Evaluation of Motivational Interviewing in Adolescents to Improve Medication Adherence

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Problem
- Medication adherence rates in adolescents are alarmingly low ranging from 34% to 89% in 14 studies with various methods of measuring adherence.
- In the study with 89% orally reported stimulant adherence saliva test showed 50% were adherent (Pappadopoulos, 2009)
- TORDIA study (2012) found 50% of 190 adolescents were taking their antidepressant 70% of time at 3 months as measured by clinician pill count
- Non-white adolescents with depression are at greatest risk for nonadherence. (WHO, 2003)
- Medication non-adherence results in poorer mental health outcomes.

Literature Review
- In a RCT using the medication electronic monitoring system (MEMS) cap as the primary measure, 50 Latino adults on SSRI medication for depression received brief MI (two to three sessions) intervention that resulted in significant improvement (30%) in medication adherence rates from 42% at baseline to 72% at completion (p < .01) (Interian et al. 2013).
- This is the first study to evaluate if brief (2 sessions) of motivational interviewing can improve medication adherence in 41 adolescents ages 12 to 18 taking psychotropic medications for mood disorders

Conflict of Interest
- I have no conflicts of interest to report
- This study was funded by private donors-Ronald and Leanne Crabbe who also have no conflicts of interest

Literature Review
- MI as an intervention occurred in youth with diseases such as diabetes, asthma, substance use and dietary adherence.
- These studies demonstrated improved physical and mental health behaviors, reductions in HBA1C levels, patient self-reported readiness for change, increased blood glucose monitoring, decreased substance use, improved asthma symptom scores, significant reduction of calories from fat intake, and significant decreases in cholesterol levels
  - (Berg-Smith et al. 1999; Channon et al. 2007; D’Amico et al., 2012; Lundahl et al. 2010; Seid et al. 2012)

Objectives
- 1) Examine if 2 Motivational Interviewing (MI) sessions improve medication adherence in 41 adolescents taking antidepressants and mood stabilizers
- 2) Evaluate if Drug Attitudes correspond with Medication Adherence
- 3) Evaluate rates of self-reported adherence to objective electronic recordings of bottle openings
- 3) Determine if 24 hours of MI training plus individualized feedback on audio taped sessions was adequate training for 6 mental health prescribers to score beginning proficiency on use of MI skills.
**What is Motivational Interviewing**

- Motivational Interviewing (MI) is a collaborative, goal-oriented style of communication attention to the language of change.
- Strengthen personal motivation and commitment to a specific goal by eliciting and exploring a person’s own reasons for change within an atmosphere of acceptance and compassion (Miller & Rollnick, 2012).
- The key elements of MI:
  - improve the clinician’s working alliance with a client
  - teach clinicians to manage resistance, to express empathy towards clients, and to help clients build motivation to change while addressing ambivalence to change (Miller & Rollnick, 2012).

**Methods**

- The quasi-experimental study trained 6 prescribers (4 NPs and 2 child psychiatrists) to perform MI
- Measured adolescent medication adherence to antidepressants/mood stabilizers using Medication Electronic Monitoring System (MEMS) before and after 2 MI sessions delivered by the prescriber in standardized 30 minute medication appointments.

**Design**

- Inclusion Criteria:
  - Eligibility included adolescents 12 to 18 years of age, of either gender and any ethnicity, currently receiving SSRI/SNRI or mood stabilizing treatment at the university outpatient clinic for a minimum of one month. There was no maximum length of time on medication.
  - The adolescents needed to be able to read, write, and speak English to complete the rating scales.
- Exclusion Criteria:
  - Adolescents with verbal communication deficits were not included in the study, as MI requires significant dialogue between the clinician and adolescent.
  - Intellectual impairment (IQ below 70) and self-care impairment were excluded as the intervention of MI involves planning and processing skills as well as independence in activities of daily living.
  - Illiteracy and lack of self-care skills and current psychosis.

**Interventionist Participants**

- 12 prescribers were invited to participate from the outpatient child and adolescent clinic, four training fellows declined to participate in the study and two child psychiatrists declined due to not being able to participate in the 3 day MI training.
- 6 faculty (4 nurse practitioners & 2 child psychiatrists) voluntarily agreed to participate in the study & signed IRB consent.
- All prescribers were Caucasian and female.
- 3 nurse practitioners were master’s prepared
- 1 nurse practitioner was doctorally prepared.
- The two child psychiatrists were both doctorally prepared.
- Of the prescribers, five had greater than 10 years of experience, one had 3 years of experience, none of the prescribers had any previous formal training in MI.

**Design**

- Evaluation of each participant’s practice of taking medication for 30 days by MEMS cap and the attitude of each adolescent toward medication occurred before and after 2 MI sessions were completed.
- Only the SSRI/SNRI and mood stabilizer adherence was monitored by the MEMS cap system. Patients were on average of 2.5 psychiatric medications
- The study evaluated if MI (independent variable) plus standardized medication treatment improved psychotropic medication adherence (dependent variable) compared to medication adherence at baseline.

**Design**

- During the first month (30 days), patient adherence to medication was monitored electronically using the MEMS cap & patient oral report.
- Drug attitude score (DAI) obtained at baseline
- At the start of the 2nd and 3rd months, each patient had 1 MI session within their monthly medication management in 30 minute appointment with a trained MI prescriber.
**Design**

- At the end of the four-month monitoring period, the patients returned the MEMS caps to the principal investigator, completed post intervention ratings using the DAI, CEMI, and patient satisfaction survey.
- Adolescents received the MI treatment alone; parents were not included in the MI training since the consistency for the MI needed to be the same for all participants.

**Study Measures**

- Medication Electronic Monitoring System (MEMS) was selected as the primary measure to determine rates of medication adherence
- The MEMS has been shown to be a more accurate and objective measure of adherence compared to clinician report, patient report, or parent report (Interian et al. 2013; Nakonezny et al., 2010).
- The MEMS cap measures how many times the patient opens the pill bottle during the time of evaluation of medication monitoring period and records the date, times and frequency of the opening of the pill bottle

**Drug Attitude Inventory-30 True or False**

- I feel that I do not need to take the medication a few times a week.
- For me, the good things about medication outweigh the bad.
- I am more aware of what I am doing, of what is going on, when I am taking medication.
- Taking medications will do me no harm.
- I would rather be sick than taking medications.
- It is easier for my mind and body to be controlled by medications than to resist them.
- Medications make me feel more relaxed.
- I am different or off medication
- The aspiration effects of medication are always present.
- I take medication only when I am sick.
- Taking medication makes me feel bad.
- I take medication only when I am told.
- I feel more confident when I am not taking medications.
- I feel more comfortable in general when I am not taking medications.
- I feel more comfortable when I am taking medications.
- I feel more comfortable if I am not taking medications.

**Video Assessment of Simulated Encounters**

- The video assessment of simulated encounters-revised (VASE-R) is a video-based exam method used for evaluating MI skillfulness that involves videotaped vignettes simulating real-world clinical encounters
- Reflective listening, responding to resistance, summarizing, eliciting change talk, and developing discrepancy are the five subscales used in the VASE-R scale to assess clinician training and MI skill level
- (Rosengren, Hartzler, Baer, Wells, & Dunn, 2009).
Client Evaluation of MI

- The CEMI is a 16-item scale measuring the participant’s evaluation of the technical and relational aspects of the implementation of MI used by the clinician.
- The CEMI questions assess collaboration, evocation, respecting autonomy, expressing empathy, rolling with resistance, developing discrepancy, supporting self-efficacy, open questions, affirmations, reflections and summaries that the clinician uses with the patient.
- Four point Likert type scale (1 = never to 4 = a great deal).

Client Evaluation of MI Counseling

- Please rate each response on the scale below relating to your most recent session with your counselor, 1-4 scale
  - Focus only on your weaknesses.
  - Help you to talk about changing your behavior.
  - Act as a partner in your behavior change.
  - Helped you to discuss your need to change your behavior.
  - Make you feel don’t align with you.”
  - Help you examine the pros and cons of changing your behavior.
  - Help you to feel hopeful about changing your behavior.
  - Argue with you to change your behavior.
  - Change the topic when you become upset about changing your behavior.
  - Push you forward when you become unwilling to talk about an issue further.
  - Act as an authority on your life.
  - Tell you what to do
  - Argue with you about needing to be 100% ready to change your behavior.
  - Show you that she/he believes in your ability to change your behavior.
  - Help you feel confident in your ability to change your behavior.
  - Help you recognize the need to change your behavior.
  - Permission obtained from Madison (2013).

MITI -4.1

- The Motivational Interviewing Training Integrity Scale, or MITI, is a one-pass behavioral coding system designed to measure treatment fidelity for motivational interviewing. The 4th edition of the scale, the MITI-4.1, was utilized in this study.
- There are 2 components of the MI, the global scores and the behavior counts. The global score takes into consideration the whole of the conversation or the “gestalt” and scores how the MI clinician creates a partnership that elicits empathy. The behavior counts focus on the behaviors of the clinician in the session.
- There are two passing scores: fair and good. In order to be classified in the fair competency range, the clinician should foster collaboration, make demonstrated efforts to understand the client’s point of view, consistently reflect the client’s change talk, and avoid emphasis on the status quo.
- Behavioral Counts: Clinician should use more reflections than questions. The ratio goal is one question for every reflection for the fair competency, and two reflections for every question for the good competency. Reflections should consist of more complex rather than simple reflections. For the fair competency at least 40% of the reflection should be complex, and for the good competency at least 50% of the reflection should be complex.
- For the purposes of this study, clinicians needed to demonstrate basic beginning proficiency (fair) prior to providing MI to clients in the study and once again at the study midpoint by having a 20 minute section of an MI session evaluated by a MINT trainer.

Examples of Terms

- Open-ended questions focus on the “how,” “where,” and “why,” related to the client’s experience.
- Affirmations: “I appreciate how hard it is for you to....” “It is very brave that you came to address this problem.”
- Complex reflections: Reflecting the deeper meaning of what the client is saying back to them. “What you believe is that...” “you want to have beer to serve your friends to be a good host, on the other hand, I wonder if it is tempting for you to have alcohol in the house...” (4)
- Summary statements: What you have discussed in your time together and be specific in identifying any changes the client said they would try.

Population

- 41 adolescents between 12 and 18 years of age with mood disorders including primary diagnosis of major depression (30), generalized anxiety (3), bipolar disorder (4), mood disorder NOS (2) and PTSD (2) who were receiving SSRIs, SNRIs, mood stabilizers, and aminoketone drugs for at least one month completed the study.
- These adolescents were on medications with both once and twice daily dosing regimens.
- Participants included 17 males (41.5%) and 24 females (58.5%) and average age of the participants was 15.6 years (SD = 1.5). (Table 1)
- Twenty-four adolescents had private medical insurance and 17 participants had state medical insurance.
- Racial backgrounds consisted of 32 (78.1%) Caucasian youth, 3 (7.3%) Black youth, 3 (7.3%) Hispanic youth and 3 (7.3%) youth of mixed Hispanic and Black race. The majority of the adolescents had a primary diagnosis of major depressive disorder (n = 30).

Population

- Average number of medication per pt: 2.5
- Drugs monitored in the study SSRIs, SNRIs, (36) mood stabilizers (5)
- Secondary drugs: antipsychotics, stimulants, alpha-agonists, bupropion, benzodiazepines (were not monitored)
- Average number of diagnosis per pt: 2.3
- Primary Diagnosis included: MDD (30), 20 MDD had comorbid GAD, GAD (3) Bipolar Disorder (4) PTSD (2) and Mood disorder NOS (2)
- Comorbid diagnosis: ADHD (20), GAD (17) Panic Disorder, Substance Abuse, Posttraumatic Stress Disorder, OCD (3), ODD, Autism Spectrum Disorder (5), social phobia (1), panic disorder (1), eating disorder (1) substance use disorder (1)
**Population**

- Thirty-one (76%) adolescents reported lifetime past medication nonadherence.
- Twenty-seven (65.9%) participants received medication treatment for more than 18 months prior to the study.
- Ten patients had been on medications between 6 to 18 months
- Four patients had been on medication less than six months.

**Results**

- Mean medication adherence scores improved by 17% after two MI sessions (p<.0001, S.D.=0.65).
- Mean baseline adherence scores were 63.7% Mean endpoint adherence scores were 80.6%.
- Taking medication >80% of time was qualifier for adherence
- Mean baseline adherence of greater than 80% of the time was 40%
- Endpoint adherence greater than 80% of time in 30 days was 70% resulting in a 30% increase in ideal adherence.

**Drug Attitude Inventory(DAI) Results**

- 17 participants demonstrated increased scores on the DAI (range 2 to 18), 12 participants’ scores decreased on the DAI (range -2 to -14) and 12 participants DAI scores remained the same from baseline to endpoint.
- There was a nearly significant change of 2.0 points from baseline (14.2, sd=8.4) to endpoint (16.2, sd=8.2) on DAI scores as a result of MI (t=1.99, df=40, p=0.054, Table 2).
- The eighteen participants who demonstrated greater than 80% adherence at baseline had a higher DAI mean score of 17.1 (sd=5.2) than the baseline mean scores on the DAI of the 23 participants with less than 80% baseline adherence (significantly lower) with a mean of 12.0 (sd=9.7) (t=2.16, df=35.915, p=0.0377)
- Of the 29 participants who had greater than 80% adherence at endpoint, their DAI mean score was 16.5 (sd=8.1) which was not significantly different than the 12 participants with less than 80% adherence at endpoint, with DAI mean score of 15.5 (sd=7.5) (t=0.35, df=39, p=0.73).

**Drug Attitude Results**

- MI did not significantly improve attitudes towards medications from baseline to end point in the entire group
- Attitudes toward medications were higher in the adherent group vs nonadherent groups at baseline.
- Nonadherent patient’s attitudes toward medication improved to similar scores as those who were adherent at endpoint
- MI’s focus on behavior change can work independently from attitudes towards medications.
- Questions on intrinsic motivation revealed 75% of youth took their medication of their own free choice at baseline and 78% of youth took medication of own free choice at endpoint

**Pt reported Adherence vs MEMS cap Adherence at Baseline**

- Baseline mean patient reported adherence=82.1%
- Baseline mean MEMS cap adherence=63.8%
- Patients over-reported medication adherence by 18.4%
- This is a significant difference (p.001)
- Pt reported adherence is overestimated, and not a reliable source of information

**VASE-R and MITI 4.1 Findings**

- 5 out of 6 prescribers passed the initial MITI-4.1. One prescriber passed the second time
- 6 out of 6 prescribers passed the MITI-4.1 at midpoint for treatment fidelity
- Pre MI training performance on VASE-R was predictive of post training performance on VASE-R and MITI in this prescriber sample
**MITI 4.1 Scores**

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**Client Evaluation of MI at Endpoint (CEMI)**

- CEMI-Relationship (Empathy & Partnership)
  - 25.0 (4.0) out of 32 (78%)
- CEMI-Technical Score (Chasing Change Talk and Side Stepping Sustain Talk)
  - 25.8 (4.8) out of 32 (80%)

**Pt Reported Satisfaction**

- 10.2 out of 12
- 1-4 scale
- How would you rate the quality of the MI?
- How satisfied are you with the motivational interviewing treatment?
- Has the motivational interviewing you received help you deal more effectively with taking your medication

**Suggestions for Future Research**

- Randomization and control group
- Don’t enroll patients who actually are adherent at baseline (greater than 92%)
- Evaluate if psychiatric symptoms correspond to adherence rates by using a depression measure
- Use MEMs for 2 months at baseline to decrease novelty vs one month
- Evaluate long term outcomes of MI
- Larger sample size to account for drop outs

**Limitations**

- Lack of Randomization and Control
- Only one drug the patient was on was evaluated so variability between drugs not captured
- MEMS cap monitoring could influence adherence—Studies found MEMS as an intervention did not improve adherence
- Long term effects were not monitored
- MEMS measures if pill bottle opened, not swallowed
- Majority of youth in the study were Caucasian, did not represent all ethnicities.

**Conclusions**

- 2 20 minute MI sessions improved adolescent psychotropic mean medication adherence by 17% from baseline to 4-5 month end point
- (p<.001) Effect size was moderate at .65
- 40% of adolescents were taking their medication >80% of the time at baseline and 70% of adolescents were taking their medication at >80% at endpoint after 2 MI sessions
- Attitudes towards medication were not significantly different at endpoint between those who were and were not adherent.
- Attitudes before and after the intervention were not significantly different for the entire group
- Attitudes improved in the nonadherent group at endpoint to similar levels as those who were adherent taking medication-80% of time
- Behavioral change occurred despite attitudes in adherence
- Self-report is not an accurate report compared to the Gold Standard MEMS cap
Conclusions

- Patients significantly overestimated the amount of medication that they were taking when comparing oral report to objective MEMS cap measures, which makes patient reported adherence a problematic measure.
- 24 hours of MI training with 2 individualized feedback sessions was adequate to prepare prescribers at beginning level competency according to the MIT and VASE-R scores.
- Patient Satisfaction and Clinical Evaluation of Prescribers. Motivational interviewing scores were high according to participants.
- Patients who did not feel MI was relevant were already 92% to 100% compliant and did not feel they needed to change their adherence behavior.

References