So You Want To Run An Outcome Study? The Challenges To Measuring Adolescent Residential Treatment Outcomes

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Abstract

The purpose of this literature review was to identify the considerations that should be addressed in the design of adolescent residential treatment center outcome studies. Specific key word searches were used with four on-line databases to identify adolescent residential treatment outcome studies from 1986 to 2005. While adolescent residential treatment outcome studies have generally indicated positive outcomes for this form of treatment, the literature also acknowledges design limitations in almost all studies. At a minimum, future outcome studies should use appropriate methods and analyses to: (a) define the population served, (b) define the treatment model used and establish treatment fidelity, and (c) define outcome to include treatment and post-discharge measures that are positive and multi-dimensional.

Introduction

Outcome studies of residential treatment of children and adolescents with emotional and behavioral disorders have generally found favorable outcomes for this form of treatment (Curry, 1991; Curtis et al., 2001; Gilliland-Mallo & Judd, 1986; Gorske et al., 2003; Jainchill et al., 2000; Larzele et al., 2001; Lyons et al., 2001; Pfeiffer, 1989; Swales & Kiehn, 1995). The literature widely acknowledges, however, that this form of treatment has been insufficiently studied and problems in the design of many existing studies limit the broad applicability of conclusions from specific studies to this form of treatment (Larzele et al., 2001; Pfeiffer, 1989; Swales & Kiehn, 1995). Problems in study designs include the following: (a) use of weaker (i.e., less valid) forms of quasi-experimental study designs, (b) a lack of clarity around the definition of what constitutes "residential treatment," (c) inadequate definitions regarding the treatment model used and how

treatment fidelity is established, (d) inadequate definitions regarding the population served, (e) failure to establish a proper baseline prior to treatment, (f) problems with defining specific outcomes to include positive and multi-dimensional measures of change, and (g) inherent weaknesses when measuring and analyzing outcome data (e.g., sufficient sample sizes, use of reliable and valid instruments, sufficient follow-up data, use of appropriate statistical methods).

And, despite the majority of studies demonstrating positive outcomes for this form of treatment, residential treatment has come under increased scrutiny due to several factors. First, managed care has attempted to shift the emphasis of residential treatment from treatment to stabilization of behaviors, shortening the length of stay in residential treatment and replacing residential treatment with less expensive outpatient services. Second, some studies have found negative outcomes or iatrogenic effects associated with residential treatment (e.g., Hoagwood & Cunningham, 1992, Lyons et al., 2001). Third, some have advocated for the decreasing use of residential treatment because of its perceived inconsistency with the "least restrictive environment" concept. Fourth, instances of abuse have occurred in a few residential treatment facilities, leaving the public with questions concerning the validity and safety of this form of intervention.

Questions concerning efficacy and safety are further heightened by the fact that residential treatment is one of the most expensive forms of mental health services (Lyons et al., 2001). Hoagwood and Cunningham (1992) found an average cost of $6,316 per month (i.e., $210.43 per day), ranging from $763 to $15,893 per month. Bates et al. (1997) suggested the annual cost of residential group care to be $1.05 billion, which was approximately one-third of the total $3.5 billion spent annually on adolescent mental health services in the U.S. The Odyssey Project (Drais-Parillo, 2005) surveyed of 12 residential group care facilities involving 2,487 participants, finding an average cost per day of $226 (SD = $68, r = $158 to $294).

Scrutiny of these monetary figures has led to questions of whether the benefits provided by residential treatment are commensurate with its costs, and whether these benefits could be provided more efficiently (i.e., at lower cost) utilizing different forms of outpatient therapy

(Lyons et al., 2001). Many authors acknowledge that this consideration provides an additional rationale for implementing outcome studies that also look at benefit-cost analyses (Goocher, 1997; Lyons et al., 2001; Pfeiffer, 1996; Pfeiffer & Strzelecki, 1990; Swales & Kiehn, 1995; Wilson et al., 1983). Competition for behavioral health service funding is also increasing and some residential treatment facilities are under increasing pressure to justify the high cost of their interventions if funded by these sources.

The involvement of managed care in residential treatment has also significantly impacted the length of client stay (Chang et al., 1996), altering the purpose of residential treatment to emphasize short-term acute-care and behavior stabilization. One reason for this shift in the purpose of residential treatment is that once behavior is stabilized by a short-term stay in residential treatment, less expensive forms of treatment are typically implemented on an outpatient basis at the community level (Curtis et al., 2001; Lyons et al., 2001). Additionally, community-based outpatient services are perceived to be more congruent with "least restrictive environment" policies.

As managed care organizations have attempted to implement policies decreasing the length of stay at all levels of residential treatment (e.g., psychiatric hospitals, residential treatment centers, group homes), one possible question is how clients requiring more acute levels of care have their needs addressed (Bates et al., 1997; Chang et al., 1996; Pfeiffer, 1989). For example, Chang et al. (1997) noted the length of stay in psychiatric units decreased from an average of four months to 3 weeks over a two year period. No rigorous research exists that clearly demonstrates populations served in residential treatment benefit from the combination of the new structures of managed care treatment and shortened lengths of stay in treatment centers.

Despite some doubts concerning the efficacy of residential treatment, the use of residential treatment for adolescents has undergone significant growth in the past 30 years. Gilliland-Mallo & Judd (1986) reported the number of adolescents in residential treatment to be greater than 29,000, with the number of clients in out-of-home placements to be over 500,000. Pfeiffer and Strzelecki (1990) suggested that approximately 20,000 children and adolescents were provided with

services in residential treatment facilities; and that this number is more than twice the rate of 20 years ago. Hoagwood & Cunningham (1992) found the number of youth with serious emotional disturbances to be increasing dramatically and the number of residential treatment facilities has continued to increase. Bates et al. (1997) reported there has been a two-fold increase in the number of children in residential treatment in the previous two decades. A study by the Child Welfare League of America (1999) found almost one quarter million children and adolescents were served in group residential care facilities. Curtis et al. (2001) stated approximately 530,000 children were living in out-of-home care at the end of 1996, with 41,000 in residential group care, 27,000 in community-based group homes, and 23,000 in treatment foster-care. Connor et al. (2002) found the demand for adolescent residential treatment services had grown from 29,000 in 1982, to 65,000 in 1990, to 117,720 in 1997 (including day and residential treatment). The U.S. Department of Justice (2002) found the number of adjudicated cases resulting in out-of-home placement rose from 119,700 in 1989 to 163,800 in 1998, a 37% increase.

These data are somewhat problematic due to the inconsistent use of terms and a lack of clarity in the definition of treatment services. However, residential treatment for children and adolescents clearly is an extremely important form of intervention both in terms of its economic impact and the number of clients served. These studies may also grossly underestimate the number of children and adolescents served in residential treatment because these studies typically focus only on publicly funded facilities. There is very little research on whether the number of children and adolescents in residential treatment has changed over the last 10-15 years with the advent of managed care's involvement in behavioral health services. No studies exist that show a decrease in the number of children and adolescents served by residential treatment facilities.

Problems in Study Design

The importance of residential treatment in the continuum of care of mental health services, combined with the significant cost of this form of treatment, underscore the importance of performing methodologically sound outcome studies to demonstrate the effectiveness of this service. Yet the literature on the assessment of outcomes in adolescent residential

treatment widely acknowledges the significant study design problems inherent in residential treatment outcome studies and the paucity of adequately designed studies (Chang et al., 1996; Curry, 1991; Curtis et al., 2001; Gilliland-Mallo & Judd, 1986; Goocher, 1997; Gorske et al., 2003; Hooper et al, 2000; Larzelere et al., 2001; Mann-Feder, 1996; Pfeiffer, 1989; Pfeiffer & Strzelecki, 1990; Swales & Kiehn, 1995; Wilson et al., 1983). These problems begin with a lack of consensus on what constitutes residential treatment (Bates et al., 1997; Curtis et al., 2001) and acknowledge that residential treatment outcome studies are inherently limited by the lack of appropriate comparison groups in the use of quasi-experimental designs (Curry, 1991).

Very few studies, if any, have ever used a true experimental design in measuring residential treatment outcomes. Most studies use weaker forms of quasi-experimental designs, either a one-group posttest only or one group pretest-posttest design (Curry, 1991). Because of the inherent risks, as well as immediate needs of the population served at this level of care, it continues to be extremely difficult (if not unethical) to implement more stringent experimental study designs. Therefore researchers are left with using more complex experimental research designs or implementing quasi-experimental study designs. This limitation does not only mean that the validity of outcome is limited by internal threats of the study, but also that the conclusions from such a study may be limited in the applicability to other facilities or to this general level of care.

Further design problems and limitations include the differences in the treatment models and philosophies utilized, failure to establish treatment fidelity, inadequate definition or establishment of the baseline measures of the population served, inconsistent or inadequate definition of outcome, non-standardized approach to data collection/ sampling problems, insufficient sample size, failure to use validated and reliable instruments, non-specification or lack of data after discharge, inadequate response rates, inconsistent consideration of the post-discharge environment, and a failure to use appropriate statistical analysis (Pfeiffer, 1989; Swales & Kiehn, 1995; Wilson et al., 1983).

Several authors have provided detailed recommendations concerning outcome study methodology. Wilson et al. (1983)

identified the following outcome study components that require sound methodology and design: (a) defining and measuring the client, (b) defining and measuring treatment, and (c) defining and measuring outcome variables. In his review of 32 child and adolescent residential treatment outcome studies, Pfeiffer (1989) identified three basic factors that should be addressed in experimental design: (a) describing the patient population, (b) describing the treatment program, and (c) design, instrumentation, and methodological considerations. These study design limitations can greatly affect the applicability of conclusions made regarding residential treatment efficacy and the identification of reliable factors that may predict outcome. While these articles were printed 24 and 18 years ago, respectively, it is noteworthy how many subsequent studies have failed to follow these straightforward recommendations. For example, Hair (2005) notes that outcome studies are still limited by the lack of comparable data regarding the variability of clients served.

Defining residential treatment

With respect to the definition of what constitutes residential treatment, the literature does not contain one standard or universally accepted definition (Bates et al., 1997; Curtis et al., 2001). This review found that the definition of what constitutes residential treatment varies widely between studies, and may include services ranging from acute psychiatric to group home stays (Bates et al., 1997; Connor et al., 2002; Curry, 1991). Studies referring to their services may use the term "out of home," and may also include services such as treatment foster care. Several outcome studies on residential treatment facilities did not provide a definition of the services provided (e.g., Gorske et al., 2003; Hoagwood & Cunningham, 1992; Lyons et al., 2001; Lyons & Schaefer, 2000; Wilson et al., 1983). In contrast, Bates et al. (1997) provide a list of common characteristics of residential treatment facilities that includes a de-emphasis of the medical model, moderate length of stay, therapeutic use of the daily living milieu, relatively fewer medical staff, a multi-disciplinary team-based treatment approach, exclusion of highly acute patients, and a degree of restrictiveness between acute psychiatric and day treatment.

Some studies define residential treatment relative to the type of clients served or the intensity of services provided within the mental

health care continuum. For example, Larzelere et al. (2001) discussed residential treatment as an out-of-home facility more treatment-oriented than a group home, but less restrictive than an inpatient psychiatric unit. Curry (1991) provided a definition of residential treatment relative to more and less restrictive levels of care. On the treatment continuum, residential treatment services are often conceptualized as one step down from acute inpatient psychiatric services and one step up from group home services.

Variations in treatment models

The definition of what constitutes residential treatment is further complicated by the range and variety of treatment models and philosophies currently in operation (Hooper et al., 2000). Bates et al. (1997) noted that the efficacy of residential treatment is difficult to assess because of the utilization of different treatment modalities, making it difficult to compare different programs. A further complication is that many facilities use eclectic philosophies or blend approaches and methods. In addition to considerations of treatment models and philosophies, residential treatment facilities may be highly variable in other components of their programs. These variations include types and range of educational services offered and quality of life issues such, as food services and recreational opportunities.

As well, many studies offer either no description (or only a cursory description) of the treatment program involved in the research (e.g., Gorske et al., 2003, Hoagwood & Cunningham, 1992; Lyons et al., 2001). Hooper et al. (2000) noted the existence of a variety of residential treatment models currently in operation and stated that traditional research paradigms may not be suitable for evaluating the complexity of residential treatment environments. The complexity of potential therapeutic factors occurring within the milieu of a residential setting was the rationale for Swales & Kiehn's (1995) proposal regarding theoretically motivated designs for outcome studies.

Pfeiffer (1989) acknowledged the importance of describing the treatment provided both in terms of the frequency and type of intervention and describing the residential treatment setting from a social-developmental context. To this end, Pfeiffer (1989) stated there have been few attempts to examine the interactions among patients and the treatment environment. Interaction such as unit atmosphere,

staff attitudes, treatment philosophy, organizational structure, parent-staff relationships, and the integration of education, treatment, and recreation have rarely been addressed and measured in outcome studies.

Treatment fidelity

Even assuming that the complexity of a residential treatment environment can be adequately defined and measured, Gorske et al. (2003) noted a potential problem in treatment fidelity between treatment described in research and what is actually implemented in programs that utilize the same (or other) models. Treatment provided in a highly structured and controlled research setting may not be easily duplicated in practice, even when the same treatment model or philosophy is being implemented. In other words, the process of designing and implementing an outcome study may influence treatment fidelity for several reasons including: (a) adherence to a formal treatment protocol, (b) intensity and duration of treatment, and (c) identification and treatment of experimental and control factors. Very few studies even address the issue of treatment fidelity, much less identify a process of defining and measuring it. These definitional problems are a preliminary issue; yet they also highlight and provide insight into the difficulty of determining the appropriate study design for assessing adolescent residential treatment.

Defining the population served

Another important problem acknowledged in the literature on adolescent residential treatment outcomes is defining the client population. The literature sometimes conceptualizes the population relative to primary areas of research: juvenile justice, substance abuse, and emotionally/behaviorally disturbed populations. These categories, however, may be more reflective of the research interests of the author or sources of funding, rather than actual differences in the population served. For example, a study by Jainchill et al. (2000) focused on the use of residential treatment for adolescents with substance abuse problems. This study described its population by the characteristics associated with substance abuse (e.g., types of substances, frequency of use). In a separate study, Grietens & Hellinckx (2003) narrowed the parameter of their study to the efficacy of residential treatment for juvenile offenders and defined their population according to criminal

behavior and recidivism. Many other studies (e.g., Connor et al., 2002; Lyons et al., 2001; Pfeiffer, 1989; Pfeiffer & Strzelecki, 1990) defined the population primarily in terms of emotionally/behaviorally disturbed (EBD) or seriously emotionally disturbed (SED).

These populations, however, often have overlapping (if not the same) characteristics. This complexity is often not reflected or acknowledged in the literature. Comorbidity, or dual diagnosis of substance abuse and EBD, may exist in a population characterized as EBD or as substance abuse-oriented. In addition, EBD and/or substance abuse problems may exist in a population characterized as juvenile justice-oriented. Therefore, one may question whether the distinction between these populations is merited and, if so, why? Additionally, how the population is initially conceptualized may, in turn, affect how the outcome study is designed, including how treatment and outcome are defined and measured.

Studies are often highly variable in the quantity and quality of data collected to describe the population served in residential treatment including descriptive statistics, demographic data, and psychosocial history. For example, studies vary greatly in the extent of descriptions on important variables such as of gender, age, race or ethnicity, and socio-economic status (SES) of the sample. Additional information concerning referral reason, intelligence, medical issues (including the use of psychotropic medications), diagnoses and acuity (and how these are measured), history of previous treatment, juvenile delinquency problems, family history, physical or sexual abuse history, education history and problems, substance abuse problems, SES, and other protective and risk factors are variably identified and measured. Studies may vary from describing basic demographic data and limited information on educational history (Hoagwood & Cunningham, 1992) to detailed demographic data and psychosocial histories, including age, gender, race/ethnicity, IQ, diagnoses, family history, sexual/physical abuse history, previous treatment history, school problems, and medical history (Hooper et al., 2000).

Wilson et al. (1983) listed four essential components that should be used to define a population in residential treatment: (a) presenting problems, (b) strengths and weaknesses, (c) family structure, and (d)

demographic data. Wilson et al. (1983) further reasoned this information is also necessary to meet the client's needs in treatment in order to provide adequate treatment planning. Pfeiffer (1989) also recognized the importance of defining the population served as a pre-requisite to adequate study design. Yet only 4 of the 32 studies reviewed in this study included a breakdown of the population according to diagnoses. In his review of studies on adolescent residential treatment, Pfeiffer (1989) found 75% of the studies offered no pre-admission information on the client and no baseline for the sample population. Pfeiffer (1989) also found 28 out of 32 studies provided no information concerning the client's history of treatment prior to admission.

Another problem is that few studies contain a rationale of how parameters for describing the population were chosen. For example, very few studies describe why specific population characteristics were chosen for measurement and why other characteristics were not considered or measured. Bates et al. (1997) further conceptualized this problem in terms of a lack of standardized placement criteria for the population being served. In other words, there is a great deal of inconsistency outlining how clinicians assess and make placement decisions regarding the use of residential treatment with respect to the populations' characteristics.

Defining outcome

With respect to defining and measuring outcomes, reviews of published studies have acknowledged a lack of definition, inconsistency between studies, and the failure to use valid and reliable instruments (Jainchill et al., 2000; Pfeiffer, 1989; Pfeiffer & Strzelecki, 1990; Swales & Kiehn, 1995). For example, many studies have measured outcomes in terms of a reduction or absence of a negative indicator, rather than an increase in a positive indicator (Jainchill et al., 2000). The reduction or absence of negative indicators is then typically used to infer a positive outcome. Under this definition of outcome, EBD-focused studies typically assess outcome by measuring the reduction in acuity of diagnoses and/or reduction in negative behaviors (Lyons et al., 2001). Substance abuse-focused studies have typically measured a reduction in drug use or relapse rate (Jainchill et al, 2000), and juvenile justice-focused studies have typically measured recidivism rates or reductions in criminal behavior (Grietens & Hellinckx, 2003).

A major flaw in previous outcome studies such as these has been the inference of a positive outcome due to a reduction in negative symptoms or behaviors.

Other studies assess outcome through ecological indicators. These ecological indicators may vary highly from study to study. In addition, some studies do not provide a rationale for why specific ecological indicators were used. For example, one study defined outcome as successful if discharge occurred to home, a significant other, foster care, or group home and defined unsuccessful outcome as either placement in detention or as a runaway (Gilliland-Mallo & Judd, 1986). Another study retrospectively defined outcome based upon a review of the client's chart to determine if treatment objectives were completed (Gorske et al., 2003). A further study measured outcome in terms of the client's functioning in their home school district after discharge from residential treatment (Hoagwood & Cunningham, 1992). These studies illustrate that outcomes have not consistently been defined. Additionally, common measures of outcome only inform the reader what is not happening to the client.

In a review of 32 outcome studies in adolescent residential treatment, Pfeiffer (1989) stated that previous studies have been too restrictive by defining "outcome" as a reduction in negative symptoms. Pfeiffer (1989) concluded that outcomes should be defined in terms of adaptation and coping and should be multi-dimensional and multi-directional. In a study of adolescents in therapeutic communities, Mann-Feder (1996) stated that multiple environmental measures should be used to determine outcomes. Jainchill et al. (2000) stated a multidimensional approach should be used that measures a broad range of outcome variables, and that the measure of change should include changes in positive behaviors. Curry (1991) stated research should be designed to measure multiple levels of outcome including symptom reduction, psychological change, relationship change, and academic or vocational functioning. Hooper et al. (2000) stated that outcomes should be defined multi-dimensionally, including school status, legal status, and level of care.

Swales & Kiehn (1995) provided an in-depth discussion of study design alternatives in residential treatment and proposed "theoretically

motivated quasi-experimental designs" as an alternative to double-blind controlled trials. For example, the authors proposed that one alternative for a study design would be to outline a specific treatment approach that is then used to make specific predictions about outcome. These predictions would then be tested in a series of single cases. Under this proposal, an outcome study for an adolescent residential treatment facility could focus on measuring changes that are consistent with the philosophical basis of the model.

Another important issue concerning measuring outcomes is when and how the measurements are taken. Reviewers have noted that many studies fail to use validated and reliable instruments to measure outcomes (Bates et al., 1997; Curry, 1991; Pfeiffer, 1989; Swales & Kiehn, 1995). Many studies also fail to measure outcome after discharge (Bates et al., 1997; Pfeiffer, 1989; Swales & Kiehn, 1995). Pfeiffer (1995) recommended that validated and reliable instruments be used, follow-up periods should be specified, and outcomes should be assessed at discharge, no earlier than 90 days, at 6 months and at 12 or 18 months post-discharge. Pfeifer (1989) also found that 63% of the studies reviewed had response rates greater than 75%, while 27% of the studies had a response rate between 50-75%.

Results of Outcome Studies

Bearing in mind the potential problems and limitations of study designs and methodology, another issue concerns the results of outcome studies on adolescent residential treatment. Pfeiffer (1989) stated a majority of studies have found positive outcomes associated with residential treatment, but that firm interpretation and generalization is difficult due to study design flaws. Curry (1991) noted that research on adolescent residential treatment efficacy has lagged behind other areas of research, but that clients generally appear to improve in residential treatment and that the post-discharge environment can be a strong determinant of positive or negative adaptation. Erker et al. (1993) found that the majority of reports indicated that adolescents in residential treatment generally improved at the time of discharge, but residential treatment did not appear to be more effective than day treatment services. Mann-Feder (1996) found significant improvement on a variety of measurements for adolescents in two different residential treatment programs (therapeutic community and

token economy). Bates et al. (1997) found that efficacy often depends upon what variables are measured, but that residential treatment was generally effective at discharge. This study also found that treatment effects typically declined with time.

Hooper et al. (2000) noted that outcomes can vary significantly from study to study, but in their study they found that program benefits were maintained for one to three years after discharge. Jainchill et al. (2000) acknowledged that some controversy exists regarding the efficacy of residential treatment, but that residential treatment is more effective than outpatient services. Larzele et al. (2001) found that adolescents in residential treatment showed significant improvement, and that these improvements were generally maintained after discharge. Lyons et al. (2001) reported that adolescents in residential treatment generally improved during their course of stay, but that there was considerable variation in which symptoms improved, as well as significant variations in outcomes between different programs. In their review of the literature, Gorske et al. (2003) and Hoagwood & Cunningham (1992) concluded there is a small amount of evidence regarding the effectiveness of residential treatment for adolescents. In sum, conclusions regarding residential treatment may be characterized as generally positive, but there also are enough limitations and caveats concerning the complexity and range of services offered, the lack of definition concerning the treatment population, some negative outcomes, and inherent limitations and flaws in study designs that present serious questions about the extent to which general conclusions may be made.

Predictive factors

This questioning is further justified by the inconsistency found in attempts to identify factors that can predict outcomes in adolescent residential treatment. Predictive factors, or factors correlating with outcome, are highly variable both in terms of what factors are identified and whether a specific factor is negatively or positively correlated to outcome. Gilliland-Mallo & Judd (1986) reported race, larger programs, longer length of stay, and high pre-commitment offense levels were correlated with high post-commitment levels of offense. Pfeiffer (1989) stated the following predictor variables should be considered in assessing residential treatment outcomes: father's involvement;

academic status; locus of control; need to achieve/affiliate; perceived alienation; attitude toward school, rules, authority and parents; feelings toward treatment; after-care services; internalization of external rules and structure; interpersonal competence. In their review of 32 outcome studies, Pfeiffer & Strzelecki (1990) addressed the following predictors of particular outcomes: IQ (3 of 7 studies found positive relationship); organicity (associated with negative outcome), diagnosis (psychotic and behavioral disorders responded less favorably); symptom pattern; age at admission (not predictive); gender (not predictive); family functioning (generally positive relationship); treatment (not generally investigated); length of stay (positive relationship in 3 of 7 studies, no relationship in 4 of 7 studies); and aftercare (strong positive association).

Curry (1991) found level of functioning post-discharge was related to post-discharge environment. Hoagwood & Cunningham (1992) found positive outcomes were associated with shorter lengths of stay, more severe presenting dysfunctional deficits at intake, and the availability of community-based services after discharge. Whittaker and Pfeiffer (1994) found acuity and treatment models were not associated with post-discharge adjustment; community network and family involvement were correlated with positive outcome; and age, gender, IQ and length of stay are only weakly related to positive outcomes. Bates et al. (1997) and Curtis et al. (2001) found level of functioning in treatment was not predictive of post-discharge functioning. Hooper at al. (2000) found that successful outcomes were associated with gender (female), higher IQ, better reading skills, fewer psychiatric diagnoses, higher ratings of internalizing behaviors, and earlier follow-up. This study also found ecological variables (e.g., history of abuse, living with the family) had lower correlations with outcome. Jainchill et al. (2000) found that the following predicted positive outcome with respect to lower drug use: Hispanic origin, level of pre-treatment drug use, the client's rating of his or her relationship to the counselor, completion of treatment, and not associating with deviant peer groups after discharge. Jainchill et al. (2000) also found the following variables associated with decreased criminal behavior: gender (female), completing treatment, and not associating with deviant peers. Curtis et al. (2001), however, found that age, gender, intelligence, and length of stay were only weakly related to outcome.

Connor et al. (2002) found that positive outcome was predicted by less severe dysfunction, better personal and social adjustment, acute (vs. chronic) onset, greater academic ability, greater capacity for interpersonal relationship, anxiety or mood-related disorders (rather than behavioral), gender (female), younger age of intervention, and higher verbal IQ. This study also found poor outcome was predicted by comorbid substance abuse, history of sexual or physical abuse, and early onset. Gorske et al. (2003) found that adolescents in residential treatment were less likely to succeed if they lived in a placement other than with their family, had more severe antisocial problems, or did not receive multiple treatment modalities.

Conclusion

The use of residential treatment for children and adolescents is an essential form of treatment for children and adolescents with emotional and behavioral problems, substance abuse, and/or juvenile delinquency problems. Residential treatment for these populations is important both in terms of the number of clients served in treatment and benefits related to treatment costs. The use and cost of residential treatment has been increasingly questioned with the advent of managed care and policies that often prefer community-based services because they are perceived to provide services in a less restrictive environment. Yet few alternatives have been successfully implemented that can safely and effectively serve this acute population in a less restrictive setting.

The research generally concludes that some forms of residential treatment for children and adolescents are effective, but also that such a statement is severely constrained by problems in study design inherently limiting the ability to make broad conclusions between programs and populations served. These inherent limitations and problems in study design have been repeatedly raised and discussed in the literature.

These limitations often begin with a lack of consensus on what constitutes residential treatment. The literature acknowledges that children and adolescent populations in residential treatment have been poorly defined, and that providing such definition is an important component of any outcome study. The literature further acknowledges

the failure of many studies to adequately describe the treatment model used, the difficulty in describing and defining other aspects of the treatment milieu, and the failure to adequately assess treatment fidelity.

Other significant problems in study designs and methodologies exist, including the failure of many studies to define outcomes. Previous studies have sometimes been flawed by defining outcomes negatively (as a reduction in symptoms or negative behaviors), and by a failure to provide a multidimensional measure of outcome that includes positive change. The lack of utilizing valid and reliable outcomes measures has also limited many studies' findings.

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