8-2009

The Effectiveness of a Restraint Reduction Policy Implemented to Reduce the Use of Physical Restraint with Children and Adolescents in a Residential Care Facility

Irma Molina Damen
University of Tennessee - Knoxville

To the Graduate Council:

I am submitting herewith a dissertation written by Irma Molina Damen entitled "The Effectiveness of a Restraint Reduction Policy Implemented to Reduce the Use of Physical Restraint with Children and Adolescents in a Residential Care Facility." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Social Work.

William Nugent, Major Professor

We have read this dissertation and recommend its acceptance:

Karen Sowers, John Wodarski, Barbara Thayer-Bacon

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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The Effectiveness of a Restraint Reduction Policy Implemented to Reduce the Use of Physical Restraint with Children and Adolescents in a Residential Care Facility

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Irma Molina Damen
August 2009

DEDICATION

I dedicate this dissertation to my parents, Guillermo and Lydia Molina, great parents and teachers, for always giving me their unconditional love, support, and encouragement and instilling in me a deep passion for learning, my brothers and sisters, for always believing in me, and my husband Tom, whose unwavering love and support made all things easier to bear.

ACKNOWLEDGEMENTS

I wish to thank my committee chair, Dr William Nugent, for his guidance and mentorship throughout the entire process of this dissertation work, for his patience in sharing with me his expertise in doing an interrupted time- series study, specifically the concept of autoregressive integrated moving average (ARIMA).

I also wish to extend a special thanks to my other committee members, Dr Karen Sowers, Dr John Wodarski, and Dr Barbara Thayer-Bacon, for their invaluable inputs and suggestions.

I also thank my family in the Philippines who believed in me all the way, and whose love and encouragement led me through all the difficult and challenging times of living away from them.

I also wish to thank my loving husband Tom, who encouraged, supported, and cheered me on, especially during those low and uneventful moments in my long journey to PhD. Your acts of love have greatly eased my burden and made my difficulties more bearable.

Last but not the least, I thank my Heavenly Father, for getting me through the program and giving me this tremendous opportunity to do research which nobody else has done, and for providing me with all the resources I needed to complete this work. I give back all the glory and honor to Him.

ABSTRACT

This simple interrupted time-series quasi-experimental study examined the effectiveness of a restraint reduction policy implemented in order to reduce the use of physical restraint in a residential treatment facility for children in the southeastern United States. Aggregate data on monthly physical restraint episodes from the agency were analyzed over a period of 4 years. A 22-month period was used as the baseline and the succeeding 26 months- when the restraint reduction policy was implemented- was the intervention phase. A regular regression model, estimated using ordinary least squares (OLS), modeled the effect of the policy change, and autoregressive integrated moving average (ARIMA) models were used to represent the autocorrelation structure of the residuals from the regression model, in the data analysis. Two ARIMA models, an ARIMA (1,0,0) and an ARIMA (0,0,1), were used to model the autocorrelation structure of the residuals from the OLS regression. The convergence of findings from these models suggested that the results of the analysis of the time-series data from this study were robust in a statistical sense because both models led to the same conclusion. There was a statistically significant decrease of about 1 restraint per child each month when the new policy of verbal de-escalation was implemented during the treatment phase. The rate of physical restraint was reduced by 70% with the implementation of the restraint reduction policy in both models. Although a significant reduction in the rate of physical restraints was associated with the implementation of the restraint reduction policy, interrupted time-series designs such as that used in this study are not strong enough for making cause-effect inferences.

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CHAPTER I

INTRODUCTION

Statement of the Problem

The use of physical restraint among children and adolescents in a variety of child psychiatric units and residential settings has been an issue of considerable debate, following reports of injury and even death, due to its use. In 2001, the Health Care Financing Administration (HCFA) estimated an average of 282,000 situations of restraint or seclusion use in psychiatric residential treatment facilities serving individuals under the age of 21. The potential for risk and injury to children as a result of restraint use is greater, since they are smaller and weaker than adults. Children are also subjected to seclusion and restraint at higher rates than adults (US General Accounting Office [GAO], 1999). Physical restraint as a form of punishment can be socially acceptable as adults are given the authority by society to control children's behavior.

In 1998 the *Hartford Courant* published an investigative series on deaths associated with restraint or seclusion based on their 50-state survey. They confirmed 142 deaths during or shortly after restraint or seclusion from 1988-1998. Twenty-three people died after being restrained in face-down floor holds and another 20 died after being tied up in leather wrist and ankle cuffs or vests and ignored for hours. Of the 125 cases whose causes of death could be confirmed, 33% died of asphyxia, and 26% died of cardiac-related causes. More than 26% of those who died were children (17 and under), nearly twice the proportion they constitute in mental health institutions (Weiss, 1998). The investigation also showed that the use of restraints was a frequent practice at most hospitals and institutions and were often used for the wrong reasons, such as for punishment, for discipline, and for the convenience of the staff. The mental health workers

responsible for making the critical decision to use physical force on patients were also found to be among the least-trained and lowest paid in the field. The investigation also found that staff training and opinion, not patient behavior, dictated restraints (Weiss, 1998).

The Children's Health Act (2000) defines physical restraint as "a personal restriction that immobilizes or reduces the ability of an individual to move his or her arms, legs, or head freely" (p. 8). This definition does not include the use of devices for the purpose of restricting a person's freedom of movement. It is generally considered as the most restrictive alternative and is used when other behavioral management techniques have failed or have proven to be ineffective in managing out- of- control behavior.

The risks associated with physical restraint use have sparked debates on whether it should be used to manage aggressive and violent behavior of children and adolescents in residential treatment centers. Empirical evidence illustrates that although the main reason for its use is to control children's aggressive and violent behavior, evidence from studies conducted among children and adults indicates that it is also used for the wrong reasons, such as: for punishment (Gallop, McCay, Guha, & Khan, 1999; Johnson, 1998; Miller, 1986; Mohr, Mahon, & Noone, 1998; Ray, Myers, & Rappaport, 1996; Singh, Singh, Davis, Latham, & Ayers, 1999); staff counteraggression (Garrison, 1984; Garrison, Ecker, Friedman, Davidoff, Haeberle, & Wagner, 1990); and due to power struggle between the staff and the client (Farragher, 2002; Johnson). These findings suggest that the use of physical restraint can have the potential for abuse.

Proponents on the therapeutic use of physical restraint adhere to the psychoanalytic theory as the basis for the use of physical restraint (Hunter, 1989; Redl & Wineman, 1963; Rich, 1997). Based from this perspective, most children referred for residential treatment suffer from a developmental arrest in their ego due to abusive and destructive caretaking. Children referred for

residential care do not have the inner mechanism to control their impulsive and destructive behavior and would therefore need adults to set external limits for their behavior and help them develop internal controls. When a child's behavior is destructive to self or others, limit-setting by adults in the form of physical restraint helps aggressive and out-of- control children feel safe and supported. It can also have significant therapeutic benefits for these children when done carefully (Barlow, 1989; Bath, 1994; Drisko, 1976; Drisko, 1981; Redl & Wineman).

The psychoanalytic theory also holds that being held results to the catharsis of pent-up anger and feelings and verbal expression of difficult feelings (Rich, 1997). Aside from preventing the escalation of aggressive behavior, the use of physical restraint provides a sense of safety and security to the child (Drisko, 1981; Bath, 1994), helps the child establish internal controls (Barlow, 1989; Drisko, 1976; Drisko, 1981; Sourander, Aurela, & Piha, 1996) and facilitates catharsis of pent-up rage (Bath; Curtis, 1997).

The therapeutic use of physical restraint is also justified on the basis of the attachment theory. The goal of restraint is to promote a positive relationship with the child through the process of bonding from the experience of physical contact of being held (Bath, 1994; Day, 2002; Sourander et al., 1996). Severely disturbed children may have experienced significantly early bonding difficulties, leaving them unable to form satisfactory attachments with caring adults (Bath).

Although proponents of physical restraint use argue that safety is an utmost concern in the decision to use physical restraint especially for out- of- control patients who have the potential to harm self or others, the risks associated with physical restraint use far outweigh its therapeutic benefits. Studies conducted with adults in various psychiatric hospitals who underwent physical restraint have shown mostly negative emotional and behavioral

consequences (Aschen, 1995; Ray et al., 1996; Johnson, 1998; Gallop et al., 1999). The few studies conducted with children in psychiatric hospitals who were subjected to restraints also illustrated mostly negative findings, such as: trauma (Mohr et al., 1998); increased aggression (Kennedy & Mohr, 2001; Mohr & Mohr, 2000; Garrison et al., 1990; Lewis, 2002; Masters, 1998; Mohr & Mohr; Murray & Sefchik, 1992; Patterson & Forgatch, 1985); opposition (Murray & Sefchik); abuse flashbacks in childhood (Gallop et al.; Goren, 1991; Kennedy & Mohr; Mohr & Mohr; Schreiner, Crafton, & Sevin, 2004); and fear of injuries during the restraint episode (Schreiner et al., 2004). Children who had been restrained reported that the practice of physical restraint is unacceptable and not therapeutic (Fink, 1994). Children also view physical restraint as a form of punishment (Mohr et al.). For children entering residential care who had already experienced abuse and trauma in their homes, physical restraint to contain their behavior results to more negative and unpleasant emotions.

The practice of physical restraint is also very controversial, owing to the fact that it can be misused and abused by staff persons in charge of these children. In most cases, staff members involved in child residential treatment have a favorable attitude toward physical restraint use and consider it as an acceptable intervention in dealing with certain child behavior problems (Bell, 1997; Goren & Curtis, 1996). They seem to use physical restraint because of habit and the prevailing culture in the organization on controlling children's behavior despite the lack of evidence concerning the effectiveness of this practice.

Media attention on the risks associated with the use of restraints caused a growing public concern about this issue, and prompted national policy reforms to standardize the use of physical restraint. The controversies associated with restraint and seclusion use paved the way for the enactment of the Children's Health Act (2000). It established national standards for the use of

seclusion and restraint in psychiatric, non-medical, community-based facilities that provide inpatient psychiatric services for individuals under 21 and receive any support from any program supported by funds appropriated to any federal department or agency. The act promotes the rights of these individuals to be free from restraints for the purpose of discipline or convenience. The law specifies that physical restraints and seclusion can only be used as a last resort when other less restrictive interventions have been determined to be ineffective, and only when there is imminent danger to self or others. Moreover, only an individual trained and certified by a state-recognized body is allowed to use physical restraints or seclusion.

In a similar vein, the American Academy of Child and Adolescent Psychiatry (AACAP) developed guidelines for the prevention and management of child and adolescent aggressive behavior in psychiatric institutions. It recommended the use of seclusion and restraint to prevent dangerous behavior to self or others, to prevent serious disruption of the treatment program including serious damage to property, and when measures promoting the child's self-control or less restrictive options have failed (Masters & Bellonci, 2002).

Since the use of physical restraint is more harmful than beneficial to children, it is important that residential treatment centers develop policies and strategies to deal with aggressive children's behavior that would include less restrictive interventions. Alternative measures to physical restraint use should be developed and tested that will have significant outcomes for these children. It is imperative that residential programs increase their level of accountability by using evidence-based practices and this could only be done through research activities on intervention outcomes. Currently, however, there is a problem of outcomes for residential care and what indicators signal "success" (Lieberman, 2004; Whittaker, 2004).

Further research on the effectiveness of treatment approaches or what kinds of treatment approaches work best is also needed (US GAO, 1999).

Current residential treatment programs have to be examined in the light of research findings, but since little is known about the therapeutic effects of physical restraint use on children, new policies and strategies to deal with aggressive behavior should be initiated in child residential settings. While the experts agree that physical restraint is sometimes necessary for some children in order to prevent danger to self or others, other alternative interventions exist that can be used to prevent escalation of behavior to a more violent level. Since the use of physical restraint is in most cases counterproductive, child residential care administrators should develop and test alternative programs to reduce and eliminate physical restraint use.

Purpose of the Study

This study evaluated the effectiveness of a restraint reduction policy implemented in order to reduce the use of physical restraint in a residential treatment facility for serving children in the southeastern United States. A time-series design equivalent to an AB single-case design was used for this purpose. The agency's aggregate data on monthly physical restraint episodes were analyzed over a period of 4 years; a 22-month period was used as the baseline, or A phase, and the succeeding 26 months when the intervention was introduced (i.e., the policy change or the restraint reduction policy) was the B phase or treatment phase. This study examined the relationship between change in agency policy on the use of physical restraint with the rate of physical restraint per resident each month. Since there is overwhelming evidence that the use of physical restraint is more harmful than therapeutic among children and adolescents, this study investigated the changes in the monthly rate of restraints before and after implementation of the restraint reduction policy.

CHAPTER II

LITERATURE REVIEW

This chapter is a review of existing literature related to physical restraint use with children and adolescents in different residential child care facilities, residential treatment centers, and inpatient or outpatient child and/or adolescent psychiatric facilities, units or hospitals. It also included some studies with adults in psychiatric settings due to the limited number of studies conducted with children. Specifically, this review examined the following areas: (1) behaviors precipitating the use of physical restraint; (2) characteristics of restrained children; (3) the positive aspects of physical restraint use; (4) the negative aspects of physical restraint use; (4) treatment acceptability; (5) alternative restraint reduction programs and their evidence for effectiveness; and (6) possible areas for future research, based from the gaps identified in the literature. The social learning theory was presented at the end of the chapter as the theoretical framework for the study.

Behaviors Precipitating the Use of Physical Restraint

A number of studies have examined the reasons for restraint. The use of physical restraint to prevent violent behavior in an insane asylum has been recorded as early as in the nineteenth century. What was then considered as violent behavior that would necessitate the use of restraints included fighting, destroying property, and injury to self. Fighting was the most frequent cause of restraint, which might have stemmed from the crowded conditions in the ward. Little research in the early twentieth or late nineteenth centuries was then devoted about the use of restraints (Esther, 1997). In the late 1970s Guirguis (1978) wrote that in dealing with psychiatric patients, restraints can be resorted to for a variety of reasons, such as: the apprehension about reactions from other team members, fear of the patient and the staff's own

anger and desire to retaliate, as a matter of convenience, does not require specialized know-how, and sanction of this technique by the administration.

Most studies on physical restraint use were conducted starting in the 1980s. Empirical studies conducted in the early and late 1980s (Garrison, 1984; Swett, Michaels, & Cole, 1989; Tsemberis & Sullivan, 1988) showed similar findings on the reasons for physical restraint use with children in psychiatric facilities. Restraint was most often times precipitated by aggressive behavior toward the staff or others. Garrison's study showed specifically that attacking any staff member increases the likelihood that a child will be physically restrained. Male staff were also found to rely upon seclusion or restraint as compared to female staff in the face of child aggression. His study illustrated that restraint was more likely when aggression was directed toward male staff as compared to female staff.

In the early 1990s, studies have shown that aggression towards the staff, non-compliance, self-injuries, and property damage were more likely to be followed by restraint (Garrison et al., 1990; Goren, Singh, & Best, 1993). Garrison et al. found a significant association between the type of aggression and the management procedure used. Assaults, self-injuries, and property damage were more likely to be followed by restraint than the nonphysical forms of aggression, such as threatening or verbalizations. Both of Garrison's studies noted that assaults against staff members were more likely to be followed by physical restraint than assaults against fellow patients and that restraint can be potentially used for staff counter-aggression.

Studies conducted in the late 1990s have indicated that aggression towards the staff and peers, as well as self injury, were associated with restraint use (Bell, 1997; Goren, Abraham, & Doyle, 1996; Goren & Curtis, 1996; Sourander et al., 1996). The other reasons cited were noncompliance or oppositional behavior (Goren et al., 1996), and property damage (Bell).

More recent studies that examined physical restraint use with children have indicated similar findings with earlier studies conducted in the 1980s and 1990s. Restraint was oftentimes used because of child aggression towards other people, property, or themselves and due to a concern for safety (Harrell, 2000; Petti, Mohr, Somers, & Sims, 2001; Sourander, Ellila, Valimaki, & Piha, 2002).

Overall, aggression or violent behavior was the precipitating factor for physical restraint use among children in the different settings (Bell, 1997; Garrison, 1984; Garrison et al., 1990; Goren et al., 1996; Goren & Curtis, 1996; Goren et al., 1993; Harrell, 2000; Sourander et al., 1996; Sourander et al., 2002; Swett et al., 1989). Although all of the studies cited aggression and violent behavior as the reasons for restraint use, only four studies empirically validated children's aggression and used reliable instruments to measure this. This included using the externalizing scores and aggression subscale of the CBCL (Garrison et al.; Sourander et al., 1996), an Overt Aggression Scale (Sourander et al.), a Spectrum of Assaultive Behavior Scale (Sourander et al., 2002), and the Revised Behavior Problem Checklist (Harrell). Petti et al. (2001) noted that aggression per se is a meaningless description of a child's behavior because it is subject to multiple interpretations and value judgment. Aggression was a concept that was not clearly measured in most of the studies reviewed. Most of the times, the organization sanctions the use of physical restraints for out-of-control children and this seems like an acceptable way of dealing with certain types of child behavior problems. A comprehensive paper on the mental health services for children in the United States by Tuma (1989) demonstrated that it is not known what therapies are most effective for treating certain problems of children. Vitiello and Stoff (1997) also found that no systematic research has been reported on the efficacy of different approaches in treating different types of aggression on children. Likewise, clinicians have little

expertise in the long-term prediction of violence, and assessment for risk for violence is a difficult challenge. Research concerning the prediction of imminent risk is lacking (Heyneman, 2003).

Characteristics of Restrained Patients

Studies on the characteristics of restrained patients in inpatient and outpatient settings for children indicated that gender and age were strongly associated with physical restraint use. Younger children and boys were more likely to be physically restrained due to their aggressive behavior than older children (Garrison, 1984; Miller, Walker, & Friedman 1989; Sourander et al., 2002). Their findings, however, were refuted by another study that indicated that there were no significant differences in age, ethnicity, or diagnosis between the restrained and nonrestrained group in a children's unit in a municipal hospital (Tsemberis & Sullivan 1988).

Studies conducted in the 1990s and 2000s have illustrated that age but not gender was a strong predictor of physical restraint use among children in various psychiatric settings and residential treatment programs, due to their violent or assaultive behavior. Younger children regardless of gender were found to be more violent and aggressive and therefore necessitated restraints (Garrison et al., 1990; Goren et al., 1993; Harrell, 2000). In one residential care unit, however, children put in restraints were not generally young. Their average age was 13 and they were mostly males (Bell, 1997).

Although lower IQ was associated with physical restraint use in a sample of emotionally and behaviorally disordered children (Harrell, 2000), another study in a residential treatment program for severe emotional disturbance among boys indicated that low intellectual ability alone is not predictive of impulsive behavior. Lower intelligence was not manifested in aggressive behavior because a client's verbal mediation abilities reflected by their verbal IQ and

verbal comprehension score were found to be a significant factor in restraint use (West, 1997). The study concluded that children with less ability to verbally mediate their circumstance may be predisposed to act out their frustration or conflict.

Other variables such as a history of physical abuse (Harrell, 2000), diagnosis (Harrell; Sourander et al., 1996; Sourander et al., 2002), length of stay (Miller et al., 1989; Sourander et al, 2002; Tsemberis & Sullivan, 1988), and a history of multiple previous restraints (Bell, 1997) were also found to be significantly associated with physical restraint use. Children with a dual diagnosis of ADHD or ODD (Harrell), those with disruptive behavioral disorder (Sourander et al., 1996) and with psychosis, suicidal acts, attachment disorder and autism were associated with certain types of physical restraint use (Sourander et al., 2002).

Positive Aspects of Physical Restraint Use

Proponents of the therapeutic benefits of physical restraint use cited limit-setting and containment as the most important reasons for its use (Bath, 1994; Drisko, 1976; Gair, 1980; Miller et al., 1989). External limits are set in order to maintain a safe environment, when the child's behavior are so destructive and is regarded as being of imminent harm to self or others. They also agree that it should be used as the treatment of last resort when other interventions have failed (Bath; Drisko, 1976, 1981; Rich, 1997). When used appropriately, it can have significant therapeutic benefits (Barlow, 1989; Bath; Drisko, 1976; Miller et al.; Rich; Sourander et al., 1996). In psychiatric settings, the need for limit-setting is very real since these patients were admitted due to deficiencies in inner controls. Limit-setting is indicated to the extent that the patient is not able to limit himself/herself (Gair). Limit-setting stops or prevents dangerous behavior when other approaches have proved ineffective (Bath; Drisko, 1981). The containment of dangerous behavior is therapeutic because it provides an external safety control for the child

who has problems with internal control of his behavior. For behaviorally disturbed children, containment is therapeutic since it meets fundamental limit-setting needs necessary of a sound personality development (Bath).

Almost all of the proponents of the positive aspects to restraint use agree that the aggressive child lacks the internal control to regulate his behavior and that they are not in control of their actions. Providing external control by adults therefore becomes necessary, to prevent escalation of aggressive and out-of- control behavior (Barlow, 1989; Bath, 1994; Drisko, 1976, 1981; Gair, 1980; Miller et al., 1989; Redl & Wineman, 1963; Sourander et al., 1996; Rich, 1997). The literature suggests that the use of physical restraint in various child and adolescent psychiatric hospitals/units or residential care settings results to therapeutic benefits, such as: the establishment of internal controls (Barlow; Drisko; Miller et al.; Schreiner et al., 2004; Sourander et al.); limit setting and containment (Barlow; Bath; Gair); promotes a sense of safety and security for the child (Drisko, 1981; Bath); helps the children gain status among peers (Schreiner et al.); provides additional attention from staff (Schreiner et al.); provides a therapeutic and positive interaction between the child and the adult (Day, 2002; Sourander et al.; Curtis, 1997; Drisko, 1981); facilitates catharsis of pent-up rage (Bath; Curtis); and helps children learn alternative ways to express strong feelings (Barlow; Sourander et al.).

It is noteworthy that the existing literature on the therapeutic benefits of physical restraint use were mostly based from the opinions of experts out of their experiences on working with children who had been physically restrained. Their theoretical positions, however, have not been systematically evaluated. There were only three empirical studies (Miller et al., 1989; Schreiner et al., 2004; Sourander et al., 1996) that supported their claim on the positive aspects of restraint use.

A literature review on the use of aversive therapy including the use of restraint with assaultive, emotionally disturbed youths illustrated that positive outcomes are short-lived after the aversive procedure is discontinued (Murray & Sefchik, 1992).

Negative Aspects of Physical Restraint Use

Patients' perspective

In almost all of the studies conducted with patients who had been physically restrained, the majority did not like the restraint experience and reported negative experiences associated to it (Aschen, 1995; Gallop et al., 1999; Johnson, 1998; Mohr et al., 1998; Ray et al., 1996; Schreiner et al., 2004). Most studies conducted with restrained patients did not substantiate the claim that the use of physical restraint promotes patients' sense of safety and security. On the contrary, many formerly restrained patients have reported feelings of vulnerability to harm and injuries (Aschen; Johnson; Ray et al.; Schreiner et al.); powerlessness, isolation, fright, and helplessness (Gallop et al.; Johnson); anxiety, fear, anger, and hostility (Aschen; Miller, 1986); and being misunderstood/ did not know why they were being restrained (Aschen; Mohr et al.). All these subjective negative experiences run contrary to the supposed therapeutic benefits of physical restraint use, and some even reported that the procedure was harmful and not therapeutic (Gallop et al.; Johnson; Ray et al.).

Some patients described the restraint experience as punitive and was a consequence of not following the rules of the unit (Johnson, 1998; Mohr et al., 1998; Ray et al., 1996). Others found it degrading and dehumanizing to be put in restraints, due to their loss of control and inability to take care of their own needs (Gallop et al., 1999; Johnson). Patients who had been victims of trauma and abuse in childhood experienced abuse flashbacks as a result of the restraint experience. This indicates that being put in restraints can result to retraumatization (Gallop et al.;

Schreiner et al., 2004). For women who had a history of sexual and physical abuse, the restraint experience was also both terrifying and degrading. The restraint experience brought back the feelings of abandonment and powerlessness which they earlier experienced as an abused child (Gallop et al.). Restraint position can also have an impact on the outcome, as a study with patients who had been restrained in a psychiatric facility indicated that patients restrained supine felt sexually vulnerable as compared to those who were restrained prone, who found the experience more tolerable (Aschen, 1995).

Eliminates patients' right to self-determination

A number of authors have discussed the negative aspects of physical restraint. Some authors have stated that restraint and behavioral control are morally unacceptable because they violate the patient's rights to self-determination, owing to their coercive nature (Kennedy & Mohr, 2001; Lewis, 2002; Stilling, 1992). This was supported by the result of a study conducted with psychiatric patients who were in leather restraints. They reported that their loss of control was dehumanizing for they cannot take care of their own basic human needs. For most of the participants, the taking away of power and control was dehumanizing and the worst part of being restrained (Johnson, 1998). The sense of powerlessness and hopelessness brought about by the lack of autonomy for being in restraint was also documented in another study conducted among women in a psychiatric institution (Gallop et al., 1999). Among psychiatric patients, a lifelong pattern of behavioral dyscontrol cannot be modified by restraints (Rosen & DiGiacomo, 1978), and using restraint as an intervention may be regarded as a failure as a preventive or therapeutic measure (Lewis, 2002).

May be used for the wrong reason

The use of physical restraint to manage aggressive and violent behavior has not been established as a behavior management strategy, although it is routinely used in hospitals and child psychiatric units. There is a prevailing assumption that restraint is necessary, although its efficacy and appropriateness have not been documented (Allen, 2000; Goren, 1991; Lewis, 2002). Staff culture seems to have a big part on its use. The results of a survey conducted among 320 staff members from 13 public and private child psychiatric hospitals indicated that respondents generally rated seclusion and/or restraint as seldom having a positive effect on the patient. The staff would persistently use this intervention despite their inability to produce desired change as a habit of practice and because of attitudes and beliefs that are rooted in organizational culture rather than to a generally accepted standard (Goren & Curtis, 1996). Bell (1997), in a survey of 14 child care workers' experiences on restraint, found that most staff recognized restraint as appropriate, although they had a concern about its potential for abuse by the staff. It can become a part of the unit "culture" because it appeared to be the easiest form of intervention.

The use of physical restraint can easily become a part of staff culture and can be used for the wrong reason, such for staff counteraggression. Aggressive acts directed towards the staff were more likely to be followed by physical restraint than aggressive acts directed towards peers (Garrison, 1984; Garrison et al., 1990). The use of counteraggressive strategy such as restraint did not show therapeutic effects on the patients as shown by the relatively stable level of interpersonal conflict between patients and staff across the duration of hospital stay (Garrison et al.). In an earlier study, Garrison noted that "seclusion and restraint may serve a useful role in the maintenance of the therapeutic milieu, but the interpersonal dynamics and potential damage of

these procedures are far from clear, especially as they pertain to children" (p. 452). The use of restraints may also be abused if it is used because of a power struggle between the patient and the staff (Farragher, 2002; Johnson, 1998).

Behavioral measures such as seclusion/restraint use can be punitive and not at all helpful or therapeutic (Johnson, 1998; Miller, 1986; Mohr et al., 1998; Ray et al., 1996; Singh et al., 1999). Patients who had been put in restraints see themselves as victims and that they were restrained as a form of punishment (Johnson; Mohr et al.; Ray et al.). This gives us the conclusion that physical restraint use can be wrongly used for punishment.

Several studies have underscored the danger of staff countertransference (conscious or unconscious reactions on the part of staff) on a patient's aggressive behavior. Since potentially violent patients can cause staff members to assume a more authoritative role, the staff members may project their own angry impulses to a patient and exaggerate the patient's capacity for violence (Dubin, 1989). Staff countertransference will trigger more violence in the patient, because it can increase the patient's feelings of helplessness (Stilling, 1992). Hunter (1989) noted that staff countertransference feelings towards children in the management of child behavior can lead to unnecessary and harmful restraints. He further stated that frontline milieu workers in psychiatric settings may find themselves in crisis situation and may not react to the best interest of the child but out of their own negative feelings for the client. The staff's inability to correctly perceive the feelings of a patient may lead to the unnecessary use of restraint (Allen, 2000; Hunter). Countertransference reactions can therefore lead a staff to escalate an already volatile situation.

A literature review on seclusion and restraint of children by Allen (2000) indicated that staff members generally have a positive attitude toward the use of seclusion and restraints with

both adults and children. The staff members perceive the use of seclusion and restraints as more beneficial than patients do and they seem not to perceive correctly the feelings of patients. The author suggested the use of alternative interventions to prevent the progression of anxiety or agitation to violence. He also reported that little is known about the use of seclusion and restraint and its effects. There was also a lack of studies with children as the sample population.

Psychological injuries

Some authors have discussed the risks associated with physical restraint use with traumatized children, owing to their limited cognitive and emotional functioning. They argued that emotionally disturbed patients who had experienced trauma may not understand why restraint is being done, and this may increase their aggression (Kennedy & Mohr, 2001; Mohr & Mohr, 2000). It will also result to retraumatization/abuse flashbacks in childhood where the act of restraint might appear like the instance of abuse experienced in childhood (Gallop et al., 1999; Goren, 1991; Kennedy & Mohr; Mohr & Mohr; Schreiner et al., 2004).

Among psychiatric children, seclusion and/or restraint use resulted to three types of trauma: vicarious trauma, alienation from staff, and direct trauma due to an inappropriate use by the staff of power and force. The children viewed seclusion and/or restraints as punishments, and lacked understanding of why they were implemented, or how they were supposed to be helpful. Vicarious trauma happens by seeing other children "taken down", causing discomfort to the observer and developing empathy to the restrained patient. In direct trauma, the children perceived themselves to be traumatized physically and psychologically, in a place which was supposed to be helpful. Staff alienation occurred because the children perceived the staff as "judgers" and "evaluators" and were not understood at all by them. It can be possible that

children view aversive treatments as "punishments" because they are experienced as painful or distressing (Mohr et al., 1998).

Murray and Sefchik (1992) noted that youngsters with a primary diagnosis of emotional disturbance or assaultive behavior have the emotional capability to be antagonized if they feel that aversive conditioning is unjustified or too harsh. The authors' literature search on the appropriateness of restrictive procedures on emotionally disturbed children indicated that "restraint has no instructive value in teaching appropriate behavior and may give the undesirable message that use of force is an appropriate way to deal with conflict" (p. 524).

Children in psychiatric facilities who are put in restraints most often suffer from some disruptive behavior disorder, and research has indicated that these children have language and cognitive deficits that includes distorting the intent of others. They may therefore misinterpret and distort the actions of others, and although a take-down in a psychiatric unit may not be designed to be a punishment, it may be perceived as such by the children experiencing it (Kennedy & Mohr, 2001).

Aside from trauma, physical restraint use engenders certain negative feelings such as demoralization and loss of self-esteem (Rosen & DiGiacomo, 1978); feelings of isolation, anxiety, and humiliation (Gallop et al., 1999; Mohr & Mohr, 2000); identifying oneself as the victim and the staff as aggressors (Guirguis, 1978; Johnson, 1998; Ray et al., 1996); sense of helplessness and loss of control (Gallop et al.; Johnson; Lewis, 2002); powerlessness, isolation, fright, and helplessness (Gallop et al.; Johnson); anxiety, fear, anger, and hostility (Aschen, 1995; Guirguis, 1978; Miller, 1986); and being misunderstood/ did not know why they were being restrained (Aschen; Mohr et al., 1998). Physical restraint use is also considered to be unacceptable and aversive (Fink, 1994); punitive (Johnson; Mohr et al.; Ray et al.; Singh et al.,

1999); dehumanizing and coercive (Gallop et al.; Johnson); and can create dependency and unwillingness to leave restraints among psychiatric patients (Rosen & DiGiacomo). Instead of promoting a sense of safety and security, many formerly restrained patients have reported feelings of vulnerability to harm and injuries (Aschen; Johnson; Ray et al.; Schreiner et al., 2004).

These negative accounts of patients on their restraint experience indicate the need for the staff to have a more positive behavioral approach in dealing with patients. The lack of emotional and psychological support that the patients experienced while in restraint was not at all therapeutic. The seeming lack of emotional support from the staff may engender more negative perceptions of the staff and an ensuing power struggle will unlikely be avoided.

Does not lead to genuine behavioral change

One criticism to the physical restraint use with children is that the desired behavioral change displayed by the patient is only superficial. The use of physical restraint does not result to the development of a person's internal control. Aggression control would require helping patients learn anger management skills and giving them the choice to control their aggression. Aggression control requires self-control to manage their aggression and not the staff controlling them (Goren, 1991; Masters, 1998; Murray & Sefchik, 1992). If genuine behavioral change is to be achieved, the individual should have a control of his/her own behavior, and this control should not be set externally by other people. The use of physical restraint does not lead to genuine or desired behavioral changes (Goren; Goren et al., 1993; Goren et al., 1996; Murray & Sefchik).

Several studies with systematic baseline and posttreatment measures on children and adolescents with developmental disabilities have indicated that aversive conditioning by the use

of physical restraint resulted to the desired behavioral change (Fisher, Piazza, Bowman, Hanley, & Adelinis, 1997; Tomporowski, 1983; Winton & Singh, 1983). However, the use of aversive therapy among developmentally disabled individuals remains controversial. Many experts in the field of developmental disability who are opposed to its use with developmentally disabled clients aver that the positive outcomes are short-lived after the aversive procedure is discontinued (Murray & Sefchik, 1992).

Research on the relationship between program restrictiveness and youth behavior problems have indicated that more restrictive programs were associated with more youth behavior problems (Handwerk, Friman, Mott, & Stairs, 1998; Mitchell & Varley, 1998). Handwerk et al. (1998) examined the relationship between program restrictiveness across seven programs (parent training program, outpatient clinic, family preservation program, treatment foster care, residential group home, acute-care shelter, and inpatient psychiatric hospital) and youth behavior problems was investigated. Three dimensions of program restrictiveness were used: physical freedoms, time constraints, and treatment considerations. The results indicated that more restrictive programs were characterized by higher levels of youth behavior problems based on the Child Behavior Checklist (CBCL) scores than youths in less restrictive settings.

A similar finding was illustrated by Mitchell & Varley (1990) who noted that juvenile correctional programs that rely heavily on isolation experience high rates of aversive behaviors among the residents. After the closure of one maximum security unit of a juvenile correctional program and a behavior modification program instituted, there were significant declines in the rates of incidents requiring the use of physical force and incidents resulting in injury to youths.

The existing literature indicates that using restrictive interventions such as physical restraint to control aggressive behavior can paradoxically escalate an already aggressive behavior

(Garrison et al., 1990; Lewis, 2002; Masters, 1998; Mohr & Mohr, 2000; Murray & Sefchik, 1992; Patterson & Forgatch, 1985). It has no instructive value in teaching appropriate behavior and may give the undesirable message that the use of force is necessary to deal with conflict (Murray & Sefchik).

Physical and medical risks

Certain physical risks associated with restraint use have been reported in the literature. These included physical injuries (Guirguis, 1978; Kennedy & Mohr, 2001; Ray et al., 1996) and asphyxial deaths (Fidone, 1988; Miles, 1996; Mohr & Mohr, 2000; O'Halloran & Frank, 2000; Rubin, Dube, & Mitchell, 1993; Siebert & Thogmartin, 2000; Weiss, 1998). Mohr and Mohr reported some of the possible causes of death that may result from the use of restraints- restraint asphyxia, positional asphyxia, death by aspiration, asphyxia secondary to neck compression, blunt trauma to the chest, and others. The most common cause of death reported was asphyxiation, or "restraint asphyxia." Restraining patients in the prone position may predispose them to suffocation, while restraining them in a supine position may predispose them to aspiration.

Fidone (1988) discussed the risks he had encountered following the application of the baskethold with low- functioning institutionalized mentally retarded persons. Based from his experience, pallor, cyanosis, cardiac arrest, loss or alteration of consciousness, apnea, hypotension, and marked cardiac slowing have developed following a restraint episode. He further stated that holding down a patient's arms so that they encircle the chest while the back is being firmly pressed to the ground affects ventilation, venous return to the heart, and cardiac output. Aggressive children in hyperarousal stage may need more oxygen and their ensuing hypoxia causes further excitement and agitation which in turn leads attendants to apply increased

force. He suggested a three-to-five minute time limit on its use and that staff should be taught how to recognize hypoxia.

The other physical risks associated with physical restraint use included reduced range of motion, shortening of tendons, and muscle atrophy due to prolonged use of mechanical restraint (Luiselli & Waldstein, 1994); bone demineralization and arrested motor development due to disuse of limbs (Fisher et al., 1997); constricted circulation and nerve damage due to improper restraint use (Mitchell & Varley, 1990); and language delay and articulation problems (Sibinga & Friedman, 1971). It has also been reported that asphyxial deaths occurred even when restraints were properly applied, suggesting the inherent danger in using this technique (Rubin et al., 1993).

Treatment Acceptability

Staff perspective

Most staff involved in child residential treatment/child psychiatric hospitals rated the use of restraint as an acceptable intervention in dealing with certain child behavior problems even if they have low levels of confidence regarding the efficacy of its use (Bell, 1997; Goren & Curtis, 1996). Concerns about the potential for its abuse and possible physical and emotional harm to the child have been reported by the staff in one residential care unit (Bell). Moreover, the use of restraint can easily become a part of staff culture and the lack of desired behavioral change even though children were being secluded up to the very day of discharge indicate that these interventions are not effective. Many nurses do not think of seclusion or restraint use as counter aggressive despite high rates of patient and staff injuries. They accepted the risks because they were seen as treatment (Goren et al., 1996). In one study, the staff reported dislike for restraint/seclusion use but used it anyway due to a lack of skills to intervene differently (LeBel et

al., 2004). In an inpatient unit for adolescents with developmental delays and severe psychiatric disturbances, the staff members were observed to practice restraint or seclusion too quickly following single initial episode of aggression or self-injury (Schreiner et al., 2004). The use of physical restraint can therefore easily become a part of staff culture and as a staff counteraggression strategy.

In some settings, the use of physical restraint in response to aggressive acts directed toward the staff was an acceptable practice. Aggressive acts directed towards the staff were more likely to be followed by physical restraint than aggressive acts directed towards peers (Garrison, 1984; Garrison et al., 1990). Goren et al. (1993) noted that the high rates of seclusion and restraint in a child psychiatric hospital indicated that the use of these methods for controlling behavior is not therapeutic. They noted that staff members in such hospitals engage in an aggression-coercion cycle, in which aggressive and coercive behaviors are exhibited by both patients and staff. Farragher (2002) documented that in one residential treatment center for emotionally disturbed children, the use of holds were done more frequently than necessary and stem not from acute client behavior but from power struggles. Organizational culture often dictates how the staff deal with certain children's behavior problems and what interventions are acceptable.

The staff members generally have a positive attitude toward seclusion and restraints with both adults and children (Allen, 2000). In psychiatric facilities, the use of physical restraint is sanctioned by the administration (Guirguis, 1978). Fisher (1994), in a comprehensive review of the literature on seclusion and restraint noted that restraint and seclusion use can be influenced both by clinical and nonclinical factors, such as cultural biases, staff role perceptions, and the hospital administration's attitude. Staff training can also be effective in predicting and preventing

violence, reducing seclusion and restraint use, as well as patient and staff injury. Personality traits of the staff can also influence the use of more coercive interventions for certain child behavior problems. According to Nunno (1997), the staff's temperament, gender, age, qualifications/lack of training, and open-mindedness affect the quality of service that they provide to children.

Institutional factors such as structure, culture, and philosophy influence staff behavior towards children. Structure refers to the "written, formally agreed institutionalized arrangements which influence behaviour" (Brown, Bullock, Hobson, & Little, 1998, p. 15). Organizational culture refers to the normative beliefs and shared behavioral expectations in an organizational unit. Some cultures may be in tune with the goals of a residential center whereas other cultures may be contrary to the objectives set for the children. The continued use of physical restraint on children despite little evidence for its efficacy suggests the role of organizational culture surrounding its use. The value placed on the children also influences the way staff handle aggressive behavior. Focusing on the children's deficiencies instead of strengths will more likely result to the use of more restrictive interventions.

Patient perspective

There is a paucity of research that focused on the perceptions of children and adolescents on the acceptability of physical restraint use. The few studies conducted with children who had been put in seclusion/restraints illustrated mostly negative findings (Fink, 1994; Miller, 1986; Mohr et al., 1998; Schreiner et al., 2004).

In a study conducted with children in a psychiatric hospital, therapeutic holding, which is a form of physical restraint, was found to be unacceptable and aversive. The majority did not like the way therapeutic holding was done and found the procedure painful. Time-out, a process

whereby a child is removed from a stimulating or reinforcing environment, was found to be significantly more acceptable than therapeutic holding (Fink, 1994).

Most studies have mixed results with regard to treatment acceptability based on the degree of restrictiveness of the intervention. The American Association of Child and Adolescent Psychiatry (AACAP) considers seclusion, physical restraint, mechanical restraint, and chemical restraint as the most restrictive interventions, while time-out lasting 30 minutes or longer, ignoring behavior, and room restriction were considered restrictive interventions. Nonrestrictive interventions included verbal prompting and de-escalating, modeling, contingency contracting, reward programs, and time-out less than 30 minutes (Masters & Bellonci, 2002).

Some studies with children tried to compare different behavioral interventions based from their degree of restrictiveness in response to aggressive or violent behavior. In almost all of the studies conducted with formerly restrained patients (adults and children), the restraint experience was viewed in a negative way (Aschen, 1995; Gallop et al., 1999; Mohr et al., 1998; Ray et al., 1996; Schreiner et al., 2004). Many formerly restrained patients have reported a variety of negative reactions regarding the physical restraint experience, such as: feelings of vulnerability to harm and injuries (Aschen; Johnson, 1998; Ray et al.; Schreiner et al.); powerlessness, isolation, fright, and helplessness (Gallop et al.; Johnson); anxiety, fear, anger, and hostility (Aschen; Miller, 1986); and being misunderstood/ did not know why they were being restrained (Aschen; Mohr et al.). Some even reported that the procedure was harmful and not therapeutic (Johnson; Gallop et al.; Ray et al.) and that they were restrained as a consequence of not following the rules of the unit (Johnson; Mohr et al.; Ray et al.). Others found it degrading and dehumanizing to be put in restraints (Gallop et al.; Johnson). These negative accounts of patients give us the conclusion that physical restraint use is an unacceptable practice.

Contrary to the use of restrictive behavioral management strategies to control aggressive behavior in children and adolescents, more positive staff behavior can have a significant effect on client behavior (Glisson & Hemmelgarn, 1998; Patterson & Forgatch, 1985; Pelton & Wierson, 2002; Willner, Kirigin, Fixsen, Philipps, & Wolf, 1977). Children and adolescents generally prefer more positive staff behaviors such as offering to help, getting to the point, giving reasons why a behavior is important to a youth, providing descriptions of alternative behaviors, positive feedback, smiling, and positive motivational incentives. These staff behaviors can be effective in modifying delinquent youth behavior (Willner et al., 1977). Therapist behaviors such as "support" and "facilitate" can be a determinant to increased client compliance relative to behaviors such as "teach" and "confront" which were associated with increased client noncompliance (Patterson & Forgatch). Adolescents in a residential facility who perceived their counselors to be less accepting displayed more internalizing behavior problems whereas those who perceived their counselors as exhibiting a higher level of psychological control displayed more externalizing behavior problems (Pelton and Wierson). It can be deduced from these studies that children and adolescents prefer more positive behavioral management procedures. Since staff behavior can have a significant impact on the behavior of a client, it is important for the staff to display a more positive and supportive attitude in order to achieve the desired outcomes for children.

Alternative Restraint Reduction Programs

Thirteen empirical studies on alternative restraint reduction programs for children and adolescents were reviewed in this study. The alternative programs were implemented in residential child care facilities for emotionally or behaviorally disturbed children and inpatient child and/or adolescent psychiatric units or hospitals. The programs reviewed included

Therapeutic Crisis Intervention (Farragher, 2002; Nunno, Holden, & Leidy, 2003; Titus, 1989); a therapeutic management protocol (Kalogjera, Bedi, Watson, & Meyer, 1989); an organizational intervention (Goren et al., 1996; Schreiner et al., 2004); a preventive, strength-based model of care (LeBel et al., 2004; Petti et al., 2001); ABCD Program (Donovan, Siegel, Zera, Plant, & Martin, 2003); Teaching-Family Model (Jones & Timbers, 2003); a planned and unplanned intervention (Singh et al., 1999);a program involving advanced crisis management and nonviolent crisis intervention (Jonikas, Cook, Rosen, Laris, & Kim, 2004); and Crisis Prevention Intervention (Jambunathan & Bellaire, 1996). Implementations of the alternative restraint reduction programs were associated with substantial reductions in the use of physical restraint.

All of the studies mentioned changing the facility's/unit's policy related to crisis episode and on physical restraint or seclusion use. Monitoring, feedback, and evaluation were also seen as key components in the implementation of the different programs (Donovan et al., 2003; Farragher, 2002; Jones & Timbers, 2003; LeBel et al., 2004; Nunno et al., 2003; Schreiner et al., 2004).

Most of the programs reviewed had a staff intervention in the form of staff training (Farragher, 2002; Goren et al., 1996; Jambunathan & Bellaire, 1996; Jones & Timbers, 2003; Jonikas et al., 2004; Kalogjera et al., 1989; LeBel et al., 2004; Nunno et al., 2003; Petti et al., 2001; Schreiner et al., 2004; Singh et al., 1999; Titus, 1989). At least 3 studies mentioned both staff and patient training as part of the strategy in order to bring their rates of restraints down (Jones & Timbers; Jonikas et al; Schreiner et al). Other strategies mentioned were using quantitative data for staff feedback/ creating a database to analyze restraint use (Donovan et al., 2003; Farragher; Goren et al.; LeBel et al.; Schreiner et al.); providing clinical consultations and technical assistance (Donovan et al.; LeBel et al.); collaboration and partnership across

disciplines (Donovan et al., Schreiner et al.); a system-wide approach that consisted of a treatment philosophy, leadership commitment and vision (Farragher); and hiring a consultant to help staff reduce their restraint and seclusion use (Singh et al.).

Implementation of the alternative programs to physical restraint use resulted to a substantial decrease in the use of physical restraint in all the different settings. In one setting, the number of serious incidents such as physical aggression, property damage, and elopement also decreased as the number of physical restraints decreased (Farragher, 2002). Another study documented that the target level of seclusion or restraints was reached even without increasing the number of staff, staff overtime, or PRN medication on children (Singh et al., 1999). One study reported that after the hospital staff received training on Conflict Prevention Institute (CPI), most of the patients reported positive outcomes like feeling safe during the restrictive intervention, no injury to themselves or staff during the restrictive intervention, and their privacy and dignity were respected during the restraint or seclusion episode (Petti et al., 2001). Other positive effects reported were an increase in the level of confidence of the direct workers in doing their job (Titus, 1989); being able to better deal with children and adolescents in crisis (LeBel et al., 2004; Titus, 1989); and increased staff satisfaction (LeBel et al.).

Staff training was fundamental and integral in decreasing restraint usage in almost all of the alternative programs reviewed. Understanding and interpreting children's aggressive behavior, learning new ways to cope with aggressive acts that includes nonphysical intervention, and allowing for some staff self-awareness of their reactions and level of arousal to children's aggressive behaviors helped the staff to gain the skills and confidence to deal with children's aggressive behavior in a different way. Programs that emphasized de-escalation strategies provided staff with the skills needed to intervene at the different levels of child aggression.

Programs that focused on building client's strengths than weaknesses or deficiencies helped the staff to change their mind set on punishing children for unacceptable behaviors. Staff training also helped changed staff culture on restraint use and ensured consistency of program implementation.

Patient interventions consisted of several forms. The ABCD program fostered patient's sense of belonging through staff-patient coaching relationships, patient's membership in the milieu, and teaching them that violent behavior is not socially acceptable. Patient intervention included giving developmentally appropriate tasks that helped children develop a sense of accomplishment and self-confidence, and gave them tasks such as mentoring new patients (Donovan et al., 2003). One program focused on outlier patients and gave them additional interventions such as providing rehearsal of anger management and de-escalation skills (Schreiner at al., 2004). The Teaching-Family Model (TFM) program taught clients to use alternative, socially acceptable behaviors during situations where they were prone to act out and focused on the correction, not the suppression, of aberrant behavior (Jones & Timbers, 2003). Three psychiatric facilities developed a unique crisis management plan for each patient based on their crisis triggers and de- escalation strategies in the past (Jonikas et al., 2004).

All of the programs reviewed involved a change in organizational policy that focused on moving away from restraint use. A deliberate effort on the part of the administration to bring about organizational change by revising policies and procedures on restraint usage was a necessary first step in changing prevailing staff culture and beliefs on restraint use. Creating a task force or a committee within the organization or hiring a consultant from outside of the organization to look into organizational practices on restraint use was mentioned in three of the studies (Donovan et al., 2003; Goren et al., 1996; Schreiner et al., 2004). Some of the changes in

the policies mentioned were: (1) adapting a new policy requiring a treatment plan review for outlier patients (Goren et al.; Schreiner et al.); (2) following each restraint/seclusion incident, staff members were mandated to process each incident and complete a form indicating how restraint/seclusion would be avoided in the future (Petti et al., 2001); (3) developed a protocol for each restraint incident (Farragher, 2002); (4) adopting a hospital directive unrelated to patient's clinical concerns that changes hospital policy to reduce restraint/seclusion use (Singh et al., 1999); (5) standardization of the behavioral management program of policies and procedures related to crisis episode (Goren et al.); (6) creation of a behavior management manual that sets behavioral expectations from staff (Farragher, 2002); and (7) requiring the staff to be recertified annually in crisis intervention (Goren et al.; Jones & Timbers, 2003).

Finally, a treatment philosophy shapes institutional policies, how staff members carry out behavioral management intervention, and the value they place on children in residential care. It usually consists of the institution's belief system about the care for these children which should be carried out by the staff. Focusing on client's strengths rather than weaknesses and using supportive approaches helped the staff deal effectively with children and adolescents and subsequently avoided power struggles.

Methodological Limitations/Gaps in Research

Previous research on physical restraint with children is limited to the following areas: (1) rationale for physical restraint use; (2) demographic characteristics of children; (3) precipitating behaviors for physical restraint use; (4) positive and negative aspects of physical restraint; (5) its acceptability as a form of treatment based mostly from the staff members' perspective; and (6) alternative programs to reduce physical restraint use.

Most studies conducted on the effects of physical restraint on children were exploratory-descriptive, and none used a true experimental design to infer causality to physical restraint use. Although the empirical literature overwhelmingly supports the fact that the use of physical restraint is detrimental to one's mental and physical well-being, well-controlled studies that utilized the experimental design to test the effects of physical restraint are nonexistent. No control or comparison groups who were not physically restrained were used to clearly link the outcome to the use of physical restraint. In most of the studies on the effects of physical restraint use, self-reports were used, which affect the internal validity of the studies.

A similar observation can be made concerning the studies conducted on the alternative programs to physical restraint use. Although these studies tried to examine the effectiveness of the alternative programs to physical restraint use, none used the experimental design to do this. Most programs have documented a decrease in restraint episodes following program implementation, but the results cannot be directly linked to the intervention because a true experimental design was not used. Hence, there is no conclusive evidence that the outcomes can be attributed to the treatment program.

Although there were longitudinal studies that assessed the impact of the alternative programs to reduce the use of physical restraint, none used the interrupted time- series design to evaluate the longitudinal effects of the alternative programs or interventions. This is a gap in research that the present study aims to fill. Most studies reviewed also focused on both seclusion and restraints, making the findings confusing.

Additionally, all of the alternative programs to physical restraint use have the reduction in the number of physical restraints as the main variable of interest, but the majority of them did not directly measure the effects of the program on children's violent and aggressive behaviors. The

existing literature has documented that aggression is the main precursor for the use of physical restraint with children, but aggression as an outcome variable was not measured in most of the studies reviewed. It is important to know whether moving away from the control-oriented use of physical restraint to a more relationship-based, positive verbal interactions with emotionally disturbed children in residential settings will produce less aggression.

Still another gap in the literature is the lack of investigation on alternative means of preventing or dealing with emotionally disturbed children's aggressive behaviors in residential treatment settings that will not necessitate the use of physical restraint. For the most part, the literature reflects the use of physical restraint as an intervention in psychiatric settings while only a few studies have been conducted in residential treatment centers. Similar studies have to be conducted in other settings and populations to see if the treatment effect will occur across settings and populations.

Finally, there is a paucity of research on the impact of restraint from a child's subjective experience. Most studies conducted on the restraint experience have adults as respondents. The few studies conducted with children who had been put in seclusion/restraints illustrated mostly negative findings

Theoretical Framework

The psychoanalytic theory is often used to justify the use of physical restraint (Hunter, 1989, Redl & Wineman, 1963; Rich, 1997). Human behavior is viewed as driven by inner drives, needs, motivations, and instincts, most of which operate below the level of consciousness (Freud, 1940, 1989). According to this perspective, most children referred for residential treatment suffer from a developmental arrest in their ego due to abusive and destructive caretaking. As a result, these children learn to adopt an early defensive orientation that is adaptive or self-preservative.

These defenses function to externalize painful affect and may consist of an impulsive behavior and acts on the environment to obtain relief. This theory also holds that being held results to the catharsis of pent-up anger and feelings and verbal expression of difficult feelings (Rich). It is viewed that children in residential care with severe ego disturbances need adults to provide external control for their impulsive behavior. They necessitate adult interference, because of their inability to control their own impulses. Although they may struggle against adult takeover, they expect the adult not to be punitive. Aside from their need for love and affection, these children also demand the role of the adult as a "protector" to protect them from their own impulses and loss of control should their behavior go too far (Redl & Wineman). Aggressive children are afraid of the consequences of their own actions and need adults to protect themselves from their own impulses. They need adults to set external limits and help them develop internal controls. Limit-setting by adults helps aggressive and out-of- control children feel safe and supported (Barlow, 1989; Bath, 1994; Drisko, 1976, 1981; Miller et al., 1989; Redl & Wineman).

The therapeutic use of physical restraint is also justified on the basis of the attachment theory. The goal of restraint is to promote a positive relationship with the child through the process of bonding from the experience of physical contact of being held (Bath, 1994; Day, 2002; Sourander et al., 1996). Severely disturbed children may have experienced significantly early bonding difficulties, leaving them unable to form satisfactory attachments with caring adults (Bath).

Although the psychoanalytic model of residential treatment dominated the first half of the 20th century, it has been criticized for lacking empirical demonstration of its treatment effectiveness and its limited applicability to some client populations such as the psychotic, retarded, or nonverbal (Lyman & Campbell, 1996). The psychodynamic theory seems to be the

prevailing theoretical model used by people who advocate the use of physical restraint to justify its use. This theory, however, is neither testable nor refutable by empirical evidence. Although it can interpret behavior that has happened in the past, it cannot predict future behavior (Bandura, 1986). Outdated conceptual paradigms have to be replaced with more current theories to explain children's aggression.

The social learning theory is a better alternative to explain children's aggression. In the social learning theory, psychological functioning is seen as a product of a continuous reciprocal interaction of personal and environmental determinants. It also gives importance to the role that symbolic, vicarious, and self regulatory processes play in determining human behavior (Bandura, 1977). Most human behavior is learned by observation through modeling (Bandura, 1973, 1977, 1986). The social learning theory analyzes behavior in terms of stimulus events and the reinforcing consequences from the environment. It further regards human aggression as a learned conduct that is under stimulus, reinforcement, and cognitive control. According to the social learning theory, people react differently to aversive treatment, depending on the type of response learned for coping with stress. A person's response depends on his or her general state of emotional arousal that can facilitate a variety of behaviors (Bandura, 1973).

The social learning theory holds that almost all learning phenomena results vicariously from observing the consequences of other people's behavior for them. This helps people acquire patterns of behavior without having to learn it the hard way through trial and error. In vicarious reinforcement, observed punishments reduce similar behavior in observers while observed rewards generally enhance observed behavior (Bandura, 1973, 1977, 1986). The social learning theory, however, emphasizes that not all learned behavior is translated into action. A high risk for punishment decreases the possibility of imitative aggression. Children who saw a filmed

model of verbal and physical aggression performed more imitative aggressive responses when the observed model of aggression was either rewarded or received no consequences for his aggressive behavior as compared to children who observed the modeled aggression punished (Bandura, 1973). Observed reward serves as a motivator in observers that a similar behavior will result to similar benefits whereas observed punishment decreases the likelihood that a similar behavior will be imitated.

Aggressive modeling results to children acting more punitively than if they have not been exposed to aggressive models. An experimental analysis of aggressive modeling among nursery school children showed that children exposed to aggressive models exhibited more aggressive responses than children who observed the nonaggressive adult model. Children who observed the nonaggressive model also displayed significantly less aggression than the control group who had no model for aggression. The experiment showed that being exposed to aggressive models taught the children new ways of aggressing and later emulated their new ways of aggressive behavior and speech (Bandura, 1973).

The social learning theory also regards that observed punishment can actually promote learning of the acts being punished by focusing attention on those acts (Bandura, 1977). Observed punishment is just as effective as observed reward in promoting observational learning. Although observed punishment draws attention to the behavior, people generally avoid behaviors with aversive or painful consequences. The social learning theory offers several processes by which observed rewards and punishments alter the thoughts, feelings, and actions of others. One of these processes is the value preferences that partly determine behavior. "Observed consequences can change observer's valuation of the reinforcing agents as well as of the recipients" (Bandura, 1977, p. 127).

The misuse of power by people in authority to reward and punish will more likely generate an increase in aggressive behavior and opposition rather than compliance. Negative modeling therefore becomes an unintended effect of punitive sanctions. When misused, institutionally sanctioned aggression for behavior control can promote the learning and legitimation of aggression (Bandura, 1973). In a similar manner, familial transmission of aggression occurs when parents use coercion to discipline their children. Parents who favor coercive discipline have children who tend to adopt similar styles of behavior and likewise use coercive means with peers (Bandura, 1973, 1986). The modeling provided by parents in disciplinary actions contradicts the intended effect of the method to discipline. People are most influential when they are consistent in what they practice and what they preach, and inconsistency with what they do and say considerably weakens the impact of their behavior (Bandura, 1973). A similar finding was also reported by Reid, Patterson, and Snyder (2002), who noted that coercive family processes predicted concurrent antisocial behavior in children. An analysis of the dynamics of family interactions led them to conclude that aggressive children are both contributors and victims of a coercive relationship.

Punitive modeling produces more intensive aggression in the observers. Results from laboratory studies showed that children who had been subjected to punishment treat others in a similar manner (Bandura, 1973, 1986). Children and adults tend to behave more punitively if they have seen aggressive models than if they have not been exposed to aggressive models. Punishment can therefore inadvertently promote aggressive modes of behavior and may reduce restraints over aggression in observers.

Based from a social learning perspective, physical restraint use should lead to an increase in aggressive behaviors in children in residential care, owing to the aggressive modeling that

they see. Knowing that the use of physical restraint can promote the learning of aggressive acts and generate opposition rather than compliance, alternative measures to physical restraint use need to be developed and tested for a more accountable social work practice. Since there is overwhelming evidence that the use of physical restraint is more harmful than therapeutic when working with emotionally disturbed children and adolescents, new strategies and interventions in dealing with aggressive children's behavior that include less restrictive interventions should be initiated in child residential care facilities. Their effectiveness should also be subjected to empirical study. In order to test whether a policy intended to reduce the use of physical restraint among children with serious emotional and/or psychological treatment needs will decrease the incidents of physical restraints, this study will seek to answer the following question:

1. Is there a change in the monthly rate of physical restraint associated with the restraint reduction policy?

Hypotheses:

1. A reduction in the monthly rate of physical restraint in the facility is associated with the implementation of the restraint reduction policy.

CHAPTER III

METHODOLOGY

This chapter is organized into the following: a discussion of the study design, a description of the sources of data, a description of the variables to be analyzed, instrumentation and data collection methods, and a discussion of the data analysis.

Design

The purpose of this research was to evaluate the effectiveness of a restraint reduction policy intended to reduce the use of physical restraint in a residential treatment facility for serving children in the southeastern United States. In order to do this, a simple interrupted time-series quasi-experiment was utilized (Cook & Campbell, 1979). Specifically, this study used a time-series design equivalent to an AB single-case design in order to evaluate the effectiveness of the restraint reduction policy. Single-case designs apply the logic of time-series designs when the researcher or program evaluator wants to evaluate the effectiveness of an intervention or policy change on an individual or an organization. Repeated measures of the target problem are obtained before a particular intervention is introduced, and then these repeated measures are continued after the intervention is introduced to determine if there are changes in the target problem relative to baseline phase data patterns (Rubin & Babbie, 2000). A simple interrupted time series design is a quasi-experimental procedure in which the dependent variable is observed for some period of time before, and then after a "treatment" is introduced. One limitation in an interrupted times series design such as the AB design is that the design does not have a sufficient level of internal validity to make inferences of causality (Cook & Campbell).

The purpose of the data analysis in an interrupted time series design is "to assess the magnitude and statistical significance of any shifts in the series following the interruption"

(Cook & Campbell, 1979, p. 233). In this study, the interruption pertained specifically to the implementation of the restraint reduction policy. The timing of the policy change was November 2001, the 23rd month in the observation. Monthly restraints data from January 2000 and ending in December 2003 were used. The data for the 22 months before the intervention's (i.e., the policy change) possible effects served as the baseline, or A phase, data, and the data for the 26 months after the policy change served as the treatment or B phase data in this design.

Subjects

The focus of this dissertation was the rate of restraints of children and adolescents in a single residential treatment center in the southeastern United States which implemented a policy intended to reduce the use of physical restraints. The facility was chosen through purposive sampling. Only aggregate data on physical restraint in the facility were used. The agency was a non-profit residential treatment center that provided residential care for emotionally disturbed children and adolescents.

Variables

This study examined the relationship between a change in agency policy on the use of physical restraint with the rate of physical restraint per resident per month. The independent variable in this study was the specific policy in place concerning the use of physical restraint and was a categorical variable with two levels: the baseline phase policy was such that physical restraint was allowed as a means of managing children's aggressive and difficult behaviors. During this phase physical restraint was the main intervention used in dealing with children's aggression; to prevent injury or property damage; and to gain physical control of clients deemed to be out of control. The treatment phase policy was a restraint reduction policy intended to reduce the rate of physical restraint by the use of verbal de-escalation techniques, in lieu of

physical restraint, for managing children's aggressive and difficult behaviors. This new policy mandated that the use of physical restraint be limited to life-or-death situations only, such as when a child was about to harm or kill himself or somebody else.

Definition of Terms

Dependent Variable

The dependent variable in this study was the rate of physical restraint per resident per month. It was computed by dividing the total number of restraints in a particular month by the total number of clients resident in the facility for that month.

Physical restraint was defined as the application of physical force by one or more agency staff used to reduce, restrict, or immobilize the ability of an individual client to move his/her arms, legs, or head (Children's Health Act, 2000). In this study, it involved two staff members' use of physical contact and/or force – under supervision - in order to restrict or control the physical movement of a child.

Independent Variable

The independent variable of this study was the policy in place in the agency regarding the use of physical restraint. During baseline physical restraint was allowed. During the treatment phase of the study verbal de-escalation was emphasized in lieu of physical restraint. The agency policy during this phase was that physical restraint be used only as a last resort due to an imminent risk of harm or death to a child, staff member, or other person. Moreover, verbal de-escalation techniques were the main interventions used with children exhibiting aggressive behaviors, while physical restraint was only used when verbal de-escalation techniques had been attempted unsuccessfully. The use of physical restraint required three people, with one of them a supervisor.

Use of verbal de-escalation is a nonrestrictive intervention that uses behavioral and communication techniques such as verbal prompting, deescalating, and modeling to de-escalate a child's anger and ultimately help the child gain self-control. It focuses on prevention and the early intervention of a child's aggressive behavior through verbal intervention to prevent a crisis situation from occurring. Therefore, it presumably minimizes the need for the use of physical restraint. This intervention involves the following approaches: 1) structuring the environment to provide a safe and secure environment to the child; 2) listening to encourage the child to open up and discuss internal conflicts; 3) directing the child to learn a new behavior; 4) building a relationship with the child; and 5) teaching the child new ways of coping with crisis. Nonverbal techniques such as the use of silence, facial expression, tone of voice, and eye contact are used to help prevent an agitated child from having a violent outburst. Encouraging and eliciting techniques are also used to encourage the child to talk. These include the use of minimal encouragers, door openers, closed questions, open questions, and why questions. The use of reflecting techniques such as reflective responses and summarization helps the child to de-escalate and sort out what he/she is feeling. Active listening is used to understand a child's feelings, which encourages an upset child to talk out rather than act out. Other techniques used are isolating the young person in a potentially violent situation; speaking calmly, assertively, and respectfully to the child; statements of understanding should precede requests; introducing positive outcomes to positive behavior; and giving the young person enough time and space to reduce the pressure of the situation and help him/her consider the issue at hand and think about their choices (Nunno, 2001).

Data Collection

This research was conducted using aggregate data of restraint incidences supplied to the researcher by the agency. There were no identifying information of any kind with the data that would allow anyone to link any restraint event to a particular client. This research abided by the guidelines of the University of Tennessee Human Subjects Review requirements (Appendix A). The data on the counts of monthly restraints and numbers of clients in the agency were given to the researcher by the head of the agency in an email, and these data were stored on the researcher's personal computer in a password protected file. Prior to that, the researcher met several times with key persons in the agency to gather relevant information about the agency policies and their implementation. After permission to conduct the research was obtained from the president of the agency, and upon IRB approval, an analysis of restraints data was done.

Data Analysis

Since this study used time-series observations, a procedure termed the *combined transfer function disturbance model* by Box, Jenkins, and Reinsel (2008). This methodology involves the combination of regression techniques with autoregressive integrated moving average (ARIMA) models used to analyze the residuals from the regression model. An interrupted time series analysis, following methods detailed by Ostrom (1990) compared the rate of restraints per resident per month during baseline with that during the intervention period. Data were analyzed using SPSS 16 for windows, and a significance level of $p \leq .05$ (two-tailed) was used to analyze the relationship between the type of policy on physical restraint and the rate of physical restraint. The time series analysis approach described by Ostrom (1990) was used, with the ARIMA analysis of residuals following methods described by McClain & McCleary (1979).

CHAPTER 1V

RESULTS

In doing time series analysis, the researcher needs to model the autocorrelation structure of the data – in the present case the residuals from a regression model - prior to testing any hypothesis about the effect of an intervention (McCain & McCleary, 1979; Ostrom, 1990). This is done by modeling the stochastic or "noise" component, in this case the residuals from the regression model, so that it can be described by an ARIMA (*p, d, q*) model, where *p* is the autoregressive order of the model, *d* is the number of differencing operations needed to make the time series stationary, and *q* is the moving average order of the model. The procedure involves three steps: identification, estimation, and diagnosis. These steps are repeated until an appropriate ARIMA model is identified. The autocorrelation function (ACF) and partial autocorrelation function (PACF) are used to identify a tentative model. The need for the use of values of *p, d,* and/or *q* are hypothesized using an analysis procedure called *identification*. The parameters of the tentative ARIMA model are then *estimated* with the use of some computer software, such as SPSS 16 for the time series data in this study. The last step is to *diagnose* the adequacy of the ARIMA model with the use of the ACF and PACF for the residuals of the model identified. The purpose of the diagnosis stage is to check whether the residuals appear to be distributed as white noise; that is, as a random distribution of residuals. If the residuals appear to be distributed as white noise, the modeling phase is halted; if they do not, the process if identification, estimation, and diagnosis is repeated until an adequate ARIMA (*p, d, q*) model is generated for the regression residuals (McCain & McCleary; Ostrom).

Interrupted Time-Series Data on Restraints (January 2000-December 2003)

The time series data graphed in Figure 1 shows the average rate of restraints per resident each month, from January 2000 to December 2003. The time series is 48 months long. The first 22 months where physical restraint was the policy in dealing with children's aggressive and difficult behaviors is the baseline, and the 26 months immediately following it when the policy shifted to the use of verbal de-escalation techniques is the intervention or treatment phase. In November 2001, the 23rd month of the series, the new policy on the use of verbal de-escalation in dealing with aggressive and difficult children's behavior was implemented.
This is indicated by the broken line in the graph. The phase means are shown in this graph (the horizontal dashed lines).

The change in the level of the time series was not visually apparent on the 23rd month where the interruption of the series took place. There was just a slight drop on the time series on the 23rd month, the start of the intervention phase, suggesting a little bit of delay in the actual implementation of the new policy. Staff may have been resistant to the new policy or were adjusting in its implementation. Transition to the new policy would have possibly been met with some resistance from the staff, who got so used to their old ways of restraining residents. Then it was followed by an abrupt drop on the rate of restraints by the 24th month. The drop on the rate of restraints per resident was quite noticeable on the 24th month of the series - about half a restraint per resident, as compared with 1.5 during the 21st and 22nd months. It was notable that there was a shift in the pattern of the rate of restraints between the baseline and treatment phase, specifically a downward shift on the rate of restraints under the new policy of verbal de-escalation. The new policy on the use of verbal de-escalation was associated with a reduction in

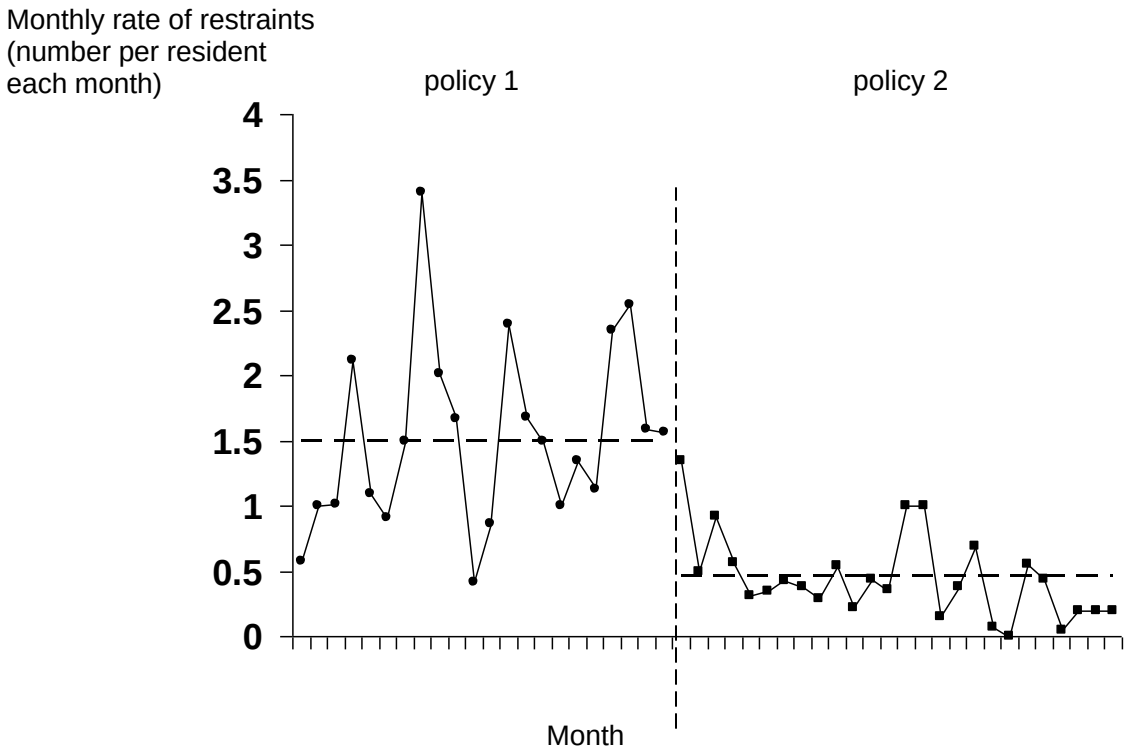

Figure 1. Interrupted time-series data on restraints from January 2000-December 2003.

Note: Dashed lines show phase means.

the monthly rate of physical restraints as shown by the downward trend in the graph during the treatment period.

Ordinary Least Squares Regression Model (ARIMA 0,0,0)

Following Ostrom (1990), the first step in the analysis was to fit the simplest model to the residuals from an Ordinary Least Squares (OLS) Regression model, which was an ARIMA (0,0,0), or a white noise, model. Rate of restraint per resident each month was used as the dependent variable in an OLS regression analysis, with treatment or policy as the independent variable. Treatment, which was also referred to as "policy," was coded as either 0 (the use of physical restraint as policy during baseline) or 1 (the use of verbal de-escalation as policy during the treatment phase). Table 1 shows that the Ljung-Box goodness of fit *Q*- statistic for this model was statistically nonsignificant, suggesting that the model was consistent with the data. The results from this OLS model, shown in Table 2, suggested that the policy change was associated with a statistically significant decrease in rate of restraint in the facility.

The second step in the analysis was to diagnose the autocorrelation structure of the unstandardized residuals from this OLS regression model. In assessing the autocorrelation structure in a time series, one needs to go back about 25 percent the length of the time series McClean & McCleary, 1979). Since this time series had 48 observations, 25 % of that time series was 12; hence the ACF and PACF were estimated for 12 lags.

Table 3 is a table of autocorrelations up to 12-lags for the residuals from the OLS regression model. The Box-Ljung statistic, which tests the hypothesis that the residuals were distributed as white noise, was statistically significant , Box-Ljung = 22.1, 12df, $p < .05$. These results suggested that some form of autocorrelation existed in the OLS residuals. The autocorrelation of the residuals in this time series suggested that the ARIMA(0,0,0) model for the

Table 1

Regression With ARIMA (0,0,0) Residuals Model Results

dependent variable	Number of Predictors	Model Fit statistics	Ljung-Box Q(18)			Number of Outliers
		Stationary R-squared	Statistics	DF	Sig.	
Rate of restraint	1	.511	27.622	18	.068	0

Table 2

Regression With ARIMA (0,0,0) Residuals Model Parameter Estimates

				Estimate	SE	t	Sig.
Baseline rate of restraint		No Transfor-mation	Constant	1.529	.115	13.293	.000
	Treat-ment	No Transfor-mation	Policy Change	-1.084	.156	-6.938	.000

Table 3

Autocorrelations for the Residuals From the Regression Model With ARIMA (0,0,0) Model for Residuals

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.206	.140	2.169	1	.141
2	-.207	.138	4.403	2	.111
3	-.242	.137	7.516	3	.057
4	.098	.135	8.037	4	.090
5	.173	.134	9.716	5	.084
6	.103	.132	10.317	6	.112
7	-.236	.131	13.567	7	.059
8	-.317	.129	19.591	8	.012
9	-.057	.127	19.791	9	.019
10	.102	.126	20.445	10	.025
11	.152	.124	21.942	11	.025
12	.048	.122	22.093	12	.036

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

OLS regression model residuals in tables 1 and 2 was not adequate for the data.

The next step in the analysis was to identify a tentative ARIMA (*p, d, q*) model for the OLS residuals. The graph of the autocorrelation function (ACF) for the residuals from the OLS regression model is shown in Figure 2. There was only a single statistically significant autocorrelation (lag-8). The confidence intervals in this figure were wide due to the small set of data used in the analysis, so the tests of these autocorrelations were low power. There were no significant spikes in the first few lags of the ACF, which would have helped determine if the time series was a moving average process. The ACF was somewhat suggestive of a sinusoidal pattern, though not one that decayed from statistically significant spikes at early lags. The patterns in the ACF were neither suggestive of an autoregressive nor of a moving average process. This ambiguity was a possible consequence of the short time series (McCain & McCleary, 1979).

The graph of the partial autocorrelation function (PACF) for the residuals (see Figure 3) from the OLS regression model also showed no particular pattern, making it hard to identify a tentative ARIMA (*p, d, q*) model. There were no clear patterns in either the ACF or the PACF that suggested whether the residuals time series was autoregressive or moving average. This time series, however, had only 48 observations; hence identifying the pattern of the residuals from the graphs (see Figures 2 & 3) was difficult. The graphs of the ACF and PACF of the residuals were inconclusive. Overall, these results suggested that the regular regression model (ARIMA 0,0,0) did not quite fit well the data. There may also be some possible autocorrelation of the residuals, as suggested by the Box-Ljung statistic in Table 3.

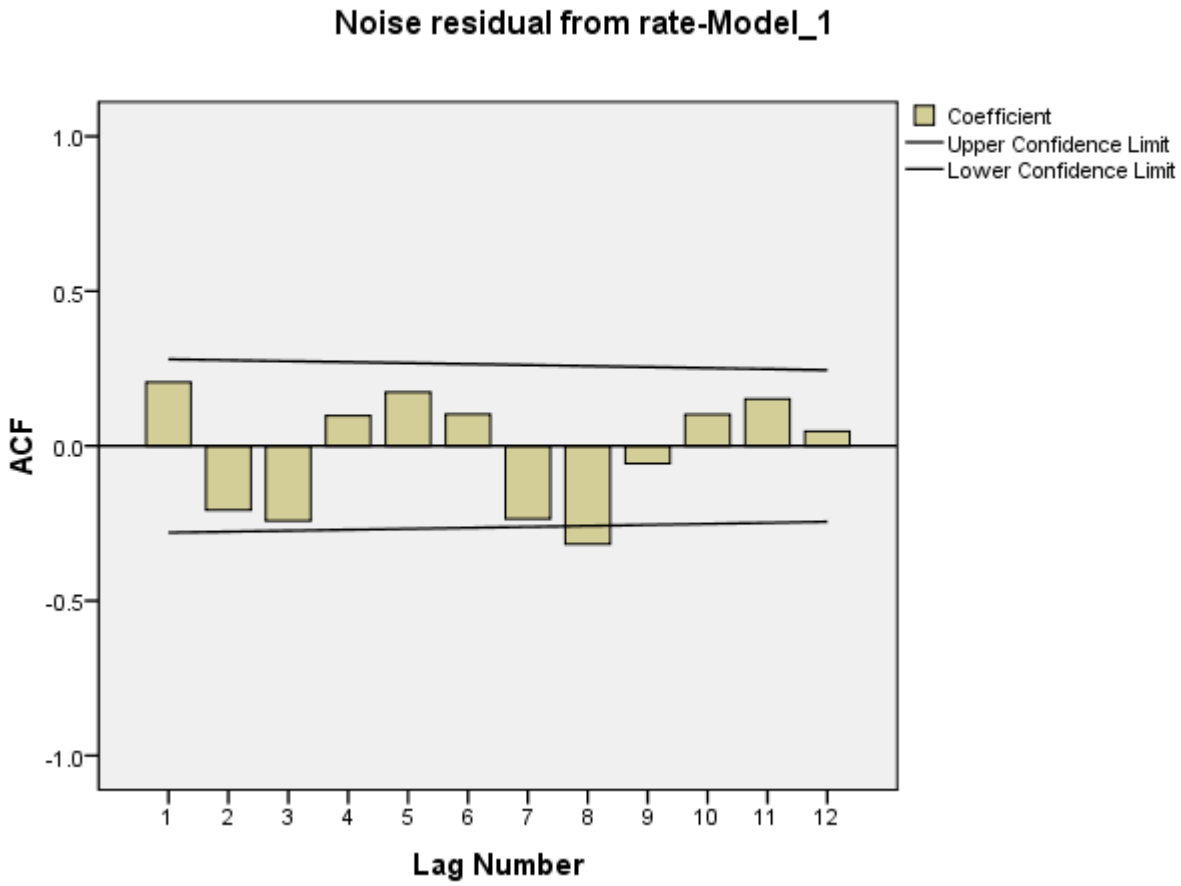

Figure 2. Autocorrelation function (ACF) for the unstandardized residuals from the regression with ARIMA (0,0,0) residuals model.

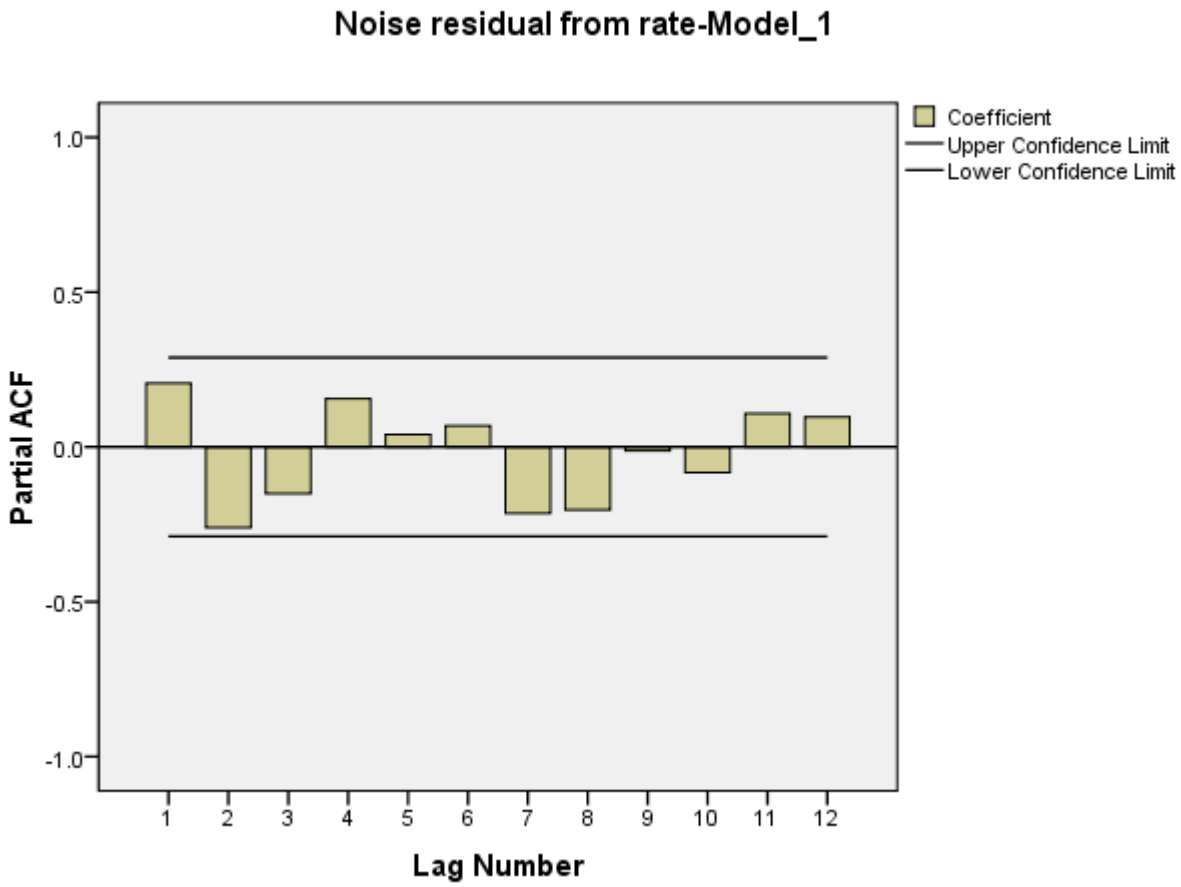

Figure 3. Partial autocorrelation function (PACF) for the unstandardized residuals from the regression with ARIMA (0,0,0) residuals model.

Lag-1 Autoregressive Model (ARIMA 1,0,0)

Since it was hard to determine whether the time series was autoregressive or moving average using the ACF and PACF, a trial and error approach was used to identify a model for the residuals. One of the simplest models to fit was an ARIMA (1,0,0), or a lag-1 autoregressive model. It was a fairly simple model and a reasonable one to start with. It was important to start with the smallest possible values of *p* (autoregressive order) or *q* (moving average order) for reasons of parsimony and because if errors in the model are made, these will show up in the subsequent diagnosis if one underestimated them. The error may not be detected, however, if one overestimated the value of p or q (McCain & McCleary, 1979).

After refitting the regression model by modeling the autocorrelation in the residuals by an ARIMA (1,0,0), or a lag-1 autoregressive model, the *Q*- statistic (see Table 4) suggested that the model fit the data better than the OLS regression model with white noise residuals, with a Chi-square of 22.870 with 17 degrees of freedom (p= .154). The estimated lag-1 autoregressive parameter in Table 5 approached but did not reach statistical significance.

The rate of restraints per resident each month during the time period (baseline) in which the agency policy allowed the use physical restraint to deal with children's aggressive and difficult behaviors (see Table 5) was about 1 ½ restraints per resident each month, t =10.459, p < .001. During the treatment phase when the agency policy shifted to the use of verbal de-escalation techniques instead of physical restraint, there was a decrease of about one restraint/child/month, t = -5.410, p <.001, two-tailed. These results suggested that the mean number of restraints per child each month during the treatment phase was less than one half (.453) that of the first time period (baseline). The research hypothesis that a reduction in the monthly rate of physical restraints per child is associated with the implementation of the restraint

Table 4

Regression With ARIMA (1,0,0) Residuals Model Results

	Number of Predictors	Model Fit statistics	Ljung-Box Q(18)			Number of Outliers
		Stationary R-squared	Statistics	DF	Sig.	
rate-Model_1	1	.533	22.870	17	.154	0

Table 5

Regression With ARIMA (1,0,0) Residuals Model Parameter Estimates

				Estimate	SE	t	Sig.
Rate-Model_1	Baseline rate	No Transfor-mation	Constant	1.503	.144	10.459	.000
			Auto-Regressive Lag 1	.221	.146	1.519	.136
	Treat-ment	No Transfor-mation	Policy Change	-1.050	.194	-5.410	.000

reduction policy was thus supported by these findings.

Table 6 is a table of autocorrelations for the residuals from this ARIMA (1,0,0) model. The lag 12 Box-Ljung statistic of 17.151 with 12 degrees of freedom was not statistically significant (p = .144), suggesting that the residuals from the ARIMA (1,0,0) model were consistent with white noise. The tentative ARIMA (1,0,0) model thus seemed to fit the data better than the simple OLS regression model with ARIMA(0,0,0) residuals model.

The last step in the analysis was to diagnose the adequacy of the model by examining the ACF and PACF for the residuals of the tentative model identified (ARIMA 1,0,0). A visual inspection of the plots of the ACF and PACF for the residuals also indicated that the model was adequate (see Figures 4 & 5). All of the values of the ACF, except lag-8, lie within the plotted confidence limits, with no significant spikes at the early lags. All of the values of the PACF, on the other hand, fell within the plotted confidence limits, indicative of what is known as a "white noise" process.

Lag-1 Moving Average Model (ARIMA 0,0,1)

The next step in the analysis was to explore alternative models that may also fit the data. The next simple model fit to the data was a lag-1 moving average, or an ARIMA (0,0,1) model. It was important to test if changing the model would lead to different results. This is a way to consider alternative explanations for the results and is a form of "sensitivity analysis;" that is, of assessing whether different ARIMA models for the OLS residuals led to different conclusions about the effects of the policy change. If changing the ARIMA model leads to different results, then it can be concluded that the particular model used to represent the data makes a big difference in results and so the conclusions about the effect of the policy change are sensitive to the analysis method used. After refitting the data by using an ARIMA (0,0,1) or a lag-1 moving

Table 6

Autocorrelations for the Residuals From the Regression Model With ARIMA (1,0,0) Residuals Model

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.047	.140	.113	1	.737
2	-.214	.138	2.513	2	.285
3	-.236	.137	5.478	3	.140
4	.124	.135	6.318	4	.177
5	.145	.134	7.497	5	.186
6	.128	.132	8.434	6	.208
7	-.203	.131	10.857	7	.145
8	-.278	.129	15.493	8	.050
9	-.014	.127	15.505	9	.078
10	.087	.126	15.978	10	.100
11	.133	.124	17.127	11	.104
12	.019	.122	17.151	12	.144

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

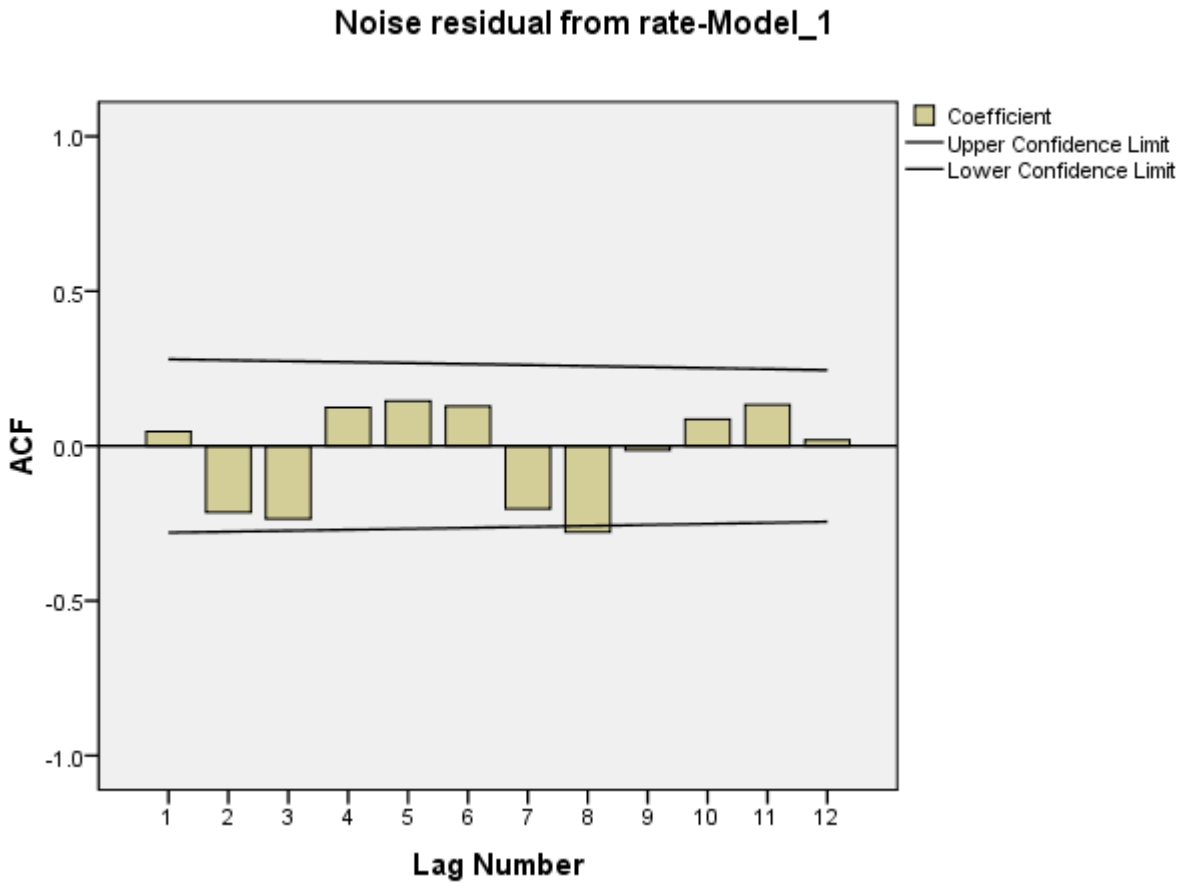

Figure 4. Autocorrelation function (ACF) for the unstandardized residuals from the regression model with ARIMA (1,0,0) residuals model.

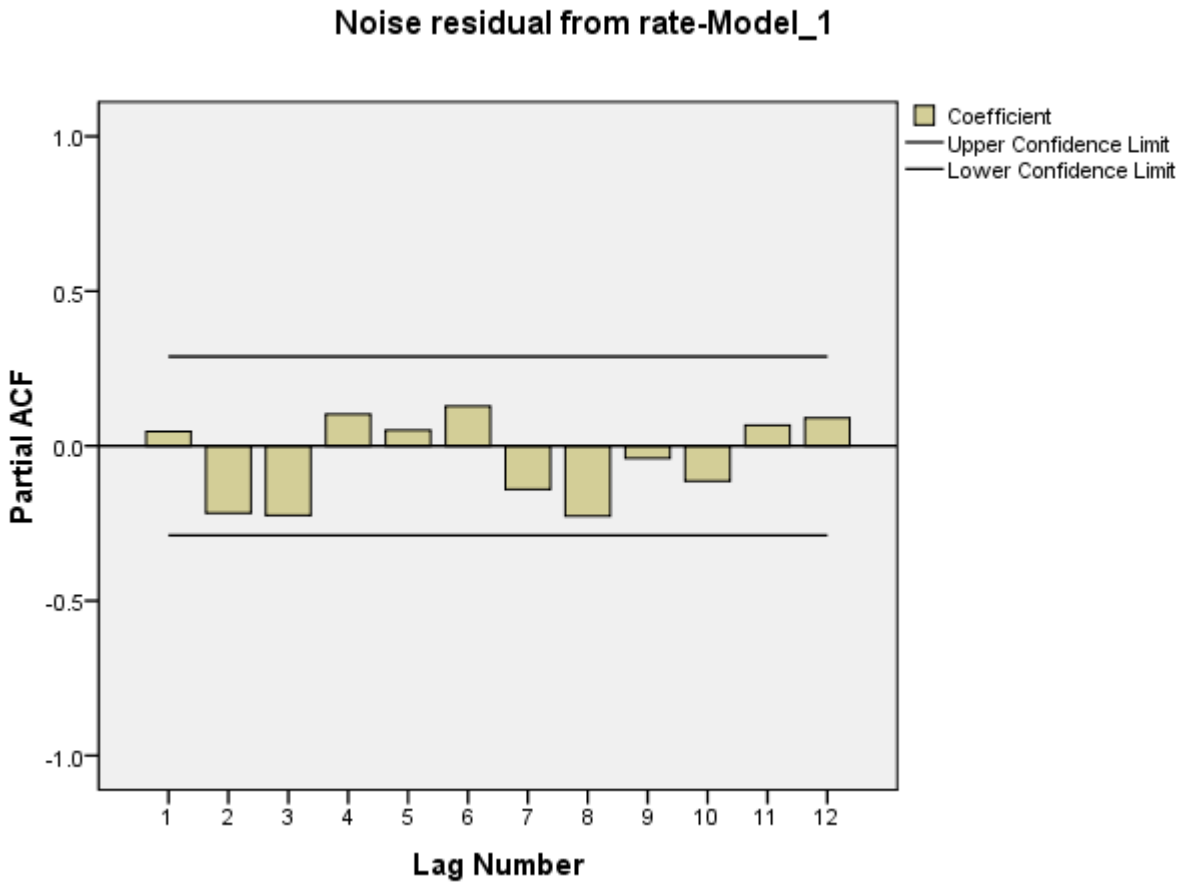

Figure 5. Partial autocorrelation function (PACF) for the unstandardized residuals from the regression model with ARIMA (1,0,0) residuals model.

average model to represent the OLS residuals (see Table 7), the *Q*- statistic suggested that this model also fit the data, with a Chi- square of 20.632 with 17 degrees of freedom (p =.243). The The lag-1 moving average term as shown in Table 8 was statistically significant (p =.047), as compared with the lag-1 autoregressive term (see Table 5), which was not statistically significant (p=.136).

These results suggested that the better fitting model for these data was the ARIMA (0,0,1), or a lag-1 moving average (see Table 8). Based upon this model, the rate of restraints per resident each month during baseline where physical restraint was allowed/emphasized to control children's behavior was 1 ½ restraints per resident each month (Estimate=1.502, *SE*=.143, *t*=10.484, p < .001). These findings were identical with the 1 ½ rate of restraints when a lag-1 autoregressive model was used (see Table 5).

During the treatment phase when the agency shifted their policy to the use of verbal de-escalation techniques, there was a decrease of about 1 restraint/child/month (Estimate= -1.047, *SE*= .194, *t*= -5.407, p <.001, two-tailed). This finding was virtually identical with the result from the lag-1 autoregressive model in Table 5, where there was a decrease of about one restraint per child each month during that period of time when the agency emphasized the use of verbal de-escalation.

Results also showed that the mean number of restraints per child each month during the treatment phase was less than one half (.455). This was computed by subtracting the reduction rate during treatment (mean rate of restraints during time period 2 where the policy was the use of verbal de-escalation) from the baseline rate (mean rate of restraints during time period 1 where the policy allowed the use of physical restraint): 1.502+ (-1.047) = 0.455. That number indicated that the mean number of restraints per child each month during the implementation of

Table 7

Regression With ARIMA (0,0,1) Residuals Model Results

Model	Number of Predictors	Model Fit statistics	Ljung-Box Q(18)			Number of Outliers
		Stationary R-squared	Statistics	DF	Sig.	
rate-Model_1	1	.543	20.632	17	.243	0

Table 8

Regression With ARIMA (0,0,1) Residuals Model Parameter Estimates

				Estimate	SE	t	Sig.
Rate-Model_1	Baseline rate	No Transfor-mation	Constant	1.502	.143	10.484	.000
			Moving-Average Lag 1	-.293	.143	-2.042	.047
	Treat-ment	No Transfor-mation	Policy Change	-1.047	.194	-5.407	.000

the new policy of restraint reduction during the treatment phase was less than one half. An almost identical finding was indicated when a lag-1 autoregressive model was used (see Table 5), where the man rate of restraint per child each month during the implementation of the new policy was -.453, or less than one half restraint per resident each month also. Hence, the model used to represent the OLS residuals did not appear to be associated with substantially different findings.

The next step in the analysis was to examine the residuals of the lag-1 moving average model (see Table 9). If the model was adequate, there should be no evidence of autocorrelation in the residuals. The lag-12 Box-Ljung statistic of 13.712 with 12 degrees of freedom was not statistically significant (p= .319). All the lags from 1 through 12 were nowhere near being statistically significant, suggesting that there was no significant autocorrelation in the residuals, and that the autocorrelation had been adequately represented by this model. It also suggested that the lag-1 moving average model left residuals that were consistent with white noise.

An examination of the plots of the ACF and PACF for the residuals in Figures 6 & 7 suggested that they were also consistent with white noise. All of the values of both the ACF and PACF lie within the plotted confidence limits, suggestive of a "white noise" process. Their ACF was also uniformly zero for all lags. These results suggested that the ARIMA (0,0,1) model adequately fit the data.

Table 9

Autocorrelations for the Residuals From the Regression Model With ARIMA (0,0,1) Residuals Model

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	-.024	.140	.030	1	.863
2	-.129	.138	.895	2	.639
3	-.233	.137	3.797	3	.284
4	.135	.135	4.788	4	.310
5	.103	.134	5.379	5	.371
6	.125	.132	6.265	6	.394
7	-.190	.131	8.389	7	.300
8	-.257	.129	12.357	8	.136
9	-.004	.127	12.358	9	.194
10	.064	.126	12.619	10	.246
11	.130	.124	13.709	11	.250
12	.007	.122	13.712	12	.319

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

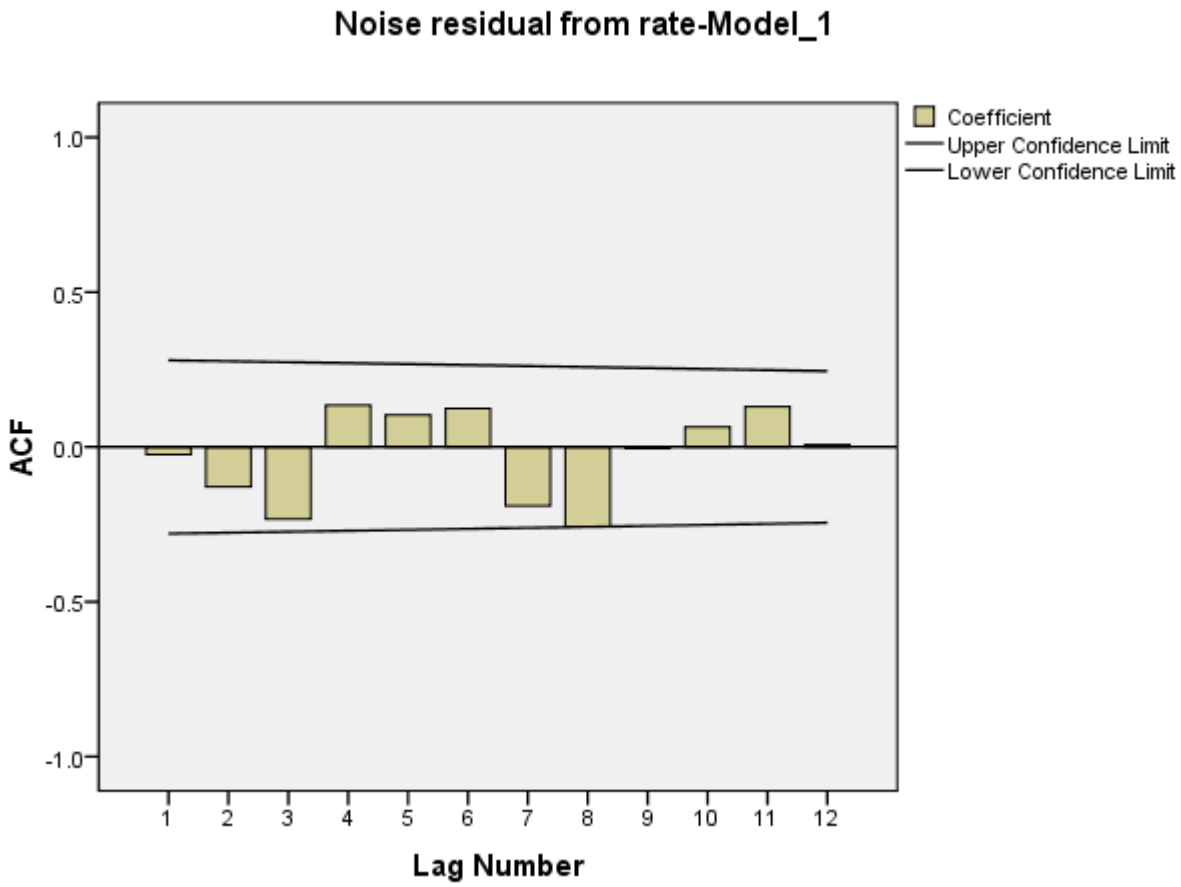

Figure 6. Autocorrelation function (ACF) for the unstandardized residuals from the regression model with ARIMA (0,0,1) residuals model.

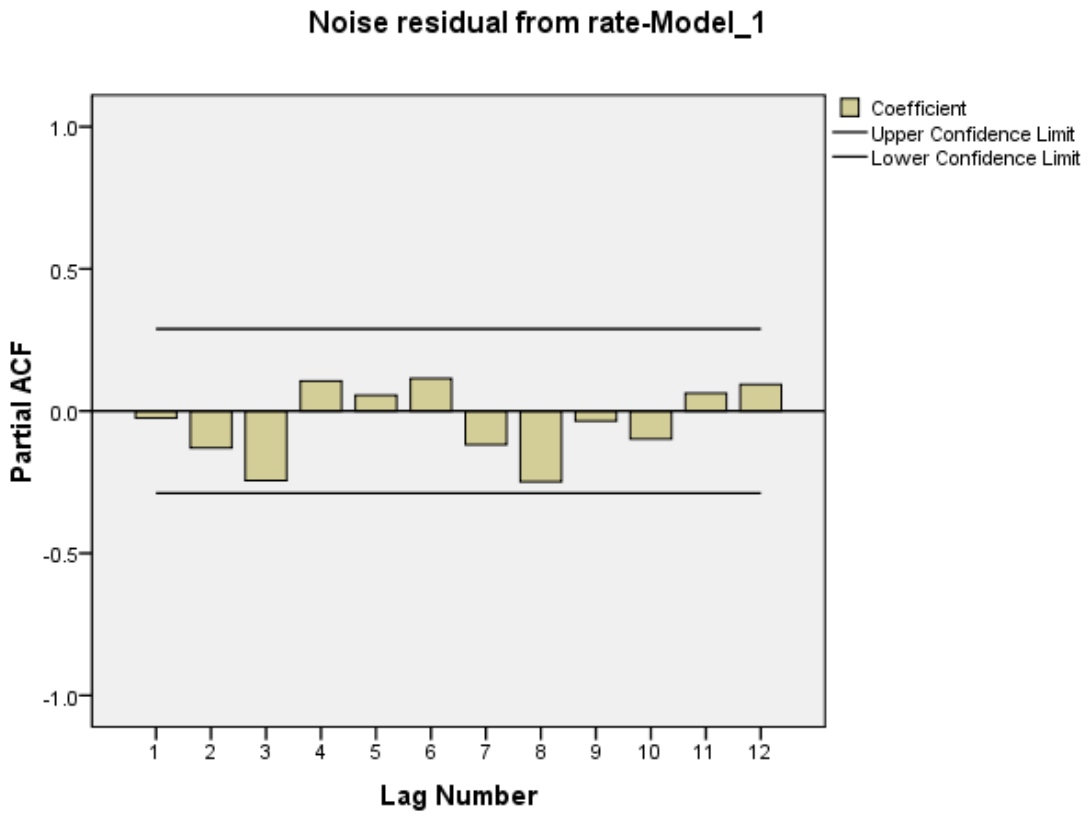

Figure 7. Partial autocorrelation function (PACF) for the unstandardized residuals from the regression model with ARIMA (0,0,1) residuals model.

CHAPTER V

DISCUSSION

Overview of Significant Findings

A regression model with two tentative ARIMA models for the residuals from the regression model - an ARIMA (1,0,0) or a lag-1 autoregressive model, and an ARIMA (0,0,1) or a lag-1 moving average model - were used to model the autocorrelation structure of the residuals from the interrupted time series analysis of the restraint data. Although it appeared that the lag-1 moving average model was the better-fitting model for these data, results suggested that the model used to represent the autocorrelation structure of the residuals from the regression analysis of the interrupted time series data did not make any difference in the results of the test of the effects of the change in policy. The results of analyses using both residuals models suggested that there was a statistically significant decrease of about one restraint/child/month when the new policy of verbal de-escalation was implemented during the treatment phase. Under the old policy of physical restraint use, children were being restrained an average of 1.5 times per month, but under the new policy of restraint reduction, children were, on the average, receiving less than one half restraint every month. There was an immediate decrease (or a "step-function" transfer function; McCain & McCleary, 1979) in the mean rate of restraints when the restraint reduction policy was implemented. The research hypothesis that a reduction in the monthly rate of physical restraints per child was associated with the implementation of the restraint reduction policy was thus supported by these findings.

These findings suggested that the results of the analysis of the time series data from this study were robust in a statistical sense because both models converged on the same conclusion. The estimated decrease in physical restraint rate was about the same regardless of which model

was used to represent the autocorrelation structure of the residuals. The implementation of the restraint reduction policy was associated with about a 70% reduction in the rate of physical restraint. These results of this study clearly indicated that a significant reduction in the rate of physical restraints was associated with the implementation of the restraint reduction policy.

Limitations of the Study

Although the new policy on restraint reduction was associated with a decrease in the use of restraints, the interrupted time series design was not strong enough in terms of internal validity to rule out other alternative causes, such as, in particular, history (Cook & Campbell, 1979). Other current events (other than the policy change) that happened either in or outside of the agency could, in part or in total, have caused the reduction in restraints. Although the implementation of the restraint reduction policy was associated with a reduction in the rate of physical restraint, it was not possible for the analyst to assess other important factors influencing the dependent variable (rate of restraint) at different time points which could have accounted for the reduction in the use of physical restraint. There was a problem associated with the level of internal validity in this study, as the simple interrupted time- series design is weak at controlling for threats to internal validity. The external validity of the current study was also limited as the study only used the data from one residential treatment center.

The small number of time series observation used in the current study made it difficult to use the ARIMA modeling procedures for modeling the autocorrelation in the OLS regression residuals. An accurate identification of these autocorrelation patterns requires a relatively long time series. Identifying the autocorrelation structures in the residuals from the model fitted to the data suffered from relatively low power. Hence, there was a problem with low power associated with the identification of the autocorrelation structure of the residuals from the regression model.

Using a complex statistical procedure with a small number of observations also runs the risk of mispecifying the model, which can produce erroneous statistically significant results as well as residuals that show some form of autocorrelation. The risk of overfitting statistical models to single case design is greater with short time series.

Treatment fidelity was also a cause for concern, as it was impossible to verify whether the two policies were implemented correctly and consistently by the staff members since the data were ex post facto. The researcher did not actually observe how the two policies were implemented and how physical restraint occurrences were carried out and recorded. Since the data had been collected already by the agency, the quality and quantity of the data used in this study was also dependent on the quality with which the data were gathered by the agency. It was not possible to verify the accuracy of the data on physical restraints or how these were recorded, or how these records were kept. A related limitation concerns the degree to which the verbal de-escalation methods were used during episodes in which residents became angry or disruptive. Hence, if were to be assumed that the policy change was responsible for the decrease in use of physical restraint, there would be several possibilities as to what was the cause of the decrease: (1) the knowledge by staff that physical restraint was discouraged; (2) the use of the verbal de-escalation techniques; (3) a change in the climate in the facility associated with the policy change that led to less frequent disruptive episodes by clients; or (4) some combination of these. If it were to be assumed that the policy change caused the decrease, there would still be ambiguity as to the operative mechanism responsible for the change.

While the results of this study should be interpreted within the context of these limitations, the results clearly suggested a large decrease in the rate of restraint associated with

the implementation of the new policy. These findings suggest that agency efforts to decrease the rate at which physical restraints are used in a residential setting can be very effective.

Implications for Policy

Any organization serving seriously disturbed children and adolescents should adopt a policy of least restrictive intervention before considering the use of physical restraint in response to acute and emergency situations (Kennedy & Mohr, 2001; Mohr et al., 1998). As demonstrated by this study, the implementation of an organizational-level restraint reduction policy can be associated with a decrease in the use of physical restraint with children and adolescents. The new policy on the use of verbal de-escalation may be associated with changes in staff behavior, which may result in the reduction of this harmful practice with children in residential care. Specific changes in policy, with specific intended changes in staff behavior, may be be effective if properly implemented. Assuming that the verbal de-escalation techniques were used properly and consistently during the treatment phase in the current dissertation, then it can it is clearly possible that the use of verbal de-escalation may cause a decrease in the use of physical restraints. This possibility needs to be studied further in future research.

There is a need for administrators to evaluate the impact of implementing Therapeutic Crisis Intervention (TCI) training program and its associated prevention and de-escalation strategies. This can be done by measuring staff members' knowledge, attitudes, skills, and confidence in dealing with children who are upset or in crisis, as well as the extent to which TCI methods are actually implemented during crisis episodes. Administrators should assess the impact of their crisis intervention system to know if staff members are actually utilizing TCI concepts and skills. Since TCI is designed to increase staff members' skills, knowledge, and confidence in responding to both the behavior and feelings of children when they are upset or

destructive (Cornell University, 2003; Nunno, 2001), it is vital that administrators measure the improvements in the staff's knowledge and skills levels, as well as their use of the TCI skills in responding to these children. Adequate staff training, education, supervision, and monitoring are the most effective means of ensuring consistency of the therapeutic treatment of children in residential settings.

This implies that staff members working directly with children in residential care must be carefully screened, selected, and trained on how to deal effectively with children and adolescents in crisis. Newly hired staff members should immediately undergo training on prevention and verbal de-escalation strategies even before they develop a mindset of restraints. Institutionalizing the approach in the organization by training the supervisors in TCI who in turn trained the staff directly working with children had a big impact on changing the organization's culture regarding the mindset to control a child by the use of physical restraint.

Federal policies on the use of physical restraint have made residential programs more aware of the need for a change from a control-oriented environment to a more positive, relationship-based way of working with children in residential care. Changing the organizational culture and mindset regarding the use of physical restraint starts from the leadership, commitment, and dedication of agency administrators, in keeping with state and federal policies. The Children's Health Act (2000) guarantees the rights of children and youth in certain community-based facilities to be free from restraints imposed for the purposes of discipline or convenience by the staff. Restraints can be imposed only when less restrictive interventions have been attempted unsuccessfully. Focusing on clients' strengths rather than weaknesses and using positive, supportive approaches such as verbal de-escalation might therefore result to more

positive mental health outcomes for children in residential care who have already experienced abuse and trauma and have never learned effective and constructive ways of coping with stress.

Agency administrators should have a strong commitment to evaluating the effectiveness of the interventions used in their agency, as well as the effects of efforts to change how the agency functions. A strong research practice evaluation component is crucial if an agency administrator wants to know the effectiveness of services provided to children in residential care. Agency heads should send key staff members to undergo trainings on research and evaluation so that they will be equipped to conduct evaluation research in their agency. Evaluating the effects of organizational-level interventions by someone from within the agency could have the advantage of facilitating the research process since they have first-hand information and experience regarding program or policy implementation.

Implications for Practice

Practitioners need to keep count of how frequently verbal de-escalation methods are used and the frequency with which physical restraints are, and are not, used in crisis situations. These data should be recorded as a way of empirically validating the effectiveness of the use of verbal de-escalation as a method for avoiding the use of physical restraint. The staff members' ability to de-escalate a potential crisis with the use of verbal de-escalation techniques, which may therefore prevent the use of physical restraint, is an outcome measure that needs to be recorded consistently. Since one of the goals of TCI is to reduce the number of physical restraints with the use verbal de-escalation (Cornell University, 2003; Nunno, 2001), monitoring the number of successful resolution of crises by using verbal de-escalation is important.

The empirical literature overwhelmingly suggests that restraint is oftentimes precipitated by children's aggressive or violent behavior. Children's aggression should therefore be measured

upon entry to residential care and upon discharge to assess if significant gains were attained in reducing this behavior. Individualized treatment plans for each child should include their triggers to crisis, an event (or events) that upsets them and increases their level of stress. If the staff can intervene at the earliest possible stage of crisis, using the TCI methods, crisis may be prevented. The impact of verbal de-escalation techniques on a child's behavior should also be monitored. How the child or adolescent de-escalated himself or herself as a result of the staff's verbal intervention must be documented. If there are stage-specific interventions during the different stages of crisis, these should all be documented on each client's records. How the staff carried out the corresponding verbal de-escalation techniques at each stage of crisis and how the child responded to these techniques should be recorded. Change in the client's behavior as a result of verbal de-escalation should be carefully specified and documented. Practitioners should always examine the success of their interventions by specifying target behaviors in clients that need to be changed. Knowing the necessary behavioral management strategies at specific stages of pre-crisis and crisis situations may well equip staff to effectively deal with aggressive children's behavior and may help prevent unnecessary use of physical restraint.

There should be an adequate record keeping that monitors and records the day-to-day implementation of guidelines, procedures, and protocols regarding the use of verbal de-escalation and physical restraint for a more accountable practice. Staff members should always be guided by their agency policy concerning the appropriateness of physical restraint use. Knowing the appropriate techniques of a safe physical restraint can prevent unnecessary injury to both child and staff.

Lastly, a treatment plan review for children who are frequently involved in restraint incidents despite the overall reduction in restraints must also be conducted. It is most

likely that these children need additional intervention and follow up.

Implications for Research

Since this study is limited to one residential treatment center, one way to generalize its findings is to replicate this study in other residential settings in different geographic areas that have similar restraint reduction policies. If the results of this study are replicated in other agencies that used similar intervention with similar clients, evidence would exist that would support the generalizability of the findings of this study and would strengthen evidence for the effectiveness of the policy change for decreasing the use of restraints. However, it is recommended that a longer time series be utilized. One of the issues in the analysis of single case design data is the fact that practice and evaluation research almost always have relatively few observations. This problem can be remedied by getting the average number of restraints per resident each week that would result in more data points and a longer time series. Identifying an ARIMA (p,d,q) model would be a much easier task if one uses a longer time series with at least 50 baseline observations.

Conducting a "true" experiment where there is a random assignment of subjects to either an experimental or control group in order to evaluate program effectiveness in an agency setting is an almost impossible task, due to obvious ethical reasons. This dilemma can be remedied by using a single-case design such as that used in this study in order to evaluate the effects of intervention or policy changes. Multiple replications, as described by Kazdin (1982), can provide evidence approximating that from more rigorous experimental designs concerning the effects of efforts to reduce the use of physical restraint. Multiple baseline type designs are also recommended to increase internal validity (Kazdin, 1982).

One of the strengths of ARIMA modeling technique is its ability to represent complex patterns of autocorrelation in the time series data. Not dealing with autocorrelation in the data can cause problems in the statistical analysis that can result to erroneous conclusions. More research using interrupted time-series design should be conducted to evaluate the longitudinal effects of interventions with children in residential care.

Future research should also explore whether a change from the use of physical restraint to verbal de-escalation reduces aggressive behavior in children. This research should include measurement of the use of verbal de-escalation methods in crisis episodes as well as the use of physical restraint. Children's aggressive and violent behaviors should also be measured as outcome variables in these studies.

In addition, future research should focus on whether a change from use of physical restraint to use of verbal de-escalation leads to better mental health outcomes for children. Contrary to the use of restrictive behavioral management strategies such as physical restraint to control aggressive behavior, more positive staff behavior can have a significant effect on client behavior and can be effective in modifying a negative behavior (Glisson & Hemmelgarn, 1998; Patterson & Forgatch, 1985; Pelton & Wierson, 2002; Willner et al., 1977). If staff behavior does have a significant impact on the behavior of a client, then it is important to test whether more positive and supportive interventions such as verbal de-escalation can achieve the desired outcomes for these children. The severity of children's psychological disorders should be described and measured upon admission and discharge to test to see whether using verbal de-escalation instead of physical restraint would lead to more positive mental health outcomes for children in residential care.

Future research should also explore whether a change in the emphasis from use of physical restraint to the use of verbal de-escalation improves the relationship between staff and residents. Since the experience of being restrained has been viewed negatively by formerly restrained children and adults (Fink, 1994; Gallop et al., 1999; Johnson, 1998; Kennedy & Mohr, 2001; Lewis, 2002; Mohr et al., 1998), it would be crucial to know if using verbal de-escalation instead of physical restraint will improve the relationship between staff and residents.

Finally, the number of resident and staff injuries should also be investigated since one of the desired outcomes of verbal de-escalation is a reduction in the number of injuries to children and staff as a result of physical restraints that are misapplied, abusive, or inappropriate (Cornell University, 2003; Nunno, 2001). If using verbal de-escalation is a safer way of handling children, there should be a reduction in injuries both to residents and staff as a result of using this intervention. Other critical incident reports that are detrimental to the well-being of the child in residential care should also be monitored, such as: physical aggression towards other children and staff, verbal aggression, runaway, suicide, attempt of suicide, and use of law enforcement. The implementation of an intervention designed to teach staff how to properly respond to aggressive children and de-escalate crisis should result to a decrease in these critical incidents.

LIST OF REFERENCES

Allen, J. J. (2000). Seclusion and restraint of children: A literature review. *Child and Adolescent Psychiatric Nursing, 13* (4), 159-168.

Aschen, S. R. (1995). Restraints: Does position make a difference? *Issues in Mental Health Nursing, 16* (1), 87-92.

Bandura, A. (1973). *Aggression: A social learning analysis.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

Bandura, A. (1977). *Social learning theory.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

Bandura, A. (1986). *Social foundations of thought and action.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

Barlow, D. J. (1989). Therapeutic holding: Effective intervention with the aggressive child. *Journal of Psychosocial Nursing, 27* (1), 10-14.

Bath, H. (1994). The physical restraint of children: Is it therapeutic? *American Journal of Orthopsychiatry, 64* (1), 40-49.

Bell, L. (1997). The physical restraint of young people. *Child and Family Social Work, 2* (1), 37-47.

Box, G.E., & Jenkins, G.M (1976). *Time series analysis: Forecasting and control.* San Francisco, CA: Holden-Day Inc.

Box, G.E.P., Jenkins, G.M., & Reinsel, G.C. (2008). *Time series analysis: Forecasting and control.* New York: John Wiley.

Brown, E., Bullock, R., Hobson, C., & Little, M. (1998). *Making residential care work: Structure and culture and children's homes.* Aldershot; Brookfield, VT: Ashgate.

Children's Health Act, 42 USC Sec. 3208 (2000).

Cook, T., & Campbell, D. (1979). *Quasi-experimentation: Design and analysis issues for field settings.* Boston: Houghton Mifflin Company.

Cornell University. (2003). *Therapeutic crisis intervention system* (5th ed.). New York: Author.

Curtis, C. R. (1997). The use of physical restraint in residential treatment: An ego psychology perspective. *Residential Treatment for Children and Youth, 14* (3), 1-12.

Day, D. (2002). Examining the therapeutic utility of restraints and seclusion with children and youth: The role of theory and research in practice. *American Journal of Orthopsychiatry, 72* (2), 266-278.

Donovan, A., Siegel, L., Zera, G., Plant, R., & Martin, A. (2003). Seclusion and restraint reform: An initiative by a child and adolescent psychiatric hospital. *Psychiatric Services, 54* (7), 958-959.

Drisko, J. W. (1976). Memo to institution staff: Physical involvement with children- a therapeutic intervention. *Child Welfare, 55* (7), 469-477.

Drisko, J. W. (1981). Therapeutic use of physical restraint. *Child Care Quarterly, 10* (4), 318-328.

Dubin, W. (1989). The role of fantansies, countertransference and psychological defenses in patient violence. *Hospital and Community Psychiatry, 40,* 1280-1283.

Esther, R. (1997). Use of physical restraints in a nineteenth-century state hospital. *History of Psychiatry, 8* (29), 83-93.

Farragher, B. (2002). A system-wide approach to reducing incidents of therapeutic restraint. *Residential Treatment for Children and Youth, 20* (1), 1-15.

Fidone, G. (1988). Risks in physical restraint. *Hospital and Community Psychiatry, 39* (2), 203.

Fink, A. D. (1994). Children's perception of treatment acceptability (Doctoral dissertation, Hahnermann University, 1994). *Dissertation Abstracts International, 56* (5-B), 2862.

Fisher, W. A. (1994). Restraint and seclusion. A review of the literature. *American Journal of Psychiatry, 151* (11), 1584-1591.

Fisher, W. W., Piazza, C. C., Bowman, L. G., Hanley, G. P., & Adelinis, J. D. (1997). Direct and collateral effects of restraints and restraint fading. *Journal of Applied Behavior Analysis, 30*, 105-120.

Freud, S. (1989). *An outline of psycho-analysis* (J. Strachey, Trans.). New York: W.W. Norton & Company, Inc. (Original work published 1940)

Gair, D. (1980). Limit-setting and seclusion in the psychiatric hospital. *Psychiatric Opinion, 17,* 15-19.

Gallop, R., McCay, E., Guha, M., & Khan, P. (1999). The experience of hospitalization and restraint of women who have a history of childhood sexual abuse. *Health Care for Women International, 20,* 401-416,

Garrison, W. (1984). Aggressive behavior, seclusion and physical restraint in an inpatient child population. *Journal of the American Academy of Child Psychiatry, 23* (4), 448-452.

Garrison, W., Ecker, B., Friedman, M., Davidoff, R., Haeberle, K., & Wagner, M. (1990). Aggression and counteraggression during child psychiatric hospitalization. *Journal of the American Academy of Child and Adolescent Psychiatry, 29* (2), 242-250.

Glisson, C., & Hemmelgarn, A. (1998). The effects of organizational climate and interorganizational coordination on the quality and outcomes of children's service systems. *Child Abuse and Neglect,* 22(5), 401-421.

Goren, S. (1991). What are the considerations of the use of seclusion and restraint with children and adolescents? *Journal of Psychosocial Nursing, 29* (3), 32-33.

Goren, S., Abraham, I., & Doyle, N. (1996). Reducing violence in a child psychiatric hospital through planned organizational change. *Journal of Child and Adolescent Psychiatric Nursing, 9* (2), 27-38.

Goren, S., & Curtis, J. (1996). Staff members' beliefs about seclusion and restraint in child psychiatric hospitals. *Journal of Child and Adolescent Psychiatric Nursing, 9* (4), 7-14.

Goren, S., Singh, N., & Best, A. (1993). The aggression-coercion cycle: Use of seclusion and restraint in a child psychiatric hospital. *Journal of Child and Family Studies, 2* (1), 61-73.

Guirguis, E. (1978). Management of disturbed patients: An alternative to the use of mechanical restraints. *The Journal of Clinical Psychiatry, 39* (4), 295-303.

Hanwerk, M. L., Friman, P. C., Mott, M. A., & Stairs, J. M. (1998). The relationship between program restrictiveness and youth behavior problems. *Journal of Emotional and Behavioral Disorders, 6* (3), 170-180.

Harrell, E. F. (2000). Client characteristics as predictors of frequency of restraints in residential treatment (Doctoral dissertation, Temple University, 2000). *Dissertation Abstracts International, 61* (4-A), 1289.

Health Care Financing Administration (2001). Medicaid Program; Use of Restraint and Seclusion in Psychiatric Residential Treatment Facilities Providing Inpatient Psychiatric Services to Individuals Under Age 21. *Federal Register, 66* (99), Tuesday May 22, p. 28114.

Heyneman, E. (2003). The aggressive child. *Child and Adolescent Psychiatric Clinics of North America, 12* (4), 667-677.

Hunter, D. (1989). The use of physical restraint in managing out-of-control behavior in youth: A frontline perspective. *Child and Youth Care Quarterly, 18* (2), 141-154.

Jambunathan, J., & Bellaire, K. (1996). Evaluating staff use of crisis prevention intervention techniques: A pilot study. *Issues in Mental Health Nursing, 17,* 541-558.

Johnson, M.E. (1998). Being restrained: A study of power and powerlessness. *Issues in Mental Health Nursing, 19,* 191-206.

Jones, R., & Timbers, G. (2003). Minimizing the need for physical restraint and seclusion in residential youth care through skill-based treatment programming. *Families in Society, 84* (1), 21-29.

Jonikas, J.A., Cook, J. A., Rosen, C., Laris, A., & Kim, J.-B. (2004). A program to reduce use of physical restraint in psychiatric inpatient facilities. *Psychiatric Services, 55* (7), 818-820.

Kalogjera, I., Bedi, A., Watson, W., & Meyer, A. (1989). Impact of therapeutic management on use of seclusion and restraint with disruptive adolescent inpatients. *Hospital and Community Psychiatry, 40* (3), 280-285.

Kazdin, A. (1982). *Single case research designs: Methods for clinical and applied settings.* New York: Oxford University Press.

Kennedy, S.S., & Mohr, W. K. (2001). A prolegomenon on restraint of children: Implicating constitutional rights. *American Journal of Orthopsychiatry, 71* (1), 26-37.

LeBel, J., Stromberg, N., Duckworth, K., Kerzner, J., Goldstein, R., Weeks, M., et al. (2004). Child and adolescent inpatient restraint reduction: A state initiative to promote strength-based care. *Journal of the American Academy on Child and Adolescent Psychiatry, 43* (1), 37- 45.

Lewis, D. (2002). Responding to a violent incident: Physical restraint or anger management as therapeutic interventions. *Journal of Psychiatric and Mental Health Nursing, 9*, 57-63.

Lieberman, R. E. (2004). Future directions in residential treatment. *Child and Adolescent Psychiatric Clinics of North America, 13* (2), 279-294.

Luiselli, J. K., & Waldstein, N. (1994). Evaluation of restraint-elimination interventions for students with multiple disabilities in a pediatric nursing care setting. *Behavior Modification, 18* (3), 352-365.

Lyman, R.D., & Campbell, N.R. (1996). *Treating children and adolescents in residential and inpatient settings.* London: Sage Publications.

Masters, K. (1998). Droperidol in hospitalized children. *Journal of the American Academy of Child and Adolescent Psychiatry, 37* (8), 802-803.

Masters, K., & Bellonci, C. (2002). Practice parameter for the prevention and management of aggressive behavior in child and adolescent psychiatric institutions, with special reference to seclusion and restraint. *Journal of the American Academy of Child and Adolescent Psychiatry, 41* (2 Supplement), 4-25.

McCain, L.J., & McCleary, R. (1979). The statistical analysis of the simple interrupted time-series quasi-experiment. In T.D. Cook, & D.T. Campbell, (Eds), *Quasi-experimentation: Design and analysis issues for field settings.* Boston: Houghton Mifflin Co.

Miles, S. (1996). A case of death by physical restraint. New lessons from a photograph. *Journal of the American Geriatrics Society, 44* (3), 291-292.

Miller, D. E. (1986). The management of misbehavior by seclusion. *Residential Treatment for Children and Youth, 4* (1), 63-73.

Miller, D., Walker, M., & Friedman, D. (1989). Use of a holding technique to control the violent behavior of seriously disturbed adolescents. *Hospital and Community Psychiatry, 40* (5), 520-524.

Mitchell, J., & Varley, C. (1990). Isolation and restraint in juvenile correctional facilities. *Journal of the American Academy of Child and Adolescent Psychiatry, 29* (2), 251-255.

Mohr, W. K., Mahon, M. M., & Noone, M. J. (1998). A restraint on restraints: The need to reconsider the use of restrictive interventions. *Archives of Psychiatric Nursing, 12* (2), 95-106.

Mohr, W., & Mohr, B. (2000). Mechanisms of injury and death proximal to restraint use. *Archives of Psychiatric Nursing, 14* (6), 285-295.

Murray, L., & Sefchik, G. (1992). Regulating behavior management practices in residential treatment facilities. *Children and Youth Services Review, 14* (6), 519-539.

Nunno, M. A. (1997). Institutional abuse: The role of leadership, authority and the environment in the social sciences literature. *Early Child Development and Care, 133*, 21-40.

Nunno, M. A. (2001). *Therapeutic crisis intervention: A crisis prevention and management system* (5th ed.). New York: The Family Life Development Center, College of Human Ecology Cornell University.

Nunno, M., Holden, M., & Leidy, B. (2003). Evaluating and monitoring the impact of a crisis intervention system on a residential child care facility. *Child and Youth Services Review, 25* (4), 295-315.

Ostrom, C.W. (1990). *Time series analysis: Regression techniques.* Newberry Park, CA: Sage Publications.

O'Halloran, R. L., & Frank, J. G. (2000). Asphyxial death during prone restraint revisited. *The American Journal of Forensic Medicine and Pathology, 21* (1), 39-52.

Patterson, G. R., & Forgatch, M. S. (1985). Therapist behavior as a determinant for client noncompliance: A paradox for the behavior modifier. *Journal of Consulting and Clinical Psychology, 53* (6), 846-851.

Pelton, J., & Wierson, M. (2002). Caregiving styles and adolescent psychosocial functioning in a residential treatment facility. *Residential Treatment for Children and Youth, 19* (3), 71-85.

Petti, T. A., Mohr, W. K., Somers, J. W., & Sims, L. (2001). Perceptions of seclusion and restraint by patients and staff in an intermediate-term care facility. *Journal of Child and Adolescent Psychiatric Nursing, 14* (3), 115-127.

Ray, N. K., Myers, K. J., & Rappaport, M. E. (1996). Patient perspectives on restraint and seclusion experiences: A survey of former patients of New York state psychiatric facilities. *Psychiatric Rehabilitation Journal, 20* (1), 11-18.

Redl, F., & Wineman, D. (1963). *The aggressive child*. Glencoe, IL: The Free Press.

Reid, J. B., Patterson, G.R., & Snyder, J. (2002). *Antisocial behavior in children and adolescents: A developmental analysis and model for intervention.* Washington, DC: American Psychological Association.

Rich, C. R. (1997). The use of physical restraint in residential treatment: An ego psychology perspective. *Residential Treatment for Children and Youth, 14* (3), 1-12.

Rosen, H., & DiGiacomo, J. (1978). The role of physical restraint in the treatment of psychiatric illness. *The Journal of Clinical Psychiatry, 39* (3), 228-232.

Rubin, B. S., Dube, A. H., & Mitchell, E. K. (1993). Asphyxial deaths due to physical restraint. *Archives of Family Medicine, 2* (4), 405- 408.

Rubin, A., & Babbie, E. (2000). *Research methods for social work* (4th ed.). California: Wadsworth/Thomas Learning.

Schreiner, G., Crafton, C., & Sevin, J. (2004). Decreasing the use of mechanical restraints and locked seclusion. *Administration and Policy in Mental Health, 31* (6), 449-463.

Sibinga, M. S., & Friedman, C. J. (1971). Restraint and speech. *Pediatrics, 48* (1), 116- 122.

Siebert, C. F., & Thogmartin, J. R. (2000). Restraint-related fatalities in mental health facilities. *The American Journal of Forensic Medicine and Pathology, 21* (3), 210-212.

Singh, N., Singh, S., Davis, C., Latham, L., & Ayers, J. (1999). Reconsidering the use of seclusion and restraints in inpatient child and adult psychiatry. *Journal of Child and Family Studies, 8* (3), 243-253.

Sourander, A., Aurela, A., & Piha, J. (1996). Therapeutic holding in child and adolescent psychiatric inpatient treatment. *Nordic Journal of Psychiatry, 50*, 375-380.

Sourander, A., Elilla, H., Valimaki, M., & Piha, J. (2002). Use of holding, restraints, seclusion and time- out in child and adolescent psychiatric in-patient treatment. *European Child and Adolescent Psychiatry, 11*, 162-167.

Stilling, L. (1992). The pros and cons of physical restraints and behavior control. *Journal of Psychosocial Nursing, 30* (3), 18-20.

Swett, C., Michaels, A., & Cole, J. (1989). Effects of a state law on rates of restraint on a child and adolescent unit. *Bulletin of the American Academy of Psychiatry Law, 17* (2), 165-169.

Titus, R. (1989). Therapeutic crisis intervention training at Kinark Child and Family Services: Assessing its impact. *Journal of Child and Youth Care, 4* (3), 61-71.

Tomporowski, P. D. (1983). Training an autistic clinic: The effect of brief restraint on disruptive behavior. *Journal of Behavior Therapy and Experimental Psychiatry, 14* (2), 169-173.

Tsemberis, S., & Sullivan, C. (1988). Seclusion in context: Introducing a seclusion room into a children's unit of a municipal hospital. *American Journal of Orthopsychiatry, 58* (3), 462-465.

Tuma, J. (1989). Mental health services for children: The state of the art. *American Psychologist, 44* (2), 188-199.

U.S. General Accounting Office. (1999). *Mental Health: Improper restraint or seclusion use places people at risk.* Washington, DC: Author.

Vitiello, B., & Stoff, D. (1997). Subtypes of aggression and their relevance to child psychiatry. *Journal of the American Academy of Child and Adolescent Psychiatry, 36* (3), 307-315.

Weiss, E. M. (1998, October 11-15). Deadly restraint: A nationwide pattern of death. *Hartford Courant.*

West, K. (1997). Client characteristics contributing to the frequency of physical restraints in child residential treatment of males. *Residential Treatment for Children and Youth, 14* (4), 63-73.

Whittaker, J. K. (2004). The re-invention of residential treatment: An agenda for research and practice. *Child and adolescent psychiatric clinics of North America, 13* (2), 267-278.

Willner, A. G., Braukmann, C. J., Kirigin, K. A., Fixsen, D. L., Phillips, E. L., & Wolf, M. M. (1977). The training and validation of youth-preferred social behaviors of child-care personnel. *Journal of Applied Behavior Analysis, 10*, 219-230.

Winton, A. S. W., & Singh, N. N. (1983). Suppression of pica using brief-duration physical restraint. *Journal of Mental Deficiency Research, 27,* 93-103.

APPENDIX

Approved IRB

FORM A

Certification for Exemption from IRB Review for Research Involving Human Subjects

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A. PRINCIPAL INVESTIGATOR: Irma Molina Damen, MSW
William R. Nugent, Ph.D. Student Advisor

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C. COMPLETE MAILING ADDRESS : 113 Peach Road Oak Ridge, TN 37830
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PROPOSAL TITLE: The Effectiveness of a Restraint Reduction Policy Implemented to Reduce the Use of Physical Restraint with Children and Adolescents in a Residential Care Facility

D. EXTERNAL FUNDING AGENCY AND ID NUMBER: Not Applicable

E. GRANT SUBMISSION DEADLINE (if applicable)**:** Not Applicable

F. STARTING DATE: Upon IRB Approval

G. ESTIMATED COMPLETION DATE : June 1, 2009

H. RESEARCH PROJECT

1. Objective(s) of Project (Use additional page, if needed.)**:**

The purpose of this study is to use retrospective organizational data to evaluate the effectiveness of a restraint reduction policy intended to reduce the use of physical restraint in a residential treatment facility for serving children in the state of Tennessee. The restraint reduction policy stipulates that the use of physical restraint in this facility should be used only in life-or-death circumstances. The objective of this study is to determine whether or not there were changes in the number of restraint episodes in the facility between two time periods, one (from January 2000- October 2001) during which physical restraint was allowed as a means of managing children's aggressive and difficult behaviors, and the second (from November 2001- December 2003) during which verbal de-escalation techniques were strongly emphasized in lieu of physical restraint for managing children's aggressive and difficult behaviors.

The hypothesis to be tested asserts that a reduction in the monthly rate of physical restraint in the facility is associated with the implementation of the restraint reduction policy.

2. Subjects (Use additional page, if needed.)**:**

The unit of analysis of this research is a single residential treatment center which implemented the restraint reduction policy. It is operated by Child and Family Tennessee (CFT), a private not-for-profit social service organization in Tennessee. Only aggregate data will be used. Therefore, no information regarding children will be available to the principal investigator.

3. Methods or Procedures (Use additional page, if needed.)**:**

This study will use a simple interrupted time series, specifically an AB single-case design in order to evaluate the effectiveness of the restraint reduction policy. This research will use secondary data from the agency for analysis. It will use the existing restraints data from the agency for the years 2000-2003. The data to

be obtained from the agency will be the number of physical restraints that occurred in a specific month, such as January of 2000, along with the numbers of adolescents resident in the facility each month, for example in the month of January, 2000. So, for example, the data received from the agency might show: January, 2000, 25 restraints, 15 residents. These data would therefore have the appearance:

January 200;
Restraints: 25;
Residents: 15.

There will be no data obtained that will include the names of either residents in the facility or staff in the facility at any point in time. This interrupted time series will compare the rate of restraints per resident per month over a period of 2 years (baseline phase), during which the agency allowed the use of physical restraint, with a subsequent 2 year period (intervention phase) in which the agency implemented a restraint reduction policy and emphasized the use of verbal techniques to deal with children's aggression and difficult behaviors.

Since this study will be conducted using aggregate data of restraint incidences, with no identifying information of any kind, there will be no way to link information to any particular individual. Clients' names will not appear in the data. This research project is supported by the agency from which the data will be collected (see attached letter). The name of neither the facility nor the agency which operates it will ever be used in any presentation or document describing this research.

The data file will be given to the researcher by the head of the agency. It will be stored on the researcher's personal computer in a password protected file, and the only person with access to it will be the researcher.

4. CATEGORY(s) FOR EXEMPT RESEARCH PER 45 CFR 46 (See instructions for categories.)**:**
45 CFR 46.101 (b) (4) Research involving the collection or study of existing data, documents, records, pathological specimens or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

I. CERTIFICATION: The research described herein is in compliance with 45 CFR 46.101(b) and presents subjects with no more than minimal risk as defined by applicable regulations. Since this research will use aggregate data of restraint incidences, no names or identifiers can be linked to any particular client. No person will be able to link the information recorded by the principal investigator with any particular client; therefore there are minimal risks associated with this research.

Principal Investigator: _____ _____ _____
Name Signature Date

Student Advisor: _____ _____ _____
Name Signature Date

Department Review Committee Chair: _____ _____ _____
Name Signature Date

APPROVED:
Department Head: _____ _____ _____
Name Signature Date

COPY OF THIS COMPLETED FORM MUST BE SENT TO COMPLIANCE OFFICE IMMEDIATELY UPON COMPLETION.
Rev. 01/2005

INSTRUCTIONS FOR COMPLETING FORM A
PLEASE TYPE THE INFORMATION REQUESTED ON THE FRONT OF THIS FORM

Provide the required information in the space available if at all possible. If additional space is necessary, attach a separate sheet. Submit one copy of this form to the Chair of your Departmental Review Committee for review and approval. [PLEASE NOTE: This form may be reproduced on a personal computer and printed on a high quality printer (*e.g.*, LaserJet, DeskJet). Form A was originally created under WordPerfect 6.1 and printed on a HP LaserJet III printer using a 9-point CG Times font.]

ALL SIGNATURES MUST BE ORIGINAL on this form. When certified by your department or unit head, a copy of the signed Form A will be returned to the Principal Investigator and a copy will be returned to the Research Compliance Services Section, Office of Research.

I.1. OBJECTIVES: Briefly state, in non-technical language, the purpose of the research, with special reference to human subjects involved.

I.2. SUBJECTS: Briefly describe the subjects by number to be used, criteria of selection or exclusion, the population from which they will be selected, duration of involvement, and any special characteristics necessary to the research.

I.3. METHODS OR PROCEDURES: Briefly enumerate, in non-technical language, the research methods which directly involve use of human subjects. List any potential risks, or lack of such, to subjects and any protection measures. Explain how anonymity of names and confidentiality of materials with names and/or data will be obtained and maintained. List the names of individuals who will have access to names and/or data.

I.4. CATEGORY(s) FOR EXEMPT RESEARCH PER 45 CFR 46: Referring to the extracts below from Federal regulations, cite the paragraph(s) which you deem entitle this research project to certification as exempt from review by the Institutional Review Board. **45 CFR 46.101(b): Research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from IRB review:**

(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as: (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, **unless**: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; **and** (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

PLEASE NOTE: *An exemption cannot be used when children are involved for research involving survey or interview procedures or observations of public behavior, except for research involving observation of public behavior when the investigator(s) do not participate in the activities being observed. [45 CFR 46.401(b)]*

(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (2) above, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) Federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

(4) Research involving the collection or study of existing data, documents, records, pathological specimens or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

(5) Research and demonstration projects which are conducted by or subject to the approval of Federal Department or Agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

(6) Taste and food quality evaluation and consumer acceptance studies, if wholesome foods without additives are consumed or if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminants at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the US Department of Agriculture.

For additional information on Form A, contact the Office of Research Compliance Officer by e-mail or by phone at (865) 974-3466.

Rev. 01/2005

VITA

Irma Molina Damen is originally from Daraga Albay, Philippines. She received her B. S. in social work degree from Bicol University in 1987. She finished her master of social work degree from the University of the Philippines in 1997 while working as a medical social worker in Manila. She eventually left her job at the hospital and accepted a social work faculty position at Bicol University in 1994, where she taught for 7 years. As a faculty of the social work department, she has received several professional honors and awards for maintaining high standards of social work education in the Philippines. She was accepted as a PhD student at the University of Tennessee in 2002 and has been published in several journals of social work as a PhD student. Her research interests include school violence, social work education, social service evaluation, and child abuse. She received her PhD in Social Work from The University of Tennessee in August 2009.