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A logic model development for an adolescent based intervention to improve benefits from Therapeutic Residential Care (TRC)

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ABSTRACT

There is a significant need to comprehensively describe and illustrate via a logic model what processes work for adolescents in residential treatment facilities and how to make improvements (Bean, White, Neagle & Lake, 2005).The purpose of this article is to highlight one Adolescent TRC's journey to develop and implement a working Logic Model.

1. Introduction

Logic models, defined as a systematic and visual way to present and share understanding of the relationships among goals, objectives and activities, and hope for change, help to conceptualize the bigger pictures of organizations (Kneale, Thomas, & Harris, 2015). The visual representation of the logic model portrays information comprehensively (Kneale et al., 2015). A well thought through logic model has the ability to help avoid errors or flaws in an organization's program delivery (Kneale et al., 2015). Additionally, a logic model can provide deep intentionality and a feedback loop for continuous quality improvement.

High quality human service agencies typically develop a Logic Model with several key components, including but not limited to: clearly defined goals, clear objectives and actions, as well as outcomes that in turn inform evolving goals (McLaughlin & Jordan, 1999). Indeed, actively engaging with a dynamic Logic Model is now considered best practice in Behavioral Health (Funnell & Rogers, 2011; Murphy, Chang, & Dispenza, 2018); thus, the impetus for developing a logic model for therapeutic residential care (TRC).

Adolescent Therapeutic Residential Care Centers (TRCs) are defined as intensive and time-limited care for a child or young person in statutory care that responds to complex impacts of abuse, neglect and separation from family and are considered central players in the behavioral health care system in the United States (Mulvey, Schubert, & Odgers, 2010; Tarolla et al., 2002). It is estimated that about twenty percent of children in the child welfare system are being treated in a residential facility (Baker, Wulczyn, & Dale, 2005). Since residential treatment is generally regarded as effective (e.g., increased academic performance and psychological adjustment) (Coll, Stewart, Juhnke, Thobro, & Haas, 2009; Leichtman, Leichtman, Barber, & Neese, 2001; Hair, 2005), there is a significant need to comprehensively describe and illustrate via a logic model what processes work for adolescents in residential treatment facilities and how to make improvements (Bean, White, Neagle, & Lake, 2005).

2. One TRC's journey

The purpose of this article is to highlight one Adolescent TRC's journey to develop and implement a working Logic Model.

The particular TRC studied is located in the rural Rocky Mountain West. What began, in 1910 as a refuge for homeless children, is now a 501(c)3 non-profit organization offering a spectrum of supports and services aimed at helping traumatized youth and their families. Services offered include residential treatment (70 beds), community prevention programs, via two crisis centers (11 beds), education (fully accredited middle and high school), and a transition/aftercare program. This TRC, as noted in their mission statement, is "devoted to restoring hope, strengthening relationships, and building futures". Built on this philosophy are the core principles including: belonging, responsibility, autonomy, hope, mastery, and spirituality. Healthy relationships are the foundation of this TRC's philosophy and treatment principles, because they are believed to be the cornerstone of change (Coll & Haas, 2013). The theoretical underpinnings of the agency are best described via Erickson's Psychosocial Development Theory, as Erik Erikson's eight developmental processes are the most comprehensive and frequently

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used constructs for understanding psychosocial development (Coll, 2017).

The TRC has a long history of working with University researchers to inform practice, with multiple articles published in peer reviewed journals (Coll, Sass, Freeman, Thobro, & Hauser, 2013). Results of such research findings were adopted to inform effective practices as the agency evolved. These research studies became important not only for continuous quality improvements but for accreditation as well. Both the Joint Commission (formerly JACHO) and State accrediting bodies began requiring treatment /therapeutic practices that were based on published, peer reviewed research. In fact, the Joint Commission's Performance Measurement System (PMS), called ORYX, approved this TRC's PMS based on such research and publications (The Joint Commission (TJC), 2012). Thus, the change mechanism that has been adopted by this TRC is best described as data-based decision making (The Joint Commission (TJC), 2012).

This body of research, which included outcome as well as exploratory research, was key in beginning the conversation about comprehensive agency goal setting and what informative information was needed. Key themes that emerged from the research studies became the Goals and Objectives of the Logic Model (see Fig. 1).

3. Research and development

Research and development at this TRC evolved over time. Two studies proved to be particularly important to context. First, Coll et al. (2013) found that residential treatment is effective among at-risk youth, but effectiveness is impacted by a treatment center's abilities to systematically address an array of issues. Second, in a study of accredited vs. non-accredited adolescent TRCs, Coll et al. (2013) proved that accreditation improved standards of practice, increased positive image, created more comprehensive record keeping and more consistent ethical practice, and that accreditation correlated with more attention to clinical and administrative practice (The Joint Commission (TJC), 2012). The Canadian Centre for Accreditation (2016) later supported these results

4. Goals and objectives

The goals were originally established through an accumulation of research-based inquiries. The dynamic for generating the goals included the university researchers and agency leadership bringing issues, observations, and ideas to discussion (e.g., social-emotional competence, family cohesion). Then, research-based studies were conducted, the results brought forward, and goals emerged. The goals were then operationalized within the TRC in terms of assigning objectives, activities and ongoing evaluation to them via procedure changes. The methodological framework for complex intervention (Craig et al., 2008) was particularly helpful. As they note developing, piloting, evaluating, reporting and implementing a complex intervention via a logic model can be a lengthy process; to the neglect of adequate development and piloting work, or proper consideration of the practical issues of implementation, will result in weaker interventions.

Consistent with Kneale et al. (2015), the process utilized was iterative in that desired results were achieved by repeating rounds of analysis. The TRC leadership team participated in the logic model development over a 6 month period and consisted of the executive director, the clinical director, the director of personnel, the head of school, the head of administrative staff, and the director of aftercare, and sought feedback on a continual basis from their constituents. Of the six members of the leadership team, five were female, average age was 42 (range 36–53). One member identified as ethnically diverse. No qualitative data were analyzed per se, yet each member took notes when meeting with their constituents and reported the information back the leadership team.

Agreed upon program goals were as follows: 1) To increase youth self-efficacy through trauma informed care, 2) To enhance social-emotional competence by building a strong sense of community between residents, 3) To create an enhanced learning environment, and 4) To increase the overall health of residents while also improving their family's interactions and functioning.

The first program goal, "To increase youth self-efficacy through trauma informed care," became immediately salient to the leadership team when they saw results from the first administration of the Trauma Symptom Children's Checklist (Briere, 1996). This tool was chosen for its strong reliability and validity value (Briere, 1996) and was administered by licensed helping professionals. This tracking revealed a high number of youth (over half) experienced high trauma symptoms of depression and disassociation, including sadness, loneliness, emotional numbness, and memory problems (Briere, 1996). These findings are consistent with published studies (Abramovitz & Bloom, 2003; Rivard et al., 2003). Adolescents in TRC are typically admitted with high instances of trauma exposure (Greeson et al., 2012). This goal is also consistent with the call for therapeutic residential services to provide more trauma-informed services (Briggs et al., 2012; Coll, Cutler Thobro, Haas, & Powell, 2009; Coll, Stewart et al., 2009).

The second program goal was developed as follows: "To enhance social-emotional competence by building a strong sense of community between residents," meaning, "to build a sense of community by involving residents in recreational activities, cottage discussions, chores, and other group activities." Again this goal became clear in looking at internal results (Coll et al., 2013) and other notably studies indicating that adolescents within a functional pro-social peer group improved socio-emotional effectiveness over time (Coplan, Ooi, & Rose-Krasnor, 2015), and youth benefit socially and emotionally from a holistic perspective, including group physical activity (Bermejo-Martins, López-Dicastillo, & Mujika, 2018; Coll et al., 2014).

The third program goal "To create an enhanced learning environment," emerged as the leadership team began reviewing measures of academic progress (via Woodcock-Johnson scores) related to important psychosocial development such as taking initiative and industriousness (Coll, Stewart et al., 2009). The **Woodcock–Johnson Tests of Cognitive Abilities** is a set of intelligence tests first developed in 1977 by Richard Woodcock and Mary E. Bonner Johnson. It was revised in 1989, again in 2001, and most recently in 2014; this last version is commonly referred to as the **WJ IV**. They may be administered to people age two years to elderly adult with strong reliability and validity. The Woodcock-Johnson scores told the collaborators that many youth were significantly behind in reading gain scores. The goal of an "enhanced learning environment" is somewhat qualitatively different from the previous two goals. The previous goals were derived directly from prior research. The enhanced learning environment academic goal appeared more organically from within the organization itself, from observing reading struggles in youth entering the facility and looking at Woodcock Johnson gain scores.

Educational performance is typically correlated with intelligence, motivation, and behavioral issues of adolescents (Harder et al., 2014). The impetus for this goal is to emphasize a stated learning environment that is both cooperative and collaborative through a strategic academic curriculum. The challenge, however, is that the majority of those in TRC are academically delayed (Leone & Cutting, 2004). In addition, it is estimated that thirty-three percent of adolescents in TRC have a disabling condition, typically an emotional disturbance, specific learning disabilities, developmental delays, and/or other health impairments (Quinn, Rutherford, Leone, Osher, & Poirier, 2005). These individuals are also typically under-identified in school systems, often because of lack of financial support (Quinn et al., 2005). Best practice TRC schools screen, assess, or provide appropriate referrals (Ko, 2008; Leone & Wruble, 2015). Historically, however, these populations upon entering TRC have typically experienced academic neglect, been left behind due to underfunding, and been labeled low priority to communities (Leone & Cutting, 2004). Harder et al. (2014) noted that educational

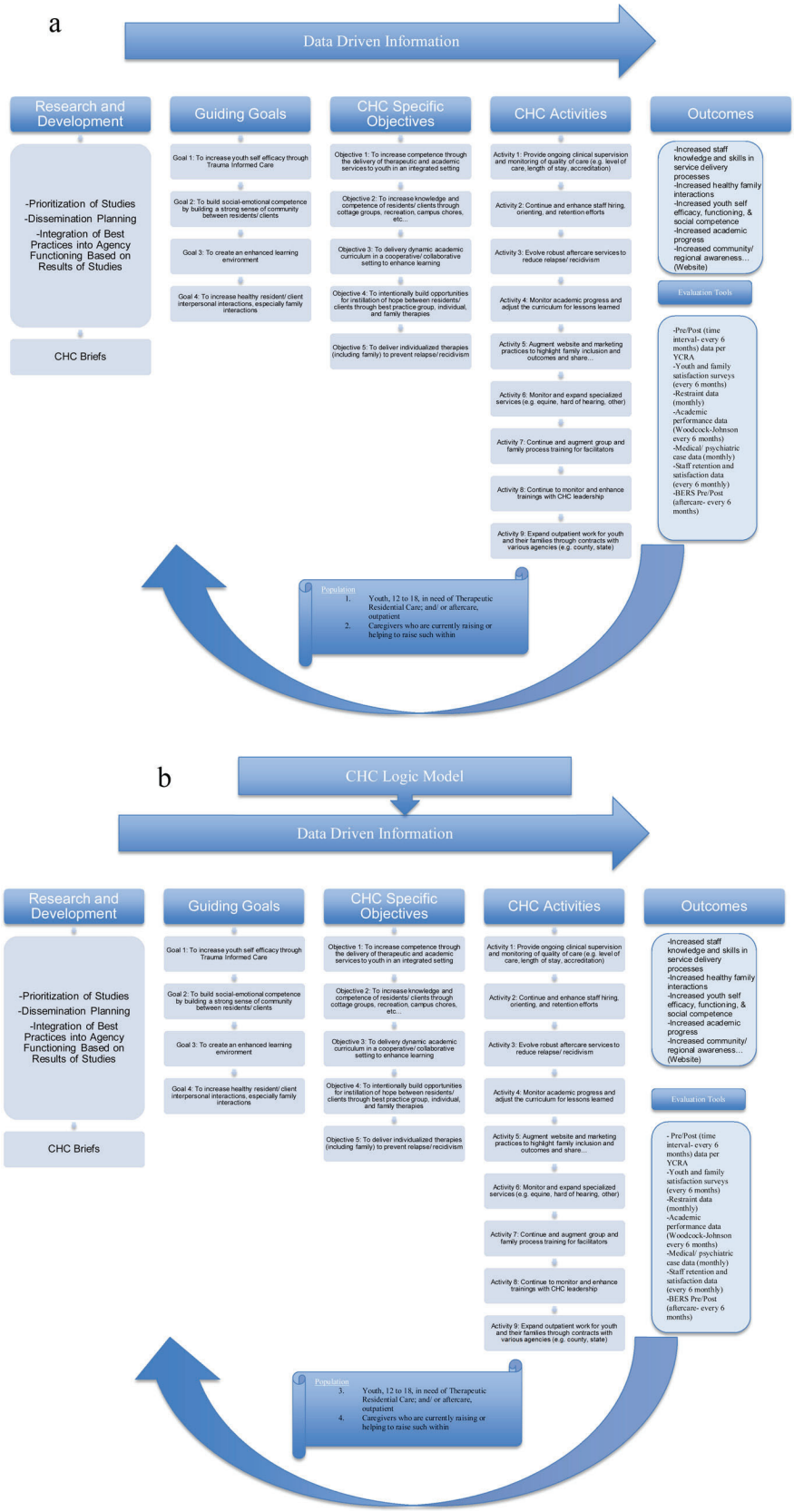

Fig. 1. Logic Model.

performance is often entwined with socio-emotional factors in residential care.

The fourth and last agreed upon goal was "To increase the overall health of residents while also improving their family's interactions and functioning." Many published studies have been done with the TRC's population, because this has become a crucial level of care (Coll et al., 2010). They work on interpersonal and family interactions by involving residents in individual, group, and family counseling. Research indicates that adolescent relationships with parents and caregivers is predictive of readmission to RTCs (Affronti & Levison-Johnson, 2009; Brown et al., 2010; Lee & Thompson, 2009; Walter & Petr, 2008). Research is clear that parents and caregivers who are more involved in their adolescent's treatment, informal interactions (e.g., phone calls) and formal interactions (e.g., family therapy) have better outcomes (Coll, Freeman, Scholl, & Hauser, 2018a; Coll, Freeman, Scholl, & Hauser, 2018b; Lakin, Brambila, & Sigda, 2004). Relationships with staff are also identified as important to treatment outcomes. Huang, Duffee, Steinke, and Larkin (2011) indicate that higher engagement and early engagement with staff in treatment programs have been correlated with more positive outcomes for adolescents in residential treatment centers. Additionally, a variety of studies internal to this TRC indicated that increased family interactions and functioning increases trust and intimacy (Coll et al., 2018a; Coll et al., 2018b; Powell, Coll, Trotter, Thobro, & Haas, 2011).

5. Objectives tied to goal

Staff developed goals, objectives, and activities aligned to objectives (see Table 1, Fig. 1). Objectives that could be tracked via outcome data were developed and logically emerged from the goals discussion that further clarifies them (see Table 1, Fig. 1).

Of note, the collaborators distinguished one important overall consideration that emerged from the process of tying goals to objectives- the need to gather more data related to aftercare, as aftercare is vital in bridging the gap between residential treatment and successful reintegration into a lower level of care (Brown et al., 2010). Preliminary results using the Behavioral and Emotional Rating Scales (Epstein, 2004) reveal that family and school reintegration are key for reduction of recidivism.

6. Program activities

As seen in Table 1, this TRC leadership team decided that staff training efforts should be one of the specific activities tied to Goal 1. Strong staff training has been correlated with positive outcomes for adolescent quality of life in residential care. Crosland et al. (2008) noted that effective staff training was correlated with decreased physical restraints and fewer injuries. Staff training has also been correlated with increased awareness of mental health issues in residential care and the important role of direct care staff in meeting needs of adolescents and children in residential care (Sebuliba & Vostanis, 2001). Coll et al. (2018a), Coll et al. (2018b) and Hurley, Ingram, Czyz, Juliano, and Wilson (2006) also identified that staff training related to motivation was correlated with decreased negative incidents and increased staff confidence and feeling of competence. Training is critical, for example, for staff to understand trauma and comprehensive youth assessment, allowing for more support with individualized youth treatment (Coll et al., 2013). Training for all staff was recommended for 1) stages of change model, 2) trauma informed care and 3) empathy development (Coll, Stewart et al., 2009).

Another activity identified for Goal One was training for therapists via clinical supervision. Clinical supervision can provide two powerful functions: supporting professional counselor development and ensure best clinical practice for TRC clients (Coll et al., 2017). Supervision, or the lack thereof, can impact therapeutic outcomes and staff wellbeing in TRC (Coll et al., 2017). Coll et al. (2017) found that supervision, when compared at pretest/posttest, improved TRC therapist scores on specific measures of therapeutic relationship, promoting positive client expectations, promoting cognitive insight, encouraging emotional expression, demonstrating effective rapport building and in-depth exploration/goal setting, and more effective decision-making process (Coll et al., 2017) (Fig. 1).

For Goal Two, increased access to recreation activities and spaces in adolescent care has been correlated with more positive adolescent well-being (Weenig & Staats, 2010). Zoerink, Magafas, and Pawelko (1997) noted the value of community service for adolescents in residential

Table 1
Goals, Objectives, and Activities.

Goals	Objectives	Activities	Examples of Relevant Internal Outcome Studies
Goal 1: To increase youth self-efficacy through Trauma-Informed Care	Objective 1: To systematically address an array of issues via trauma-informed care in the delivery of therapeutic and academic services to youth	Activity 1: Provide ongoing clinical supervision and monitoring of quality of care (e.g. level of care, length of stay, accreditation)	(Coll et al., 2017).
		Activity 2: Continue and enhance staff training (including hiring, orienting, and retention) efforts	(Coll, Stewart, Coll, Scholl, & Hauser, 2018)
Goal 2: To build social-emotional competence by building a strong sense of community between residents	Objective 2: To increase social and emotional knowledge and competence of residents through cottage groups, recreation, campus chores, etc.	Activity 3: Continue and augment group and family process training for facilitators	(Coll et al., 2013)
		Activity 4: Augment website and marketing practices to highlight family inclusion and outcomes then share	(Bart et al., 2009).
Goal 3: To Create an enhanced learning environment	Objective 3: To deliver dynamic academic curriculum in a cooperative/ collaborative setting to enhance learning	Activity 5: Monitor academic progress and adjust the curriculum for lessons learned	(Coll, Stewart et al., 2009)
		Activity 6: Continue to monitor and enhance trainings with leadership	(Coll et al., 2015).
Goal 4: To increase the overall health of resident's while also improving their family's interactions and functioning	Objective 4: To intentionally build opportunities for instillation of hope between residents and their families through best practice group, individual, and family therapies, and to support effective aftercare to prevent relapse/ recidivism	Activity 7: Monitor and expand specialized services (e.g. family equine, hard of hearing, outdoor, aftercare)	(Coll, Cutler Thobro et al., 2009; Coll et al., 2018a; Coll et al., 2018b)
		Activity 8: Expand outpatient work for youth and their families through contracts with various agencies (e.g. county, state)	Data gathering stage

treatment. Coll et al. (2013) investigated the role of outdoor education in residential treatment as a form of specialized or adjunctive service. Wilderness therapy typically includes four aspects of treatment: the role of nature in healing, sense of competence, access to diverse treatment option, and promotion of positive peer engagement (Bettmann, Freeman, & Parry, 2015). Coll et al. (2013) measured treatment differences between a control group and residential group receiving outdoor therapeutic activities through a pre-test post-test design measuring level of risk factors. The treatment group demonstrated reduced risk in the domains of substance abuse, risk to others, and adaptive functioning after engaging in the outdoor treatment program (Coll et al., 2013).

One important activity is to "augment the website and marketing practices to highlight family inclusion and outcomes and share outcomes." Bart, Coll, Haener, and Manning (2009) studied the affect that TRCs had on neighborhoods. They found that TRCs had no negative effects on the housing market, had a minor, negative effect on criminal behavior (mostly runaways), and has positive effects related to community support (Bart et al., 2009) (see Table 2, Fig. 1).

Related to Goal Three, specific activities for youth experiencing behavioral difficulties must focus on controlling children's behavior in addition to academic standards (Knitzer, Steinberg, & Fleisch, 1990 as cited in Kutash et al., 2000). Education with children experiencing behavioral difficulties also must focus on controlling children's behavior in addition to academic standards (Knitzer et al., 1990 as cited in Kutash et al., 2000). Important educational components include an education program that focus on high school completion through incorporation of GED programs, foundational academic skills, and tailoring education curriculum to the individual needs of students (Presta, Respress, Major, Arazan, & Coxe, 2002). Additionally, academic curriculum in residential treatment centers should include basic life skills such as education on employment readiness to prepare students for success outside of the residential treatment center (Trout, Hoffman, Epstein, & Thompson, 2014).

Of additional importance is the way in which curriculum is implemented and how stakeholders support it. Implementation should include reinforcement for positive academic performance, active educational personnel who are committed to student performance, and engaged parents and involved administrators (Presta et al., 2002). Coll, Stewart, Scholl, and Hauser (2019) found that scores on both the Behavioral and Emotional Rating Scale (BERS) and the Measure of Psychosocial Development (MPD) scale were related to gains in reading. They found that scores on the Identity vs. Identity Confusion subscale of the MPD accounted for 21.6% of the variance in reading gains. Additionally, positive attitudes about school were predicted by both reading gains and total positive gains. Coll et al. (2019) suggest that TRCs should focus on increasing both reading gains and total positivity while adolescents reside in TRCs. These best practice activities are now being implemented at this TRC (see Table 1, Fig. 1).

Goal Four "To increase healthy resident's and their family's interactions" include activities such as monitoring and expanding specialized services and expanding outpatient work for youth and their families through contracts with various agencies. Family engagement is considered one of the key components for youth success in TRC (Coll, Stewart et al., 2009). One effective structured therapeutic approach for TRCs, Family Preservation, helps families engage and achieve functional goals through specific family therapy and parent/caregiver coaching (Diamond, Morris, & Caudill, 2011).

In summary, the development of goals, objectives, and activities were a precursor to developing the logic model. It was concluded by all collaborators that this logic model had to develop organically from the challenges, problems, successes, and failures within the organization as especially revealed by outcome evaluation studies. This process did take some time as noted by Craig et al. (2008). Research and subsequent discussions of results was ongoing but the tipping point in the process when Fig. 1 could be drafted occurred after a confluence of events; university researchers were developing a logic model for a related grant application and realized that one could be useful for this agency, key agency leadership attended a session at the national Association for Children Residential Centers which highlighted the importance of logic models as best practice and 'roadmaps' for success, and the agency's accrediting body (The Joint Commission (TJC), 2012) began encouraging one. After initial drafting, and several iterations were drafted and shared with senior staff, and with refinement over a period of 6 months. Fig. 1 was then presented to the agency's board of directors for feedback and approval. It after that meeting and discussion that the Logic Model achieved its final form (Fig. 1), with the understanding that that it is a dynamic document requiring at least yearly reviews.

7. Outcomes and evaluation tools

Outcome research is vital to indicating that the TRC's goals and objectives were being accomplished, to what degree and what adjustments needed to take place (Coll et al., 2013; Coll, Freeman, Juhnke, Sass Thobro, & Hauser, 2015). Outcomes are a key component of a logic model. Armstrong and Barsion (2006) concluded that an outcomes research-based framework provides key stakeholders with concrete evaluation data, which is a valuable way for organizations to track goals, objectives and performance as indicated in their logic models. Note, the vast majority of outcome research studies used to guide this logic model utilized pre-post, pair-wise *t*-test designs that included comparison groups.

As previously indicated, comprehensive assessment is key for level of care, length of stay, and measuring value-added outcomes. Yampolskaya, Mowery, and Dollard (2013) noted that as residential treatment is financially costly, it is vital to identify youth that are at a higher risk for being readmitted to treatment, in order to both deliver more effective treatment and minimize readmission rates. Noftle et al. (2011) recommend tracking critical outcome measures over time to better evaluate changes in symptom severity. Similarly, Baker et al. (2005) asserted that there needs to be ongoing assessment of the types and quality of mental health services provided by residential treatment centers to monitor length of stay. A comprehensive assessment example used to inform goals objectives, activities, and outcomes for this TRC, is the Youth Comprehensive Risk Assessment (YCRA) and briefly described here (Coll et al., 2018a; Coll et al., 2018b).

The YCRA process designed by Coll, Freeman, Butgereit, Thobro, and Haas (2012) includes two procedures of assessment: self-report and clinical assessment measures (Coll, Stewart et al., 2009). The intention of this assessment is to evaluate "major risk factors that lead adolescents to offend" (Coll, Stewart et al., 2009, p. 68). These risk factors are: chemical abuse, conduct disorders, criminal thinking and low family bonding, and risk to self or others (Coll, Stewart et al., 2009). The assessment also measures social and adaptive functioning and degree of structure necessitated by the risks (Coll, Stewart et al., 2009). The YCRA includes self-report measures such as Substance Abuse Subtle Screening Inventory for Adolescents-Second Edition (SASSI-A2) (Miller & Lazowski, 2001) and the Family Adaptability and Cohesion Evaluation Scale III (FACES III) (Olson, 1985). As part of the YCRA, conduct disorder symptoms and clinical thinking are assessed utilizing Diagnostic Statistical Manual criteria (Coll, Stewart et al., 2009; Coll, 2017). The YCRA was approved by TJC in 1998 (when it was JCAHO) as a PMS for their ORYX system (The Joint Commission (TJC), 2012; Coll et al., 2013).

The pictorial representation of the goals, objectives, and activities and their interactions are illustrated in Fig. 1.

8. Conclusion

A sound and comprehensive Logic Model is highly beneficial for enhancing intentionality and identifying gaps in order to better help youth being treated in therapeutic residential settings. Therapeutic

residential care is one of the most expensive of child services, so assured effective treatment will not only help children, their families, and the treating clinicians, but will also help society by reducing recidivism and easing its financial burden (Baker et al., 2005; Bean et al., 2005). For this specific TRC, the use of the logic model has been the impetus for immediate augmentation in staff training, especially in the areas of family inclusion, creating an enhanced learning environment, and support for successful aftercare.

Conflict of interest

None.

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