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The use of restraint and seclusion in residential treatment care for youth: A systematic review of related factors and interventions

In Quebec, Canada, 12% of youth involved with child protection services are placed in residential treatment centers (RTCs; Minister of Health and Social Services, 2017). In the United States and England, approximately 1 in 120 children and 1 in 85 children is treated in a residential treatment center, respectively (RTC; Dansokho, Little, & Thomas, 2003). Recent statistics from the Australian Institute of Health and Welfare ([AIHW]; 2018) reveal that, as of June 30 2017, 5.2% of Australian children needing child welfare services were living in RTCs. These centers typically involve a supervised and structured environment that provides daily psychoeducational interventions for youth (Brown, Hamilton, Natzke, Ireys, & Gillingham, 2011). RTCs are typically utilized by children from 6 to 21 years old with extremely complex and challenging behavior when other placement options have been exhausted (Stuck, Small & Ainsworth, 2000; Delfabbro, Osborn, & Barber, 2005). Children in RTCs present greater functional impairment than children receiving services in non-residential settings, namely with regards to academic difficulties, behavioral problems, attachment problems, runaway behavior, substance abuse, suicidal ideation, self-injury, oppositional defiant disorder, conduct disorder, and criminal behavior (Thomann, 2009; Briggs et al., 2013; Fraser, Archambault, & Parent, 2016). These complex functional impairments observed among youth in RTCs are often associated with a history of abuse and neglect, exposure to violence in the community, and multiple placement transitions and attachment disruptions (Ledoux, 2012; Zelechowski, Sharma et al., 2013). Importantly, the aggressive behaviors that contribute to the youth's placement often continue beyond admission and represent a necessary focus of intervention (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013). In this context of aggression, seclusion

and restraint (S&R) are interventions that ought to be used as a last resort by educators when every other option has failed (Day, 2002). In the present review, restraint will refer to any control measure limiting the freedom of movement of a person, either through human force or handcuffs. Seclusion will refer to the confinement of a person in a given place for a given time from which he or she cannot freely leave.

The use of R&S is controversial, as this type of intervention is not without consequences both for the youth and the educator (Day, 2002). On this matter, [LeBel et al. \(2004, p.38\)](#) have stated that: “Because [R&S interventions] have the potential to produce serious consequences, such as physical and psychological harm, loss of dignity, violation of an individual’s rights, and even death, organizations continually explore ways to prevent, reduce, and strive to eliminate the use of R&S through effective performance initiatives”. Although regulated by laws and organizational guidelines, the decision to utilize one intervention rather than another ultimately depends on a complex multifactorial process (Steckley & Kendrick, 2008) implicating a wide range of factors (Thomann, 2009).

Literature regarding the variables associated with the use of R&S in RTCs is scarce (Minjarez-Estenson, 2009), thus largely limiting our understanding of the use of R&S to psychiatric settings. In these mental health settings, factors related to the patient (e.g., sex, age, nationality, diagnosis), the care provider (e.g., attitude towards mental illness, level of education, years of experience, stress), the organization (e.g., training programs, documentation of episodes), the team of workers (e.g., norms), and the environment (e.g., degree of intimacy, physical space) have been shown to be connected with the decision to use R&S by nurses in situations of client agitation or aggression (Larue, Dumais, Ahern, Bernheim, & Mailhot, 2009). This model of complex and dynamic interactions between the patient, the nurse, the culture and

the situation underscores the multifactorial process at play in the decision to use R&S (Steckley & Kendrick, 2008). The importance of the professional's personal characteristics is corroborated in the psychiatric literature, with Mann-Poll, Smit, de Vries, & Boumans Hutschemaekers (2011) concluding that the characteristics of the care provider are as significant as those of the patient in the decision to seclude. The importance of client characteristics is also upheld in the literature, as Grimes (2012) identified a number of patient-related psychological and contextual factors predicting R&S in a psychiatric setting for minors. A younger age at admission, a history of past placements, an older age at the first event of restraint or seclusion, impulsivity, and a longer length of stay were some of the factors positively influencing the use of R&S. In a systematic review of factors influencing the use of R&S in similar settings, De Hert, Dirix, Demunter, & Correll (2011) identified non-white ethnicity, suicidal behavior, more severe psychopathology, and past or current aggression and/or violence as patient-related predictors. Notably, this study emphasized the lack of data regarding the therapeutic effectiveness of R&S and indicated that these interventions may lead to severe psychological and physical consequences.

As for the use of R&S in RTCs specifically, the most recent systematic review examining the factors associated with these interventions is over 15 years old (Day, 2002). The author concluded that R&S interventions were routine in RTCs and reported seven common reasons for the use of R&S by educators: (a) to prevent a child who is acting out of control from harming himself; (b) to prevent a child from harming others, including staff or other patients; (c) to prevent a child from damaging property; (d) to bring a sense of control to a unit; (e) to respond to a rule violation or other acts of noncompliance; (f) to use when other, less restrictive methods have proven ineffective; and (g) to promote self-control and enhanced coping skills. Importantly,

Day (2002) also highlighted the heterogeneity within the existing literature regarding the prevalence, practice, and reasons behind the use of R&S.

Objectives of the current study

A new systematic review investigating the factors leading to the use of R&S in RCTs is warranted, as a number of studies have been published on the matter since the last review (Day, 2002). While the review conducted by Day (2002) focused on the reasons for the use of R&S cited by RTC staff, the present paper will examine factors related to the use of R&S from an eco-behavioral approach (Barker, 1978), as suggested by Day (2002). The first objective is to identify the factors related to the use of R&S in RTCs for youth. The second objective is to review the interventions aiming to reduce the use of R&S. The identification of factors related to the use of R&S in RTCs is a first step towards intervening upon these factors in the goal of minimizing the use of these measures. To identify these factors, we reviewed studies utilizing a variety of samples and designs, including qualitative, quantitative and mixed methods.

Methods

Search strategy

First, CINAHL, Pubmed, ERIC, and Psychnet were searched for research reports published between January 1st, 2002 and July 5th, 2017. The keywords included in the search strategy were: ("Restraint*" OR "Seclusion*" OR "intrusive* intervention*" OR "coercitive* measure*" OR "intrusive* measure*" OR "immobilization*") AND (youth OR child* OR teen* OR adolescen* OR juvenile) AND ("residential care" OR "residential facilit*" OR "residential setting*" OR "residential treatment*" OR "residential child care" OR "juvenile correction* setting*" OR "juvenile detention" OR "residential service*" OR "juvenile facilit*" OR "child home"). Second, articles citing Day (2002), the last systematic review on the subject, were

screened. Third, the reference lists of included studies were explored for relevant articles. When articles could not be found, the corresponding author was contacted in order to request a manuscript. When applicable, we also searched using MeSH Terms, found in the National Library of Medicine's controlled vocabulary thesaurus. This thesaurus consists of sets of terms naming descriptors in a hierarchical structure, which permits searching at various levels of specificity. However, terms associated to our subject found in the Mesh Databases, did not permit to add any pertinent studies.

Inclusion criteria

Studies were included if they reported on factors affecting the use of R&S in RTCs. In addition, the selection was limited to studies conducted in RTCs for youth under the age of 21 years old and to studies reporting original and empirical data (i.e., studies including data collection and analysis). Grey literature, including thesis dissertations, was also considered. Qualitative, quantitative and mixed methods were included.

Exclusion criteria

Since the focus was on RTCs for youth, studies examining the use of R&S in school settings, with youth presenting autism spectrum disorder or intellectual disability, in a medical setting or in a psychiatric setting were excluded. Psychiatric settings were distinguished from RTCs offering services for youth with mental health diagnoses by the type of staff and services offered: institutions solely offering medical services were identified as psychiatric, whereas settings offering both medical and social services were included. Other exclusion criteria were (1) papers reporting on several types of settings with no possibility of separating the results, (2) articles including both youth and adults, and (3) guidelines, government reports, literature reviews, meta-analyses, and book chapters. Inaccessible papers were only excluded after

contacting the author and receiving no response (see appendix A Table 3 for inaccessible papers).

Selection of studies and data extraction

One judge (CR) first screened the titles and abstracts of all the potential studies that she identified. A second judge (SG) screened 20% of these titles and abstracts and yielded an interrater agreement of 90%. Problematic articles were discussed in pairs, involving another judge (XX). The selected articles were then read in full. Reasons to exclude an article were documented. In line with PRISMA recommendations (Moher, Liberati, Tetzlaff, Altman, & PRISMA Group, 2009), a flowchart is included in Annex I and contains information regarding the number of unique records identified by the searches, the number of records excluded after the preliminary screening, and the number of records retrieved in full text. All relevant studies were scrutinized attentively to extract data regarding the study sample, design, objectives, outcome measures, results and limitations. Pairs of authors (AC, CR, SG, MF, GFC & CD) independently extracted data to minimize errors and reduce potential biases. One author (CR) combined the data into an Excel spreadsheet and two authors (CR & SG) reviewed all data extraction.

Assessment of study quality

The methodological quality of the included studies was assessed using two evaluation grids, one for qualitative design and one for quantitative design. Both were extracted from the *Standard quality assessment criteria for evaluating primary research papers from a variety of fields* (Kmet, Lee, & Cook, 2004). The quantitative grid assesses the description of the objective, the study design, the method of sampling, the description of subjects, if randomisation is possible, if blinding is possible and reported, the definition of the outcome measures, the sample size, the analytic method, estimates of variance, control of confounding variables, the detailed

presentation of results, and whether the conclusion is supported by results. Thus the total is on 14. If non applicable, the criterion is removed from the total. The qualitative grid assesses the description of the question, the study design, the context of the study, the connection to a theoretical framework, the sampling strategy, the data collection method, the data analysis, the use of verification procedures, the conclusion, and the reflexivity of the account. The total is on 10, and if a criterion is not applicable, it is taken off the total. Mixed designs were assessed with both grids. Three pairs of authors (MF, CR, GFC, AC, & CD) rated the studies separately and when a disagreement occurred, it was solved by a discussion with a third author (SG). A cut-off score of 75% was established in order to focus our discussion only on robust research design. Thus, studies scoring below this standard were excluded from the results and discussion, but are still presented in Tables 4 and 5.

Results

Study selection

A total of 807 potentially relevant articles were identified; 31 met the criteria to be included in this systematic review, but only 23 were retained for analysis based on the 75% cut-off score for study quality. Only articles in English fit all criteria. Factors were divided into four meaningful themes: personal characteristics of the youth, personal characteristics of the staff, environmental characteristics, and programs for the reduction of R&S. *Figure 1* presents a flowchart of the study selection procedure.

Study characteristics

Twenty studies were conducted in the United States and the remaining three were from Canada, Scotland and Australia. Seventeen followed a quantitative design, four were qualitative, and two presented a mixed design. Ten of the included studies aimed to evaluate the outcomes of

an implemented program affecting R&S. Sixteen studies had a sample composed of youth, and four of staff. One article presented a sample of both staff and youth and two studies relied on administrative records. Two studies included youth admitted as juvenile delinquents, and all others examined youth admitted under child protection care or on a voluntary basis. Ten studies focused exclusively on restraint, five examined seclusion only, and eight investigated both R&S.

Personal characteristics of the youth

Nine studies examined the personal characteristics of the involved youth in relation to R&S (see Table 4). Quantitative studies are discussed first. In terms of sociodemographic factors, being African-American was associated with a greater use of restraint (Leidy, Haugaard, Nunno, & Kwartner, 2006) and R&S (DosReis *et al.*, 2010; Krezmien *et al.*, 2015). Being younger was associated with more R&S in two studies (Leidy & al., 2006; Stewart, Theall-Honey, Armieri, & Cullion, 2010). As for sex, being male was associated with more R&S in one study (Stewart & al., 2010), while another concluded that boys were more likely to be restrained whereas girls were more likely to be secluded (Hood, 2011). Youth placed for neglect or on a voluntary basis (e.g., at the request of the parents) had a higher proportion of restraint than youth admitted as a “person in need of services” or as a juvenile delinquent (Leidy & al., 2006).

One study stated that the management of psychotropics used during the RTC stay was associated with a 72% reduction of restraint incidents (Bellonci *et al.*, 2013). Moreover, this reduction was more salient for those whose medication was reduced or maintained than for those who had no medication or saw their medication increased (Bellonci & al., 2013). Finally, Miller, Riddle, Pruitt, & Zachik (2013) concluded that youth who were the targets of several R&S incidents had higher dosages of antipsychotics compared to those with fewer R&S events.

Posttraumatic stress disorder and oppositional defiant disorder were both highly prevalent diagnoses among those with the most R&S events. Behaviors associated with R&S appeared to be severe aggression, threatening behaviors, the threat of injury to self, and self-harm (Miller & al., 2013; Stewart & al., 2010). In one study, youth with disabilities spent more time in seclusion than youth without disabilities (Krezmien & al., 2015). This study also showed that youth with emotional disturbances spent more time in seclusion than children with other disabilities (Krezmien & al., 2015). One study stated that race, age, sex, and diagnoses may not be significant indicators of R&S use (Hood, 2011). On the other hand, another study concluded that the best youth-related predictors of restraint were age and diagnostic group (Leidy & al., 2006).

One mixed design study examined the characteristics of the youth and revealed different results: youth admitted because of dangerous behaviors towards the self had fewer restraint events than youth placed for other motives (e.g., neglect, delinquency; Thomann, 2009). Among youth for whom no restraint was needed, posttraumatic stress disorder and major depression were the most reported diagnoses (Thomann, 2009). The author also found that self-harming behaviors were associated with less restraint (Thomann, 2009). Aggressive and running away behaviors were identified as leading to restraint more rapidly (Thomann, 2009). Youth with a greater uncertainty regarding their discharge plan as well as greater instability in their general level of functioning, less family involvement, greater social environment problems, greater sexual abuse histories and significant relationship disruptions had a greater proportion of restraint than youth without those characteristics. They also tended to be triggered by feeling lonely and to have a perception that they should not be left alone for long periods of time (Thomann, 2009). Finally, in a qualitative study examining the perceptions of youth in RTCs (Steckley, 2017), participants reported that a loss of control, needing to be stopped by the staff, a

build up of strong emotions over time, and emotional ‘explosions’ led to the use of R&S towards them. Some youth even reported deliberately asking staff for the use of R&S in order to manage their emotions and vent off anger.

Personal characteristics of the staff

Five studies investigated the characteristics of the RTC staff in relation to the use of R&S. In the quantitative studies, age (Lee-Lipkins, 2014) and satisfaction with one’s clinical supervision (Minjarez-Estenson, 2016) were negatively associated with the use of restraint. On the other hand, perceived exposure to indirect aggression, perceived child agitation, a favourable attitude toward corporal punishment, a higher level of education, and masculine gender roles were positively associated with the use of restraint (Lee-Lipkins, 2014). In one mixed design study, getting to know the client, understanding the client’s needs, and developing a solid working relationship based on honesty and trust were identified by staff as effective interventions to reduce the use of restraint (Thomann, 2009). Finally, in qualitative studies, a sense of parenting at a distance (i.e., duality between parental role and distance required to manage problematic behaviors), the pressures for consistency, the desire for balance between control and connection, the desire for normality, the inconsistent nature of the relationships with youth (McLean, 2013), the negative perception of safety, and the perception of noncompliance of the youth were dynamics reported by staff as influencing the use of restraint (Smith, & Bowman, 2009).

Environmental characteristics

Five studies examined the environmental and situational factors associated with R&S. In the quantitative studies, R&S was found to occur more often in the after-school period (DosReis & al., 2010; Leidy & al., 2006), in the third month of placement (DosReis & al., 2010), and on

Mondays (Leidy & al., 2006). The first month of placement was associated with fewer R&S events (DosReis & al., 2010). The length of stay was positively associated with restraint (Leidy & al., 2006). The middle and the end of the placement period were associated with more restraint than the rest of the stay (Leidy & al., 2006). A new federal law restricting the use of R&S in RTCs led to a 50% reduction of these measures in one RTC (McGlenn, 2005). Ratios of verbal reinforcement significantly decreased as seclusion events approached (Peter, 2005).

In line with the quantitative results of Leidy & al. (2006), Thomann (2009) utilized a mixed design and found that the length of stay was positively associated with restraint. In addition, being placed in a unit for girls, a unit without a time-out room, and a unit for a less acute population were associated with more restraint than other types of unit (Thomann, 2009).

Programs for the reduction of R&S

Six studies described the implementation of programs aimed to reduce the use of R&S (see Table 5 for more information). Programs studied in a quantitative approach showed that, the Relationship-Based Crisis Prevention Curriculum (Van Loan, Gage, & Cullen, 2015) and Healing-Touch Therapy (Stiles, 2015) did not significantly influence the use of R&S. Five programs did lead to a statistically significant reduction in the use of R&S: the Behavioral Staff Training Program (Crosland *et al.*, 2008), the Trauma-Informed Sports Program (D'Andrea, Bergholz, Fortunato, & Spinazzola, 2013) the TARGET Program (Ford & Hawke, 2012), the Implementation of Interventions at Several Levels of a Multisite Program RTC (Miller, Hunt, & Georges, 2006), and the NASMHPD's six core strategies implantation (Wisdom, Wenger, Robertson, Van Bramer, & Sederer, 2015).

A qualitative study reported on the numerous benefits associated with implementing a program called Collaborative Problem Solving (CPS) to reduce the use of R&S in RTCs

(Andrews, 2017). Specifically, the author found that the program helped managers adopt a more favorable attitude toward their staff dropping power struggles with youths or delaying their decision to use R&S. Managers also reported that CPS helped improve team collaboration and allowed them to make better-informed choices regarding the make-up of their staff. On that note, the staff found CPS also improved their understanding of problematic behaviors which enabled them to engage with youths in a more effective, need-based, and individualized manner. Youths reported that CPS taught them to “behaved differently” and taught them skills to solve problems appropriately.

Methodological quality of the studies

Eight studies obtained a score below 75% on the quality assessment scales (Deveau & Leitch, 2015; Farragher, 2002; Green-Hennessy & Hennessy, 2015; Helin, 2007; Hidalgo, Maravić, Milet, & Beck, 2016; Huefner, Griffith, Smith, Vollmer, & Leslie, 2014; Jani, Knight, & Jani, 2011; Nunno, Holden, & Leidy, 2003) and were excluded, while seven received a perfect score. Although almost all of the included studies presented specific and adequately described objectives or research questions, 9 of the 19 quantitative or mixed studies did not control for confounding variables (see Table 4). None of the ten studies examining the implementation of a program were randomized controlled trials.

Discussion

The objectives of this systematic review were first, to identify the factors related to the use of R&S in RTCs for youth, and second, to examine the interventions aimed at reducing the use of these measures. As the last systematic review on the subject was conducted in 2002, the current paper included studies published between 2002 and 2017. A total of 60 variables influencing the use of R&S were identified and were then categorized into four groups

summarized in a conceptual model (*Figure 2*): characteristics of the youth, characteristics of the staff, environmental characteristics, and implemented programs. Of the 60 variables identified, 53 each relied on one study, while 6 relied on 2 to 3 studies. The discussion to follow will focus mostly on those factors replicated in more than one study, and will also draw comparisons between the variables influencing R&S in RTCs and those affecting the use of R&S in psychiatric settings, based on the conceptual model of Larue & al. (2009).

Insert Figure 2 here

Characteristics of the youth

Ethnicity, age, sex, self-harming behaviors, and medication management stood out in the literature as youth-related characteristics associated with the use of R&S in RTCs. First, African-American youth were subjected to R&S more often than youth of other ethnic backgrounds (Leidy & al., 2006). On one hand, this may result from the fact that African-American children represent the highest proportion of youth in RTCs in the United States (Smith & Devore, 2004). On the other hand, a possibility of institutional racism may account for the overrepresentation of Black youth both in terms of placement in RTCs and the use of R&S. Institutional racism can be defined as «the systematic oppression, subjugation and control of one racial group by another dominant or more powerful racial group, made possible by the manner in which the society is structured. In this society, racism emanates from white institutions, white cultural values, and white people. The victims of racism in this society are Black people and other oppressed racial and ethnic minorities» (Billingsley & Giovannoni, 1972).

In terms of the relation between age and R&S, the consensus in the literature is that younger children tend to experience more R&S events in RTCs than older children (Leidy & al.,

2006; Stewart & al., 2010). This appears to be in line with previous findings suggesting that younger children have more frequent aggressive behaviors in residential treatment in comparison to older youth (Baker, Archer, & Curtis, 2005), which may account for greater use of R&S.

In accordance with past findings by Larue & al. (2009), one study found that male youth were more likely to be the subjects of R&S in RTCs (Stewart & al., 2010). In line with this result, a study in psychiatric settings for youth suggested that the greater number of R&S incidents among young boys was associated to their frequent aggressive behaviors (Garrison, 1984). However, another study in our systematic review came to the novel conclusion that girls are more likely to be secluded while boys are more likely to be restrained (Hood, 2011). The author hypothesized that boys and girls may present with differing types of impairment at admission, and that the behaviors stemming from these impairments may engender different responses and interventions (Hood, 2011).

In two studies, self-harming behaviors were positively associated with the use of R&S (Miller & al., 2013; Stewart & al., 2010) while another found that these behaviors were linked to fewer restraint incidents (Thomann, 2009). These conflicting findings regarding self-harming behaviors in relation to R&S may be explained by the fact that different types of behaviors necessitate different levels of intervention. In some cases, the removal of the tool being used to self-harm may suffice to stop the behavior (Thomann, 2009). In other cases, R&S may be needed to end self-harming behaviors such as banging one's head on an object or severely scratching oneself (for examples of self-harming behaviors in psychiatric settings for youth, see Thomassin, Quint, Sezlik, & Shaffer, 2017).

Finally, medication management was found to be negatively associated with R&S. This is consistent with Donat's (2002) hypothesis that both medication and restraint make it less likely

for youth to develop behavioral coping skills. When one of these external forces is reduced, the child can develop coping skills to deal with adversity and will therefore require less external control.

Overall, the client characteristics named in Larue & al. (2009)'s decision-making model regarding R&S (i.e., age, sex, nationality, and diagnosis) were all identified in this systematic review. Additional factors specifically pertaining to the context of RTCs were also identified (e.g., reasons for placement in RTC, types of behaviors, familial and personal history). Further studies examining these factors could be valuable, as they may serve as indicators regarding the risk of R&S for a specific youth, both at admission and during placement.

Characteristics of the staff

All of the factors related to care providers cited by Larue & al. (2009) as influencing decisions on R&S were included to various extents in the studies covered in this systematic review, with the exception of training, experience and stress level. Future studies regarding R&S in RTCs should consider these factors, as Leblanc, Regher, Shlonsky and Bogo (2012) have suggested that situational stress experienced by child protection workers unexpectedly confronted by a client was positively associated with the use of coercive interventions to manage the situation. It thus appears feasible that elevated stress, paired with a possible lack of situational training, may play a role in the decision to use of R&S.

Characteristics of the environment

The after-school period was associated with the use of more R&S. It is plausible that, at this time of day, children may be tired and composing with the stressful events of the school day and may thus react more negatively to frustrating situations in the RTC. It has also been suggested that learning difficulties, discrepancies between school and RTC interventions, and

difficulties with transitions may lead to more problematic behaviors from youth after school and an increase in R&S use by staff as a response (DosReis & al., 2010). Furthermore, a longer stay in the RTC was associated with more incidents of R&S. This is consistent with the results of Taylor *et al.* (2012) in psychiatric settings, supporting that the length of hospitalization was highest among patients with histories of multiple R&S events. Thus, a longer stay in either psychiatric or RTC contexts seems to translate into more opportunities of being secluded or restrained. It is likely that those youth with longer stays are also those with more severe functional and behavioral impairment.

Among the environmental factors identified by Larue & al. (2009), the level of support was the only factor uncovered in this systematic review. The level of personal freedom, the degree of intimacy, the existence of meaningful activities, and physical space have yet to be evaluated in relation to R&S in RTCs. In addition, studies examining the characteristics of the team (i.e., the team of educators and child protection workers) are needed.

Implemented programs

The majority of the programs covered in this systematic review led to a reduction of R&S use in RTCs following their implementation. However, no studies analysed which specific elements of the program had an influence on the reduction of R&S. It would be an important clinical contribution to identify which elements of those programs are effective to reduce R&S. Also noteworthy is the fact that none of the ten studies examining the implementation of a program were randomized controlled trials, thus making it difficult to state that the observed findings were directly linked to the implemented intervention. Indeed, the advantage of using a randomized controlled trial is the reduction of the risk of bias so that the only variable that differs is the intervention (Schulz, Chalmers, Hayes, & Altman, 1995). In addition, because the

results were based on case studies, effect sizes were unavailable. Thus, the results associated to these RTC programs should be interpreted with caution. Future studies should investigate other organizational factors identified by Larue & al. (2009) as influencing R&S, which have yet to be studied in the context of RTCs. These include the “documentation of episodes” by staff.

Implications and directions for future studies

R&S interventions are controversial because of their iatrogenic effects on both the youth and the staff involved (Day, 2002). The current systematic review identified a number of variables related to the youth, the staff, the environment and the programs implemented in RTCs in association with the use of these contentious strategies. The identification of factors influencing the use of R&S in RTCs represents the first step towards intervening upon these factors in the goal of minimizing such interventions. The findings of one study (McGlenn, 2005) included in this systematic review suggest that governments can be influential in reducing the use of R&S in RTCs. Indeed, this study reported that RTC staff decreased their use of restraints by over one third following the imposition of a law regulating the use of R&S in the United States. More research regarding the impact of federal, state and organizational policies on the short and long-term use of R&S in RTCs is needed. Developing and applying regulations for these interventions appears necessary, as this review has shown that the decision to use R&S is driven by multiple factors unrelated to its clinical relevance or therapeutic utility. Policies promoting the use of alternative interventions when possible may be beneficial to both youth and staff (e.g., disciplinary measure instead of security measure; Day, 2002). The biological sex and ethnic origin of the youth, as well as the age of both the youth and the educator, were found to influence the use of R&S. These findings highlight the different associations between R&S and diversity among RTC staff and residents. Further research regarding R&S in relation to minority

groups would be interesting to pursue, as it would provide more information on how diversity may impact such practices. Moreover, the sensitive subject of the overrepresentation of certain ethnic groups in RTCs (Putnam-Hornstein, Needell, King, & Johnson-Motoyama, 2013) was not addressed in the studies included in the present review and should be further examined in relation to the use of R&S.

In addition, this systematic review revealed that studies assessing the factors associated with R&S in RTCs have important methodological limitations. Only 23 out of 31 studies reached the cut-off score of 75% for methodological quality, and even these studies were limited by certain flaws that hinder the robustness and generalizability of their findings. To overcome these weaknesses, future quantitative studies should focus on the following criteria: outcome and exposure variables that are well defined and well measured, confounding variables that are statistically controlled, and clearly described sample characteristics. In qualitative studies, a description of the sampling strategy should always be presented. None of the studies evaluating the implementation of programs utilized random allocation or blind investigators and subjects. Moreover, additional qualitative and mixed-design studies would supplement our limited understanding of the perceptions and subjective experiences of both staff and youth in relation to R&S. Furthermore, certain factors identified by Larue & al. (2009), such as stress, characteristics of the team, and organizational variables including professional culture have yet to be examined in connection to R&S in RTCs. As authors both from the psychiatric and RTC fields have suggested (Grimes, 2012; Mclean, 2013; Ledoux, 2012), future studies should also investigate the interaction between the staff and the youth as it relates to the decision to use R&S. Lastly, as recommended by Day (2002), « researchers should clearly describe the procedures used, populations studied, and settings under investigation to allow for comparisons across studies. »

Overall, further studies are clearly needed in order to confirm or infirm past findings, as most of the factors presented in this review were identified in only one study (see Annex 1).

Limitations

A number of limitations should be considered. First, inconsistency between samples, RTC types, and study designs did not allow for a comparison between the studies or an evaluation of the cumulative or interactional influences of identified factors. Second, many studies did not control for confounding variables, thus calling into question the causal relationship between the factors under study and R&S (Porta, 2014). Finally, the fact that only one author conducted the initial screening for this systematic review may have induced bias.

Still, this systematic review has several strengths. First, to minimize language bias (Egger, Smith, Schneider, & Minder, 1997), we searched for all manuscripts published in English and French. To reduce availability bias (Tramer & al. 1997), we included grey literature such as a doctoral dissertation. To dampen availability and cost bias (Tramer & al. 1997), we wrote to several authors requesting a copy of their manuscript and paid for those that were otherwise unavailable. To diminish familiarity bias, we included studies from all disciplines. Our review process also allowed for the prevention of duplication bias (Tramer & al. 1997). Furthermore, we included qualitative, quantitative and mixed design studies to cover the phenomenon from different perspectives. Finally, we introduced an external co-author outside of the field of R&S to maximize objectivity in the review process.

Conclusion

This systematic review, undertaken from an eco-behavioral perspective as suggested by Day (2002), highlights the complex and dynamic nature of the decisional process leading to the use of R&S in RTCs. The present findings underscore the fact that the decision to use R&S is not

merely the result of rational deliberation on the part of the educator, but rather the outcome of a multitude of factors related to the client, the staff, and the environment. This systematic review identified these factors and aggregated them within a conceptual model, establishing the base for future studies.

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