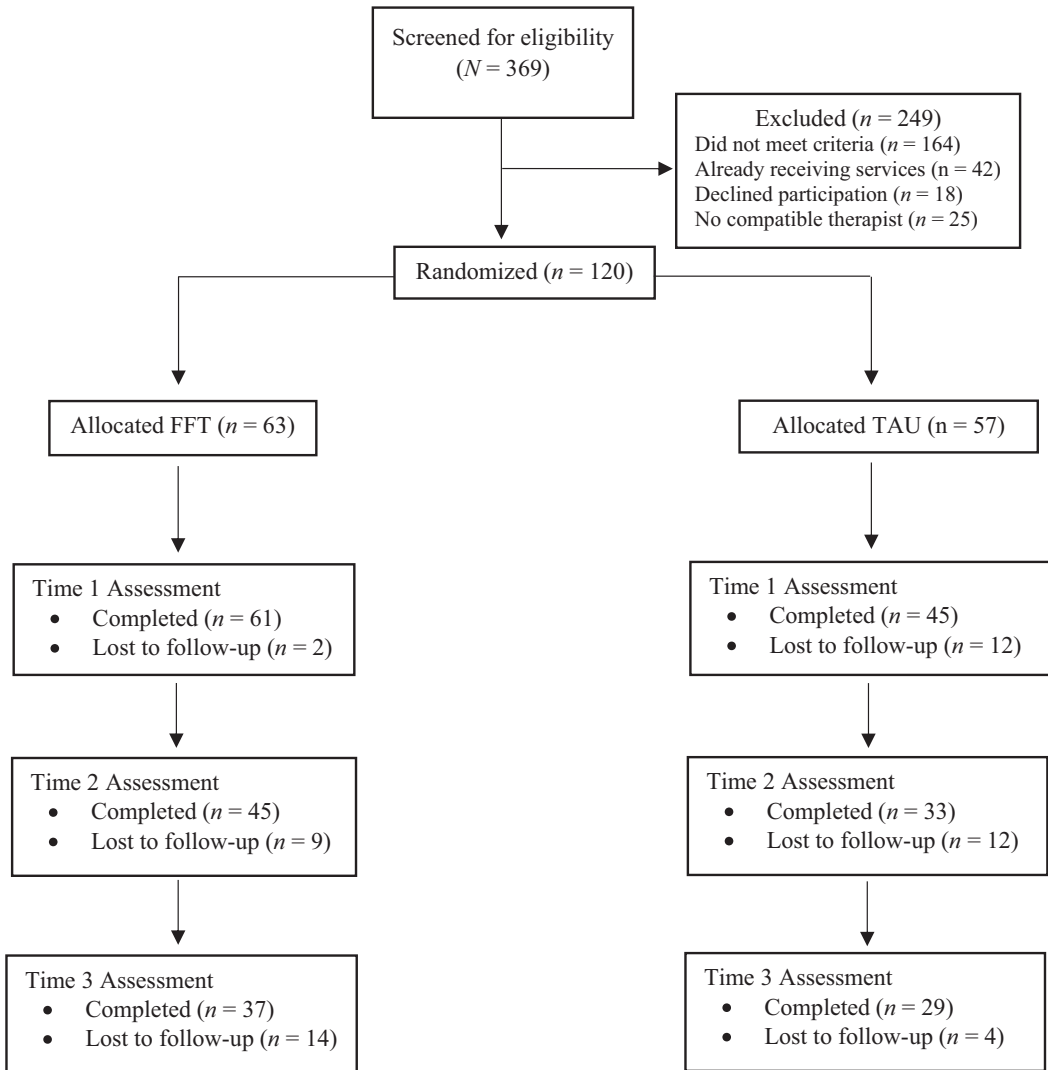


FIGURE 1. CONSORT Diagram Summarizing Participant Flow Through the Study.

Measures

Youth Outcome Questionnaire—Self-Report 2.0

The Youth Outcome Questionnaire Self-Report Version 2.0 (YOQSR2.0; Wells, Burlingame, & Rose, 2003) for adolescents was used as a measure of well-being. The 64-item questionnaire assesses emotional and behavioral problems that may require clinical follow-up across six domains: *Intrapersonal Distress* (18 items), *Somatic Complaints* (eight items), *Interpersonal Relations* (10 items), *Social Problems* (eight items), *Behavioral Dysfunction* (11 items), and *Critical Items* (nine items). Each item is scored on a 5-point scale with the following response categories: “Never or Almost Never,” “Rarely,” “Sometimes,” “Frequently,” and “Always or Almost Always.” Each response is assigned a numerical score. Scores for each item were summed to yield an overall distress score, as well as domain-specific scores. Higher scores indicated poorer levels of well-being, and a total

score of 47 and above was considered clinically significant. The YOQSR2.0 has been found to exhibit good reliability and validity across its subscales, and sensitivity to change resulting from intervention (Ridge, Warren, Burlingame, Wells, & Tumblyn, 2009). Internal consistency for the overall YOQSR2.0 scale in this sample was excellent ($\alpha = 0.94$).

Family Assessment Device—General Functioning Scale (FAD-GF)

The General Functioning subscale of the McMaster Family Assessment Device (FAD; Epstein, Baldwin, & Bishop, 1983) was used to assess youths' perceived family functioning. The FAD-GF consists of 12 items, each of which is scored on a 4-point scale with the following response categories: "Strongly Agree," "Agree," "Disagree," and "Strongly Disagree." Half of the items are reverse-scored. Higher scores indicate poorer perception of family functioning, with a score of 2 or greater indicating problems with family functioning (Ryan et al., 2012). Recent research supports the FAD-GF's psychometric properties, and its suitability for use in both normative and clinical samples as a standalone measure (Mansfield, Keitner & Dealy, 2015). Internal consistency for the FAD-GF in this sample was excellent ($\alpha = 0.91$).

Probation completion rates

Probation completion data were obtained from official case closure reports. Youth who were assessed by their probation officers to have completed probation successfully would have shown positive treatment progress during their order and demonstrated adherence to the conditions of probation. Youth who did not complete probation satisfactorily would have committed one or more of the following infringements during their order: (i) defaulting on reporting visits or program attendance without a valid reason, (ii) failure to comply with curfews or other restrictions, and (iii) engagement in delinquent behaviors (e.g., truancy, fighting, reoffending).

Sample Size Calculation

This trial was adequately powered. Based on a power analysis conducted using G*Power Version 3.1.9.3 (Faul, Erdfelder, Lang & Buchner, 2009), a sample size of 91 would be required to detect an effect size of $d = 0.5$ at 80% power and p (two-tailed) $< .05$. The estimated effect size of $d = 0.5$ was obtained from previous meta-analyses examining studies which compared the outcomes of FFT with that of alternative treatment or control groups (Baldwin, Christian, Berkeljon & Shadish, 2012; Hartnett, Carr, Hamilton & O'Reilly, 2017). Given that data were obtained from 120 participants (FFT = 63, TAU = 57) for probation completion rates and 106 participants (FFT = 61, TAU = 45) for psychometric outcomes, the sample size for this study was sufficient.

Statistical Analyses

An intention-to-treat (ITT) approach was adopted for all analyses. By accounting for attrition and noncompliance with treatment, this approach minimizes the Type I error rate, thereby yielding more conservative but robust estimates of treatment effects (Gupta, 2011). For participants with missing psychometric data at Time 2 or Time 3, the last observation was carried forward—data obtained from the last available time-point was retained for subsequent time-points for analysis (Streiner & Geddes, 2001).

Descriptive statistics were computed for demographic and outcome variables. Chi-square tests of independence and independent t tests were computed to identify any differences between the FFT and TAU groups, and whether any variables were associated with the outcomes of interest. These tests were also used among participants who received FFT, to explore possible differences between program completers and dropouts.

To investigate whether FFT led to statistically significant improvements in mental well-being and family functioning, two 2×3 mixed analyses of variance (ANOVAs) were conducted, with Group and Time as the between-subjects and repeated measures variables, respectively. Post hoc analyses for the Time variable were conducted using the Bonferroni correction to minimize Type I error (Benjamini & Hochberg, 1995).

Clinically meaningful change in self-reported outcomes was examined in two ways. Reliable Change Indices (RCIs; Jacobson & Truax, 1991) were computed for Time 1 versus Time 2 scores on the YOQRS2.0 and the GF scales. The RCI is a standardized measure of clinical change which accounts for the psychometric properties of the outcome measure used, and variation in baseline data (Zahra & Hedge, 2010). Differences in the proportion of participants with RCIs < -1.96 (since lower scores indicate better outcomes on both scales) were compared. In addition to RCIs, clinically meaningful change was also assessed by comparing the proportion of participants who reported clinically significant scores at Time 1, but subclinical scores at Time 2. All between-group comparisons were tested using chi-square tests of independence.

Multiple logistic regression analyses controlling for baseline recidivism risk and gender were conducted to examine whether treatment predicted probation completion rates. Odds ratios were used as effect size estimates of the strength of the associations between variables. All analyses were conducted using SPSS version 25.0.

RESULTS

Sample Characteristics

Sixty-three youth were randomized to the FFT group, and 57 to the TAU group. Of these, 14 (FFT = 2, TAU = 12) dropped out from the study before Time 1 psychometric data were collected, owing either to revocation of the probation order, or logistical difficulties. Study attrition at time 1 and time 2 were due to treatment dropout. The study follow-up rate for the questionnaire outcomes was approximately 60%. Among participants who completed psychometric ratings at all time-points, the average follow-up duration (i.e., time between the T2 and T3) was 9.82 months ($SD = 4.21$).

Baseline participant characteristics, split by treatment group (FFT vs. TAU) and treatment completion (completers vs. dropouts) are shown in Tables 1 and 2, respectively. There were no differences between treatment groups in relation to demographic characteristics, recidivism risk profiles—as measured by the Youth Level of Service/Case Management Inventory 2.0 (YLS/CMI 2.0; Hoge & Andrews, 2011)—and psychometric outcome scores. There were also no differences between trial completers and trial-dropouts on the aforementioned variables. This suggests that attrition from the study was approximately random.

FFT Treatment Characteristics and Therapist Fidelity

Entry rate for FFT was 96.8%—61 of the 63 youth assigned to undergo FFT underwent at least one session of the program. 10 of the 61 youth who commenced FFT did not successfully complete the program, resulting in a dropout rate 16.4%. Program dropouts were due either to scheduling difficulties, or violation of the conditions of probation resulting in revocation of the probation order. Youth who completed FFT spent an average of 4.7 months in the program and underwent an average of 12 therapy sessions.

Dissemination adherence and fidelity ratings consistently surpassed developer-prescribed benchmarks over a three-year period. 100% of all dissemination adherence and fidelity ratings recorded during the first 2 years of implementation were above the prescribed cutoff scores. In the third year, 100% of all dissemination adherence ratings and

TABLE 1
Baseline Demographic and Clinical Characteristics of the Study Sample

	Value (<i>SD</i> or %)		<i>t</i> / <i>X</i> ²	<i>p</i>
	FFT (<i>n</i> = 63)	TAU (<i>n</i> = 57)		
Age	16.3 (1.28)	16.0 (1.39)	<i>t</i> (118) = -0.898	.37
Gender (male)	57 (90.5%)	50 (87.7%)	<i>X</i> ² (1) = 0.235	.63
Socioeconomic status (meet criteria for social assistance)	29 (46%)	26 (45.6%)	<i>X</i> ² (1) = 0.002	.96
YLS/CMI 2.0 rating	18.5 (3.54)	17.7 (3.75)	<i>t</i> (118) = -1.16	.25
YLS/CMI 2.0 classification (high vs. mod risk)	17 (27%)	12 (21.1%)	<i>X</i> ² (1) = 0.574	.45
	FFT (<i>n</i> = 61)	TAU (<i>n</i> = 45)		
YOQSR 2.0 total score	42.1 (27.2)	50.5 (28.2)	<i>t</i> (104) = -1.56	.12
FAD-GF total score	1.96 (0.50)	2.07 (0.59)	<i>t</i> (118) = 1.09	.28

90% of fidelity ratings were in the target range. This was because two of the six therapists joined the team only during the third year of implementation. Nonetheless, their subsequent ratings steadily increased above the aforementioned thresholds. In summary, the FFT team consistently demonstrated sufficient levels of adherence to FFT LLC's protocol and competence in their delivery of the program.

Outcomes

Means and standard deviations of YOQSR2.0 scores and FAD-GF scores and findings from the ANOVA analyses are presented in Table 2. Longitudinal changes in mean scores for each group are shown in Figure 2.

Mental well-being

Aggregate change

Mauchly's test indicated that the assumption of sphericity had been violated for the Time variable ($X^2(2) = 0.881, p = .001$). Thus, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon = 0.89$). A significant Group \times Time interaction effect was observed for YOQSR2.0 scores, $F(1.79, 185.8) = 4.67, p = .013, \eta^2_{\text{partial}} = 0.043$. Post hoc *t* tests for the FFT group revealed that, compared to YOQSR2.0 scores at Time 1, scores at Time 2 ($p = .011$), and Time 3 ($p = .001$) were significantly lower. Taken together with the pattern of findings illustrated by the graph plots, YOQSR2.0 scores in the FFT group decreased from Time 1 to Time 2, and treatment gains were maintained from Time 2 to Time 3.

Reliable change

The percentage of youth in the FFT and TAU groups who demonstrated reliable improvements in YOQSR2.0 scores ($RCI < -1.96$) was 29.5% and 15.6%, respectively. Chi-square tests revealed a marginally significant association between treatment group and the proportion of participants demonstrating reliable improvements in YOQSR2.0 scores, $X^2(df = 1, N = 106) = 2.80, p = .094, V = 0.16$.

Clinical recovery

The percentage of youth in the FFT and TAU groups who reported baseline YOQSR2.0 scores at or above the clinical threshold was 34.4% (21/61) and 48.9% (22/45), respectively. Of these, 42.9% (9/21) of youth in the FFT group and 18.2% (4/22) of youth in the TAU

TABLE 2
ANOVA Analyses of Longitudinal Changes in YOQSR2.0 and FAD-GF Scores

	Mean (SD)			Group × Time Interaction	Effect Size (η^2_{partial})	Post hoc <i>t</i> tests		95% CI	
	Time 1	Time 2	Time 3			T1-T2	T2-T3	T1-T2	T2-T3
YOQSR 2.0									
FFT (<i>n</i> = 60)	42.5 (27.2)	31.4 (23.2)	28.6 (24.0)	4.67*	0.043	5.67*	8.32**	1.02, 10.3	3.02, 13.6
TAU (<i>n</i> = 45)	50.5 (28.2)	49.9 (26.3)	47.3 (25.3)						
FAD-GF									
FFT (<i>n</i> = 60)	1.95 (0.50)	1.85 (0.58)	1.78 (0.44)	1.94	0.018				
TAU (<i>n</i> = 45)	2.07 (0.59)	2.10 (0.56)	2.05 (0.51)						

**p* < .05.

***p* < .01.

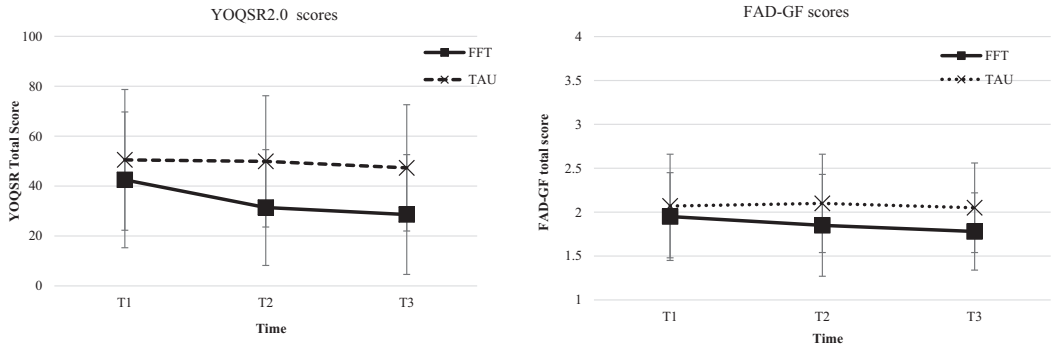


FIGURE 2. Changes in Mean Scores of the YOQSR2.0 and FAD-GF Over Time.

group demonstrated clinical recovery. Chi-square tests revealed a marginally significant association between treatment group and clinical recovery rates in YOQSR2.0 scores, $\chi^2 (df = 1, N = 106) = 3.10, p = .078, V = 0.27$.

Family functioning

Aggregate change

Mauchly's test indicated that the assumption of sphericity had been violated for the Time variable ($X^2(2) = 0.888, p = .002$). Thus, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon = 0.90$). No Group \times Time interaction effect was found for FAD-GF scores, $F(1.80, 185.3) = 1.94, p = .15 (ns), \eta^2_{\text{partial}} = 0.018$. As depicted by the graphs, FAD-GF scores remained relatively constant for both groups across time.

Reliable change

The percentage of participants in the FFT and TAU groups who demonstrated reliable improvements in FAD-GF scores ($RCI < -1.96$) was 21.7% and 6.7%, respectively. Chi-square tests revealed a significant association between treatment group and the proportion of participants demonstrating reliable improvements in FAD-GF scores, $\chi^2 (df = 1, N = 106) = 4.48, p = .034, V = 0.21$.

Clinical recovery

The percentage of youth in the FFT and TAU groups who reported baseline FAD-GF scores at or above the clinical threshold was 39.3% (24/61) and 51.1% (23/45), respectively. Of these, 41.7% (10/27) of youth in the FFT group and 13.0% (3/23) of youth in the TAU group demonstrated clinical recovery. Chi-square tests revealed a significant association between treatment group and clinical recovery rates in FAD-GF scores, $\chi^2 (df = 1, N = 106) = 4.81, p = .028, V = 0.32$.

Probation completion

The probation completion rate was 88.9% (56/63) for the FFT group and 70.2% (40/57) for the TAU group. Results from logistic regression analysis controlling for baseline YLS scores and gender are presented in Table 3. The Hosmer-Lemeshow statistic was not significant $\chi^2(8) = 4.28, p = .83$, showing that the model at this step was a good fit for the data. Nagelkerke's R^2 showed that the model explained approximately 14.7% of the variance. Baseline recidivism risk emerged as a significant negative predictor of probation completion rates, $B = -0.15, OR = 0.86, 95\% CI [0.76, 0.99], p = .031$. Gender did not predict probation completion, $B = -0.052, OR = 0.95, 95\% CI [0.23, 4.00], p = .94 (ns)$.

TABLE 3

Results of Multiple Regression Analysis Examining Effect of Treatment on Probation Completion Rates

Model	Predictor	<i>B</i>	<i>SE (B)</i>	Wald's χ^2	<i>df</i>	<i>p</i>	OR	95% CI	
								Lower	Upper
	Constant	3.55	1.50	5.57	1	.018			
	YLS score	-0.15	0.068	4.66	1	.031	0.864*	0.76	0.99
	Gender	-0.052	0.73	0.005	1	.94	0.95	0.226	3.99
	Treatment group (reference: TAU)	1.38	0.52	7.23	1	.007	3.99**	1.46	10.9

p* < .05.*p* < .01.

Treatment group emerged as a significant predictor of probation completion rates, $B = 1.38$, $OR = 3.99$, 95% CI [1.46, 10.9], $p = .007$. Specifically, youth in the FFT group were approximately four times more likely to complete their probation order relative to youth in the TAU group.

DISCUSSION

The current study aimed to investigate the effectiveness of FFT toward improving well-being, family functioning, and probation completion rates among youth offenders on community probation. This trial is the first independent evaluation of FFT in Asia, and therefore the first study to examine the effectiveness of FFT in a non-Western culture. Importantly, it is one of only a handful of studies that has looked into FFT's impact on clinically meaningful outcomes other than recidivism.

On the whole, FFT therapists demonstrated high levels of adherence to, and competence in, the FFT model. Nearly all dissemination adherence and fidelity ratings met FFT LLC's prescribed benchmarks. Evidence of high therapist adherence and fidelity is crucial in two ways. First, it demonstrates that FFT can be transported and delivered successfully in a non-Western culture. At a broader level, it adds to the body of literature supporting the cross-cultural transportability of FFT in cultures that are very different from the one in which the program was developed. Second, good fidelity is vital toward establishing the validity of an outcome evaluation. It allows poor implementation to be ruled out as a potential explanation for null outcomes (Breitenstein et al., 2010) and provides support that any positive outcomes observed are a result of high-quality program delivery. This is particularly relevant in the context of FFT, as previous research has found that therapist adherence moderates FFT's effect on client outcomes (Sexton & Turner, 2010).

The findings generally supported FFT's effectiveness in improving mental well-being. Group-level data showed that the FFT group reported higher levels of well-being immediately following the program and that these gains were maintained up to the end of probation. Conversely, there were no longitudinal changes in self-reported well-being for the TAU group. The effect sizes obtained were somewhat smaller than that reported in earlier studies (e.g., Hartnett et al., 2016). This could be due differences in the psychometric measures employed. Furthermore, previous evaluations have found effect sizes of parent-reported outcomes to be generally higher than youth-reported outcomes (Vardanian et al., 2019). RCIs and clinical recovery rates yielded convergent findings in partial support of FFT's effectiveness in relation to well-being. RCIs revealed that a greater proportion of youth in the FFT group exhibited reliable improvement from Time 1 to Time 2, relative to

the TAU group. Similarly, analysis of data from a subsample of youth who reported clinically significant scores at Time 1 showed that clinical recovery rates were higher for the FFT group than the TAU group. Although it must be noted that both these analyses only approached significance, it is possible that a larger sample may have yielded more conclusive results. Collectively, the study results generally resonate with those from earlier studies that have measured similar outcomes.

Results for family functioning were somewhat mixed. Although the ANOVA analyses found no improvements in either group, RCIs and clinical recovery rates revealed that a greater proportion of youth in the FFT group reported better family functioning at Time 2 relative to Time 1. In comparison, earlier evaluations generally reported improvements in family functioning (Hartnett et al., 2016; Vardanian et al., 2019). However, it is noteworthy that a recent UK-based RCT also did not find greater improvements on indicators associated with family functioning (Humayun et al., 2017). Similar to that study, it is unlikely that the present findings were due to the lack of therapist competence. Therapists' high fidelity ratings in the current study suggested that they had adhered closely to the FFT model and remained family-focused during their interventions. Notwithstanding, there could be two plausible explanations for the current findings. First, the FAD-GF may not have been sufficiently sensitive in capturing changes in family functioning in this study sample. This may be possible even though the clinical utility of the FAD-GF has been found to be comparable with that of the full FAD (Mansfield et al., 2015). Second, floor effects may have contributed to the lack of significant positive change. The minimum and maximum scores on the FAD-GF scale are one and four, respectively. However, the mean baseline FAD-GF scores for each group were approximately two (refer Table 2). This pattern of baseline FAD-GF scores was unexpected, given that the presence of significant family-related risk factors was an eligibility criterion for referral to FFT. Cultural influences may have contributed to underreporting of family-related difficulties. One of the major challenges faced by FFT therapists in Singapore was the unwillingness of clients to be candid about negative feelings toward other family members at the beginning of therapy (Gan et al., 2018). Specifically, it was observed that families tended to deny or trivialize conflicts and negative emotions, especially during the first session. FFT therapists often needed to use a range of culturally sensitive engagement and motivation strategies in the first two to four sessions before family members started sharing their problems (Gan et al., 2018). Given that the FAD-GF was usually administered during the first session, this reluctance to disclose emotions, typical in Asian cultures (Safdar et al., 2009), might have partially accounted for the baseline ratings obtained.

As hypothesized, youth who underwent FFT during probation had higher completion rates than their counterparts who did not. To date, no evaluation of FFT in a juvenile justice context has examined the program's effectiveness in relation to successful probation completion. Despite this, probation completion is an indicator important both to practitioners and policymakers. Failure to complete probation is not only an indicator of poor treatment progress; it usually results in deeper involvement to the criminal justice system, which in turn, incurs heavier societal costs. Using probation completion as a proximal indicator also facilitates nimble decision-making in situations where agencies do not have the luxury of time to await the accumulation of recidivism data. Thus, this finding extends current knowledge of FFT's effectiveness with regard to successful probation completion.

The present study contributes to the evidence base of FFT in three important ways. As discussed earlier, few rigorous, independent evaluations of FFT have been conducted, and none outside of North America and Europe. This is the first independent RCT investigating FFT's effectiveness in a non-Western culture. Thus, the study findings provide pioneering evidence of FFT's effectiveness in a non-Western culture. In addition, not many

previous evaluations of FFT have studied outcomes other than recidivism. The present evaluation addressed this gap by focusing on three outcomes that are important and clinically relevant in the juvenile justice context. Finally, this study extends previous research on the cross-cultural transportability of FFT by providing evidence of high-quality and sustained implementation in a non-Western culture. This suggests that high-quality delivery of FFT is possible in a culture different from the one in which the program is developed.

The study findings should be considered in the context of several limitations. Unlike recent evaluations, caregiver-specific outcomes were not examined. Operational constraints made it difficult to obtain data from caregivers of youth assigned to the TAU group. Also, time-points for collection of Time 2 and Time 3 psychometric data were not standardized. Collection of data at specific time intervals was not feasible owing to variability in the length of court-mandated probation orders. Only approximately 60% of study participants provided full psychometric data. However, study attrition was mostly due to the youth's re-involvement with law enforcement agencies. This made it difficult to collect questionnaire data at the point of study dropout. This limitation is mitigated by the finding that there were no differences in baseline scores between trial completers and noncompleters, supporting the view that attrition across both groups was at random. As study attrition was greater for the TAU group, carrying the last observation forward to replace missing longitudinal data may have artificially reduced variability in TAU group scores at Times 2 and 3 to a greater degree than the FFT group (Salkind, 2010). However, this data imputation method would likely also have resulted in more optimistic estimates of mean scores at later time-points for the TAU group—evidence has shown that dropouts from youth offender rehabilitation programs are more likely to demonstrate poorer outcomes following attrition (Olver, Stockdale & Wormith, 2011). Thus, it is unlikely that the use of this data imputation method, despite its limitations, would have influenced the main study outcomes. Finally, this study was unable to investigate the effects of case experience and therapist fidelity on client outcomes, which has been explored recently (Turner, Robbins, Winokur Early, Blankenship, & Weaver, 2019). Levels of case experience within the FFT team were closely similar. In addition, therapists' ratings mostly met or exceeded developer-prescribed benchmarks. Thus, distinguishing therapists based on case experience or competency would not have been meaningful.

In summary, this study is the first independent evaluation to furnish evidence of FFT's cross-cultural effectiveness and transportability in a non-Western culture. It also adds to the wider evidence-based literature through examining the impact of family-based programs on proximal outcomes that are pertinent in the context of youth offender rehabilitation. A rigorous evaluation design was employed, and study limitations were controlled for where possible. Future experimental studies should seek to examine caregiver outcomes alongside youth outcomes. It may also be worthwhile for longitudinal evaluations to explore the association between intermediate outcomes and long-term outcomes such as recidivism rates.

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