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The Impact of Group Motivational Interview on Motivation to Change among Adolescent Drug Abusers

Dr. Eid Abo Hamza

Assistant Professor of Psychology, Department of Social Sciences, Qatar University, Qatar

Abstract:

The study's purpose is to examine the effectiveness of Motivational Interview (MI) on motivation to change as measured by the University of Rhode Island Change Assessment (URICA;McConaughy, Prochaska & Velicer, 1983).Participants were drawn from a convenience sample of 22 adolescent males (treatment group n=11; control group n=11) who were in a mandated residential adolescent substance abuse program and who held a formal diagnosis of substance abuse or dependence.One-way repeated measures ANOVA (O'Rourke et al., 2005) utilized to examine the difference in the means of URICA among participants whose scores were recorded at three different times: before treatment, after treatment, and after a 5-weeks follow up. The overall results show that there is a statistical significance for the time effect. Additionally, there is a significant difference for the group time interaction effect, which indicates that the MI intervention is significant across time. Further, the simple main effects show no significant difference for the control group across times but did find significant differences for the experimental group. Finally, tests on the group simple main effect indicated significant differences between control and experimental groups at the pre-assessment, but no significance difference were found between the control group and experimental group in either the post-assessment or follow-up assessments. Implications of the study and suggestions for future research are explored further.

Keywords: Addiction counseling, drug abuse, group counseling, motivational interview, motivation to change

1. Introduction

Substance related issues and concerns remain a significant detriment to the personal, relational, fiscal, and occupational wellness of Americans. Substance abuse, addiction and its consequences cost the U.S. nearly \$467.7 billion in 2005 (CASA; The National Center on Addiction and Substance Abuse, 2009). Substance use disorders are among the most common mental health problems in the United States (U.S.). In the U.S., The National Survey on Drug Use and Health (NSDUH, 2009) estimated that approximately 23 million Americans struggled with substance abuse or dependence. Predictably, widespread social, medical and economic problems are associated with substance problems. While it may seem reasonable to focus on the problematic use of substances among adults, substance abuse and dependence is well documented among American adolescents (Johnston, O'Malley, Bachman, & Schulenberg, 2006). For example, 4.6 million people, most under the age of 21 (85.5%), tried alcohol for the first time in 2009, while 10% of individuals aged 12 to 17 were classified as current illicit drug users, meaning they had used either marijuana/ hashish, cocaine (including crack), inhalants, hallucinogens, heroin, or used prescription-type psychotherapeutics such as stimulants, sedatives, tranquilizers, or pain relievers for non-medical purposes (Substance Abuse and Mental Health Services Administration, SAHMSA, 2009) at least once within the last 30 days. Currently, the three most commonly used substances among youths are alcohol, cigarettes, and marijuana. Overall, 1.1 million individuals aged 12 to 17 were found to be in need of treatment related to illicit drug use, yet only 10.5% actually received specialized care. There are also numerous potential physical and mental health implications related to adolescent substance abuse and dependence. For some, such as heart disease or breast cancer (Reichmann, 1994), the risks may seem distant. On the other hand, adolescent substance use may lead to high risk sexual behaviours and sexually transmitted diseases (Garfein, Vlahov, & Galai, 1996). A growing number of individuals struggling with substance problems are also living with and/or are affected by the Human Immunodeficiency Virus (HIV) or Acquired Immune Deficiency syndrome (AIDS) or other blood-borne infections such as Hepatitis C (HCV) (Garfein et al., 1996).

Research has shown that slowing the onset of substance abuse can temper substance abuse problems later in life (Grant & Dawson, 1997; Lynskey et al., 2003). These findings highlight the need for efficient, evidence-based interventions aimed at preventing and reducing adolescent substance use and abuse. Significant efforts are needed to reduce the tremendous human and financial costs of substance abuse among adolescents. Part of this need is, predictably, the availability of appropriate treatment. The most recent data from the 2009 National Survey of Substance Abuse Treatment Services (N-SSATS) and (Cartwright, 2008) identified 13,513 facilities treating over 1.1 million adolescents and adults with substance

related problems. Of these facilities, 3948 are treating 78,000 adolescents. Still, there remains an immense need for treatment dedicated to adolescent substance abuse prevention and treatment. Even with the presence of these dedicated facilities, there remains a need to expand the variety of evidence-based treatment options for this troubled segment of the population. In general, though, research clearly illustrates the ongoing problems associated with substance abuse and dependence among nearly all segments of society.

Many traditional approaches have been utilized with adolescents battling substance abuse and dependence. Examples include Narcotic Anonymous (Galanter, Dermatis, Mansky, McIntyre, & Perez-Fuentes, 2007; Rawson & McCann, 2011), 12-step program and the matrix model (Rawson & McCann, 2011), and the psychoeducational approach (O'Brien & Perfas, 2005). However, this study utilizes a group MI framework that was developed specifically to work with adolescents in a residential treatment setting.

Miller and Rollnick (2002) defined MI as "a client centred directive MIhod of enhancing intrinsic motivation to change by exploring the resolving ambivalence." (p.25). The MI approach was developed as a means for handling the challenging and often frustrating treatment variables associated with clients dealing with substance abuse and dependence, many of whom lack essential coping skills. MI addresses these and other concerns through the use of a client-centred therapeutic focus that, ultimately, use non-directive techniques and language in order to facilitate motivation to change addictive behaviours (Miller & Rollnick, 2002). Furthermore, MI aims to resolve the common feeling of ambivalence among individuals who are struggling with addiction problems.

Operationally, MI "involves recognizing a problem, searching for a way, and then beginning and sticking with that change strategy" (Miller, 2008, p.1). In short, MI relies on the potential of the human being to evoke change. Miller (1995), Miller and Rollinick (2002), Rapp et al. (2008), and Tomlin and Richardson (2004) described this fundamental element of MI as collaborative, evocative, and respectful of autonomy. Personal motivation also plays a vital role in the change process. According to the trans theoretical model (Prochaska & DiClemente, 1982), individuals with a higher internalized motivation for change have a greater chance to move successfully through the change process. MI, as paradigm working on motivation to change, began as a natural recovery approach introduced by Prochaska and DiClemente (1982, 1984).

MI utilizes recognized and evidence-based counselling techniques. These include asking open-ended questions, reflective listening, building rapport, providing empathy and support, and working on self-efficacy. Other techniques more specific to MI include summarizing self-motivational materials, eliciting self-motivation statements, and evoking change through a plan (Miller, 2008; Rapp et al., 2008; Tomlin & Richardson, 2004; Velasquez, Maurer, Crouch & DiClemente, 2001).

MI is also supported as a group intervention (Easton, Swan, & Sinha, 2000; Foote et al., 1999; Lincourt, kuettel, & Bombardier, 2002). Berman, Forsberg, Durbeej, Källmén, and Hermansson (2010) and Galloway et al. (2007), for example, argue that using group MI within an inpatient facility can have a positive impact on client self-efficacy. Applying this new or renewed sense of efficacy can be especially positive when applied to the challenges of remaining free of substances and help facilitate a client's motivation to change their previously negative patterns of substance use. Others point to the more traditional benefits of group therapy, such as saving time and money (Finn, 2002; Morgenstern & Longrabaugh, 2000; Pita, 1992; Rotgers & Nguyen, 2006; Royce & Scratchley, 1996) and that it allows members to receive direct feedback from group members. Other advantages of group therapy include the potential for clients to feel a sense of belonging (Ingersoll, Wagner, & Gharib, 2002; Pita, 1992; Royce & Scratchley, 1996; Webb, Scudder, Kaminer, & Kadden, 2003), experience diverse views, and have the opportunity to receive on-the-spot self-awareness (Finn, 2002; Morgenstern & Longrabaugh, 2000; Rotgers & Nguyen, 2006). When this occurs, group members discover not only how they look or come across to others, but also have the opportunity to identify and process their emotional responses in the present tense. In other cases, they have the opportunity to respond to others in a safe environment (Ingersoll et al., 2002; Monti, 2008; Rotgers & Nguyen, 2006). Within the group MI framework, then, members can rehearse dealing with various life situations and learn how their new behaviours are received by others.

On the other hand, it is important to recognize potential pitfalls of the group MI format. Walters et al. (2002) noted that because group counseling involves complex interpersonal interactions, client resistance, nonparticipation, and/or conflict may increase. This may be particularly evident within residential treatment facilities where many of the group members are mandated for treatment and feel their treatment is being imposed on them. On the other hand, the interpersonal pressure or constructive feedback received from group member could lead to successful group outcomes despite intermittent ruptures in the group alliance.

The basis for this study is the lack of empirical research of the MI with mandated adolescent males; this research topic has not been previously investigated. Although MI is common treatment for substance abusers, research has only focused on adult population. Therefore, the current study seeks to examine the impact of group MI on the motivation to change among adolescent males in a residential substance abuse program. The program is designed for male adolescents in a residential substance treatment facility who possess a formal psychiatric diagnosis of either substance abuse or substance dependence. The design of the study will be quasi-experimental. The independent variable is the MI group intervention that was provided under the care of a professional licensed counsellor trained on MI. This counsellor was also an employee of the residential facility used in this study. The dependent variable is willingness to change and is assessed using the University of Rhode Island Change Assessment ((URICA; McConaughy, Prochaska & Velicer, 1983)) prior to starting the program, after completing the program, and five weeks after the end of the program. The sample of the present study consists of two groups ($n = 11$ in the

experimental group, and $n = 11$ in the control group) of male adolescents who have been diagnosed with drug dependence or drug abuse. Their ages range from 12 to 18 years old. These two groups will be divided into the following:

- An experimental group that will receive the group MI intervention.
- A control group that will receive treatment as usual.

2. Hypotheses and Research Questions

The following research questions have been derived from the review of existing literature in the area of adolescent substance abuse and will be presented in the second chapter.

- Research Question: Following treatment, will significant differences exist between the MI group and treatment as usual group as assessed by improved scores on URICA?
- Research Question: Following treatment, will significant differences exist (on URICA scores) at the following time points: before treatment, after treatment, and at follow-up assessment for the MI group?
- Hypothesis: No significant differences will exist between the MI and control groups as assessed by improved scores on URICA.
- Hypothesis: No significant differences will exist between the MI group before, after, and follow up the intervention (MI) as assessed by improved scores on URICA.

3. Methods

3.1. Participants

The study sample consisted of 22 adolescent males with ages ranging from 12 to 18 who are mandated to receive substance abuse treatment in a residential facility. Demographic and archival data relative to race, age, types of drugs that were abused/used, diagnosis, psychosocial history, medicaid information, and assessments were available through the facility's formal records on each participant. All participants had MI the treatment facility's admission criteria for residential substance abuse treatment. These criteria included the following:

- All participants have a current DSM-IV-TR (APA, 2000) diagnosis of substance abuse or substance dependence.
- All participants have an IQ of equal or greater than 70 as measured by the
- Wechsler Adult Intelligence Scale (WAIS-III), (Wechsler, 1997) which indicates a normal level of cognitive functioning.
- All participants are in the same inpatient residential treatment facility.
- All participants are between 12 to 18 years old.
- All participants are court mandated to receive treatment on the facility.

3.2. Research Design and Approach.

This study used a quasi-experimental design with the aim of evaluating the effectiveness of MI. The URICA (McConaughy et al., 1983) was administered and collected before the treatment began (pre-test), after completing the treatment (post-test), and after another five weeks as a follow-up assessment. The independent variable is group MI, while the dependent variable is motivation to change. The study is looking at whether there is a difference in the post- scores between the two groups (experimental and control) in the motivation to change. Additionally, the researcher is interested in whether there is a difference in post-scores and follow-up scores among the two groups in the motivation to change. However, any conclusion drawn from this study must consider the existence of several threats to the following internal, external, and construct validity of this study:

3.3. Threats to Internal Validity

- After being informed of MI, participants in the treatment group may have adapted their approach in responding to the counsellor providing MI.
- Secondary gains such as social desirability or benefits from the residential facility for completing the assessment could have influenced client responses.
- Testing effects due to administering the same pre and post and follow-up measurements could have occurred. For instance, knowledge of the concept of motivation to change, along with their understanding of the facility's treatment expectations, may have influenced participant responses to the assessments at post-test and follow-up.
- All participants of the study were mandated for treatment, further limiting the generalizability.

3.4. Threats to External Validity

- The small sample size and homogeneity of the groups limits generalization of results to adolescent, male drug abusers/users in the inpatient facility. Additional data collection would be needed to improve the statistical power of the effectiveness of group MI on motivation to change.
- Sample bias (O'Rourke, Hatcher & Stepanski, 2005) could occur due to the use of a convenience sample of adolescents' male drug abusers/users.

- Most of the literature review and the data collected by different organization categorized young adolescent between age 12- 17 years old. However, the residential policy accepts age between 12-18 years old which limits the study's generalizability to adolescence era.
- The study consisted of only male, adolescent participants in an adolescent substance abuse treatment program, further limiting the generalizability of the study.

4. Instruments

4.1. University of Rhode Island Change Assessment (URICA)

The readiness for change, also referred to in this study as motivation to change, is measured by the University of Rhode Island Change Assessment scale (URICA; McConaughy et al., 1983). The URICA has been adapted specifically for populations with alcohol and/or drug problems (DiClemente & Hughes, 1990). The URICA (see Appendix A) is a 32 item, self-report measure that includes 4 subscales corresponding to 4 stages of change (i.e., precontemplation, contemplation, action, and maintenance) described by Proschaska and DiClemente's (1982) Transtheoretical Model. Participants mark responses on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree), (McAnulty, 2010). Example statements for the precontemplation stage statements include:

- I'm not the problem. It doesn't make much sense for me to be here.
- I wish I had more ideas on how to solve the problem.
- I'm not following through with what I had already changed as well as I had hoped, and I'm here to prevent a relapse of the problem.

Example statements associated with the contemplation stage include:

- I am doing something about the problems that had been bothering me.
- I have been successful in working on my problem but I'm not sure I can keep up the effort on my own.
- I guess I have faults, but there's nothing that I really need to change.

Example statements for the action stage include:

- I think I might be ready for some self-improvement.
- I thought once I had resolved my problem I would be free of it, but sometimes I still find myself struggling with it.
- I may be part of the problem, but I don't really think I am.

Example statements for the maintenance stage include:

- At times my problem is difficult, but I'm working on it.
- I have started working on my problems but I would like help.
- I hope that someone here will have some good advice for me.

Each stage is measured using 7 questions (one question is omitted in each category) (DiClemente & Hughes, 1990). Scoring involves the summation of the seven questions for each subscale and then dividing the score by 7 in order to produce a separate score for each stage of change. The total readiness to change score is produced by adding the cumulative scores from the stages contemplation, action, and maintenance and then subtracting the precontemplation stage score. Scoring can range from a final score of -2 to 14, with higher total scores being indicative of greater motivation to change. Participants scoring 8 or lower are classified as precontemplators. Participants scoring between 9-11 are classified as contemplators. Those scoring between 12-14 are viewed as preparing to become Action Takers (DiClemente & Hughes, 1990).

URICA assessment was approved to use in this study to assess readiness to change by the author (See Appendix E). URICA assessment was chosen because it has proven to be both valid and reliable. For example, the internal consistency values (Cronbach's alpha) for the subscales reflect adequate reliability at between .88 and .89 for each of the four scales (Precontemplation = .88; Contemplation = .88; Action = .89; and Maintenance = .88) in the original study (McConaughy et al., 1983). The URICA also provides reasonable predictive and concurrent validity (DiClemente & Hughes, 1990) and the URICA subscales have also been supported by factor analysis (McConaughy et al., 1983). Furthermore, Amodei and Lamb (2004) examine the concurrent validity of the URICA using an instrument called Contemplation Ladder. Contemplation Ladder is an alternative measure to the URICA which has been designed a continuous measure of readiness to smoking cessation (Biener & Abrams, 1991). Contemplation Ladder consists of three subscales similar to the first three subscales in the URICA. The study, using 183 smokers, indicated that there is high positive correlation between URICA and Contemplation Ladder. The subscales in both URICA the instrument (precontemplation, contemplation, action and the maintenance) and Ladder's subscales (no plans, definite plans, and recently changed) are positively correlated (.77 - .90) in the discrimination of participant's intent or action across the three categories of change in smoking behaviour. The finding provides support for the concurrent validity of these two scales.

4.2. Procedure

Several administrative steps preceded the formal implementation of the study. To begin, the researcher made an informal inquiry with the treatment facility used in this study in order to ascertain their interest in the study. Once the facility's informal interest was verified, and upon approval by the researcher's dissertation committee, the study proposal was

submitted to the University of Arkansas Institutional Review Board (IRB) for approval. After a review by the full IRB, approval for the study was granted (IRB # 10-05-638), (see Appendix B).

Following IRB approval, the researcher submitted the study proposal to the treatment facility's Best Practices Team and the program Director for formal approval to conduct the study with the facility's clients. The committee determined that the study posed no threat and no risk to the delivery of appropriate treatment services to the facility's residential adolescent clients or their substance abuse treatment program (see Appendix F). The researcher sent the consent forms (See Appendix C and D) of the treatment and control group to the facility to be signed by the client, their families or whoever has the custody on them. Further, since the researcher is not licensed as professional counsellor in United States, the MI intervention was conducted by a licensed counselor employed by the treatment facility who had received formal training in MI through a graduate level counseling course. Throughout the study, the researcher attended each of the 10 sessions and MI with the counselor before and after each session in order to facilitate adherence to the MI curriculum.

Participants were randomly placed into treatment and control groups by the residential facility. However, in order to maintain the integrity of the two previously compiled groups, the researcher used two pre-existing groups. The experimental group ($n = 11$) received 10 sessions of MI, twice a week, over the course of 5 weeks. Participants in the treatment groups completed the URICA prior to beginning the first MI session, after 5 sessions, and again 5 weeks after the completion of the full regimen of 10 group MI sessions. The control group (control group, $n = 11$) received treatment as usual, which in this case involved the treatment facility's use of cognitive-behavioural therapy and different other techniques. Participants in the control group also completed the URICA prior to beginning the first MI session, after 5 sessions, and again 5 weeks after the completion of the full regimen of 10 group MI sessions.

On the first day of the treatment, both groups are given the URICA assessment. Each member is asked to complete the instrument at three intervals (pre-assessment, post-assessment, and follow-up assessment). Coding numbers were used to represent each adolescent in order to maintain confidentiality. All collected data was stored in a locked cabinet in a locked office at the treatment facility in order to ensure confidentiality. Data was analyzed using SAS 9.2, with the results reported of the study are reported as group information in presentations and written reports. After the instruments were completed by the participants at three different times, the researcher analyzed the data using SAS 9.2. Data was used only to fulfil the purpose of this study.

5. Data Analysis

One-way repeated measures ANOVA which contained a between-subjects factor (i.e., experimental vs. control group), as well as a within-subjects factor (i.e., pretest, post-test, and follow-up), was utilized to examine if there was a statistically significant difference in the means of URICA among participants whose scores were recorded at three different times: before treatment, after treatment, and after a 5-weeks follow-up. SAS 9.2 was utilized to test for the difference in the means as well as to report the descriptive statistics.

6. Results

The purpose of this study is to explore the effectiveness of MI on the levels of motivation for change among adolescent males in a residential substance abuse treatment program versus the treatment as usual group. Participants were already assigned into two groups by the treatment facility before the study started. The researcher then randomly selected the two groups into experimental (MI) and control (treatment as usual) group. Led by a licensed professional counsellor (not the researcher) affiliated with the residential treatment facility, the first group received ten sessions from the MI perspective. The second group, led by their regular counsellor, received treatment as usual (i.e. cognitive-behavioural therapy as indicated by the treatment facility protocol). At three previously established intervals, participants were asked to complete the University of Rhode Island Change Assessment Scale (URICA; McConaughy et al., 1983) and were collected from all participants in the treatment and control groups. Statistical analyses were performed using the means of URICA scores for each assessment time from the two groups to identify interaction effects.

6.1. Demographic/Descriptive Data

The 22 participants in the study are male and are court mandated to receive treatment. Ten (40%) of the respondents were Caucasian, 11 (44 %) were African American, 3 (12%) were Latino/Latina and 1 (4%) is Native American. Ages range from 12 to 18 years old ($M = 16.3$, $SD = 1.31$), (see Table 1). All of the participants have been diagnosed with substance abuse or substance dependency according to DSM-IV-TR (APA, 2000). All participants have an IQ greater than 70 as measured by the Wechsler Adult Intelligence Scale (Wechsler, 1997), indicating a normal level of cognitive functioning. As mentioned, the group is an open group format and relies on clients who were previously mandated by the courts for treatment at the facility. In the treatment group, 13 participants completed the pre and post assessments, while 11 completed the follow-up assessment. In the control group, the number of participants of the pre-assessment and post-assessment was 12 participants, while 11 completed the follow-up assessment. Participants who do not complete all 3 assessments were eliminated from the study ($N=22$).

Age	Frequency	Percentage
14	3	13.6
15	3	13.6
16	5	22.7
17	7	31.8
18	4	18.2

Table 1: Age, Frequencies and Percentages

The means and standard deviations from both groups at each interval are shown in Table 1. The mean of the pre-assessment of URICA measurement for the treatment group was 4.15 at the pre-assessment, increased to 9.55 at post-assessment measure, and decreased slightly at the follow-up assessment to 7.82. The control group mean pre-assessment is 9.21, decreased at the post-assessment to 8.95 and follow-up assessment (8.75), (see Table 2).

Time of Assessment	M	SD
Pre-Assessment		
Experimental Group	4.15	2.16
Control group	9.21	2.32
Total	6.57	3.38
Post-Assessment		
Experimental Group	9.55	1.49
Control Group	8.96	1.78
Total	9.26	1.63
Follow-up Assessment		
Experimental Group	7.81	2.02
Control Group	8.75	1.63
Total	8.29	1.85

Table 2: Means, Standard Deviation of URICA in Experimental and Control Groups (N=22)

Note: Upon the post-assessment two participants from experimental group and one participant from control group did not participate in this follow-up assessment (treatment group =11 participants, control group participants = 11).

6.2. Investigations of the Main Hypotheses

- Hypothesis I: There will be a statistically significant difference in the means of URICA between the treatment group and the control group.

A repeated measures ANOVA was conducted to analyze the first hypothesis and to compare the effect of MI program on motivation to change as assessed by URICA assessment among adolescent drug dependents or abusers.

Sources	df	SS	MS	η^2	F
Between Subjects	20	107.06			
Group	1	69.85	69.85	.54	13.03*
Residual between	20	107.06	5.35		
Within Subjects	40	306.66			
Time	2	80.97	40.48	.51	14.61*
Group*Time Interaction	2	114.84	57.42	.42	20.72*
Residual within	40	110.85	2.77		
Total	60	413.72			

Table 3: Summary of Repeated Measure Two-Way ANOVA (N = 22)

* $p < .01$

Results are analyzed using a two-way ANOVA with repeated measures on one factor. The Time main effect and Group with Time interaction effect are tested using the multivariate criterion of Wilks's lambda (Λ). The Time main effect is statistically significant, Wilks's $\Lambda = .46$, $F(2, 19) = 11.32$, $p < .001$, as well as the Group \times Time interaction effect, Wilks's $\Lambda = .42$, $F(2, 19) = 13.15$, $p < .001$. As shown in Table 3, the univariate test associated with the Group \times Time interaction is also statistically significant, $F(2, 40) = 20.72$, $p < .001$, which indicates that the MI intervention is significant across times. This finding indicates that the motivation to change is different among groups and across time which is consistent with the hypothesis of the relationship between the time variable and motivation to change scores among group variable.

6.3. Time Simple Main Effects

• *Hypothesis II:* There will be a statistically significant difference in the means of URICA for the intervention group before treatment, after treatment, and at the follow-up stage.

Further analysis is conducted to explore the time simple main effects and the group simple main effects. Because the interaction effect between Group and Time is significant on both the multivariate and univariate results, the researcher ignored the main effects (i.e., Group main effects and Time main effects) and focused on examining the Time simple main effects. To control Type I error across two simple main effects (i.e., the differences of URICA mean scores across time for control and experimental groups separately), the Bonferroni correction was used with an alpha of .025 ($.05/2 = .025$). Results show no significant differences for the control group across times, $F(2, 20) = .84, p = .45$, but there are significant differences for experimental group, $F(2, 20) = 25.63, p < .001$.

Since the simple effect for Time is significant in the experimental group, follow-up tests with three pairwise mean comparisons are conducted with alpha set at .008 ($.025/3 = .008$) to control Type I error inflation.

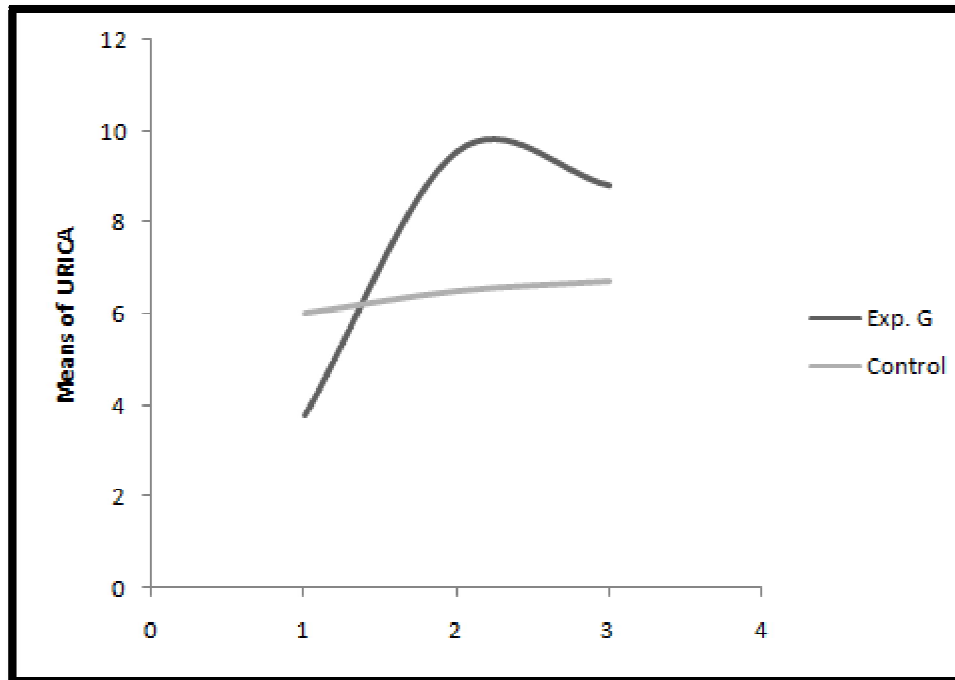


Figure 1: Significant TIME x GROUP Interaction Obtained in the Analysis of the MI Data

The MI intervention elicits a significant increase in motivation to change as assessed by URICA assessment in the experimental group from pre-assessment to post-assessment (4.15 ± 2.16 vs. 9.55 ± 1.49 , respectively) which is statistically significant, $F(1, 10) = 37.06; p < .001$. Follow-up assessment has been increased to (7.81 ± 2.02) which is statistically significantly different from pre-assessment and follow-up assessment, $F(1, 10) = 18.61; p < .001$.

In term of mean comparisons, the mean of URICA scores increases 5.04 in the experimental group from pre-assessment to the post-assessment (see Figure 1). The mean of URICA score of the treatment group decreases slightly 1.74 from the post-assessment to the follow-up assessment (see Figure 1). The mean of URICA score of the control group decreases very slightly 0.24 from pre-assessment to the post-assessment (see Figure 1), and again the mean of URICA score of the control group decreases very slightly 0.21 from the post-assessment to the follow-up assessment (see Figure 1).

6.4. Group Simple Main Effect

To verify the results of the previous test, the researcher conducts further analysis to examine the simple effects for the Group factor (i.e., control vs. experimental group). Three one-way between subject's ANOVA are conducted to assess differences between groups at each time period, with alpha set at .017 ($.05/3 = .017$) to control Type I error inflation. There are significant differences between control and experimental groups at Time 1 (i.e., pre-assessment), $F(1, 23) = 31.90, p < .001$. The mean of the MI group in the pre-assessment is 4.15, and the treatment as usual is 9.21. The results are shown in Figure 2.

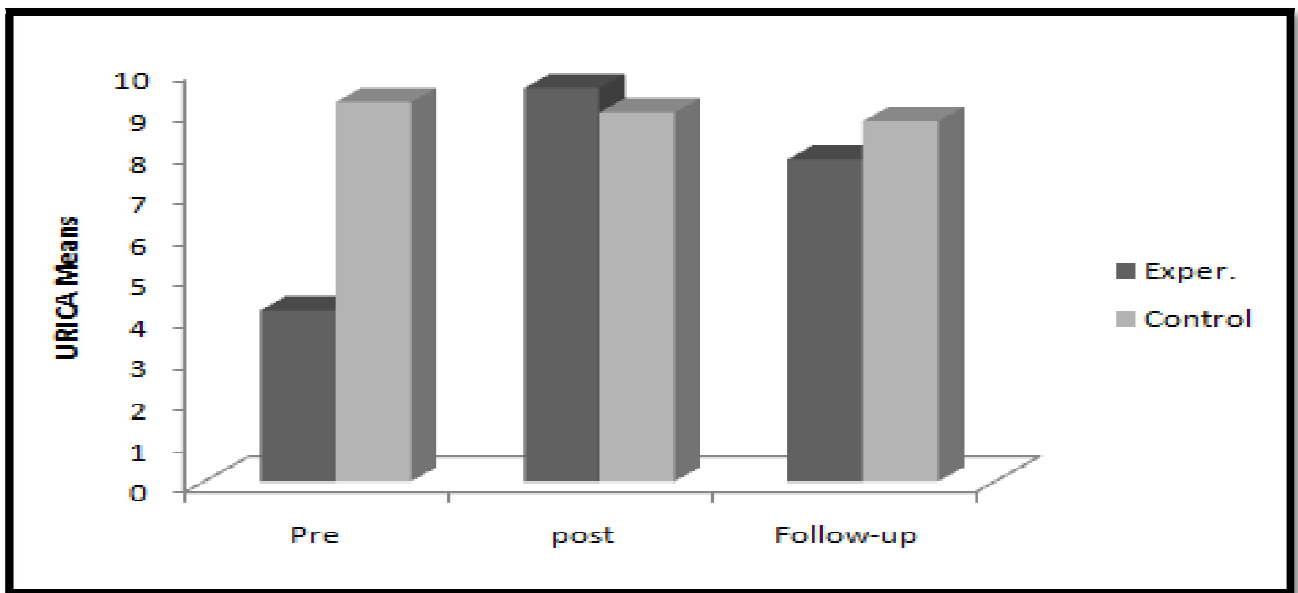


Figure 2: Changes of URICA Means for Experimental and Control Groups at Three Times Assessments

For comparing control and experimental group at Time 2 (i.e., post-assessment), there is no significant differences, $F(1, 23) = .80, p = .38$. The mean of the MI group in the post-assessment is 9.55, and the treatment as usual is 8.95 (see Figure 2). Again, there is no significant differences between groups at Time 3 (i.e., follow-up assessment), $F(1, 20) = 1.43, p = .25$. The mean of the MI group in the follow-up assessment is 7.82, and the treatment as usual is 8.75 (see Figure 2).

7. Discussion

The following sections detail the results of each hypothesis and discuss the results.

7.1. Hypothesis 1

There will be a statistically significant difference in the means of URICA between the intervention group and the control group

It was hypothesized that the group that received the MI treatment would have better results than the group receiving the usual treatment for substance abuse/use. The researcher relies on the literature review that confirmed that MI has better outcomes (Burke et al., 2002; Burke et al., 2003; Brown & Miller, 1993; Miller, 1995; Miller & Wilbourne, 2002; Noonan & Moyers, 1997; Project MATCH, 1997; Rapp et al., 2008; Saunders et al., 1995; Stephen et al., 2000; Tomlin & Richardson, 2004). Results of the study do support this hypothesis and fail to reject the hypothesis. Potential reasons for this result include the idea that the MI modality is specifically designed for the treatment of adolescent substance abusers/users. In this case, group MI was provided to its intended audience. However, the results should be interpreted cautiously as other variables such as group, facility, or psychopharmacological (i.e., clients taking prescribed psychotropic medications vs. clients not taking psychotropic medications) effects were not controlled for in the study.

The findings indicate that the motivation to change is different among groups and across time. This is consistent with the hypothesis that the relationship between time and motivation to change scores among group variable. These results are consistent with the main MI goals of increasing awareness of personal risk and substance abuse consequences, encouraging the client to explore ambivalence about use and abstinence, and ultimately, supporting the clients' self-efficacy. These results also are supported by studies that support MI over other types of treatment (Burke et al., 2002; Burke et al., 2003; Brown & Miller, 1993; Miller & Wilbourne, 2002; Noonan & Moyers, 1997; Project MATCH, 1997; Saunders et al., 1995; Stephen et al., 2000; Witkiewitz et al., 2010).

As noted, the URICA scores in the pre-assessment treatment group were low (4.15). This may be attributed to the fact that most participants in the treatment group were new to the facility, and most of them had not yet received any kind of treatment. Conversely, control group members had been in the facility for a period of time, and most of them had already received different treatments, including individual counselling, group counselling, and family counselling.

The mean of the URICA score is increased by 5.04 between the pre and post-assessment measures among treatment group members (see Figure 2) but decreased slightly (1.74) between the post-treatment and follow-up assessment (see Figure 1). In addition, the mean URICA score of the control group decreased slightly between the pre-assessment and post-assessment (see Figure 2), while the mean URICA score of the control group decreased very slightly between the post-assessment and follow-up assessments (see Figure 2).

This increase of URICA scores may be explained because the MI intervention was conceptualized and normed on adolescents. The slight decrease in the URICA score in the follow-up assessment is typical and may be explained in two ways.

First, participants received an intensive course about MI that work successfully with their motivation to change, which was obvious in their post-assessment. The second is that participants subsequently returned to treatment as usual, which is not effective enough to work on their motivation to change, which may be the reason behind the slight decrease in the follow-up assessment at five weeks after the intervention. Berman et al. (2010), Galloway et al. (2007), and Monti (2008), (Project MATCH Research Group 1997, 1998) mentioned that MI has a positive impact on self-efficacy regarding abstinence in connection with positive feelings, and appreciation of positive drug effects increased; participants tended to undergo a transition toward preparation/action stages of change, reduction of addiction, and anger management.

The possible interpretation of why the motivation to change scores changed significantly in the treatment group over time may include, but are not limited to, the following:

- Participants received specifically designed treatment for adolescent substance abuse/use in the MI, whereas the generalized treatment employed standard procedures.
- According to the trans theoretical model's view of motivation is a dynamic process which can be helpful in interpreting the significant effect of MI intervention with court mandated clients. According to Sia, Dansereau, & Czuchry (2000) court mandated clients starting their treatment with a low intrinsic motivation that can change once clients are into treatment intervention. There are several factors that can play the role of the external motivational role such as court decision to receive treatment, familial pressure, employer or co-worker. This external motivation factors may interpret the significant of the experimental group. Not all of the mandate clients are unwilling to change and participate in treatment (Farabee, Shen & Sanchez, 2002), and internal motivation for change can be developed via MI program.
- The participants of the MI treatment group experienced an increase in their motivation to change, indicating this with certain stages on the wheel of change. By looking at teach clients' score, will find moving further in the wheel of change to the next stage.
- The MI intervention in this study is a ten-session program focused on the motivation to change and remained true to the study's intention. In other words, the focus remained on substance abuse behaviors and not issues such as co-morbid mental health disorders or other known medical issues of the clients.
- One possibility for the reduction in the URICA score in the follow-up assessment in the control group is the lack of motivational interventions within the "treatment as usual" (i.e., cognitive-behavioral therapy) interventions or by how they were presented by the treating clinician and/or interpreted by the control group members.

7.2. Hypothesis II

There will be a statistically significant difference in the means of URICA for the intervention group before treatment, after treatment, and at the follow-up stage.

Results indicate that MI has a significant effect between time points among the treatment group, suggesting higher levels of motivation to change over time. Conversely, tests for simple effects showed the mean of URICA scores for the control group displayed no significant differences across time. Therefore, the second hypothesis of the study should be rejected. Several factors, viewed individually or concurrently, may help account for these results. Thus, in addition to the impact/non-impact of MI on motivation to change, factors include the sample bias, the quality of the therapeutic alliance, social learning theory, learning theory, group-think, peer pressure, or geographical location.

7.3. Sample Bias

The sample in this study was, ultimately, not a randomized sample given that the residential facility's administration assigned clients to the treatment and control group (convenience sample). As a result, sample bias could impact the outcomes of the study (O'Rourke et al., 2005). In the control group, for example, the researcher noticed that in 7 out of 13 pre-assessment measures were all scored as 5 on the Likert scale. This can be recognized from the URICA score's mean of the control group at the pre-assessment of 9.21. In comparison, the mean of the treatment group was 4.15. When the researcher asked them to answer honestly or repeat the questionnaire they refused. One explanation for their refusal may be a reaction to the "system", as all clients have been court mandated for treatment. According to Moyers and Rollnick (2002), resistance increases higher when the client experiences a potential loss of freedom or choice.

7.3. The Therapeutic Alliance.

The quality of the relational component of the study should also be considered. Carl Rogers (1957) asserted that permanent therapeutic change relies on the creation of an authentic relationship between counselor and clients (Bernard & Goodyear, 2004). Rogers argues that therapeutic improvement is more likely in environments where the clinician demonstrates empathy, unconditional positive regard, authenticity, warmth, and congruence to the client. Rogers titled these factors as "core conditions", which he deemed necessary for sufficient and lasting therapeutic changes and a stronger therapeutic relationship (Bernard & Goodyear, 2004; Greenberg et al., 2001; Orlinsky & Howard, 1986). Therefore, if group members perceived a lack of any of those core qualities, it could have ramifications on the quality of the therapeutic relationship between the treating clinician and the group members and could, for example, help account for the nonsignificant time effect of MI found in this study with the control group. Further, the researcher at one point asked the group members to

answer honestly. Because this was done by the researcher and not the treating clinician, participants could have concluded that the treating clinician was not being genuine with them and, as a result, lowered their trust in the treating clinician and study as a whole.

A more contemporary view of the therapeutic relationship is Bordin's (1979) working alliance model. The alliance, viewed as a "collaboration to change" between counsellor and client(s), can have a clear impact on both the current therapeutic efforts and treatment outcomes (Bordin, 1983). Specifically, the alliance involves the mutual agreeing on treatment goals and tasks and the strength of the emotional bond that is present among the participants. The pantheoretical and dynamic nature of the alliance model also provides a means for understanding the core elements in relationship to therapy over time, a critical component as conflict (and the potential for positive resolution of conflict) is inevitable in any relationship.

For example, members refusing to answer questions honestly during the initial assessment when prompted by the researcher to do so suggest an expected "tear" in the alliance between the researcher and participants. However, because the tear was between the researcher and participants and not the clinician and participants, opportunities to "repair" and strengthen the relationship were not available. This could also be viewed in other ways within the model, such as the potential that a level of trust between the treating clinician and participants was not able to overcome, initially at least, the sense that they were admonished by someone who was not their treating clinician, or that there was a lack of agreement on the tasks and goals connected with completing each of the assessment. In essence, the task of completing the assessments at each stage was vital to the researcher, but not the clients. On the other hand, the results indicate that this scenario did not play out over time, suggesting that the alliance between the counsellor and participants in the treatment group was able to overcome this tear over time. In future studies, it is recommended that the researcher have no contact with participants relative to how they responded to questions posed on the assessments.

7.4. Social Group Thinking and Peer Pressure

"Social groupthink" (Labrie, Hummer, Huchting, & Neighbors, 2009) and peer pressure (Borsari & Carey, 2001) could also have played a role in this study. Adolescence is a time where many social demands are placed on individuals. Some are better equipped to handle these pressures than others. Examples include social concerns, familial relationship difficulties, death of a family member, peers, friends, or financial and/or academic difficulties. Frydenberg et al. (2004) acknowledged that there is a link between these issues and higher propensity toward numerous cognitive, emotional, and social problems encountered by adolescents. Frydenberg et al. (2004) report this may include academics failure, depression, social misbehaviour, and interpersonal relationship problems. As a result, many adolescents struggle during this period to understand and cope with these expected transitional demands (Jackson & Bijstra, 2000). Therefore, satisfactory peer relationships are important (Moore & Zaff, 2002), so refusing to answer questions honestly could have been the result of a participant who felt a bit marginalized with the group to show his allegiance to his peers. Moreover, because they are both mandated for treatment and housed in a residential facility away from their parents or guardians, peer relationships may be even more important to them at the time than the influence of their families. For instance, Field, Diego and Sanders (2002) suggested that the higher level of peer attachment might influence adolescent adjustment more than parental attachment.

Hair, Jager and Garrett (2002) mentioned when these peer relationships are positive, it can discourage aggression, hostility, antisocial behaviour, and emotional distress. When these relationships are negative, unacceptable and irresponsible behaviours such as drug abuse/use may be more likely. Further, Moore and Zaff (2002) acknowledged that adolescents often influence each other by modelling behaviours, convince each other to behave in specific ways, or to adopt certain attitudes. In this study, social group think and or peer pressure may have played a role with the control group behaviours when the control group refused the researcher's request to repeat the pre-assessment. Peer pressure, whether through bullying tactics or an otherwise established social hierarchy among adolescents in a treatment facility, could have also played a role in how participants responded to the researcher and, later, to the treating clinician.

7.5. Social Learning Theory

Learning theory plays an important role in interpersonal relationships and is also supported by theories of social learning and social control. Burgess and Akers (1966) developed a theory of social learning that can be applied to many types of behaviours. However, the best application is for groups who receive reinforcement or any kind of gain such as gangs, peer groups, or social groups (Akers, 1973). The gain varies, including positive attention from their group, or pleasure, or even committing a crime or assaulting a member in the group. This bears relevance to the relationship among peers in the group, especially as they are in an inpatient facility with more opportunities for social learning and social contact. In most cases, a person will learn behavior from others, and then this behavior is reinforced (Akers, 1973; Lee, Akers & Borg, 2004; Pfohl, 1994). Akers (1985) studied smoking behavior among adolescents and found that social involvement and social learning theory explained why adolescents engage in this behavior. Han-Ying (2008) asserted that social learning has the strongest direct effect and a significant indirect effect through the mediator of beliefs about drug abuse/use behaviors.

In this study, much of the participant's behaviour could be better understood through the lens of social interaction, (Hektner, August, & Realmuto, 2003). More specifically, aggressive participants in the group chose to be connected and friends with those with similar traits. As such, the behaviours of these participants remained similar throughout the study. Based on

the results of the study, this modelling appears to have had both positive and negative effects over the course of the study, including an initial refusal by some to participate that later dissipated among the same group members.

7.6. Social Control Theory

Social learning theory also interprets behavior of the control group. The theory acknowledges that in the case of weak relationships with peers and families, individuals are likely to engage in unacceptable and irresponsible behaviours, such as substance use/abuse (Moos, 2007). According to social learning theory, peers, family members and other individuals who are important to the person can cause the person to misuse drugs or engage in other negative actions because of modeling and imitating others' behaviours. An individual observes that behavior in others, begins to engage in that behavior, and their drug abuse is consequently positively reinforced, which then leads to problematic behavior (Bandura, 1977; Moos, 2007) such as drug abuse/use. The opposite can also be true for individuals seeking treatment for substance use/abuse. If they have positive relationships within their social networks, whereby their networks include others seeking treatment or others not abusing substances, the individual can model these positive behaviors and their involvement in treatment is reinforced, thus increasing the likelihood of continuing in treatment and becoming more engaged. Participants on the usual treatment included many individuals who were molding their peers to act negatively during their stay in the treatment facility. Overall, the pro-social institution, social learning, and social control theories interpret a good part of the behavior of the control group in the pre-assessment.

7.7. Treatment Experience Variables

In addition to the participant's characteristics and social influences, treatment experience variables are important variables that should be taken into consideration. It is important to consider how satisfied the participants are with the intervention programs provided in the facility. The treatment experience may directly influence the engagement of participants in the treatment (Kabela & Kadden, 1997). In the current study, participants may not have had a positive treatment experience with the facility, nor had enough time to become accustomed to the facility given that it may have been a long distance from their places of residence. Additionally, all of the participants were court mandated, which for some could involve a sense of having their autonomy restricted. There are several challenges working with mandatory clients. Sia et al. (2000) said that "Clients who are legally coerced into substance abuse treatment often have low intrinsic motivation to participate, are less ready for treatment, and are consequently more problematic to treat and less satisfied with their treatment than are voluntary clients.". In this study, it was the observation of the researcher that participants interpret many of the requests from the administration as a formal directive, especially if the request came within a classroom setting. In the current study with the control group in the pre-assessment, the researcher asked the class teacher to ask participants to answer the URICA scale, and participants were highly resistant to the researcher's request. However, MI appears to have, over time, been useful in helping clients regain their sense of personal control, as evidenced by the fact that the control group completed the remaining assessments without resistance and the treating clinician was able to develop a reasonable strong working alliance with members of the control group.

7.8. Convenience, Location and Accessibility

Convenience, location, and accessibility of the treatment center are other factors that should be taken into consideration. The level of convenience with attending treatment may seriously impact the ability and willingness of individuals to engage in treatment. Many substance users/abusers in the facility are from all over the area of Arkansas, and some of them from areas further afield. This creates a psychological distance between them and the facility, a factor compounded by being court mandated. If a treatment center is located far from the individual's home, or if the center has limited hours of operation, these limitations may seriously impact the acceptance of the treatment at the facility. Indeed, the research team from Project MATCH (Mattson & Del Boca, 1998) found small but statistically significant support for the relation between location and accessibility of the facility and individuals' attendance at prescribed treatment sessions. Their analyses also suggested the amount of time it takes to travel to the treatment center can predict compliance; those that have to travel less tend to comply more with treatment than those who have to travel further. The researcher recognizes the impact of the distance on the participants, especially during the family session, which holds weekly in the facility.

7.9. Treatment Approaches

Treatment approaches and how well that program addresses participant needs can have a big role in terms of a participant's willingness to engage in treatment. Programs that respect the diversity of the participants and acknowledge participant differences may be more likely to engage participants in treatment than programs that focus only on the individual's addiction and take the same approach for all participants (Carroll, 1997), for example. In this study, state licensing laws dictated that the researcher not provide direct service to the participants in the study. While necessary in this case, it is recommended that future studies utilize the researcher as the service provider.

7.10. Implications and Future Research

Substance abuse places a tremendous burden on society, with males having higher substance abuse patterns than women (Cartwright, 2008; Hartel et al., 2006; Kloos et al., 2009; NSDUH, 2009; & Van Etten & Anthony, 1999). Specialized substance abuse treatment programs for male substance abusers/users is one recognized mean to deal with the adult population, with treatment shown to reduce crime, violence, mental health issues, and even death (Cartwright, 2008).

This study explored one evidence-based model, group MI, in relation to its potential impact on readiness to change, or motivation to change, among adolescent males in a residential substance abuse treatment facility. Although MI is a relatively new treatment modality, it was chosen due to that fact that it was designed for adolescent drug abusers/users. The MI has been shown to be an effectively designed intervention to treat adolescent substance abusers/users. Overall, the results of this study add to the literature indicating the effectiveness of MI, group MI in particular (Easton et al., 2000; Flores, 1997; Foote et al., 1999; Lincourt et al., 2002; Miller et al., 2003; Pita, 1992; Royce & Scratchley, 1996), with other studies that show MI's effectiveness in increasing client motivations to change among substance abusing clients (Burke, Arkowitz, & Dunn, 2002; Burke, Arkowitz, & Menchola, 2003; Brown & Miller, 1993; Miller & Wilbourne, 2002; Noonan & Moyers, 1997; Project MATCH, 1997; Saunders, Wilkinson, & Phillips, 1995; Stephen, Roffman, & Curtrain, 2000; Witkiewitz et al., 2010).

Despite the fact that the MI shows improvement in motivation to change, the results of this study found interesting discrepancies in the initial assessment. As mentioned, specialized treatment for adolescent substance abusers is important (Miller & Wilbourne, 2002; Noonan & Moyers, 1997; Project MATCH, 1997; Saunders et al., 1995; Stephen et al., 2000). In this study, when the treatment and control groups were compared, the treatment group showed improvements in URICA scores between first and second assessments. Further, while the treatment group improved their scores on URICA (5.04) for post-assessment, the control group decreased slightly by 0.24. Research suggests this difference may be attributed to individuals having low baseline motivation to change scores benefits more from MI techniques (Katie, Bryan & Dennis, 2010). In this study, the MI group started in the pre-assessment with a very low score (4.15), and the control group started with a high pre-assessment of 9.20.

In the follow-up assessment, both groups showed a decrease in URICA scores, with the MI group by 1.74 and the control group by 0.21. One reason for these scores may be the MI group felt energized to implement changes that would eliminate substance use from their lives. However, it is not uncommon to see decreases in motivation five weeks after the program. Another interesting variable in this study was that a majority of the control group participants had been at the facility for longer periods of time than most of the treatment group members. As such, they may have developed a perception of the facility, clinicians, program, or their ability to stop abusing substances that tempered the efforts of the treating clinicians and staff. Perhaps as a result, some MI group members were more motivated to work in the program in order to reduce their restrictions and be viewed initially as participating in their treatment in order to reduce the length of their stay at the facility or appease the court mandates. Overall, however, MI group members handled their resistance successfully, which is reflected in their scores on URICA post-assessment (an increase of 5.04). This suggests the need to recognize that even within specialized treatment programs and group modalities, clinicians using MI will need to recognize the individual nature of each member's individual circumstances and abilities. In that sense, the MI group in this study maintained a focus on reducing substance abuse behaviours.

Based on the findings of the study, the MI was found to be a successful treatment intervention for increasing motivation to change. This study's results could endorse positive social change in the following manner:

- Devising a treatment that can help in reducing the number of adolescent substance abusers/users who could damage their current and future lives.
- Decreasing the number of victims killed every day as a result of drink-driving victims, fatal accidents, and suicides.
- Decreasing the number of fatal diseases such as the Human Immunodeficiency Virus (HIV) or Acquired Immune Deficiency syndrome (AIDS), as well as other blood-borne infections, such as Hepatitis C (HCV), which are often caused by drug abuse (Garfein et al., 1996; McGinnis & Foege, 1993).
- Decreasing the incidence of petty crimes such as stealing money to purchase the substance being abused (Lehnert et al., 1994; Silver et al., 2000).
- Decreasing the number of high-risk behaviours, leading to less involvement with the legal system (Lehnert et al., 1994; Silver et al., 2000).
- Decreasing the economic burden that substance abusers place on society due to reducing the number of substance abusers (NSDUH, 2009).

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