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Delinquency and Crime Prevention: Overview of Research Comparing Treatment Foster Care and Group Care

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Abstract

Background Evidence of treatment foster care (TFC) and group care's (GC) potential to prevent delinquency and crime has been developing.

Objectives We clarified the state of comparative knowledge with a historical overview. Then we explored the hypothesis that smaller, probably better resourced group homes with smaller staff/resident ratios have greater impacts than larger homes with a meta-analytic update.

Methods Research literatures were searched to 2015. Five systematic reviews were selected that included seven independent studies that compared delinquency or crime outcomes among youths ages 10–18. A similar search augmented by author and bibliographic searches identified six additional studies with an updated meta-analysis. Discrete effects were analyzed with sample-weighted preventive fractions (PF) and 95 % confidence intervals (CI).

Results Compared with GC, TFC was estimated to prevent nearly half of delinquent or criminal acts over 1–3 years (PF = 0.56, 95 % CI 0.50, 0.64). Two pooled study outcomes tentatively suggested that GC in homes with less than ten youths may prevent delinquency and crime better than TFC, $p = 0.08$. Study designs were non-equivalent or randomized trials that were typically too small to ensure controlled comparisons.

Conclusions These synthetic findings are best thought of as preliminary hypotheses. Confident knowledge will require their testing with large, perhaps multisite, controlled trials. Such a research agenda will undoubtedly be quite expensive, but it holds the promise of knowledge dividends that could prevent much suffering among youths, their families and society.

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Keywords Treatment foster care · Group care · Delinquency · Crime · Overview · Meta-analysis

Introduction

More than half a million youths are in foster care in the United States and Canada (Statistics Canada 2012; U.S. Department of Health and Human Services 2013). Many of them have experienced some form of abuse or neglect. Such traumas are associated with numerous health problems which, if not dealt with appropriately, can lead to ever worsening challenges for them, their families and society (Herrenkohl et al. 2013). Youths in foster care are two to four times more likely to experience depression, posttraumatic stress, personality disorders, substance abuse, attention deficit and learning disorders than youths not in care (Havlicek et al. 2013; Zito et al. 2008). Perhaps not surprisingly, their risk of academic failure is also much greater (Trout et al. 2008). If not attended to, a trajectory of increasingly risky, delinquent and criminal behaviors can ensue (Goldstein et al. 2013; Lansford et al. 2007). By the time most foster children reach mid-adolescence they have been in care for two to five years or more and commonly been placed with more than ten families, probably further amplify their risks (Oosterman et al. 2007). Consequently, nearly half of all youths who age-out are arrested after they transition from foster care at age 21 (Stott and Gustavsson 2010). The human and social costs are bound to be great if we do not do better for this potentially vulnerable population.

Many youths who perpetrate seriously delinquent or criminal acts are placed in large, secure residential facilities. When possible, treatment foster care (TFC) and group care (GC) are less restrictive, and potentially more therapeutic, options for youths (Turner and MacDonald 2011). TFC is an adjunct to typical family foster care, providing youths and their foster families with additional treatment and supportive resources. Though more restrictive, GC has become a valuable resource for child welfare agencies in North America and is often the last resort for youths whose behavior would otherwise prevent them from being placed in care. More expensive than TFC, GC provides therapeutic efficiencies by bringing together a relatively small number of similarly challenged youths with professional and paraprofessional staff members. Some have suggested, however, that bringing similarly challenged youths together in group homes may produce so-called negative peer contagions that undermine therapeutic processes (Barth 2005; Leve and Chamberlain 2005). That is, close residential associations with delinquent peers might produce increased, rather than decreased, delinquent or criminal behaviors. Others in this field have found little evidence of such overwhelmingly negative peer influences in group homes (Huefner and Ringle 2012; Knorth et al. 2008; Robst et al. 2013) while Lee and Thompson (2009) preliminarily pointed out the probability of positive peer influences under certain, not yet well defined, GC conditions. Such seems an important unresolved element of the TFC-GC debate.

TFC and GC are the most prevalent and seemingly promising options for similarly traumatized at-risk youths (Breland-Noble et al. 2005; Dorsey et al. 2012; Lee et al. 2011). Placement decisions, however, seem to be based predominantly on regional program availabilities. Decision makers could use knowledge about the relative success rates of TFC and GC in planning child welfare and associated services. Therefore, this research synthesis aims to clarify what is known about the relative effectiveness of TFC and GC in

caring for youths at risk of moving from the child welfare system to the criminal justice system.

Overview of Systematic Reviews and Meta-analyses

An exploratory review found that a number of systematic reviews of the effects of TFC or GC had already been published (Osei 2014). When the effectiveness of TFC had been the study's focus, it was most typically compared with GC, and when the study's primary objective was to observe GC's effects, the most typical comparison group was TFC. So we thought that a research overview would be the best way to clarify this field's knowledge. Overviews are intended to summarize systematic reviews of different interventions or of different outcomes (Becker and Oxman 2011). Such was the case in this field where TFC and GC have been studied across diverse behavioral outcomes, including delinquency and crime. Osei's (2014) exploratory review suggested that foster care program endowments vary widely and that the most recent research in this field has not been critically reviewed. Previous reviews typically analyzed studies that had been published more than a decade ago. Foster care in group homes seemed to vary tenfold or more on number of a youths per home, with clear implications for staff/resident ratios and therapeutic resourcefulness. Tripodi and Bender (2011) wondered if small group practices might be used to engage the prosocial behaviors of at-risk youth. We analogously wondered if smaller group homes, probably more resourceful with smaller staff/resident ratios, might not be less prone to negative peer contagion, more prone to positive peer contagion and ultimately, more effective in preventing delinquent or criminal behaviors.

This research synthesis had two aims. First, we aimed to broadly clarify the preventive potentials of TFC and GC by the means of an overview of systematic reviews and a historical meta-analysis of their independent studies. We hypothesized that TFC more effectively prevents delinquency and crime. Second, we explored the hypothesis that smaller, better resourced group homes have greater preventive impacts than larger homes by means of an updated-meta-analysis.

Methods

Overview and Meta-analytic Samples

The following databases were searched from January of 1990 to January of 2015: *Campbell and Cochrane Database of Systematic Reviews*, *Social Work and Social Service Abstracts*, *PsycINFO*, *ERIC*, *PubMed*, *Proquest Dissertations*, *Conference Proceedings Citation Indexes* and *Google Scholar*. This sampling frame included published and unpublished literatures designed to control for publication bias (de Smidt and Gorey 1997; Grenier and Gorey 1998). These keywords were searched: foster care and (group home or residential or family or treatment) and (delinquency or crime or arrest or conviction or incarceration) and (systematic review or meta-analysis). We searched for reviews that included quasi-experimental or experimental studies of at-risk youths 10–18 years of age. Five systematic reviews of 45 independent studies were selected. Twenty-two studies were excluded because the majority of their participants were less than 10 years of age. Sixteen studies were excluded on methodological grounds: their outcome was irrelevant or they

were pre-experiments. The seven remaining conceptually and methodologically relevant studies were this historical overview's sample for meta-analysis. Because the typical study had been published more than a decade ago, we attempted to bring the sample more up-to-date. Using the same search keywords, augmented by author and bibliographic searches of retrieved manuscripts, we retrieved six additional studies for an updated meta-analysis. Samples of systematic reviews (a), the studies they reviewed (b) and our updated sample of studies (c) are noted as such in the references section.

Meta-analyses

Intervention effect sizes were calculated to shed light on the practical significance of study findings. Studies were reanalyzed using the preventive fraction (PF) and Cohen's U_3 statistic, respectively, for discrete and continuous outcomes (Cohen 1988; Miettinen 1974). The PF is the proportion of undesirable outcomes that were likely prevented by an intervention. A PF of 0.50, for example, would mean that youths in that study's key foster care treatment group had perpetrated half of the incidents of delinquency or crime than had youths in its comparison group. U_3 is an intuitively appealing statistic that we used to compare all of the youths' scores in one study group with the median youth's score in another. Its practical strength is that it assists in putting the emphasis on people rather than on statistics. For example, a U_3 of 75 % resulting from the comparison of TFC with usual care on number of days incarcerated would be interpreted as follows. Three-quarters of youths in TFC were incarcerated fewer days than the typical youth in usual care. Statistical significance was estimated with 95 % confidence intervals (CI; Greenland 1987).

To learn as much as we could, multiple study outcomes were presented in tables. But in calculating meta-analytic statistics, multiple outcomes were averaged so that each study counted once. Pooled effects were weighted by their inverse variances so that larger, more precise studies influenced summary measures more than smaller studies (Chinn 2000; Cooper 2010). Effect distributions were tested for heterogeneity with Cochran's Q statistic (Fleiss et al. 2003; Hedges and Olkin 1985). With a Chi square (χ^2) distribution, it tested if the variability of effects was greater than expected by random error. When so, potential sources of variability were explored. One such exploratory hypothesis, the difference between smaller and perhaps better-resourced, and larger and perhaps more poorly resourced group homes was tested with Cochran's Q_b statistic. It should be noted that these were indirect comparisons (Hoaglin et al. 2011), smaller or larger homes compared to other treatment conditions, typically TFC, rather than directly compared with each other.

Results

Overview of Systematic Reviews

Sample Description

This overview of the preventive impacts of TFC and GC on delinquency and crime was based on seven studies, representing the aggregate sample of five systematic reviews published between 2005 and 2011. They sampled youths between the ages of 10 and 18, who with one exception, were in care during the 1990s or earlier. All were US studies, five accomplished by a Eugene, Oregon-based practice-research team. The others studied rural

Ohio and Los Angeles. While the aggregate sample included 8987 youths, the five randomized controlled trials (RCT) and two quasi-experiments (QE) were typically quite small (Mdn = 79, range 14–8226). Slightly more boys (57.3 %) than girls (42.7 %) participated and more than three-quarters of the aggregate sample was comprised of youths of color: African American (46.1 %), Hispanic (31.0 %) and Native or Asian American (1.9 %). One retrospective cohort with quasi-experimental features was an outlier. It studied a large, ethnically diverse sample in Los Angeles after 2000. Excluding it, the aggregate sample was of 761 predominantly non-Hispanic white (83.1 %) boys (86.5 %). They seemed to best represent this sample.

Historical Meta-analysis

Characteristics of the seven studies are displayed in Table 1. Most hypothesized greater benefits of TFC. All ten outcomes were in the hypothesized direction, but four were not statistically significant. For example, the first listed study followed very small samples of seriously delinquent youths in TFC or GC to see if they had been incarcerated over two years. Half of the TFC group had been (50.0 %) while nearly all in the GC had (93.8 %, $PF = 0.53$). TFC was estimated to prevent nearly half of incarcerations compared with GC. The same study examined a continuous outcome, the number of days youths were incarcerated (middle Table 1). A non-significant trend of fewer days among the TFC group ($U_3 = 61.0$ %), suggested that six of every ten youths in TFC experienced fewer days of incarceration than the typical youth in GC. Excluding the outlying study and converting all outcomes to discrete ones, the pooled PF was 0.56 (95 % CI 0.50, 0.64). This pooled effect was not significantly heterogeneous; $Q(5) = 5.65$, $p = 0.34$.

TFC was relatively well defined. It was typically foster family-based with one or two youths placed with case management support and regular individual and family treatments. GC was more vaguely defined and group homes varied greatly in size, ranging from two to more than 25 youths per home, sometimes within the same study. Moreover, such variability was not accounted for in any study's analysis. Though we could not explore the effect of program endowment in this analysis, such became an exploratory hypothesis in our updated analysis. This hypothesis seems to have been first developed by Gordon et al. (2000). They estimated the preventive impact of a "newer" and smaller group treatment facility nearly on par with that of TFC. Such relatively well-resourced GC was estimated to prevent 29 % more felony reconvictions than more poorly resourced, "traditional" facilities ($PF = 0.71$, 95 % CI 0.56, 0.90).

Updated Meta-analysis

Sample Description

This meta-analysis of the preventive impacts of GC was based on six studies published between 2004 and 2013. Four sampled youths in care after 2000, two during the 1990s. All were US studies, including two national and four state samples (Nebraska, Oregon and two in Florida). The five QEs and one RCT had an aggregate of 5366 participants (Mdn = 497, range 79–2800). The "QEs" really seemed to be retrospective cohorts with QE features, typically aiming to compensate for selection bias by propensity score matching 10–25 characteristics of youths, families and neighborhoods. The majority of the sample was boys (61.9 %) and about half each was non-Hispanic white (54.8 %) and youths of color: African American (28.7 %), Hispanic (13.4 %) and other ethnic backgrounds (3.1 %).

Table 1 Characteristics of studies included in the overview: treatment foster care versus other forms of care

Study	Design length FU	Intervention versus comparison or control	Analytic sample	Youth samples characteristics	Discrete outcomes incidence rates (%)	Effects PF 95 % CI
Chamberlain (1990)	QE 2 years	Treatment foster care	16 ^b	Seriously	Incarcerated in state training school 50.0	0.53 0.34, 0.83
		Group home ^a	16 ^b	Delinquent	Reconvicted 93.8	
Gordon et al. (2000)	RCT 2 years	Group home—newer	252	Male	31.3	0.71 0.56, 0.90
		Group home—traditional	224	Felons	43.8	
Ryan et al. (2008)	QE 3.5 years	Family foster care	4113	Abused or	Arrested 8.0	0.40 0.36, 0.45
		Group home	4113	Neglected	20.0	
Continuous outcomes					<i>U</i> ₃ (%)	
Means					SDs	
Chamberlain (1990)	QE 2 years	Treatment foster care	16 ^b	Seriously	Days incarcerated in state training school 44.3	61.0
		Group home ^a	16 ^b	Delinquent	66.8	47.2, 73.6
Chamberlain and Reid (1991)	RCT 7 months	Treatment foster care	7	Emotionally	Caregiver-reported daily behavior problems ^c 9.0	nd
		Community settings ^d	7	Disturbed	14.0	NSS
Chamberlain and Reid (1998)	RCT 1 year	Treatment foster care	37 ^e	Seriously	Number of criminal referrals 2.6	76.1 72.2, 79.6
		Group home	42 ^e	Delinquent boys	5.4	
Self-reported felony assaults						
1.2					2.7	
2.7					3.8	

Table 1 continued

	RCT	Treatment foster care	37	Chronically	Continuous outcomes		U_3 (%)		
					Means	SDs			
Leve et al. (2005)	1 year	Treatment foster care	37	Chronically	0.8	1.1	64.4		
		Group home	44	Delinquent girls	1.3	1.7	47.2, 79.1		
Smith et al. (2010)	1.5 years	Treatment foster care	37	Seriously	Number of criminal referrals		69.5		
					Group home	42		Delinquent boys	Caregiver reported delinquent behavior ^f
									Self-reported use of illicit drugs ^h
					Group home	42		Delinquent boys	64.7
Group home	42	Delinquent boys	70.0	11.1	50.4, 83.4				

Bolded effects significant at $p < 0.05$

CI confidence interval, *FU* follow up, *nd* no data, *NSS* not statistically significant, *PF* preventive fraction, *QE* quasi-experiment, *RCT* randomized controlled trial, *SD* standard deviation

^a Eight in group homes, 4 in secure treatment, 2 in parents' homes/parole supervision, 2 in specialized foster care/another community

^b No data lost to follow-up (administrative records), but groups differed on loss to the study (running away). Respectively, 1 of 16 and 7 of 16 of youths in treatment and comparison groups ran away; $\chi^2(1, N = 32) = 6.00, p < 0.05$

^c Measured with Parent Daily Report Checklist (Chamberlain and Reid 1987)

^d One each placed in group home, secure treatment and juvenile corrections, 4 with families/relatives, 3 in state hospital

^e No data lost to follow-up (administrative records), but groups differed on completion. Respectively, 73.0 and 35.7 % of youths in treatment and comparison groups completed programs; $\chi^2(1, N = 79) = 10.88, p < 0.05$. Most non-completers seemed to have run away

^f Measured with Delinquency subscale of Child Behavior Checklist (Achenbach 1991)

^g Overall sample and attrition rate (29.6 %) inferred from degrees of freedom. Samples and attrition rates by study groups not reported

^h Use of marijuana or other drugs over past 6 months measured on 5-point Likert scale: 1 (never) to 5 (once day or more)

Heterogeneity and Moderator Analysis

The effect distribution only approached heterogeneity; $Q(5) = 9.30, p = 0.10$, so we merely explored program endowment. All nine study outcomes provided directional hypothesis support, but seven were not statistically significant (Table 2). Two outcomes supported the greater preventive impact of relatively well-resourced GC in homes with less than ten youths. Their pooled analysis estimated that the incidence of undesirable outcomes over nine months among youths in GC was 29 % less than the incidence among youths in TFC: $PF = 0.71$ (95 % CI 0.59, 0.85). Seven outcomes supported the non-significance of GC-TFC or the lesser impact of more poorly resourced GC in homes with typically more than ten youths. Their pooled analysis estimated that the incidence of undesirable outcomes over one to three years in GC was 17 % more than the incidence in TFC: $PF = 1.17$ (95 % CI 1.11, 1.24). The contrast between PFs associated with better ($PF = 0.71$) and less resourced ($PF = 1.17$) GC approached significance: $Q_b(1) = 3.04, p = 0.08$.

Discussion

This historical overview allowed for the inference that family-based, TFC prevents half of the delinquent or criminal acts among youths in care that might have been perpetrated had they been living in group homes. For a number of reasons, however, it seems a tentative inference. GC residences were generally ill-defined and diverse. They ranged widely, for example, on their numbers of residents. Typically group homes seemed quite large so the pooled TFC-GC comparison was probably biased in favor of TFC. The fact that five of the seven studies were accomplished by the same team that designed and implemented the TFC program also suggests that its advantage may be overestimated (Gorey 1996). Finally, though the majority design was a RCT, they were typically quite small. Arguably this field's germinal trial; cited well over 200 times, had only seven treatment participants. Such very small trials probably cannot truly control myriad confound explanations. Treatment fidelity is another factor that potentially confounded our findings. As TFC programs have proliferated across the US and some Canadian provinces there is evidence that adherence to its evidence-based practices has varied greatly (Farmer et al. 2010; James and Meezan 2002). These limitations substantially temper inferences about TFC's effectiveness. Evidence about its preventive potential developed over the past generation in the US essentially represents a hypothesis that remains to be confidently tested.

We also found some support for our exploratory hypothesis that smaller, probably better resourced group homes have greater preventive impacts than larger, less resourced homes. This updated meta-analysis suggested that smaller homes prevent a third of the delinquent or criminal acts that might otherwise have been perpetrated had they been living in larger homes. However, this indirect, and so correlational, contrast only approached significance as its comparison of a limited number of outcomes lacked power (Hoaglin et al. 2011). Admittedly, we used a rough, convenience criterion to define these groups: less than 10 or 10 or more youths per home. Though the major research design was a QE with propensity score matching, residual confounding by family histories of substance abuse or domestic violence, mental illness and prior placements still seems likely (Barth et al. 2007; Lee and Thompson 2008). Peer contagion is another factor that potentially confounded our review comparisons. Our indirect findings were consistent with previous suggestions that negative peer contagion effects would be smaller and positive peer contagion effects larger in group homes with fewer residents (Lee and Thompson 2009; Robst et al. 2013; Tripodi and

Table 2 Characteristics of studies included in the updated meta-analysis: group foster care versus other forms of care

Study	Design length FU	Intervention (# youth/home) comparison or control	Analytic samples	Youth sample characteristics	Discrete outcomes	Incidence rates (%)	Effects PF 95 % CI
Smaller, relatively well-resourced group homes							
Lee and Thompson (2008)	QE	Group care (6 to 8)	76	Delinquent	Self-reported legal involvement ^a	10.5	0.88
	9 months	Treatment foster care	76	“Troubled”	Did not returned home ^b	12.0	0.34, 2.27
Larger, more poorly-resourced group homes			110			35.2	0.59
			110			60.0	0.45, 0.78
Criminal referral for a violent offense							
Eddy et al. (2004)	RCT	Group care (6 to 15)	37	Seriously		38.1	2.02
	2 years	Treatment foster care	42	Delinquent boys		18.9	0.97, 4.20
Undesirable outcome ^c							
Barth et al. (2007)	QE	Residential care (8 to 12)	432	Delinquent		44.5	1.15
	1 year	Intensive in-home care	937	“Troubled”		38.5	0.99, 1.33
Caregiver reported behavior problems ^d							
McCrae et al. (2010)	QE	Group care (many) ^e	62	Maltreated		nd	1.03
	3 years	Non-kinship foster care	62			nd	0.88, 1.21
Felony or misdemeanor charge							
Robst et al. (2011)	QE	Treatment group care (12)	421	Serious psychiatric or behavioral disorder		24.0	1.24
	6 months	Treatment foster care	421			19.3	0.96, 1.59
Involuntary examination							
						15.5	1.03
						15.0	0.76, 1.39
Felony or misdemeanor arrest ^f							

Table 2 continued

Study	Design length FU	Intervention (# youth/home) comparison or control	Analytic samples	Youth sample characteristics	Discrete outcomes	Incidence rates (%)	Effects PF 95 % CI
Robst et al. (2013)	QE 6 months	Treatment group care (12) Psychiatric inpatient or treatment foster care	637 2163	Serious psychiatric or behavioral disorder	22.4 15.6	22.4 15.6	1.37 1.17, 1.60
					Felony or misdemeanor arrest ^f	22.4 15.6	1.17 0.96, 1.43

Bolded effects significant at $p < 0.05$

CI confidence interval, FU follow up, *nd* no data, PF preventive fraction, QE quasi-experiment, RCT randomized controlled trial, SD standard deviation

^a Arrests, convictions, probation or jail sentences

^b To parents or relatives

^c Not living with family or making progress in school, in trouble with law or unstable placement

^d Externalizing behavior problems measured with Child Behavior Checklist Achenbach (1991)

^e Group care or residential treatment

^f Upper estimate not adjusted for arrests during treatment; lower estimate was adjusted

Bender 2011). However, no study in this field has directly measured such contagions, positive or negative, so that they presently confound the therapeutic effects of GC. Future research ought to directly account for peer contagion, allowing for direct observations of the independent effects of GC interventions and peer influences. Because of these limitations the evidence on the relationship between GC endowment and preventive potential represents a tentative hypothesis that remains to be further developed and tested.

Group Care Black Box

A black box is a metaphorical system with known inputs (youths entering GC) and outputs (followed to outcomes), but without understandings of the system's inner-workings (GC treatment). The problem with such a system is that when it produces successes they cannot be reliably replicated. Much of the GC research remains inside a black box. Exemplary GC program descriptions tended to be very general, such as these. Approximately half of the youths received some family therapy. Most were provided with some individual and group counseling. Families were encouraged to be involved with the group home. But, what were the staff/resident ratios? What were the intensities and durations of therapies? What theories shaped the therapeutic milieu and specific therapies? Who were the counselors or therapists? What were their disciplinary backgrounds and credentials? How experienced were they? None of these questions has been answered. Future research will need to more closely examine the inner-workings of the GC black box.

Future Research Needed to Steer Foster Care Practices and Policy

Geminal studies have sampled the experiences of less than 10–20, typically non-Hispanic white boys. Yet clinical and policy decisions involving billions of dollars and millions of lives are made in this field each year. Given the human and societal significance of delinquency and crime among youths as well as the policy significance of providing sound prevention programs, investment in much more rigorous research in child welfare seems an ethical imperative. After synthesizing this field's limited knowledge base and reviewing the research methods that produced it, we see no reason not to use experimentation in the future. What seems clearly called for as we invest further billions each year in child welfare programs are more confident knowledge bases that could be produced by large, multisite RCTs. Longer-term prospective cohort investigations would certainly also help to advance this field's knowledge. A RCT-based, nationwide, perhaps multinational research agenda across the foster care continuum will undoubtedly be quite expensive, but such an investment holds the promise of huge knowledge dividends (Gorey 2009). Such a commitment to the most effective care of our most vulnerable children seems long overdue.

Conclusions

Assuming therapeutic implementation based upon the best evidence, two practice principles were suggested by this research synthesis. Placement of seriously at-risk youths in less restrictive and probably more effective TFC is preferred. GC in less restrictive homes with low staff/resident ratios, however, may be nearly as effective. This field's small

retrospective quasi-experiments and largely uncontrolled trials of “black box” programs have provided little assurance that assignment and observational biases are not potent alternative explanations. Consequently, thus far, it has provided suggestions, rather than confident knowledge. These suggestions are of great human and social policy significance however. They ought to be tested by independent investigators using amply funded research designs that include powerful samples, randomly assigned to programs that are well defined and vigorously followed.

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(a) Systematic reviews in overview, (b) studies in overview, (c) studies in updated meta-analysis

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