DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

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Does Multisystemic Therapy Change Criminogenic Risk Factors?

A 10-Year Study Among Norwegian Youths With and Without Offenses

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Abstract

Our study examined Multisystemic Therapy outcomes for youths with and without recorded offenses. Over 10 years, 4103 youths completed MST in Norway, with 5.39% having a recorded offense. Reductions in risk factors were evident for both groups, but the highest effect sizes were found in the group with recorded offenses. Future research should investigate whether MST prevents recidivism in adulthood.

Keywords: recorded offense, juvenile delinquency, Multisystemic Therapy, YLS/CMI, criminogenic risk factors, routine outcome monitoring data, recidivism.
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A 10-Year Study Among Norwegian Youths With and Without Offenses

1. Introduction

In Norway, there has been an increase in registered offenses committed by youths under the age of 18 years (Aase et al., 2020; Ministry of Justice and Public Security, 2020-2021). This calls for evidence-based interventions. The UN and the Council of Europe (2021) are recommending home-based care interventions. Multisystemic Therapy (MST) is such an intervention.

In the present study, we investigated changes in dynamic criminogenic risk factors among youths with and without prior or current offenses over the course of MST. Offense history was registered at intake to treatment through the national routine outcome monitoring (ROM) data collection that includes broadband measures of risk factors in MST. The data were collected over a 10-year period and include the entire population of young people who completed MST treatment during that period in Norway.

1.1. Criminogenic risk factors

Criminogenic risk factors are evidence-based characteristics or problems that directly relate to the individual’s likelihood of adult criminal offense or delinquency (Bonta & Andrews, 2018). Often a distinction is made between static and dynamic risk factors, whereof the first cannot be modified and targets for intervention (Clarke et al., 2017). Static factors are features of a person’s background and history (e.g., age, gender, and current/prior offenses), which has been found to relate to future criminal offenses and thus account for a substantial amount of risk prediction variance (Casey, 2016). Previous offense history is considered a strong static predictor of juvenile criminal recidivism (Baglivio & Jackowski, 2013; Cottle et al., 2001; Cuervo & Villanueva, 2015; Savage et al., 2013), and therefore the
static risk factor that is consistently included throughout the evolution of risk assessment tools (Miller et al., 2021). On the other hand, dynamic risk factors (or criminogenic needs) are predictors of criminal behavior that can be modified, changed and provide incremental predictive values over the static risk factors (van den Berg et al., 2018). These encompass pro-criminal attitudes, pro-criminal associates, antisocial personality pattern, family/marital relationships, school/work functioning, leisure/recreation activities, and substance abuse (Heffernan et al., 2019), and are associated with reduced recidivism when addressed with appropriate interventions (Hanson et al., 2009). Altogether, the static factor of criminal history and these seven dynamic factors make up the “central eight” criminogenic risk factors that are found to be significant predictors of youth criminal behavior (Bonta & Andrews, 2018). A recent Norwegian study evaluated the Youth Level of Service/Case Management Inventory YLS/CMI and its usefulness in MST. The study found significant correlations between the total and dynamic YLS/CMI change scores and the additive index of various risk behaviors, that included criminality. The study concluded that the YLS/CMI seems to capture relevant risk factors in the youths’ environment (ANONYM, 2023).

1.2. Multisystemic Therapy and Research on Juvenile Delinquency

One home-based program aiming to decrease youth delinquent behavior and prevent recidivism is Multisystemic Therapy (MST; Henggeler et al., 2009). MST is a family-based treatment developed for adolescents aged 12–18 years at risk for out-of-home placement due to serious antisocial behavior. The program is based on social-ecological theory and is designed to address a comprehensive range of empirically validated dynamic risk factors while at the same time building protective factors. These dynamic risk factors are actively addressed in the work with the family. In MST, the family is the most important arena for intervention. Dysfunctional parenting is an important dynamic risk factor for juvenile
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

delinquency, and it is also theorized that appropriate interventions targeting caregivers will reduce other dynamic risk factors, for example, the influence of antisocial peers and collaboration with teachers and other community resources Bonta & Andrews, 2018. Thus, MST is designed to address criminogenic dynamic risk factors for recidivism or serious delinquency both directly and indirectly. The overall treatment goal is to reduce the youth’s problem behavior. MST is anchored in nine principles that are applied in an analytic process focusing on creating engagement with the family, clarifying treatment goals, assessing multisystemic drivers to problem behaviors, targeting prioritized drivers with research-supported interventions, continuously monitoring treatment progress, and adjusting treatment interventions based on weekly feedback. The MST team consists of a supervisor and 3–4 therapists. The team is accessible 24 hours a day, 7 days a week. The course of treatment typically lasts 3–5 months.

MST was implemented on a nationwide scale in Norway in 1999. There are currently 25 operational Norwegian MST teams, 600 families receive MST per year and approximately 12,000 youths and families have been admitted to treatment. Youths are referred from the municipal child welfare services (CWS). MST teams in Norway are established within the state/regional, specialized CWS. Cultural adaptation of materials to the Norwegian context was approved by the U.S. developer organization.

Juvenile delinquency is a major indicator for inclusion in MST, and preventing recidivism is an important treatment target. Several studies have found both short- and long-term reductions in rearrests and convictions after MST treatment (e.g., Borduin et al., 1995; Butler et al., 2011; Henggeler et al., 1992; Henggeler et al., 1993; Schaeffer & Borduin, 2005; Timmons-Mitchell et al., 2006). A follow-up of a randomized clinical trial found that, 21.9 years after treatment, there was a decrease of 36% in felony arrests, 75% in violent felony arrests, and 33% in days in adult confinement for the MST group compared to
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

individual therapy (Sawyer & Borduin, 2011). However, Weiss et al. (2013) found no significant reductions in arrests after MST, and Fonagy et al. (2018) found no reductions in arrests for the MST group 18 months after treatment compared to management as usual.

Two studies suggest that MST is a useful and effective intervention towards serious problem behaviors in a Norwegian context (ANONYM 2023, ANONYM 2022).

Meta-analyses on MST also show a mixed picture. Van der Stouwe et al. (2014) included 23 studies from 1985 until 2012 and found small but significant treatment effects on delinquency (N = 4066, ES = .201 for overall delinquency). On the other hand, Littell et al. (2021) included 23 studies. The included studies were conducted between 1983 and 2020, and the authors concluded that MST out-of-home placements and arrests/convictions, but only in the United States (N = 3987 families, ES = .27). The analysis of the treatment showed a positive impact on self-reported delinquency in general. However, it is important to note that the studies included in this meta-analysis covered a wide range of MST adaptations for various target groups besides juvenile delinquency, such as psychiatric disorders, autism spectrum disorder, problem sexual behavior, and child abuse and neglect. As a result, the potential effects that are specific to MST for juvenile delinquency may have been blurred.

There may also be limitations on the generalizability of these studies to Norway, the Nordic countries, and a broader range of European countries. MST was developed in the United States, where the age of criminal responsibility varies across states, and juvenile delinquency is most often met through sanctions within the judicial system. This differs from the Norwegian context, where there is a long-standing policy of responding to juvenile delinquency by giving parental support or treatment from the CWS. Traditionally, the majority of youths with serious conduct problems in Norway have been placed in child welfare institutions. In 1999, the Norwegian government presented a 5-year plan against
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

youth crime (Ministry of Children and Families, 1999). Thus, MST was implemented nationwide as a treatment for youths with serious problem behaviors as an alternative to residential placement.

Currently, the Norwegian age of criminal responsibility is 15 years. Thus, juvenile offenders under the age of 15 are taken care of by the CWS, while youth aged 15–17 years are the responsibility of the adult criminal justice system but governed by special legislation. Youths under 18 years of age very rarely get convicted. For example, in 2021, 59 youths below the age of 18 received a community sentence, and 28 youths aged 15–17 were imprisoned (Kriminalomsorgen, 2022). This represents 0.01% of the population in this age group. Thus, most children and young people with delinquent behavior never encounter the criminal justice system (Statistics Norway, 2022). Even so, in 2019, persons aged 15–24 accounted for 29% of all charges in Norway (Ministry of Justice and Public Security, 2020–2021). Furthermore, since 2016 there has been an increase in registered offenses committed by youths under the age of 18 years, an increase mainly attributable to violence, physical abuse, and sexual offenses (Ministry of Justice and Public Security, 2020-2021). This calls for evidence-based interventions to prevent and stop criminal pathways for youths (Aase et al., 2020) who are eligible for services from CWS but are not in contact with the criminal justice system. This current study makes a new contribution to the existing literature on MST in Norway, and could give us some more understanding of how criminogenic risk factors change through treatment.

1.3. The Present Study

The present study investigated (a) youths with recorded prior or/and current offenses and (b) youths without recorded prior or/and current offenses. These represent two different risk groups as the static risk factor of prior offenses, along with dynamic risk factors, is a strong predictor for subsequent offending behavior. However, unlike static factors, dynamic
Does MST Change Criminogenic Risk Factors?

Risk factors can be changed if addressed appropriately, which can reduce the risk of subsequent offenses. Thus, dynamic risk factors represent possible treatment targets. This study examined potential differences in criminogenic dynamic risk factors for youths where the static risk factor of recorded prior or/and current offenses was either present or not present.

Because there is a very high threshold for conviction of youths in Norway, we hypothesized that the group of youths having a recorded offense would also have a higher level of risk based on the dynamic risk factors at intake to MST. This corresponds with other studies from the Norwegian context (Aase et al., 2020; Bhuller & Røgeberg 2022). Based on earlier studies (ANONYM et al., 2022; Fonagy et al., 2018; Littell et al. 2021), we hypothesized that the two groups would reduce their dynamic risk factors from pre- to post-MST and that the reduction would be equal between the two groups.

The static risk factor of prior and current offenses is routinely reported at intake in the ROM when youths are assigned to MST. The dynamic risk factors pertaining to family/relationships, school/work, antisocial peers, substance abuse, leisure/recreation, antisocial personality, and antisocial attitudes/orientation were assessed by ROM pre- and post-treatment.

The present study had the following aims:

- to investigate possible differences between the groups of youths with and without recorded prior offenses regarding number of youths, length of treatment, and characteristics (age, gender, etc.)
- to investigate differences between the two risk groups of youths with respect to the dynamic risk factors at intake to MST
- to test for possible differences from intake to completion of MST within and between the two groups of youths regarding the dynamic risk factors
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

2. Methods

2.1. Participants

Eligible participants were youths between the age of 7 and 18 years who were referred to MST treatment by the municipal CWS and who completed the program between 2013 and 2022. The current study included 4,103 youths (63% boys). The sample mean age was 14.4 (SD = 1.6); only eight participants were between 7 and 8 years old, and five were 18 years old. The mean number of treatment days was 143 (SD = 39).

2.2. Measures

2.2.1. Characteristics of Youth

The following baseline characteristics were collected by the youth’s MST-team; do not attend to school, use violence and substance abuse. All non-risk outcomes were scored 1 (else 0). In addition to characteristics as gender, age, ethnic minorities, foster home and days of MST treatment.

2.2.2. The Youth Level of Service/Case Management Inventory

The Youth Level of Service/Case Management Inventory-Part I (YLS/CMI; Hoge & Andrews, 2011) assesses risks and identifies treatment targets among young offenders (12–17 years). The scale content is organized around the “central eight” criminogenic risks, and items are designed to reflect the unique needs of youths (Olver et al., 2012). The measure includes 42 items that are scored on a dichotomous scale (present = 1/not present = 0) and summarized across the eight subscales. In the present study, as part of the ROM for MST in Norway, the MST team leader completed the measure based on the referral from the CWS as well as initial assessment with the family at the beginning of treatment and family and therapist information at the end of treatment.

YLS is also used for research purposes (e.g., ANONYM et al., 2021). Psychometric support for the YLS/CMI in terms of reliability and validity is presented in the YLS/CMI
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

manual (Hoge & Andrews, 2011) and supported by other studies (e.g., Onifade et al., 2008; Schmidt et al., 2005). The psychometric properties of YLS/CMI-Part I have also been investigated in a Norwegian context (ANONYM et al., in press), where it was shown that the instrument had satisfactory concurrent and predictive validity. Reliability of the total and dynamic YLS/CMI scale was somewhat low at the time of admission to treatment, but considerably higher at the end of treatment, suggesting that the YLS/CMI subscales overlapped more at the latter time point.

The static risk factor prior and current offenses and dispositions was used to make two groups: (a) youths with recorded prior and current offenses (value = 2–5) and (b) youths without recorded prior and current offenses (value = 0–1). The value 0 indicated that the youth had not interacted with the justice system. The score 1 could indicate that the youth had interacted with the justice system. However, Fit could also indicate a failure to comply (i.e., a breach of conditions related to a criminal or community sentence or to out-of-home placement by the child welfare services, such as failure to appear or comply or being unlawfully at large). A score of 2 to 5 indicated that the youth had committed one or more offenses that led to grave societal reactions, such as custody, convictions, and/or probations, (or, if below the age of criminal responsibility, committed acts that would otherwise have qualified for a serious judicial response).

The following seven dynamic risk factors were used to measure change from intake to posttest:

1. Family circumstances/parenting measures inadequate supervision, difficulty in controlling behavior, inappropriate discipline, and poor youth–parent relationship (value = 0–6).

2. Education/employment measures disruptive classroom/schoolyard behavior, problems with peers or teachers, low achievement, and truancy (value = 0–7).
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

3. Peer relations measures the presence of delinquent friends or acquaintances, and lack of positive ones (value = 0–4).

4. Substance abuse measures occasional and chronic drug and alcohol use and associated negative life consequences or offenses (value = 0–5).

5. Leisure/recreation measures limited organized activities, poor use of leisure time, and lack of personal interests (value = 0–3).

6. Personality/behavior measures inflated self-esteem, verbal and physical aggression, short attention span, poor frustration tolerance, and inadequate guilt feelings (value = 0–7).

7. Attitudes/orientation measures antisocial/pro-criminal attitudes, avoidance or rejection of help, defiance of authorities, and lack of concern for others (value = 0–5).

2.3. Procedure

This study utilized a pre-post design and ROM data from national Norway's MST continuous quality improvement system developed by [ANONYM]. In this study, MST treatments started on or after January 1, 2013, and completed before August 31, 2022, were included. Data on YLS/CMI were collected at baseline and at end of treatment from the youths’ MST teams.

Recruitment of families to MST takes place through the municipal child welfare services. Referrals to these services can be made by family members, schools, or by professionals or other adults that are in contact with the youth and/or family. The inclusion criteria for MST are youth between 12 and 17 years of age at risk of severe system consequences due to serious externalizing, antisocial, and/or delinquent behaviors. Exclusionary criteria are youth living independently; youth who engage in sex offenses in the absence of other antisocial behavior; youth with moderate to severe autism; youth who are actively homicidal, suicidal, or psychotic; youth whose psychiatric problems are the primary
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

reason leading to referral or who have severe and serious psychiatric problems; or youth for whom an intellectual disability is the only influence or is the most powerful, direct contributor to the youth’s referral behaviors.

All the included cases were categorized as having completed MST treatment. Cases were scored as “completed” if the family was able to receive the full MST treatment without interruptions due to lack of engagement, out-of-home placement, or factors unrelated to the progress of treatment, such as illness/death or family relocation.

2.4. Ethics

The data material used in this study was collected for quality assurance purposes and anonymized after data collection was concluded. For data collected before July 20, 2018, the processing was approved by the Norwegian Data Protection Authority. After the European Union’s General Data Protection Regulation (GDPR) came into force, the processing was based on informed consent. This informed consent gave explicit information that they can opt out at any time. The study was submitted to the Norwegian Regional Committee for Medical and Health Research Ethics (REC) which concluded that the project was considered quality assurance under Norwegian law and thus not subject to Norwegian law on research ethics and medical research.

2.5. Data Analysis

Baseline descriptive statistics of the included study variables were calculated. Categorical variables were presented using the number of participants, and percentages and differences were investigated using the chi-square test. Continuous variables were presented by means and standard deviations (SDs), and independent t tests were conducted. Pre and post group differences were examined using a paired sample t test. Cohen’s d was used to consider effect size, indicating the standardized difference between two means, and can be calculated as the difference between the means divided by the pooled SD (d = .20 is a small
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

effect size, $d = .50$ is medium, and $d = .80$ is large; Cohen, 1992). Subsequent independent $t$
tests were conducted, with posttests on the dynamic risk factors as dependent variables and
youth group as independent variables. The significance threshold was set to 0.01. Out of the
sample of 4103, only 0.3% had missing data. All analyses were done using SPSS v. 29 and
JASP v. 0.17.1.

3. Results

3.1. Sample Characteristics and Dynamic Risk Factors at Intake

In the total sample of youths ($N = 4103$), 5.39% ($n = 221$) had recorded prior and
current offenses. As shown in Table 1, the number of treatment days was not significantly
higher for youths with registered offenses compared to those without. However, the high
standard deviation indicated large variations in both the groups (range = 7 to 343 days of
treatment). There were more boys with a somewhat higher mean age in the youth group with
offenses than in the other group. About 70% used violence and/or threats, and the rate of such
behavior was equally distributed between the groups. Youths with offenses showed a
significantly higher rate of substance abuse compared to the others (74% vs. 44%). There was
a higher percentage of youths with an ethnic minority background in the group with an
offense. For further details, see Table 1.

Table 1

Sample Characteristics of Youth at Intake to MST

| INSERT HERE TABLE 1 |

Table 2 shows the difference between offenders and non-offenders at intake to MST
regarding dynamic risk factors. The group with recorded offenses scored significantly higher
on five out of the seven dynamic risk factors. Substance abuse showed the largest mean
difference of 1.06 ($d = 1.03$), followed by peer relations ($M_{diff} = .92$, $d = .92$), followed by
attitudes/orientation towards antisocial/pro-criminal attitudes ($M_{diff} = .65$, $d = 1.97$). It
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

follows that, even though the mean difference scores are small, high effect sizes indicate that their practical significance should not be ignored. See Table 2 for details on all the subscales.

INSERT TABLE 2

3.2. Differences in Dynamic Risk Factors from Intake to Posttest

Table 3 shows changes from intake to posttest on all seven YLS/CMI risk factors for both groups. All change scores were significant, and the effect sizes ranged from \( d = 0.48 \) to \( d = 2.93 \) (\( p < .001 \)), which indicates a medium to large change (Cohen, 1992). For the group of youths with recorded prior and/or current offenses, the effect sizes were large, \( d = 1.40 \) to \( d = 2.93 \) (\( p < .001 \)). It is in this group that we find the highest effect sizes and thus positive change from treatment.

Youths in the no-offenses group showed effect sizes that ranged from medium to large (\( d = 0.48 \) to \( d = 2.71, p < .001 \)). The pattern of change was the same across the two groups, except for one risk factor, substance abuse. The difference in substance abuse (YLS/CMI) from pre- to posttest between the two groups was \( d = 0.92 \). Youth with prior offenses scored significantly higher at intake (\( M = 1.72 \)), but they also had a larger change after MST compared to the group with no prior offenses (difference in \( d = 0.92 \)). See Table 3 for details.

Table 3

Paired Sample \( t \) Tests and Effect Sizes Within Treatment

INSERT TABLE 3

Subsequent independent \( t \) tests were conducted, with posttests on the dynamic risk factors as dependent variables and youth group as an independent variable. This revealed that there was a significant difference in three dynamic risk factor scores at posttest (Figures 1, 2 and 3). Youths in the no-offenses group scored significantly lower on negative peer relations (\( t[4083] = -10.15, p < .001 \)), substance abuse (\( t[4083] = -4.11, p < .001 \)), and positive
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

attitudes/orientation towards criminal behavior ($t[4083] = -2.88, p = .004$). No other significant differences were found between the youths with and without a recorded offense at posttest. See Table 3 for mean values and SD at posttest. Figures 1, 2, and 3 illustrate the significant differences between the two groups.

INSERT FIGURES 1, 2 and 3

4. Discussion

Adolescence is an important phase that lays a foundation for later life. Breaking the law during this period can harm the prospects for youths. Research has shown that committing an offense at a young age is strongly related to recidivism later in life (Bonta & Andrews, 2018; Frase & Roberts, 2019).

Our results showed that, during the last 10 years, 4103 youths completed MST in Norway. These youths were referred to MST based on serious externalizing, antisocial, and/or delinquent behaviors. Of these youths, 5.39% ($n = 221$) had recorded prior or/and current offenses, resulting in custody, convictions, and/or probations (or the offenses would have had such consequences if the youth were above the age of criminal responsibility). The mean age in the group was 15 years, indicating that some were under the Norwegian age of criminal responsibility. These youths fell well within the definition of juvenile delinquency and were therefore extremely marginalized in Norway. This is in line with another study; among youths who were 15–17 years old when they committed their first offense, about half were charged again within five years (Bhuller & Røgeberg, 2022). The youths in the present study did not receive significantly more treatment days compared to those with no offenses at intake. This is in accord with the basic principles of MST, which is designed particularly for youths at high risk, targeting known risk factors while emphasizing brief and time-limited treatment.
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

There were more boys and youths with an ethnic minority background in the group of youths with recorded offenses. This is in line with research showing that boys are more likely than girls to be involved in delinquency between the ages of 12 and 15 (Smith & McAra, 2004). In addition, register based studies from Nordic countries show that youths of ethnic minority background were overrepresented in registered offenders (Klement, 2020; Salmi et al., 2015). Such differences could be explained by differences in social background, neighborhood resources (Hällsten et al., 2013), or weaker parental monitoring among immigrant parents (Salmi et al., 2015), but consideration should also be given to the possibility that such difference could be attributed to racial bias among police and court system (Holmberg & Kyvsgaard, 2003)

Importantly, 70% of the sample in both groups of youths did not go to school, and/or was in a school setting which increased the risk of marginalization. Administrative data from Norway also shows that offending youths are overrepresented among those with the lowest performances in primary school measured by school credits, which indicates that they struggle at school (Bhuller & Røgeberg 2022). This is worrying, because schools are important developmental arenas for youths, and school dropout can lead to delinquency (Henry et al., 2012), unemployment (Doku et al., 2019), and poorer health later in life (Lansford et al., 2016). In addition, arrests and incarceration might affect future employment opportunities (Bhuller et al., 2019).

The findings showed that youths with offenses scored significantly higher on six out of the seven dynamic criminogenic risk factors at intake, with mean differences ranging from .23 to 1.06. Overall, youths with offenses in this sample also had higher risk levels on dynamic risk factors, that constitute predictors of re-offense (Bonta & Andrews, 2018). This should be addressed to reduce the risk of recidivism. Of note is the large difference between the offenses and the no-offenses groups regarding substance abuse, the mean difference
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

between the groups being 1.06, suggesting that the offenses group had substantial problems with substance use. There could be several explanations for this. One reason could be that the use of substances was a mediating factor for offending, as the influence of drugs or alcohol might lower the threshold for committing offenses. Another explanation could be that, for some, the use of illegal substances constituted the actual offense.

We tested for possible differences from intake to completion of MST within the two groups of youths regarding the dynamic risk factors. All the factors measured by YLS/CMI were significantly reduced from intake to the end of MST. This is in line with what we expected based on former studies (ANONYM et al., 2022; 2023; Fonagy et al., 2018). These results correspond with the multisystemic focus of MST, as interventions with the caregivers are intentionally developed to address several of the risk and protective factors which are included in the YLS/CMI: positive parenting and family cohesion, peer relationships, substance abuse, school attendance and functioning, and positive activities during the youth’s free time (Henggeler et al., 2009).

One of the largest reductions was found for family circumstances/parenting ($d = 2.91$ vs. $d = 2.71$). This indicates that inadequate supervision, difficulty in controlling behavior, inappropriate discipline, and poor youth–parent relationship decreased after the family participated in MST. Increased family cohesion, positive and consistent parenting, and parental monitoring are among the primary aims of MST (Henggeler et al., 2009), and the results indicate that MST succeeded in attaining these aims.

The results indicate that the pattern of change in dynamic risk factors is similar and shows large effect sizes in change for both groups of youths. There is one exception: the change in substance abuse for the offenses group is considerably greater than for the no-offenses group ($d = 1.40$ vs. $d = 0.48$). Among juvenile offenders, previous research indicates that substance use disorder appears to negatively moderate the relationship between risk
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

Factors such as peer relations and antisocial attitudes and outcomes such as rearrest (Schubert et al., 2011). Youths with substance use disorders have been shown to have a greater number of risk-relevant treatment targets, which should be addressed as an immediate target for change in young offenders (Guebert & Olver, 2014). In the Norwegian administrative dataset, Bhuller & Røgeberg (2022) found that recidivism is particularly high among people who are punished for drug offenses.

Except for peer relations, the risk factors at the end of MST treatment were comparatively equal in the offenses and non-offenses group. Although there were significant differences between the two groups regarding substance abuse and attitudes/orientation at the end of treatment (cf. Table 3), the mean differences between these two factors were small (0.17 and 0.19, respectively). This may indicate that, on average, the effect of MST treatment levels off at a certain point regardless of initial risk. It also suggests that MST treatment is more effective for youths presenting higher risk levels at intake, who also represent the defined target group of MST. This might imply that MST is less effective when severity is lower. However, this is not supported in the present analyses, as the risk levels at the end of treatment were just as low or lower for the no-offenses group.

The one exception from the aforementioned pattern was peer relations. The differences in risk level between the two groups were large and significant both at intake and end of treatment, and the reductions in risk during treatment were large and significant for both groups. However, unlike the other factors, association with negative peers concluded at an elevated and moderate risk level for the offenses group. Thus, it appears that for the initially more criminally burdened group, breaking negative and building positive peer-relations was harder to attain during MST treatment. As negative peer relations are considered the most proximal risk factor for delinquency in the MST model (Henggeler et al.,
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

2009), this may point towards a need to review and, if possible, strengthen the interventions directed at peer relations and thereby prevent further marginalization.

4.1. Limitations and Strengths

Several limitations and strengths should be considered when interpreting the results. This study examines changes in a single group using a pre-post design. Thus, we cannot exclude the possibility that changes during treatment may be caused by, for example, history, maturation, or regression toward the mean. It should also be noted that, when comparing a small group (youths with prior offenses) with a larger group, there are several factors that may affect the validity and generalizability of the results. First, a smaller group has less statistical power to reveal statistical differences than the larger group and may be less representative for the target population compared to the larger group. Initial findings also revealed some differences between the two groups, for example, with regard to gender. Second, in this study we subtracted effect sizes between a small group (n = 221) and a large group (n = 3882), well aware of the fact that sample size is part of the equation, and larger samples tend to produce smaller standard errors and more precise estimates than small sample sizes. Consequently, the interpretation of these results should be carried out with caution.

Furthermore, we used scores on the YLS/CMI 1 to define the groups with and without recorded prior and current offenses. A score of 0 or 1 was used to define the group of non-offenders. Since we only had sum-scores available for the YLS/CMI, we cannot be absolutely sure what a score of 1 includes, still we believe it reflects a low score on prior current offenses.

Several strengths of the study should, however, be noted. In this study, we use ROM data collected from MST teams over the past 10 years, which represent a national sample of all families that have completed MST. This strengthens external validity, as the data reflect
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

MST in regular clinical practice. The large sample and near absence of missing data (0.3%) adds power to the analyses. According to Hodgson et al. (2007), such data have a lower risk of selection bias than data from RCT studies. A significant limitation is that we could not estimate reliability for the YLS/CMI subscales, as we did not have access to item-level data. This limits the internal validity of the study. Responses from different informants (e.g., youths and therapists) would increase knowledge and strengthen the external validation of the study.

The standardization of the YLS/CMI derives from the Canadian manual (Hoge & Andrews, 2011). However, YLS/CMI is not standardized in Norway. Thus, comparison of the total YLS/CMI score to other studies should be made with caution. One study has investigated the use of YLS/CMI for young people who have been referred for institutional treatment in Norway and found that the norm data is different from the original Canadian norm groups (Kanestrøm & Stallvik, 2021), which may have consequences regarding the classification of the risk groups. Age and gender are also static risk factors that predict criminal behavior. However, such variables cannot be modified and were not included in these analyses. Future research should, however, investigate whether gender and age present important moderators in MST regarding the criminogenic risk factors.

4.2. Conclusion

In this study, we investigated the national sample of youths that had completed MST over the last ten years ($N = 4103$). 5.39% ($n = 221$) of the youths had a recorded prior and/or current offense at intake. There was an overrepresentation of boys and ethnic minorities in this risk group. The level of criminogenic factors indicates that these youths represent a marginalized and vulnerable group, and many were under the age of criminal responsibility (15 years).
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

A relevant question is, thus whether MST changes the dynamic criminogenic risk factors. In conclusion, MST appears to be effective in reducing dynamic risk factors for youths both with and without an offense. Inspections of the effect sizes indicate that the largest changes in the criminogenic outcomes were in the offenses group. On the other hand, the no-offenses group scored significantly lower on negative peer relations, substance abuse, and positive attitudes/orientation towards criminal behavior postintervention. MST is an important intervention from the CWS to interrupt and prevent criminal pathways for youths.

In the Norwegian context, there is a long-standing policy of responding to juvenile delinquency by giving parental support or treatment from the CWS. Norway has a restorative rather than punitive policy regarding juvenile offending. This present study supports this policy.

References

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ANONYM, (2023).

DOES MST CHANGE CRIMINOGENIC RISK FACTORS?


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https://doi.org/10.1177/1477370815587768


https://doi.org/10.4236/psych.2013.46A2001


26
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?


**Table 1. Characteristics of Youth at Intake to MST.**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Youths with Offenses (n = 221)</th>
<th>Youths without Offenses (n = 3882)</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>45</td>
<td></td>
<td>1482</td>
<td>38.3%</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>176</td>
<td></td>
<td>2400</td>
<td>61.8%</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean age</td>
<td></td>
<td></td>
<td>M = 15.21</td>
<td>SD = 1.29</td>
<td>M = 14.32</td>
<td>SD = 1.60</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Ethnic minority</td>
<td></td>
<td></td>
<td>58</td>
<td>26.2%</td>
<td>579</td>
<td>14.9%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Days of MST</td>
<td></td>
<td></td>
<td>M = 141.63</td>
<td>SD = 40.16</td>
<td>M = 143.52</td>
<td>SD = 39.49</td>
<td>.48</td>
</tr>
<tr>
<td>Foster home</td>
<td></td>
<td></td>
<td>33</td>
<td>14.93%</td>
<td>328</td>
<td>8.45%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Not school</td>
<td></td>
<td></td>
<td>162</td>
<td>73.30%</td>
<td>2647</td>
<td>68.19%</td>
<td>.03</td>
</tr>
<tr>
<td>Use violence</td>
<td></td>
<td></td>
<td>160</td>
<td>72.40%</td>
<td>2862</td>
<td>73.72%</td>
<td>.69</td>
</tr>
<tr>
<td>Substance abuse</td>
<td></td>
<td></td>
<td>165</td>
<td>74.66%</td>
<td>1716</td>
<td>44.20%</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

**Note:**

Youths with offenses = scored 2 to 5 on YLS/CMI Prior and Current Offenses
Youths without offenses = scored 0 to 1 on YLS/CMI Prior and Current Offenses
Table 2.
Sample T-Tests on Differences Between the Groups at Intake to MST

<table>
<thead>
<tr>
<th>YLS-CMI Risk factors</th>
<th>Youths with Offenses</th>
<th>Youths without Offenses</th>
<th>df</th>
<th>t</th>
<th>p</th>
<th>Mean diff</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intake M (SD)</td>
<td>Intake M (SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Circ/Parenting</td>
<td>3.87 (1.24)</td>
<td>3.72 (1.20)</td>
<td>4101</td>
<td>-1.63</td>
<td>.09</td>
<td>.12</td>
<td>1.20</td>
</tr>
<tr>
<td>Education/Employment</td>
<td>4.17 (1.71)</td>
<td>3.90 (1.61)</td>
<td>4101</td>
<td>-3.29</td>
<td>.001</td>
<td>.36</td>
<td>1.61</td>
</tr>
<tr>
<td>Peer Relations</td>
<td>2.80 (1.02)</td>
<td>1.87 (1.11)</td>
<td>4101</td>
<td>-11.86</td>
<td>&lt;.001</td>
<td>.92</td>
<td>1.12</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>1.72 (1.46)</td>
<td>0.65 (1.00)</td>
<td>231</td>
<td>-10.68</td>
<td>&lt;.001</td>
<td>1.06</td>
<td>1.03</td>
</tr>
<tr>
<td>Leisure/Recreation</td>
<td>2.21 (0.81)</td>
<td>1.93 (0.95)</td>
<td>4101</td>
<td>-4.23</td>
<td>&lt;.001</td>
<td>.27</td>
<td>.94</td>
</tr>
<tr>
<td>Personality/Behavior</td>
<td>4.45 (1.60)</td>
<td>4.21 (1.50)</td>
<td>242</td>
<td>2.11</td>
<td>.03</td>
<td>.23</td>
<td>1.51</td>
</tr>
<tr>
<td>Attitudes/Orientation</td>
<td>2.74 (1.20)</td>
<td>2.09 (1.19)</td>
<td>4101</td>
<td>-7.38</td>
<td>&lt;.001</td>
<td>.65</td>
<td>1.97</td>
</tr>
</tbody>
</table>

Note:
YLS-CMI = Youth level of service/Case management inventory, M = mean, SD = standard deviation, d = Cohen’s d, p = p-value.
Youths with offenses = scored 2 to 5 on YLS-CMI Prior and Current Offenses.
Youths without offenses = scored 0 to 1 on YLS-CMI Prior and Current Offenses.
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

<table>
<thead>
<tr>
<th>YLS/CMI Risk factors</th>
<th>Youths with Offenses</th>
<th>Youth without Offenses</th>
<th>Change in $d$-value between youth with and with no offenses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intake $M$ (SD)</td>
<td>Post-test $M$ (SD)</td>
<td>Intake $M$ (SD)</td>
</tr>
<tr>
<td><strong>YLS/CMI Risk factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Circ./Parenting</td>
<td>3.87 (1.24)</td>
<td>3.72 (1.20)</td>
<td>2.91 &lt; .001</td>
</tr>
<tr>
<td>Education/Employment</td>
<td>4.17 (1.71)</td>
<td>3.80 (1.61)</td>
<td>2.93 &lt; .001</td>
</tr>
<tr>
<td>Peer Relations</td>
<td>2.80 (1.05)</td>
<td>1.87 (1.11)</td>
<td>1.33 &lt; .001</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>1.72 (1.46)</td>
<td>0.65 (1.00)</td>
<td>1.40 &lt; .001</td>
</tr>
<tr>
<td>Leisure/Recreation</td>
<td>2.21 (0.81)</td>
<td>1.93 (0.95)</td>
<td>1.17 &lt; .001</td>
</tr>
<tr>
<td>Personality/Behavior</td>
<td>4.45 (1.69)</td>
<td>4.21 (1.50)</td>
<td>2.89 &lt; .001</td>
</tr>
<tr>
<td>Attitudes/Orientation</td>
<td>2.74 (0.58)</td>
<td>2.69 (1.19)</td>
<td>1.84 &lt; .001</td>
</tr>
</tbody>
</table>

Note: YLS/CMI = Youth level of service/Clinical management inventory. $M$ = mean, $SD$ = standard deviation, $d$ = Cohen $d$, $p$ = p-value.
Youths with offenses = scored 3 to 5 on YLS/CMI Prior and Current Offenses.
Youths without offenses = scored 0 to 1 on YLS/CMI Prior and Current Offenses.
DOES MST CHANGE CRIMINOGENIC RISK FACTORS?

![Graphs showing changes in Peer Relations, Substance Abuse, and Positive attitudes/orientation towards criminal behavior from Intake to Post-test in MST.]

Figure 1. Results from Intake to Post-test in MST.