Incremental net benefit of early intervention for preschool-aged children with emotional and behavioral problems in foster care ☆

Frances L. Lynch [a,*], John F. Dickerson [a], Lisa Saldana [b], Phillip A. Fisher [b,c]

[a] Center for Health Research, Kaiser Permanente Northwest, 3800 N. Interstate Ave., Portland, OR 97227, USA
[b] Oregon Social Learning Center, 10 Shelton McMurphey Blvd., Eugene, OR 97401, USA
[c] University of Oregon, Department of Psychology, Eugene, OR 97403-1227, USA

ARTICLE INFO

ABSTRACT

Of 1 million cases of child maltreatment identified every year in the United States, one-fifth result in foster care. Many of these children suffer from significant emotional and behavioral conditions. Decision-makers must allocate highly constrained budgets to serve these children.

Recent evidence suggests that Multidimensional Treatment Foster Care for Preschoolers can reduce negative outcomes for these children, but the relative benefits and costs of the program have not been evaluated. The objective of this study was to assess net benefit, over 24 months, of Multidimensional Treatment Foster Care for Preschoolers compared to regular foster care.

Data were from a randomized controlled trial of 117 young children entering a new foster placement. A subsample exhibited placement instability (n = 52). Intervention services including parent training, lasted 9–12 months. Multidimensional Treatment Foster Care for Preschoolers significantly increased permanent placements for the placement instability sample. Average total cost for the new intervention sample was significantly less than for regular foster care (full sample: $27,204 vs. $30,090; $P = .004$; placement instability sample: $29,595 vs. $36,061; $P = .045$). Incremental average net benefit was positive at all levels of willingness to pay of zero or greater, indicating that the value of benefits exceeded costs.

Multidimensional Treatment Foster Care for Preschoolers has significant benefit for preschool children in foster care with emotional and behavioral disorders compared to regular foster care services. At even modest levels of willingness to pay, benefits exceed costs indicating a strong likeliness that this program is an efficient choice for improving outcomes for young children with emotional and behavioral disorders in foster care.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Child welfare agencies identify nearly 1 million substantiated claims of child maltreatment per year, and about one-fifth of these children enter foster care (Zerbe, Plotnick, Kessler, et al., 2009). Many of these children have significant emotional and behavioral problems related to their experiences of neglect and abuse, and these problems often interfere with a successful adoption or stable foster placement. As a result, many children end up having failed permanent placements and multiple placements. This lack of stability and the associated stresses of disrupted relationships and entering new environments greatly increase a child's risk of serious long-term emotional and behavioral problems. In addition, instability and its related stress can result in many negative health, psychosocial, and developmental outcomes (Barth, Weigensberg, Fisher, Fetrow, & Green, 2008; Fisher, Gunnar, Dozier, Bruce, & Pears, 2006; Rubin, O'Reilly, Luan, & Localio, 2007); for example, there is emerging evidence that instability negatively impacts areas of brain development involved in executive functioning (Lewis, Dozier, Ackerman, & Sepulveda-Kozakowski, 2007; Pears, Kim, & Fisher, 2008).

Recent studies have found that permanent placements, such as adoption, improve physical and mental health, school performance, and social and overall functioning for children who move to permanent placement compared to those who remain in foster care (Hansen, 2008). In addition, research suggests that intensive treatment programs can reduce the number of foster care placements—particularly the number of negative transitions, such as failed placements due to the child's disruptive behavior (Fisher, Burraston, & Pears, 2005; Fisher & Kim, 2007; Fisher, Kim, & Pears, 2009; Fisher, Stoolmiller, Mannering, Takahashi, & Chamberlain, 2011; Price et al., 2008; Reddy & Pfeiffer, 1997). Together, this previous work suggests that early intervention to increase permanent placement of children in foster care is likely to improve the health and well-being of children in foster care. In particular,

early intervention may help to decrease particularly deleterious outcomes such as multiple failed foster care placements.

Specifically, one intensive, specialized program, the Multidimensional Treatment Foster Care for Preschoolers (MTFC-P) program has demonstrated more than double the rate of successful attempts at placing children in permanent placements (e.g., adoptions) compared to regular foster care (RFC; Fisher et al., 2009, 2011). The MTFC-P program specifically targets the individual child emotional and behavioral challenges and provides improved skills for foster parents in order to reduce the likelihood of multiple foster care placements. Although these results are very encouraging, specialized services for foster children such as MTFC-P require significant financial commitment from public agencies, which routinely operate within extremely constrained budgets. In order for public agency managers to make informed decisions about the viability of new programs, they need good information on the incremental or additional benefits and costs of those programs compared to the regular foster care services provided by the agency.

Few researchers have conducted any type of economic evaluation of interventions for children in foster care (Corso & Lutzker, 2006; Sefton, Byford, McDaid, Hills, & Knapp, 2002), and no studies have examined the costs or net benefit of MTFC-P for preschoolers with emotional and behavioral conditions who are in foster care. This report examines the incremental net benefit of the MTFC-P intervention compared to RFC among such preschool children with emotional and behavioral conditions entering foster care.

2. Materials and methods

2.1. Participant characteristics

The data for this study came from a randomized clinical trial to evaluate the MTFC-P program (Fisher et al., 2009). The sample included 117 foster children, aged 3–5, who were entering new foster placements: children new to foster care, children re-entering care, and children moving between placements. Eligible foster children were randomly assigned to the MTFC-P experimental condition (n = 57) or to the RFC comparison condition (n = 60; see Fig. 1). The children were predominantly European Americans (88.89%), which was representative of the region in which the study was conducted. There was no significant group difference in ethnicity. Prior placement instability was defined as a child having experienced 4 or more placements prior to study entry. This definition has been used in prior research studies (Webster, Barth, & Needell, 2000) and by state social welfare agencies for program planning (Hartnett, Leathers, Falconnier, & Testa, 1999). This number not only allows for routine practice that may include more than one placement (e.g., an emergency placement followed by a longer-term foster placement), but also recognizes that additional placements increase risk for the child. Of the 117 children enrolled, 52 children (27 boys and 25 girls; 23 RFC and 29 MTFC-P) met this threshold. There were no significant differences in age at first placement or demographic characteristics at baseline for the groups with placement instability (Fisher et al., 2009). A permanent placement was defined as the child
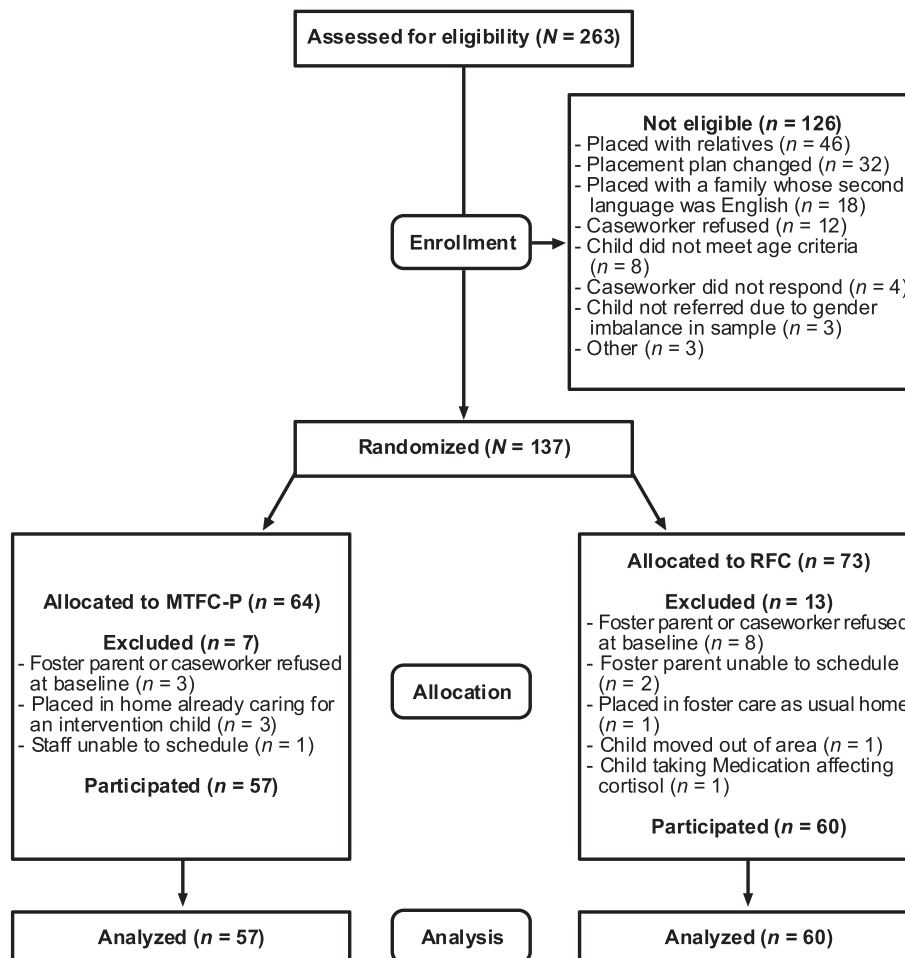

Assessed for eligibility (N = 263)

Enrollment

Not eligible (n = 126)
- Placed with relatives (n = 46)
- Placement plan changed (n = 32)
- Placed with a family whose second language was English (n = 18)
- Caseworker refused (n = 12)
- Child did not meet age criteria (n = 8)
- Caseworker did not respond (n = 4)
- Child not referred due to gender imbalance in sample (n = 3)
- Other (n = 3)

Randomized (N = 137)

Allocation

Allocated to MTFC-P (n = 64)

Excluded (n = 7)
- Foster parent or caseworker refused at baseline (n = 3)
- Placed in home already caring for an intervention child (n = 3)
- Staff unable to schedule (n = 1)

Participated (n = 57)

Allocated to RFC (n = 73)

Excluded (n = 13)
- Foster parent or caseworker refused at baseline (n = 8)
- Foster parent unable to schedule (n = 2)
- Placed in foster care as usual home (n = 1)
- Child moved out of area (n = 1)
- Child taking Medication affecting cortisol (n = 1)

Participated (n = 60)

Analysis

Analyzed (n = 57)

Analyzed (n = 60)

Fig. 1. Consort diagram.

being re-unified with the biological parent or adopted by a relative or nonrelative.

The children were assessed over a 24-month period. There was no difference between groups in mean time spent in foster care at the baseline assessment. Study procedures were approved by the IRBs at the Oregon Social Learning Center and the Oregon Department of Human Services, Public Health Division/Multnomah County Health Department, Public Health.

2.2. Intervention

The MTFC-P intervention addresses key developmental and social–emotional needs for foster preschoolers. Each foster parent completes 12 h of intensive training. After placement, the foster parents work with a consultant and receive support and supervision through daily telephone contacts, weekly support group meetings, and the availability of 24-hour, on-call staff. The consultant works with each foster parent to maintain a positive, responsive, and consistent environment through concrete encouragement for children's positive behavior and clear limit-setting for problem behavior. Children receive services from a behavior specialist working in preschool/daycare and home settings. Additionally, the children attend weekly socialization playgroup sessions.

Children typically receive services for 9–12 months, including the period of transition to a permanent placement (or, if the child is remaining in long-term foster care, until his/her behavior has stabilized and the risk of placement disruption has been mitigated). Whenever possible, a family therapist works with birth parents or adoptive parents to familiarize them with the parenting skills used by the foster parents in the program.

The program staff were clinicians with bachelor's and master's degrees, with a licensed psychologist as the clinical supervisor. Group supervision occurred weekly, with individual consultation as needed. Treatment fidelity for all MTFC-P components was monitored via progress notes and checklists completed by the clinical staff (for more detail see Fisher, Ellis, & Chamberlain, 1999; Fisher et al., 2005).

Families randomized to RFC received routine services typically available through the agencies including individual psychotherapy, screening for possible developmental issues, social service support, mental health treatment, and general parent training (outside the research protocol).

2.3. Design of the economic analysis

This economic evaluation uses the net benefit regression method to calculate incremental benefits, incremental costs, and incremental net benefit (Hoch, 2009; Stinnett & Mullahy, 1998; Willan & Lin, 2001). This method has been developed recently to address statistical challenges associated with estimation of a cost-effectiveness ratio. Net benefit is measured as the product of the value of each additional unit of outcome, multiplied by the number of additional units of outcome achieved by the new program, minus the incremental cost of the new program. The value of each additional unit of effect is the willingness to pay for an additional unit of outcome by the decision-maker who is considering adoption of a new intervention. A positive net benefit indicates that the value of the additional outcomes from the new intervention is greater than the additional costs of producing the new intervention. This approach also allows for evaluation of the net benefit that may accrue to particular subgroups of the sample (Hoch, Briggs, & Willan, 2002).

This analysis was conducted from a public agency perspective, including costs to all public agencies serving this population (health, social welfare, and education). Some expert guidelines (Gold, Siegel, Russell, & Weinstein, 1996) recommend the societal perspective because it includes all costs and benefits to any groups that may be significantly affected by intervention outcomes. However, these guidelines

also assert the relevance of other perspectives, particularly those of agencies or organizations responsible for implementing an intervention. The public agency perspective can help to assess whether a new program can achieve key public agency outcomes more efficiently than a comparison program. We followed the general methodology recommended for economic evaluation in health and social services (Corso & Filene, 2009; Gold et al., 1996; Haddix, Teutsch, & Corso, 2003) in our cost data collection.

2.4. Measures

A variety of clinical outcomes have been used in economic evaluations of health and social programs. Some expert guidelines have favored the use of quality-adjusted life years (QALYS) as the benefit or effect measure (Gold et al., 1996). QALYS are attractive as an outcome measure because they ideally measure an intervention's impact on a person's overall functioning and well-being, rather than focusing narrowly on one outcome such as life years saved and a reduction in symptoms.

However, researchers have expressed concern that in certain situations QALYS may not capture intervention effects well for particular populations, such as people with mental health problems (Brazier, 2008; Dolan, 2008; Knapp & Mangalore, 2007). QALYS are calculated by directly collecting data (often self-reported) on the quality of life of subjects. However, collecting accurate self-reported quality-of-life data in very young children is quite difficult, particularly in children with emotional and behavioral disorders, which are common in preschool children entering foster care. Alternatively, a young child's quality of life is sometimes measured through a proxy reporter such as a parent. However, in the case of young children in foster care, foster parents may not have adequate experience with the child to be accurate reporters. When QALYS are difficult to measure accurately, other key outcomes are typically used such as depression-free days (Lave, Frank, Schulberg, & Kamlet, 1998; Lynch et al., 2011; Simon, Ludman, & Rutter, 2009), percent of subjects who have a re-arrest (French, Fang, & Fritz, 2010); and days of stable housing (Rosenheck, Kasprow, Frisman, & Liu-Mares, 2003). The outcomes selected are typically key measures used by decision-makers to evaluate the performance of their programs. In the case of public agencies responsible for the health, safety, and well-being of children in foster care, one outcome of particular importance is permanent placement (e.g., adoption). This outcome has been associated with a variety of improved health and social outcomes for children in foster care (Hansen, 2008).

In order to calculate net benefit, clinical outcomes are valued at the decision-maker's willingness to pay for an additional unit of clinical outcome. Because there is no generally agreed upon dollar value for an additional permanent placement, net benefit is calculated for a range of possible levels of willingness to pay for each additional outcome and the results are often presented graphically to show the net benefit at varying levels of willingness to pay.

2.4.1. Permanent placements

We used the primary outcomes from the randomized controlled trial reported elsewhere for the clinical outcome in the economic evaluation (Fisher et al., 2009). The primary clinical outcome for the trial was permanent placement. The children's placement experiences and maltreatment histories were coded from official case records obtained from the county branch of the Oregon Department of Human Services Child Welfare Division and were updated every 6 months. A representative of the child welfare agency prepared the case records, removing all identifying information. Specifically, the trial measured the overall rate of successful permanency for each group. Permanent placement included three types of placements: re-uniting with biological parent, relative adoption, and nonrelative adoption. For this measure, the numerator was the number of first permanent placement attempts after which there was no subsequent placement change; the denominator was the total

number of cases in each group. Thus, this measure included children for whom there were and were no permanency attempts. This helped to rule out the possibility that the intervention was only successful in increasing permanency because fewer children experienced permanency attempts.

2.4.2. Cost outcomes

To estimate the health and social services provided outside of MTFC-P or RFC programs, comprehensive profiles of usual care services were created from a self-report survey designed for this study and administered at each assessment point. Each service was valued using published unit costs (Gold et al., 1996; Lynch et al., 2011).

The total cost of the MTFC-P intervention was estimated from clinical trial records and study staff estimates. Study accounting records provided payroll costs, cost of facilities and overhead, and information on purchases of goods and services. Study staff members estimated the time to complete each intervention task. The cost of staff supervision, time to develop treatment plans for the child and family, and staff training were also included.

Staff members from the child welfare agency provided estimates of time spent delivering RFC services. When agency-reported costs for delivering RFC services were not available, published unit costs were used (Gold et al., 1996; Lynch et al., 2011).

2.5. Statistical methods

Incremental net benefit was computed as the value of added clinical outcomes (permanent placements achieved) minus the cost difference between the MTFC-P and RFC groups. The analyses were carried out on an intention-to-treat basis. Complete clinical data on all participants and complete services data on 69% of participants were available. In some cases service use data was not assessed at a particular time point or assessment was incomplete for some types of services. In this case, missing data were imputed using multiple imputation with chained equations (Little & Rubin, 2002; Royston, 2004, 2005) using STATA statistical software.

The primary analysis was of total public agency costs for two years postrandomization. The net benefit regression method (Hoch et al., 2002; Stinnett & Mullahy, 1998) with ordinary least squares regression analyses was used to calculate net benefit; all analyses were adjusted for baseline characteristics (age, gender, number of placements prior to the study, and severity of abuse).

3. Results

Detailed analyses of clinical outcomes are presented elsewhere (Fisher et al., 2009). For the full sample and the placement instability sample, the MTFC-P had more permanent placements in both samples; however, the difference was only significant in the placement instability sample (full sample: MTFC-P M = 36.84% vs. RFC M = 31.67%, $P = 0.787$; placement instability sample: MTFC-P M = 48.28% vs. RFC M = 13.04%, $P = 0.002$).

In Table 1, results are presented that compare the patterns of service use and cost between groups. The cost of nonprotocol services was significantly lower for the MTFC-P group in both the full sample and in the placement instability sample. The total cost of RFC services was also significantly lower for both the full sample and the placement instability sample. The intervention cost an average of $6168 per child to deliver in the full sample and $6097 to deliver in the placement instability sample. Total costs were significantly lower for the MTFC-P group in both the full sample and the placement instability sample (full sample: MTFC-P was $2886 lower than RFC [$P < .005$]; placement instability sample: MTFC-P was $6466 lower than RFC [$P < .05$]).

Table 1
Unadjusted mean (SD) costs (2008 USD).

Type of cost	Full sample		Placement instability sample	
	RFC N = 60	MTFC-P N = 57	RFC N = 23	MTFC-P N = 29
1. Nonprotocol service cost	8749 (5644)	5058 (3506)**	8948 (5471)	5921 (3901)*
2. Total RFC services cost	21,253 (8515)	16,003 (7256)**	27,113 (5973)	17,577 (8094)**
3. MTFC-P intervention	NA	6168 (1760)	NA	6097 (1916)
4. Total foster care costs (sum of items 2 and 3)	21,253 (8515)	22,171 (8754)	27,113 (5973)	23,674 (9747)
5. Total public agency cost (sum of items 1 and 4)	30,090 (11,014)	27,204 (9939)**	36,061 (9160)	29,595 (11,243)*

Abbreviations: RFC, regular foster care; MTFC-P, Multidimensional Treatment Foster Care for Preschoolers.
Significance tests adjusted for differences in gender, number of placements prior to start of study, and baseline severity.
 * $P < .05$.
 ** $P < .005$.

3.1. Net benefit results

The net benefit was calculated as the value of the incremental permanent placements achieved by MTFC-P in comparison to RFC minus the incremental cost of MTFC-P compared to RFC. When the net benefit is positive this indicates that the value of the additional outcome (here permanent placement) is greater than the additional cost of the intervention. Fig. 2 presents how the incremental net benefit of MTFC-P over RFC varies over different levels of willingness to pay for an additional permanent placement. For example, if a decision-maker believes that an additional permanent placement is worth $10,000, the average net benefit for the full sample is $4591 (95% CI: −596 to 9779) and the average net benefit for the placement instability sample is $8087 (95% CI: 188 to 15,987). For the full sample, the average net benefit is positive at all levels of willingness to pay, but the confidence intervals are wide and we cannot exclude the possibility of a negative value for the net benefit. For the placement instability sample, net benefit is unambiguously positive if a decision-maker is willing-to-pay $10,000 or more per additional permanent placement achieved.

4. Discussion

Few studies have conducted economic evaluations of interventions aimed at improving the health and well-being of young children with emotional and behavioral problems in foster care (Corso & Lutzker, 2006; Sefton et al., 2002), and none have examined the incremental value of parent training for foster parents of young children with emotional and behavioral conditions in foster care. Results of this analysis indicate that the average incremental net benefit of the MTFC-P program compared to RFC is positive at all levels of willingness to pay indicating that the value of the additional clinical outcomes from the MTFC-P intervention is greater than the additional costs of producing the new intervention. Although the clinical results were only statistically significantly better in the subgroup of children with placement instability, clinical results were in the preferred direction in both the overall and the subgroup analysis. In addition, MTFC-P was less costly for both groups. Thus although MTFC-P was significantly superior to RFC in terms of overall public agency cost, even after considering the cost of providing MTFC-P.

Although no studies have provided closely comparable analyses to the work reported here, a few studies have conducted economic evaluations of parent training for other high-risk populations. Three studies have used data from randomized trials to examine the cost-effectiveness of parenting programs in reducing child behavior problems in children at various levels of risk (Edwards, Céilleachair, Bywater, Hughes, &
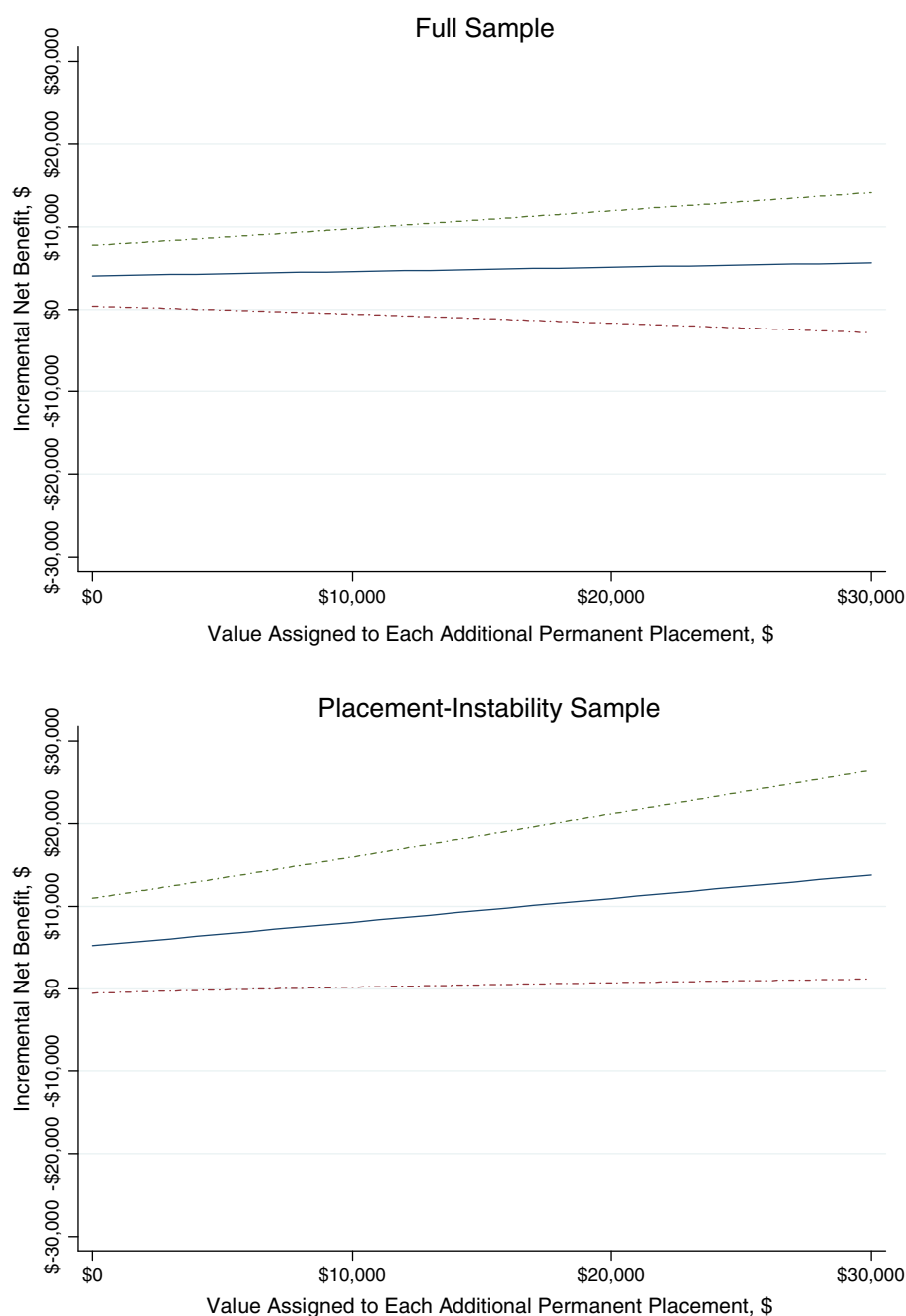
Full Sample

Placement-Instability Sample

Fig. 2. Incremental net benefit—Permanent placements.

Hutchings, 2007; Foster, Olchowski, & Webster-Stratton, 2007; Muntz, Hutchings, Edwards, Hounsome, & O'Céilleachair, 2004). In each case, the clinical outcome was child behavior problems. One study (Muntz et al., 2004) failed to find significant differences in clinical outcomes or costs between the study groups. Foster et al. (2007) found that more intensive versions of the Incredible Years programs were cost-effective if a decision-maker was willing and able to pay at least $3000 per additional unit of child behavioral improvement achieved. Edwards et al. (2007) found that, if a decision-maker is willing to pay at least $194 per one unit improvement in a child behavior outcome, the probability that the Incredible Years program is cost-effective for youth at risk for conduct disorder is about 84%.

None of these studies is closely comparable to the present study, however, because none examined permanent placement and none focused on young children with emotional and behavioral conditions in foster care. The outcomes used in this study—permanent placements achieved—is a relatively long-term, comprehensive measure that has been associated with a variety of improvements in health, mental health, and development for young children in foster care. Although there is no standard for how much a decision-maker is likely to be willing to pay for any type of clinical outcome for children in foster care, recent research suggests that willingness to pay for reductions in child neglect and abuse are high (Corso, Edwards, Fang, & Mercy, 2008; Corso, Fang, & Mercy, 2011). It also seems likely that decision-makers would be willing to pay more for the comprehensive outcomes examined in this study (permanent placement) compared to one-unit reductions in child behavior problems. In addition, lack of permanent placement has been linked with a variety of other costly and damaging outcomes: increased use of future services including child welfare services, special education health, mental health, substance abuse treatment, law enforcement contact, and justice system involvement; as well as lost productivity; and reduced quality of life (Corso & Fertig, 2010;

Corso et al., 2008; Prosser & Corso, 2007). These findings suggest that there may be unmeasured benefits of this intervention for children who have a successful permanent placement.

Our results should be considered in light of several limitations. The sample size was relatively small and had limited racial and ethnic diversity, and the intervention was conducted in only one site. Replication of these results with larger samples, in multiple sites, and in populations with greater ethnic and racial diversity would provide additional valuable information. This study was limited to 24 months of follow-up. Other researchers have suggested that some early intervention programs might continue to have positive clinical effects over a much longer time period (Foster, Prinz, Sanders, & Shapiro, 2008; Knapp, McCrone, Fombonne, Beecham, & Wostear, 2002; Lee, Aos, & Miller, 2008; Mihalopoulos, Sanders, Turner, Murphy-Brennan, & Carter, 2007). This other research suggests that we might also see long-term reductions in use of public services beyond the study period for children who are successfully placed in permanent homes through the MTFC-P program. Finally, the study did not collect time or monetary costs for foster parents. Future studies that include these costs would allow for a more comprehensive economic evaluation of MTFC-P.

5. Conclusions

Many young children with emotional and behavioral issues enter foster care each year, and many of these children experience multiple disruptive placement changes during their time in foster care. These vulnerable children are at risk for many negative health and social outcomes. The public agency decision-makers who are responsible for these children typically operate with highly constrained budgets and have multiple competing priorities. Understanding the cost of delivering MTFC-P and the relative value of the intervention compared to currently available programs could greatly aid decision-makers in allocating their scare resources efficiently.

The results from this study indicate that, from the public agency perspective, the MTFC-P program is highly likely to have a positive net benefit for increasing permanent placements in comparison to RFC for preschool children with emotional and behavioral conditions entering a new foster placement. Mounting evidence suggests that very vulnerable young children entering foster care can be significantly helped by MTFC-P; however, given highly constrained public resources, more information on the relative costs and benefits of MTFC-P and other alternative programs is needed to ensure that the best programs can be available to a wide variety of children.

Conflicts of interest

No authors have any conflicts of interest to disclose regarding this study.

Financial disclosure

Contributors' statement

All individuals listed on the title page meet the three author criteria.

References

Barth, R. P., Weigensberg, E. C., Fisher, P. A., Fetrow, R. A., & Green, R. L. (2008). Reentry of elementary age children following reunification from foster care. Children and Youth Services Review, 30, 353–364.

Brazier, J. (2008). Measuring and valuing mental health for use in economic evaluation. Journal of Health Services Research & Policy, 13(Suppl. 3), 70–75.

Corso, P.S., Edwards, V., Fang, X., & Mercy, J. (2008). Health-related quality of life in adults who experienced maltreatment during childhood. American Journal of Public Health, 98, 1094–1100.

Corso, P.S., Fang, X., & Mercy, J. A. (2011). Benefits of preventing a death associated with child maltreatment: Evidence from willingness-to-pay survey data. American Journal of Public Health, 101(3), 487–490.

Corso, P.S., & Fang, A.R. (2010). The economic impact of child maltreatment in the United States: Are the estimates credible? Child Abuse and Neglect, 34, 296–304.

Corso, P., & Filene, J. (2009). Programmatic cost analysis of the Family Connections program. Protecting Children, 24(3), 77–87.

Corso, P.S., & Lutzker, J. M. (2006). The need for economic analysis in child maltreatment prevention research. Child Abuse and Neglect, 30, 727–738.

Dolan, P. (2008). Developing methods that really do value the 'Q' in the QALY. Health Economics, Policy, and Law, 3, 69–77.

Edwards, R. T., Céilleachair, A., Bywater, T., Hughes, D. A., & Hutchings, J. (2007). Parenting programme for parents of children at risk of developing conduct disorder: Cost effectiveness analysis. BMJ, 334, 682.

Fisher, P. A., Burraston, B., & Pears, K. (2005). The Early Intervention Foster Care Program: Permanent placement outcomes from a randomized trial. Child Maltreatment, 10, 61–71.

Fisher, P. A., Ellis, B. H., & Chamberlain, P. (1999). Early intervention foster care: A model for preventing risk in young children who have been maltreated. Children's Services: Social Policy, Research, and Practice, 2, 159–182.

Fisher, P. A., Gunnar, M. R., Dozier, M., Bruce, J., & Pears, K. C. (2006). Effects of a therapeutic intervention for foster children on behavior problems, caregiver attachment, and stress regulatory neural systems. Annals of the New York Academy of Sciences, 1094, 215–225.

Fisher, P. A., & Kim, H. K. (2007). Intervention effects on foster preschoolers' attachment-related behaviors from a randomized trial. Prevention Science, 8, 161–170.

Fisher, P. A., Kim, H. K., & Pears, K. C. (2009). Effects of Multidimensional Treatment Foster Care for Preschoolers (MTFC-P) on reducing permanent placement failures among children with placement instability. Children and Youth Services Review, 31, 541–546.

Fisher, P. A., Stoolmiller, M., Mannering, A.M., Takahashi, A., & Chamberlain, P. (2011 Aug). Foster placement disruptions associated with problem behavior: Mitigating a threshold effect. Journal of Consulting and Clinical Psychology, 79(4), 481–487.

Foster, E. M., Olchowski, A. E., & Webster-Stratton, C. H. (2007). Is stacking intervention components cost-effective? An analysis of the Incredible Years program. Journal of the American Academy of Child and Adolescent Psychiatry, 46, 1414–1424.

Foster, E. M., Prinz, R. J., Sanders, M. R., & Shapiro, C. J. (2008). The costs of public health infrastructure for delivering parenting and family support. Children and Youth Services Review, 30, 493–501.

French, M. T., Fang, H., & Fritz, R. (2010). Economic evaluation of a pre-release substance abuse treatment program for repeat criminal offenders. Journal of Substance Abuse Treatment, 38, 31–41.

Gold, M. R., Siegel, J. E., Russell, L. B., & Weinstein, M. C. (1996). Cost-effectiveness in health and medicine. New York, NY: Oxford University Press.

Haddix, A.C., Teutsch, S. M., & Corso, P.S. (2003). Prevention effectiveness: A guide to decision analysis and economic evaluation (3rd ed.)New York, NY: Oxford University Press.

Hansen, M. E. (2008). The value of adoption. Adoption Quarterly, 10(2), 65–87.

Hartnett, M.A., Leathers, S., Falconnier, L., & Testa, M. (1999). Placement stability study. Urbana, IL: Children and Family Research Center.

Hoch, J. S. (2009). Improving efficiency and value in palliative care with net benefit regression: An introduction to a simple method for cost-effectiveness analysis with person-level data. Journal of Pain and Symptom Management, 38(1).

Hoch, J. S., Briggs, A. H., & Willan, A.R. (2002). Something old, something new, something borrowed, something blue: A framework for the marriage of health econometrics and cost-effectiveness analysis. Health Economics, 11, 415–430.

Knapp, M., & Mangalore, R. (2007). The trouble with QALYs. Social Psychiatry and Psychiatric Epidemiology, 16, 289–293.

Knapp, M., McCrone, P., Fombonne, E., Beecham, J., & Wostear, G. (2002). The Maudsley long-term follow-up of child and adolescent depression: 3. Impact of comorbid conduct disorder on service use and costs in adulthood. British Journal of Psychiatry, 180, 19–23.

Lave, J. R., Frank, R. G., Schulberg, H. C., & Kamlet, M. S. (1998). Cost-effectiveness of treatments for major depression in primary care practice. Archives of General Psychiatry, 55, 645–651.

Lee, S., Aos, S., & Miller, M. (2008). Evidence-based programs to prevent children from entering and remaining in the Child Welfare System: Benefits and costs for Washington (Document No. 08-07-3901). Olympia, WA: Washington State Institute for Public Policy.

Lewis, E. E., Dozier, M., Ackerman, J., & Sepulveda-Kozakowski, S. (2007). The effect of placement instability on adopted children's inhibitory control abilities and oppositional behavior. Developmental Psychology, 43, 1415–1427.

Little, R. J., & Rubin, D. B. (2002). Statistical analysis with missing data (2nd ed.)Hoboken, New Jersey: John Wiley and Sons.

Lynch, F. L., Dickerson, J. F., Clarke, G., Vitiello, B., Porta, G., Wagner, K. D., et al. (2011). Incremental cost-effectiveness of combined therapy vs medication only for youth with selective serotonin reuptake inhibitor-resistant depression: Treatment of SSRI-resistant depression in adolescents trial findings. Archives of General Psychiatry, 68(3), 253–262.

Mihalopoulos, C., Sanders, M. R., Turner, K. M., Murphy-Brennan, M., & Carter, R. (2007). Does the Triple P-Positive Parenting Program provide value for money? Australian and New Zealand Journal of Psychiatry, 41, 239–246.

Muntz, R., Hutchings, J., Edwards, R. T., Hounsome, B., & O'Céilleachair, A. (2004). Economic evaluation of treatments for children with severe behavioral problems. Journal of Mental Health Policy and Economics, 7, 177–189.

Pears, K. C., Kim, H. K., & Fisher, P. A. (2008). Psychosocial and cognitive functioning of children with specific profiles of maltreatment. *Child Abuse and Neglect, 32,* 958–971.

Price, J. M., Chamberlain, P., Landsverk, J., Reid, J., Leve, L., & Laurent, H. (2008). Effects of a foster parent training intervention on placement changes of children in foster care. *Child Maltreatment, 13,* 64–75.

Prosser, L. A., & Corso, P.S. (2007). Measuring health-related quality of life for child maltreatment: A systematic literature review. *Health and Quality of Life Outcomes, 5,* 42–142.

Reddy, L. A., & Pfeiffer, S. I. (1997). Effectiveness of treatment foster care with children and adolescents: A review of outcome studies. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 581–588.

Rosenheck, R. A., Kasprow, W., Frisman, L. K., & Liu-Mares, W. (2003). Cost-effectiveness of supported housing for homeless persons with mental illness. *Archives of General Psychiatry, 60,* 940–951.

Royston, P. (2004). Multiple imputation of missing values. *Stata Journal, 4,* 227–241.

Royston, P. (2005). Multiple imputation of missing values: Update. *Stata Journal, 5,* 118–201.

Rubin, D.M., O'Reilly, A. L. R., Luan, X., & Localio, A.R. (2007). The impact of placement stability on behavioral well-being for children in foster care. *Pediatria, 119,* 336–344.

Sefton, T., Byford, S., McDaid, D., Hills, J., & Knapp, M. (2002). *Making the most of it: Economic evaluation in the social welfare field.* York, UK: Joseph Rowntree Foundation.

Simon, G. E., Ludman, E. J., & Rutter, C. M. (2009). Incremental benefit and cost of telephone care management and telephone psychotherapy for depression in primary care. *Archives of General Psychiatry, 66*(10), 1081–1089.

Stinnett, A. A., & Mullahy, J. (1998). Net health benefits: A new framework for the analysis of uncertainty in cost-effectiveness analysis. *Medical Decision Making, 18*(2 Suppl.), S68–S80.

Webster, D., Barth, R. P., & Needell, B. (2000). Placement stability for children in out-of-home care: A longitudinal analysis. *Child Welfare, 79*(5), 614–632.

Willan, A.R., & Lin, D. Y. (2001). Incremental net benefit in randomized clinical trials. *Statistics in Medicine, 20*(11), 1563–1574.

Zerbe, R. O., Plotnick, R. D., Kessler, R. C., Pecora, P. J., Hiripi, E., O'Brien, K., et al. (2009). Benefits and costs of intensive foster care services: The Casey Family Programs compared to state services. *Contemporary Economic Policy, 27,* 308–320.