Benefiting All the Beneficiaries of Social Assistance:

The 2-Year Effects and Expense of Subsidized Versus Nonsubsidized Quality Child Care and Recreation

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At 2 years, 337 Canadian children (0 to 24 years of age) randomized to subsidized child care/recreation (compared to 304 children who financed and directed their own recreation) were engaged in more activities (p = .02) and more "quality" activities (p = .003) such as clubs and teams—the activity most associated with higher social (r = .37) and total competence (r = .30)—and were lower users of physician (p = .03), social work (p = .07), and child care services (p = .01). The beneficial effects on improved competency for children was most noted for youth with an initial behavioral disorder (p = .04). Parents of experimental children endorsed fewer nervous system (p = .02), sleep (p = .03), and anxiety disorders (p = .04); needed less child care (p = .01), counseling (p = .02), and food bank services (p = .02); endorsed a higher economic social adjustment (p < .05); and reported receiving greater child support (alimony) (p = .04).

In Canada, the 1994-1995 National Longitudinal Survey of Children and Youth (NLSCY) (Offord & Lipman, 1996) revealed that 20% of children between 4 and 11 years of age have one or more emotional and behavioral problems.

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AUTHORS' NOTE: From 1994 to 1999, funding was provided by Health Canada Children's Mental Health Division, No. 6070-10-6/9401; Hamilton Community Foundation; and the National Health Research and Development Programme, No. 6606-5306-201

NATIONAL ACADEMIES OF PRACTICE FORUM, Vol. 1, No. 2, April 1999 131-142

Approximately one in six children in the NLSCY was living in a single-parent, mother-headed family. Both family status and low income significantly and independently influenced the prevalence of childhood emotional and behavioral problems (33.5%) when compared with rates of any disorder in non-low-income single mothers (27.9%), low-income two-parent families (21%), and two-parent families not of low income (18.3%) (Lipman, Offord, & Dooley, 1996).

Clinical services alone can never reduce such a high burden of suffering. Universal (for all children) and targeted (for high-risk children) programs are needed (Offord & Lipman, 1996), and their relative effectiveness must be assessed. Such was the purpose of this study of the effectiveness of proactive and subsidized quality child care/recreation for children from 0 to 24 years of age on social assistance.

Doherty (1991) has summarized the evidence on the beneficial impact of quality versus poor quality child care on child functioning and outcomes. This summary was based on the best research conducted in the United States (Howes, 1990; Zoritch, Roberts, & Oakley, 1998), Canada (Goelman & Pence, 1988), England, Western Europe, Bermuda, and New Zealand. The majority of this evidence about young children was cohort analytic investigations with small sample sizes. Only studies that controlled for parental income and education were included in the review.

It appears that early, quality child care exerts an independent effect on short- and long-term child outcomes such as social competence, language and play development, self-regulation, compliance, and fewer school problems (Doherty, 1991; Goelman & Pence, 1988; Howes, 1990; Zoritch et al., 1998). This effectiveness occurs irrespective of parents' socioeconomic advantage. Children at risk because of poverty and/or home environment are doubly at risk because they are more often placed in poor child care environments (Doherty, 1991; Goelman & Pence, 1988; Howes, 1990; Zoritch et al., 1998).

Evidence supporting the benefits of recreation for youth living in circumstances of risk has been recently summarized (McKay, Reid, Tremblay, & Pelletier, 1996). *Youth at risk* broadly refers to youth living in any circumstance of risk, such as poverty, abuse, or neglect. Recreation activities have been associated with healthy lifestyle activities, physical fitness and self-esteem, involved parents and adults, desirable peer associations, and improved cognitive function. In addition, physical activity and recreation minimizes boredom in youth, which is associated with deviance.

A majority of this evidence about the value of recreation is before-after descriptions of the effects of recreation for volunteers of convenience samples. The validity of many of the empirical studies is weakened by methodological shortcomings including problems with sampling, representativeness, and inadequate control groups and analyses that fail to adjust for the confounding effects of factors, such as maternal depression, known to be associated with problems in youth. More information is needed on the effects of subsidizing recreation programs for youth at risk at various ages and genders and of types and degrees of behavior problems at the outset.

Limited capacity for subsidized child care and recreation placements in the research setting created the possibility of a randomized trial of proactive subsidized child care and recreation for children of single parents on welfare. The degree to which the single parents with and without mood disorder in the other arm of the trial arranged for quality child care and recreation programming was monitored.

There is promising evidence on the effectiveness of quality and subsidized child care (Doherty, 1991; Goelman & Pence, 1988; Howes, 1990; Zoritch et al., 1998) and recreation (Bouchard, 1990; Calfas & Taylor, 1994; Frankish, Milligan, & Reid, 1998; Jones & Offord, 1989; McKay et al., 1996). The cost-effectiveness and benefit of these interventions for certain types of parents receiving social assistance and their effect on children still awaited documentation in a randomized trial that avoided the methodological weaknesses of previous investigations. The proposed comparison of provider-initiated and subsidized versus self-directed and financed child care/recreation interventions was tested in this randomized trial.

METHODS

The Hamilton-Wentworth and Halton YMCA, regional social service agencies, and public health agencies are partners in the McMaster University Health System-Linked Research Unit on Health and Social Service Utilization. Funding for this study was received from Health Canada's Children's Mental Health Division and Hamilton's Community Foundation and from the National Health Research and Development Programme.

As shown in Figure 1, after parents' eligibility to receive social assistance (income maintenance and/or subsidized child care) was established, parents were approached by the income maintenance worker for their willingness to participate in this study. Consenting parents were phoned by the project coordinator. The coordinator asked recipients about their willingness to participate in this study about the child care/recreation needs of their families, their current use of services, and their willingness to be interviewed annually during the next 4 years. The rationing of services became agency policy.

Consenting parents who were eligible and receiving income maintenance were randomly allocated to one of two treatment strategies, as shown in Figure 1, using a computerized

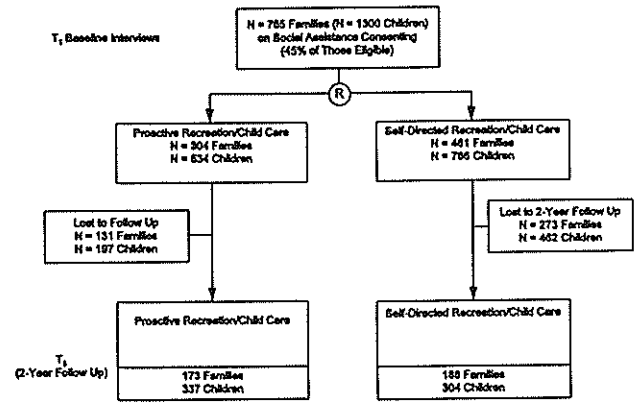

Figure 1 Trial flow diagram.

randomization schedule that blocked randomly after every 5th or 10th participant (household) to ensure equal numbers at baseline in both treatment groups.

This was a randomized trial of provider-initiated and subsidized versus self-directed and self-financed approaches to providing age-appropriate recreation/quality child care to all children living with a single parent on social assistance. Intake occurred over a 12-month period. The final stage of the 2-year intervention was completed by the end of Year 3. The full period of the follow-up will be annual measurements (1 year after intake) for 4 years. Child care or income maintenance workers were not informed of the clients' participation in the child care/recreation services. Baseline and outcome assessments of parents and children were obtained by interviewers concealed to the purpose of the study.

An age-appropriate child after-school recreation opportunity was provided to all children in a household randomized to receive the proactive and subsidized recreation/quality child care intervention by a collaborative effort between the YMCA and 21 other youth-serving organizations. Options were negotiated with the parent by the recreation project coordinator located within the YMCA of the region. The child, whose parent was on social assistance, joined existing weekly YMCA-based programs for children ages 0 to 2, 3 to 5, 6 to 8, 7 to 10, and 11 to 13 years. School-based programs for older youth were offered by the YMCA for high school student as part of the YMCA's existing community outreach initiatives. Some of these efforts were youth reemployment for the older youth, ages 18 to 24.

A menu of enriched, age- and gender-appropriate subsidized child programming opportunities were available through the joint efforts of the YMCA and collaborating youth-serving agencies. Options were negotiated with the parent by the recreation/skills development project coordinator located within the YMCA of the region. This coordinator continued to actively recruit children over the 2 years allocated to the recreation study group into the program. Two programs or more per week per annum were selected in light of parent-child age, gender, culture, and specific preferences. Program attendance was counted and priced for this component of the intervention. Children of general welfare recipients allocated to the self-directed arm of the trial received no additional provider-initiated or financed recreation/child care service. Parents and children in this group were free to enroll in any recreation activity of their choosing and received no subsidy. Historically, the average length of receiving income assistance for sole-support parents is 4 years. The rate at which parents of children also engaged in self-directed services or programs for themselves or children were measured.

Adult recipients of social assistance were described in terms of the usual information gathered on the income maintenance application form: gender, race, family constellation and size, first language, education, work history, prior welfare applications, employability status, and mood. The characteristics of those deemed ineligible and who decline participation at any decision point of the study were compared, in aggregate form, to those who completed the study. The female was designated family respondent regarding measures of all members of the household, except in 10 cases in which the single-parent family was led by the father.

The data gathered on children's attendance at quality (Harms & Clifford, 1980, 1984, 1989) extra-curriculum-enriched programming beyond school or child care services are, at once, a measure of the compliance with and dose of the type of child care/recreation interventions that occurred and a measure of additional resources consumed by participants in the trial. The annual frequency of using resources is multiplied by the dollar value of the resource (Browne, Arpin, Corey, Fitch, & Gafni, 1990). The dollar total of annual resources consumed per child and per parent was compared between the arms of the trial (Browne, Gafni, Roberts, Goldsmith, & Jamieson, 1995).

The primary measures of effect were childhood psychiatric disorder at baseline and follow-up and child competence at follow-up. The Survey Diagnostic Instrument of the Ontario Child Health Study (Offord, Boyle, & Jones, 1987; Offord, Boyle, Szatmari, et al., 1987) was developed from the Achenbach and Edelbrock Child Behaviour Checklist (Achenbach, 1978, 1979; Achenbach & Edelbrock, 1983), which provided a basic pool of items to assess childhood psychiatric disorders—conduct disorder, hyperactivity, and emotional disorder (neuroses)—in youth 4 years or older. *Diagnostic and Statistical Manual of Mental Disorders*

(*DSM-III*) (American Psychiatric Association, 1980) criteria guided the selection of items for each scale. Checklist items applicable to a particular disorder or competence are grouped to form a scale. Each item is scored 0 (*never*), 1 (*sometimes*), and 2 (*often*), indicating how often the behavior is true of the child. Children in each group must have a score below the threshold to qualify as not having a disorder (Offord, Boyle, Szatmari, et al., 1987).

For children younger than 4 years, the two scales from the Minnesota Child Development Inventory (MCDI) were used: Minnesota Infant Development Inventory (MIDI) for children 0 to 14 months and the Early Child Development Inventory (ECDI) for children 15 months to 3 years. The validity of the MCDI has been established (Gottfried, Guerin, Spencer, & Meyer, 1983, 1984; Ireton & Thwing, 1984), and the median reliability of each scale for the useable age range is .68 to .90 (Ireton & Thwing, 1984).

The MIDI for children 0 to 14 months measures development in five areas: gross motor, fine motor, language, comprehension, and personal-social. The inventory also allows the mother to describe her child and report any problems or concerns about the child. If the infant's development in an area falls below the behavior of infants 30% younger, the infant's development in that area is considered to be below age expectations or delayed.

The ECDI is a parent report for use with children ages 15 months to 3 years. The ECDI includes six sections: general development, possible problems, child description, special problems or disabilities, questions or concerns, and parent's functioning. The first two sections provide objective, standardized measures of developmental and other problems, whereas the last four sections provide open-ended information that is rated for the presence and severity of the problem. The general development scale covers seven developmental areas (language comprehension, expressive language, gross motor, fine motor, self-help, situation comprehension, and personal-social). A child is considered to be possibly developing below age expectations if he or she obtains a score that is lower than the average score for children who are 20% younger. The percentage with delay is a more accurate reflection of difficulties than is the percentage with possible problems such as earache, crying, and so forth.

The total child competence score (Achenbach, 1991) comprises the sum of three scale scores: Activities (sports, hobbies, organizations, groups, jobs, or chores), Social (number of friends, contact with friends), and Academic (for ages 6 and older, performance in reading or English, history or social studies, arithmetic or math, science, and other classes). The competence scales of 4- and 5-year-olds are not measured because these children are not in academic settings. Thus, the number of competence scores are usually lower than the total number of child behavior checklists. The competence scales distinguish referred and nonreferred child populations in expected directions (Achenbach, 1991). Childhood competence was thought to be a more discriminating measure of a population that was 75% to 80% nondisordered; it was introduced as a measure at the 2-year follow up.

The secondary effects of child care and recreation were changes in parent mood, social adjustment, and expenditures for use of health and social services. Questions about a person's emotional well-being were asked using the University of Michigan Composite International Diagnostic Interview (UM-CIDI short form) (Kessler et al., 1994). This screening device, derived from the WHO CIDI (Composite International Diagnostic Interview) reflected the *DSM-III-R*. It was believed to be the best instrument to identify major depressive episodes, dysthymia, generalized anxiety disorders, phobias, panic attacks, and alcohol and substance abuse and dependence in adults.

Although there are a number of measures of adult adjustment and quality of life (Achenbach, 1991), the Social Adjustment Scale (SAS) (Weissman & Myers, 1978; Weissman, Prusoff, Thompson, Harding, & Myers, 1978) measure was chosen because of its applicability to the population, prior use in studies of adults with mood disorder, and high degree of reliability, validity, and test use across all samples with varying levels of mental, social, and vocational competence (Weissman & Myers, 1978; Weissman et al., 1978). In support of its validity, the SAS distinguishes among depressed versus nondepressed respondents (Kocsis et al., 1985; Kocsis, Frances, Voss, Mann, et al., 1988; Kocsis, Frances, Voss, Mason, et al., 1988). The SAS-SR is a self-rated measure of social functioning over the past 2 weeks on 5-point scales for items measuring three broad areas of work, family, and leisure functioning. It has seven areas of social and vocation function: work for pay, housework or school work, social and leisure activities, marital role as a spouse, parental role, membership in the family unit, and financial or economic functioning (enough money to take care of family's financial needs).

Parent employment activities and exit behaviors (Gorlick, 1991; Gorlick & Pomfret, 1991; Gorlick & Wood, 1991) were measured in terms of months of job training and months to financial independence (partial or full independence). A parent may engage in part-time or full-time work and still receive supplementary assistance if wages are below the poverty line for the size of the family.

Savings were defined as expenditures averted due to a reduced use of social or therapeutic services in the previous 12 months. Reductions in the self-reported length of time on assistance and family benefits (Browne et al., 1990) between groups, multiplied by the dollar value of the benefit (which

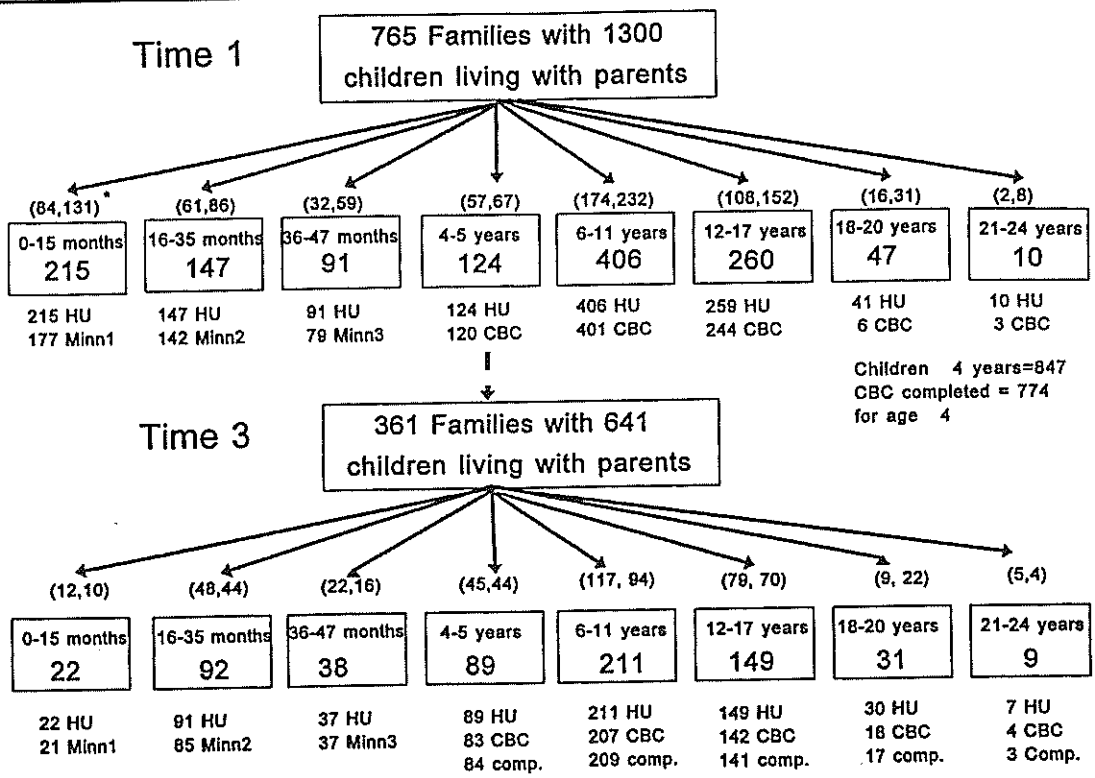

Figure 2 The number of children of different ages at two points in time in study groups (recreation, nonrecreation).
Note: HU = Health Services Utilization Questionnaire (all ages); Minn1 = Minnesota Infant Development Inventory (0-14 months); Minn2 = Minnesota Early Child Development Inventory (15-35 months); Minn3 = Minnesota Preschool Inventory (15-36 months); CBC = Child Behaviour Checklist (4 years and older); comp = completed.

depends on the family constellation and size), equals the dollars saved due to the intervention.

The Health and Social Service Utilization Inventory (Browne et al., 1990) is used to tally the frequency of using all types of health and social services by all members of the family. The 2-week frequency is annualized and multiplied by the dollar value of the service and summed as a per family dollar measure of utilization compared between the two groups (Browne et al., 1995).

RESULTS

The analysis of this 2-year follow-up study proceeded as follows. As shown in Figure 2, of the total number of families allocated at baseline ($N = 765$) to receive proactive, subsidized recreation services or not, some 361 families were retained in the analysis of the 2-year follow-up and 404 families had dropped out.

Families retained in the 2-year follow-up analysis ($n = 361$) were compared with those who dropped out ($n = 404$) to assess if dropping out affected the representativeness of the respondent group on important study variables. Second, in case dropout events rendered groups incomparable in some way, the families (and children) retained in the 2-year follow-up who randomly received proactive and subsidized recreation (173 families and 337 children) were compared on baseline variables with those (188 families and 304 children) who directed and financed their own recreation. If so, adjustment for these imbalances at baseline would need to be made when testing the hypothesis of difference associated with a 2-year exposure to recreation/child care. Parents of children of different ages filled out the age-appropriate child behavior questionnaire, and each age group is analyzed separately. Children were only included in the analysis if they lived with the parent. Children not living with the parent at baseline may have started living with them at 2-year follow up. Children who were different ages may have had parents fill out one type of form at baseline and another at the 2-year follow up. These factors affect the number of children in each group in the analysis, as shown in Figure 2.

There was a higher retention of participants (families and children) randomized to receive proactive and subsidized recreation/child care services when compared with participants (families and children) randomized to not receive

subsidized recreation/child care services ($\chi^2 = 21.10$, $p = .0003$). Using questionnaire baseline information, the characteristics of participant families in the 2-year follow-up were compared with those of dropouts in case these dropout events affected the representativeness of participants.

Participant parents were similar to dropouts in family size where 54.6% of families had two or more children and 60.8% of families had children 6 years of age or older living at home; in the 52.9% having prior use of social assistance, 28.0% were never married, and 68.4% were separated or divorced. Participant parents were similar to dropouts in the 93.9% English speaking, 85.3% Canadian in ethnic identity, and 68.2% Christian in religious orientation. A greater proportion of participants were women (98.1%) compared to dropouts (95.5%), where $\chi^2 = 3.77$, $p = .05$, and received family benefits allowance (41.8%) compared to dropouts (34.9%), where $\chi^2 = 3.88$, $p = .05$. It appears we retained those more entrenched in the social assistance program.

Participant parents ($n = 361$) were similar to dropouts ($n = 404$) in the 15.8% who had fair to poor health, the 21.8% who worried half or most of the time, the 29.2% reporting pain or physical discomfort limiting activities, the 38.8% with two or three health conditions, and the 60.4% reporting two or more mental health problems. Participants, in comparison to dropouts, had fewer respiratory problems (6.2% vs. 10.6%; $\chi^2 = 4.52$, $p = .03$), more general anxiety disorders (12.5% vs. 8.2%; $\chi^2 = 3.84$, $p = .05$), and more desire for job training (67.3% vs. 59.2%; $\chi^2 = 5.44$, $p = .02$).

Study participant parents were slightly older at baseline ($M = 32.7$ years $\pm$ 8.0 vs. $M = 31.2$ years $\pm$ 8.3; $t = 2.66$, $p = .008$), had poorer work adjustment scores ($M = 1.8 \pm .6$ vs. $M = 1.7 \pm .5$; $t = 2.08$, $p = .04$), but had better extended family adjustment ($M = 1.6 \pm .5$ vs. $M = 1.7 \pm .5$; $t = -2.41$, $p = .02$) when compared with dropouts.

Finally, at baseline, participant parents were higher users of family counselor services ($t = 2.53$, $p = .01$) and had higher total expenditures for use of all community health and social services not including hospital costs ($2,060) compared to dropouts ($1,632), where $t = 2.27$, $p = .02$. Participants were higher recipients of other government cash transfers such as worker's compensation ($t = 2.18$, $p = .03$), family benefits assistance ($t = 3.33$, $p = .001$), and total cash transfers ($t = 2.01$, $p = .05$) compared to dropouts. Higher rates of recipients of family benefits versus welfare and social assistance meant the family had been in receipt of social assistance longer than those who dropped out. In summary, participant parents tended to have greater needs and use more government entitlement services. It appears we retained, in this 2-year follow-up, a somewhat more disadvantaged parent population.

In the original 765 families, there were 1,300 children, 1 week to 24 years of age. Some 847 of the 1,300 were 4 years or older at baseline, and 775 of these had completed child behavior checklists at baseline. Although 489 children 4 years or older were in the 2-year follow-up (T_3), 336 of the 489 children had a baseline behavior checklist completed in full. The remainder had just become 4 years old by follow-up. Complete competence scores include the academic rating. This could be obtained on those 214 of 336 children 6 years or older who were in school.

The loss of children 4 years of age or older did not affect the representativeness of the comparable group of children remaining in the 2-year follow-up. The proportion of children with disorder at baseline who remained in the 2-year follow-up (23.1%) was statistically similar to the proportion of children with disorder (18.0%) who had dropped out ($\chi^2(1) = 2.98$, $p = .08$). It was decided to also measure children's competence (Achenbach, 1991) at 2-year follow-up as possibly a more sensitive measure of the effect of the interventions on children 6 years or older, 75% to 80% of whom had no disorder at baseline. In summary, the 336 children 4 years or older with baseline and follow-up checklists participating in the 2-year follow-up were representative of the 775 children 4 years or older originally sampled in the proportion with a behavior problem and degree of problem at baseline.

The proportion of participant children younger than 4 years of age who endorsed some type of developmental delay was compared to the proportion delayed among dropouts. Participant children were representative of all children in the proportion of 0- to 14-month-old (5.7%), 15- to 35-month-old (3.1%), and 36- to 47-month-old (5.3%) children endorsing some type of delay at baseline. A greater proportion of participant children 0 to 14 months (4.6%) were delayed in social skills ($\chi^2 = 4.05$, $p = .04$).

Those children of all ages remaining in the 2-year follow-up ($n = 629$) were compared to those who had dropped out ($n = 671$) on annual per child expenditures for use of health and social services at baseline. Overall at baseline, there was no significant difference in total direct expenditures for health and social services utilization by children who were retained in the 2-year follow-up compared to baseline expenditures of those children who had dropped out. There were, however, some differences in the use of discrete services at baseline by children participating in the 2-year follow-up compared to dropouts. Participating children were higher users of family counselor services ($t = 2.83$, $p = .01$) and all laboratory tests ($t = 2.03$, $p = .04$). If anything, children who used slightly more services were retained in the 2-year follow-up.

Parents and children in study groups were compared on baseline data given the higher dropout rate in the groups not offered subsidized recreation services compared to those who received subsidized recreation. Parents whose children received subsidized recreation were similar at baseline to those parents whose children did not receive subsidized recreation in age, education, number of children, 18 of 19 health conditions, health status and use of medication, 13 types of mood/anxiety disorders, need for health, counseling, support services, coping style, social adjustment, source of income in the past year, and per parent direct annual expenditures for use of services. Although some findings could be due to chance when engaged in multiple testing, three group differences were noted. Parents of those children who received subsidized recreation had a greater proportion of ill-defined signs and symptoms at baseline (16.1%) when compared to parents whose children were not offered recreation (7.6%), where $\chi^2(1) = 6.20, p = .01$. At baseline, some parents of children receiving subsidized recreation had more problems with drug dependence (4.6% vs. 1.1%), where $\chi^2(1) = 4.24$, $p = .04$, and reported a greater need for counseling services (54.9% vs. 42.6%), where $\chi^2(1) = 5.5, p = .02$.

At baseline children 4 years or older (see Figure 2) who were retained in the 2-year follow-up and who were offered subsidized recreation services ($n = 179$) were comparable to those not offered the services ($n = 157$). At baseline, youth in the 2-year follow-up 4 to 24 years of age allocated to receive subsidized recreation versus no subsidized recreation were similar in the proportion with one or more behavior problems at baseline (20.7% and 26.1%), where $\chi^2(3) = 5.39, p = .15$.

Children younger than 4 years at baseline in the subsidized versus nonsubsidized recreation groups were compared using the MIDI for 0- to 14-month-olds, the ECDI for 15- to 35-month-olds, and the Preschool Inventory for 36- to 47-month-olds. Children of all these ages, younger than 4 years, were comparable at baseline between recreation groups in the small proportion (2.5% to 6.7%) with skill, language, and development disorders. There was a lower proportion of children 15 months to 35 months with three or more possible problems (such as crying, earache, and disobedience) or one uncommon problem or disability at baseline in the subsidized (56.8%) versus nonsubsidized recreation groups (81.5%), where $\chi^2 = 4.33, p = .04$.

Of the 641 children of all ages retained in the 2-year follow-up, there were 604 children with utilization forms for both the baseline and follow-up periods. The total direct expenditures for use of health and social services at baseline by all those children of any age receiving subsidized recreation services ($n = 314$) compared to those not subsidized ($n = 290$) were compared. Total direct annual expenditures for subsidized recreation and children's use of health and social services were statistically lower at baseline ($1,638 per child per annum vs. $3,097 per child per annum). Children who were to receive subsidized recreation services were, at baseline, lower users of psychologist services ($t = -2.45, p = .01$), family counselor services ($t = -2.38$, $p = .02$), and naturopathic services ($t = -1.99, p = .05$), yet higher users of recreation services ($t = 2.48$, $p = .01$), compared to children who would not receive subsidized recreation services. The use of analysis of covariance will adjust for these imbalances.

The recreation intervention engaged 73.8% to 78.8% of children, with most children receiving one or two programs during each of 2 years.

Primary Effects: Impact of Subsidized Recreation on Childhood Behavior and Competence

There was no statistical difference in the proportion (11.2% to 16%) of children 4 to 19 years whose behavior (emotion, conduct, and hyperactivity) improved in both subsidized and nonsubsidized recreation groups, $\chi^2(3) = 4.69$, $p = .09$. Two years after receiving subsidized recreation services, the children's average activity was statistically but not clinically higher than that of the nonsubsidized group of children (6.4 vs. 5.8 activities per child, $t = 2.67, p = .01$). There were no statistical differences between groups in the children's social or school competence.

Children 6 years of age or older in the nonsubsidized recreation group were nevertheless highly involved in activities, and this may explain why the groups remained equivalent in their degree of behavior improvement and overall moderate level of competence. The relationship between the type of child activity, particularly membership in clubs, and its relationship to the social competence score ($r = .37$) among children 6 years or older was statistically significant. Proactive subsidized child care had double the proportion of children 6 years or older involved in two or more clubs and teams, $\chi^2(3) = 13.96, p = .003$.

Children younger than 4 years of age improved in their developmental skills over 2 years in both subsidized and nonsubsidized recreation groups. The equivalence in childhood development in both groups 2 years later is noted even for motor skill development or those areas not comparable at baseline and favoring the recreation groups. The conclusion of no difference at 2 years can be made whether the data is analyzed by mean scores or by the proportion of children's delayed scores.

The recreation group, with the lowest dropout rate, retained a 5% greater proportion of children 4 years or older still endorsing higher hyperactive and emotional mean and percentage problem scores at 2-year follow up. These

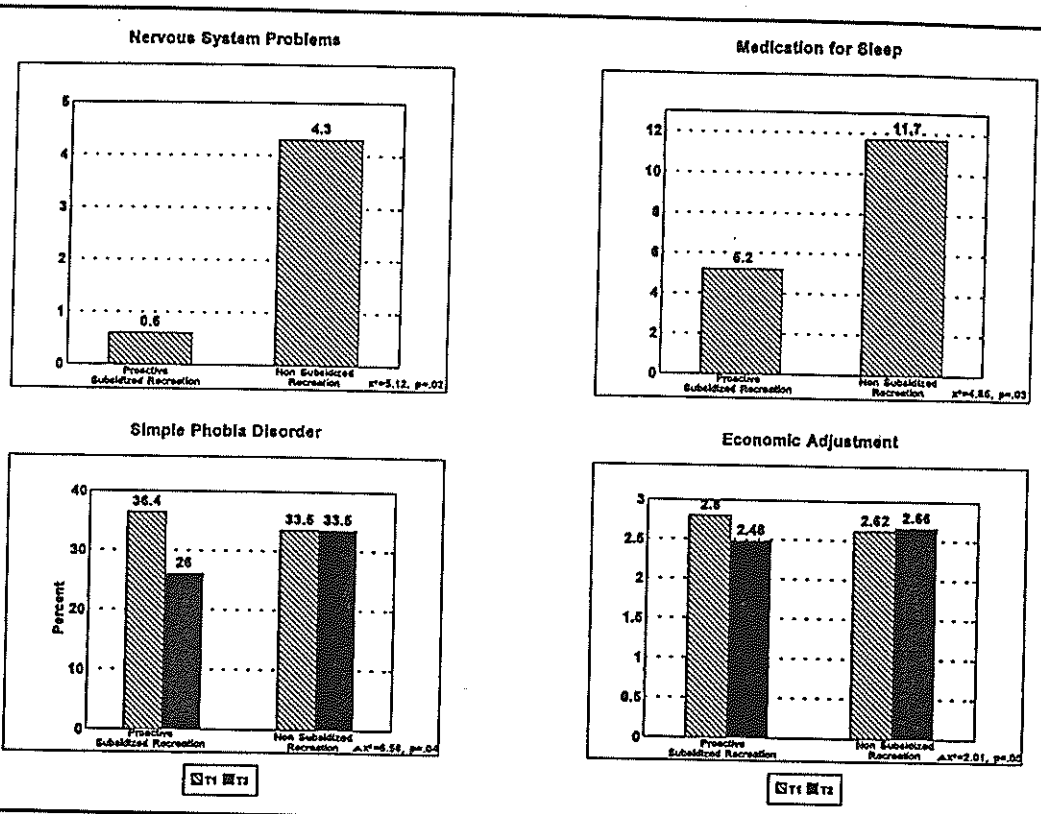

Figure 3 Parent outcomes 2 years later.

children 4 years or older were enrolled in a significantly greater number of clubs, teams, and groups ($t = 2.48, p = .02$) when offered proactive subsidized recreation. Those that had become old enough (6 years or older) to be rated on academic, social, and activity competence ($n = 7$) showed significantly higher overall competence ($t = 4.39, p = .01$) when offered proactive subsidized recreation.

After including the cost of recreation services, children receiving subsidized recreation services expended, 2 years later, equivalent dollars for the total direct use of other health and social services ($2,143 per year per child) compared to annual expenditures for children's use of services when their recreation was not subsidized ($2,313 per year per child). This $170 per child administrative savings favoring children receiving subsidized recreation multiplied by 314 children amounts to a savings of $53,380 per year per 314 children from the points of view of the Ministry of Health Social Services and of Corrections. The small total annual direct per child savings achieved by those enrolled in subsidized recreation was achieved by their lower use of specialist ($t = -2.18, p = .03$), social worker ($t = -1.83, p = .07$), day care ($t = -2.67, p = .01$), other providers ($t = -2.21, p = .03$), and heart monitoring ($t = -2.30, p = .02$). These savings paid for the higher use of recreation ($t = 9.94, p = .001$), family counselor services ($t = 1.96, p = .05$), and subsidized child care services ($t = 1.94, p = .05$) by those enrolled in proactive, subsidized recreation.

Secondary Effects: Impact of Subsidized Child Recreation on Parents

It was hypothesized that gains made by children through proactive subsidized recreation would also be associated with gains in parent outcomes. Two years after having their children proactively enrolled in subsidized care, parents in both groups remained similar in their proportion (30%) with job activities. However, as shown in Figure 3, 2 years later, a smaller proportion of parents of children in the subsidized recreation group (0.6%) endorsed nervous symptom disorders compared to 4.3%, where $\chi^2 = 5.12, p = .02$. Similarly, fewer parents whose children were in subsidized recreation used medication for sleep (5.2% vs. 11.7%), where $\chi^2 = 4.85, p = .03$, or worsened with simple phobia (26% vs. 33.5%), where $\chi^2 = 6.58, p = .04$).

A greater proportion of parents whose children received proactive, subsidized recreation services no longer needed

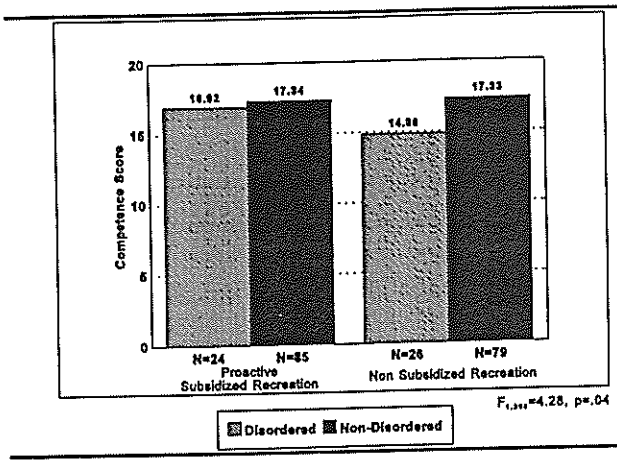

Figure 4 The effect of recreation on the competence of children with disorder.

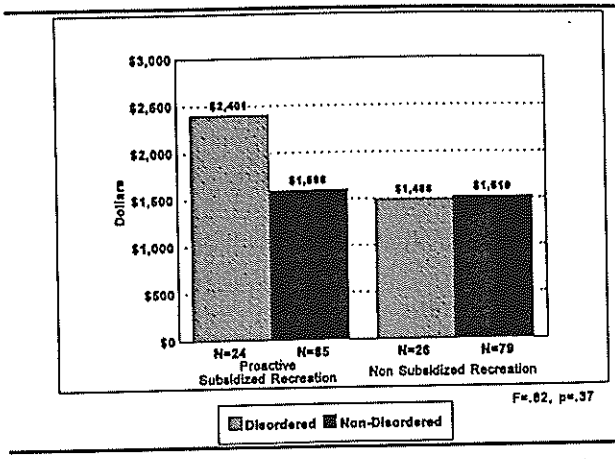

Figure 5 Total per child expenditures for 214 children's direct use of health and social services 2 years after proactive subsidized recreation.

child care (31.8% vs. 18.6%), where $\chi^2 = 9.86, p = .01$; counseling services (30.6% vs. 21.3%), where $\chi^2 = 8.17, p = .02$; or food bank services (23.1% vs. 14.4%), where $\chi^2 = 8.31$, $p = .02$. A greater proportion of these parents whose children received subsidized recreation services reported continuing to need this service (85.5%) compared to those parents not offered this service (68.6%), where $\chi^2 = 14.47$, $p = .0001$. Viewed somewhat differently, a large proportion of parents in both groups reported needing this subsidized recreation service.

Those parents whose children received subsidized recreation endorsed an improved economic adjustment situation ($t = 2.01, p < .05$) associated with their children's receipt of subsidized recreation and child care and greater child support or alimony ($\chi^2 = 4.08, p = .04$). Parents whose children received recreation expended, 2 years later, fewer total direct per parent dollars on the use of health and social services ($1,570 vs. $2,592), where $t = -1.75, p = .08$, in spite of their higher use of some discrete but nevertheless potentially more appropriate services such as the psychiatrist ($t = 1.97, p < .05$) and adolescent school counselor ($t = 2.08, p = .04$).

Variables Explaining Childhood Competence

Analysis of variance and covariance examining interactions was performed on the characteristics of the mother at baseline (depressed: yes or no; high or low coping) and characteristics of the child (any childhood behavioral disorder at baseline: yes or no; age and gender at baseline) as these may have affected or interacted with the subsidy of recreation services (yes or no) to explain child competence (activity, social, and academic) 2 years later.

Neither the subsidy and therefore amount of recreation for kids ($F = 1.92$, $p = .17$) nor the presence of mother's depression ($F = 3.63, p = .60$) affected the child's total activity and social and academic competence 2 years later. Rather, the presence of any childhood disorder at baseline ($F = 4.95$, $p = .03$) was most predictive of childhood competence 2 years later.

Of interest (see Figure 4), children with any disorder had higher competence scores if they received subsidized recreation compared to those not receiving this subsidy ($F = 4.28$, $p = .04$). The hypotheses that subsidized proactive recreation improved the competence (see Figure 4) of children with disorder and their appropriate use of health services (see Figure 5) are supported. Children with disorder whose parents directed and financed their child care/recreation used no more services than did children without disorder.

QUALITY OF THE EVIDENCE AND LIMITATIONS

The findings may not be generalizable to all children on social assistance because baseline data of parents were gathered on 65% of the population and follow-up was available on 45% of these. These findings of effectiveness and expense must be viewed with caution for one additional reason. On one hand, cointerventions and synergistic effects were operative in one half of the subsidized child care/recreation group. These cointerventions of public health nursing and employment retraining in combination with recreation/child care were found (Browne et al., 1998) to be more effective in promoting parent economic adjustment and exit from social assistance than any intervention alone including self-directed

care. On the other hand, although not statistically significant, the recreation group retained a 5% greater proportion of children with disorder. This bias could have worked in the opposite direction making it harder for the youth with disorders in the recreation group to achieve the level of competence that was observed. The true effect of the second bias remains unknown. Although conclusions on the primary outcomes are robust, multiple testing of individual subscores may have resulted in chance findings. Nevertheless, the randomized design with intent-to-treat analysis (which included even those 25% to 27% of youth not engaged in proactive, subsidized recreation) and endless efforts to identify potential bias renders this study among the best scientific evidence available in the published literature and the first evidence available in a system of national health insurance (Frankish et al., 1998; Zoritch et al., 1998). Finally, this study of formal and informal child care and participation in recreation activities by youth of welfare parents represents a first in documenting the quality of care available to welfare children not in receipt of special subsidies.

CONCLUSION

In summary, 47% of 765 families were retained in the 2-year follow-up. The single parents (98.1% women) retained in the 2-year follow-up were recipients of income benefits and other cash transfers for longer amounts of time, had poorer work social adjustment subscores, had more general anxiety disorders, and were higher users of children's aid services.

There were 1,300 children in these 765 households, 775 of whom were 4 years of age or older; 336 or 43% of children 4 years or older were retained in the 2-year follow-up. Some 23.1% of the 336 children 4 years or older endorsed some type of behavior problem, and this was statistically similar to the 18% of children with disorder who had dropped out. The 4-year-olds and older children retained in the 2-year follow-up were higher users of physician specialists and lower users of social work or subsidized day care services. In spite of the high dropout rate, we retained more disadvantaged parents in the 2-year follow-up.

Furthermore, in spite of the higher dropout rate in the nonsubsidized recreation group, parents and children in both groups remained similar in age, education, number of children, health status, mood/anxiety disorders, coping style, social adjustment per parent to direct expenditures for use of health and social services, proportion of children with disorder (21% to 26%), and per child total direct expenditures for use of health and social services.

Children in both arms of the trial were engaged in a number (average of six activities per child) of recreation activities, and subsidizing these or proactively arranging for these did make a difference in the type of quality activity (team/clubs) most associated with childhood social competence. Subanalyses indicated that children with any disorder achieved the same level of competence as children without disorder if offered proactive subsidized recreation services. This was not the case for children with disorder not receiving proactive subsidized recreation services.

Subsidizing recreation services had a significant impact on improving parents' health and economic social adjustment. Compared to nonsubsidized parents, subsidized parents reported having more money to take care of their financial needs. After including the cost of recreation services for both subsidized and nonsubsidized groups, children of all ages receiving proactive subsidized recreation services in a system of national health insurance expended, 2 years later, equivalent dollars for the total direct use of other health and social services ($2,143 per year) compared to annual expenditures for use of other health and social services when their recreation was not subsidized ($2,313 per year). The small savings by children were due principally to lower use of psychologist, probationary child care/day care, and laboratory services by those enrolled in subsidized recreation services. In addition, on average, parents of children in subsidized recreation expended, 2 years later, fewer dollars for their use of health and social services ($1,570 vs. $2,592 per parent per annum) compared to expenditures of parents of children not subsidized.

Subsidized proactive recreation services were more effective than nonsubsidized self-directed recreation services for children with a behavioral disorder. In addition, in a system of national health insurance, it paid for itself and was associated with slightly lower use of expensive health and social services from a societal point of view by both parents and children.

DISCUSSION

In general, the use of proactive subsidized recreation services did increase the number and quality of recreation activities children were involved in, compared to a self-directed nonsubsidized group of welfare children, at no further cost to society for children's use of services. In general, the degree of improvement in their childhood behavior problems and their social and academic competence 2 years later remained equivalent. Nevertheless, subanalysis revealed that in children older than 5 years with a behavioral disorder proactive subsidized recreation services maintained the level of the child's competence to be similar to that of children without a disorder. If not subsidized, the competence of children with a disorder was lower 2 years later. Thus, subsidized

recreation services have demonstrated a significant protective quality for children with behavioral disorders. Proactive subsidized recreation services had the secondary effect of improving parents' economic adjustment and slightly lowering expenditures for parents' use of health and social services. More effect for children and parents can be achieved at a lower cost to society. Subsidized recreation services in a system of national health insurance pays for itself in averting the use of health and social services and increases the economic adjustment of parents on social assistance.

The data on proactive, subsidized recreation services improving the competence of children with any behavioral disorder supports the health promotion and social policies of providing this service and the estimated economic justification of its value (Cleveland & Krashinsky, 1998).

A number of other policy lessons have been learned from this study of the effect and expense of subsidizing age-appropriate quality child care or recreation versus allowing families on social assistance to direct their children's programs of recreation. The subsidy directly affected the engagement of the greatest number of disadvantaged families on social assistance when compared to other professional service models. In addition, the child's membership in quality group activities most associated with child competence resulted from the subsidy. Subsidized child care and recreation services for children of all ages also resulted in measurable gains in the parents' mental health, economic adjustment, and expenditures for parents' use of health and social services. The $1,000 per person per annum immediate savings from parents' reduced use of total direct services was far in excess of the annual cost of the subsidized recreation. In real terms, it costs society, in a system of national health insurance, more money immediately and in the future when it fails to invest in the disadvantaged segments of society. Structural changes in society have made recreation and child care necessary services. This necessity is highlighted for children with behavioral disorders. The best outcomes can be achieved for parents and children when society pays for quality child care/recreation. Benefiting all the beneficiaries of social assistance is within our reach.

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