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A randomized pilot study of MOTivation and Enhancement (MOVE) Training for negative symptoms in schizophrenia

Dawn I. Velligan^{a,*}, David Roberts^a, Jim Mintz^a, Natalie Maples^{a,b}, Xueying Li^a, Elisa Medellin^a, Matt Brown^a

^a University of Texas Health Science Center at San Antonio, Department of Psychiatry, M.S. # 7792, 7703 Floyd Curl Drive, San Antonio, TX 78229-3900, United States

^b University of Texas School of Public Health, Center for Health Promotion & Prevention Research, M.S. # 7792, 7703 Floyd Curl Drive, San Antonio, TX 78229-3900, United States

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ABSTRACT

Introduction: Among individuals with schizophrenia, those who have persistent and clinically significant negative symptoms (PNS) have the poorest functional outcomes and quality of life. The NIMH–MATRICS Consensus Statement indicated that these symptoms represent an unmet therapeutic need for large numbers of individuals with schizophrenia. No psychosocial treatment model addresses the entire constellation of PNS.

Method: 51 patients with PNS were randomized into one of two groups for a period of 9 months: 1) MOTivation and Enhancement (MOVE) or 2) treatment as usual. MOVE is a home based, manual-driven, multi-modal treatment that employs a number of cognitive and behavioral principles to address the broad range of factors contributing to PNS and their functional consequences. The components of MOVE include: Environmental supports to prompt initiation and persistence, in-vivo skills training to ameliorate deficits and encourage interaction, cognitive behavioral techniques to address self-defeating attitudes, in-vivo training in emotional processing to address affective blunting and problems in identifying emotions, and specific techniques to address the deficits in anticipatory pleasure. Patients were assessed at baseline and each 3 months with multiple measures of negative symptoms.

Results: Repeated measures analyses of variance for mixed models indicated significant Group by Time effects for the Negative Symptom Assessment (NSA; $p < .02$) and the Clinical Assessment Interview for Negative Symptoms (CAINS; $p < .04$). Group differences were not significant until 9 months of treatment and were not significant for the Brief Negative Symptom Scale (BNSS).

Conclusion: Further investigation of a comprehensive treatment for PNS, such as MOVE, is warranted.

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1. Introduction

The negative symptoms of schizophrenia are major contributors to lost productivity, poor quality of life, social deficits, poor occupational attainment and generally poor outcomes (Kirkpatrick et al., 2001, 2006; Kurtz et al., 2005; Milev et al., 2005; Buchanan, 2007). Dimensions of negative symptoms include restricted affect, diminished emotional range, poverty of speech, decreased motivation and interests, diminished sense of purpose and diminished social drive. In contrast to the positive symptoms of schizophrenia, negative symptoms are more difficult to treat and often persist long after positive symptoms have resolved or been substantially reduced (Buchanan, 2007). Negative symptoms have been found to be more predictive of concurrent and future functioning in the community than positive symptoms (Mueser et al., 1990; Breier et al., 1991; Velligan et al., 1997; Ho et al., 1998; Milev et al., 2005). Recent factor analyses of many negative symptom instruments are composed of 2 factors, emotion expression and anhedonia/amotivation (CAINS; Forbes et al., 2010; BNSS; Kirkpatrick et al., 2011).

The NIMH–MATRICS Consensus Statement on Negative Symptoms indicated that persistent negative symptoms (PNS) are a distinct therapeutic indication and represent an *unmet therapeutic need for large numbers of individuals with schizophrenia* (Alphs, 2006; Kirkpatrick et al., 2006; Buchanan, 2007). According to the 2009 update of the Schizophrenia Patient Outcomes Research Team (PORT) treatment recommendations (Kreyenbuhl et al., 2009) there is no sufficient evidence to recommend *any* current pharmacologic agent for the treatment of deficit or persistent negative symptoms in schizophrenia. With respect to psychosocial treatments, recent work on CBT has demonstrated improvements in measures of negative symptoms (Riggs et al., 2012). Studies of Cognitive Adaptation Training (the use of environmental supports to bypass the cognitive and motivational problems underlying functional impairment) have demonstrated improvements on the Motivation factor of the Negative Symptom Assessment (Alphs et al., 1989; Velligan et al., 2000a, 2008a,b), with effect sizes in the moderate range. However, with respect to both CBT and CAT, design features essential to prove efficacy for PNS have not been followed (Buchanan, 2007).

To address the need for novel treatments we developed MOTivation and Engagement (MOVE) Training. MOVE is based upon techniques

* Corresponding author. Tel.: +1 210 567 5508; fax: +1 210 567 1291.
E-mail address: velligand@uthscsa.edu (D.I. Velligan).

from a variety of interventions that each addresses a piece of the negative syndrome presentation. Our theoretical model of negative symptoms supporting the MOVE intervention has previously been published (Velligan et al., 2014). Briefly, negative symptoms are thought to be related to disruptions in ventral striatal reward systems (Wise, 1982; Goldstein and Volkow, 2002; Juckel et al., 2006). Beck et al. (2009) have proposed that negative symptoms may emerge during the early experience of psychosis as a psychological defense against experiencing distress beyond one's capacity to cope. Once negative symptoms are present, our model proposes that the avolition leads to increasing difficulty for an individual to initiate action (Frith, 1992; Maples and Velligan, 2008), if prompted to do something or if able to generate a plan, negative cognitions about the possibility of failure may prevent the individual from executing or persisting at the behavior (Beck et al., 2009; Granholm et al., 2009). Moreover, deficits in anticipatory pleasure may prevent the individual from perceiving that they will enjoy the activity sufficiently to make it worth the effort (Gard et al., 2007). Negative thoughts as well as the atrophy of previously mastered social and work skills, may make failure more likely when a behavior is attempted (Bellack et al., 2004), and repeated negative consequences following the initiation of various activities may further prevent initiation (Beck et al., 2009).

1.1. MOTivation and Enhancement Training

MOVE is a home-based manual driven treatment described in detail in the *Manual* available upon request from the first author (Velligan et al., 2014). Procedures include an initial assessment of negative symptoms, basic cognition, defeatist attitudes, and social skills completed during the first month and 1/2 of treatment. MOVE treatment plans are developed in a collaborative manner with the client. Interventions are, agreed upon, explained, maintained and altered as necessary on weekly visits from a MOVE trainer. MOVE sessions are conducted in a person's home or community (e.g., restaurants, stores, activities) and last for approximately 1.25 h once weekly. Conducting sessions in the client's environment reduces the demand for generalizability and has been found to be extremely effective in improving adaptive behavior (Velligan et al., 2000a, 2008a,b, 2009). Homework assignments to practice or do specific activities are often suggested (Table 1).

MOVE includes 5 companion interventions, antecedent control, anticipatory pleasure, emotional processing and expression, CBT to address self-defeating thoughts and skill building. These interventions build upon one another to address both the emotion expression and anhedonia/amotivation domains of negative symptoms. These 5 components are discussed below.

1. *Antecedent control* involves the use of environmental supports such as signs, alarms, and the appropriate placement of supplies to cue specific behaviors in the home environment. This aspect of treatment allows small behavioral changes with initial success that forms the foundation for later changes. When behavior is externally cued (e.g., "call Susan about going out for coffee"), the individual does not have to generate an idea or plan (Velligan et al., 2000a,b, 2008a, 2009). Once the behavior is initiated, ensuring clear behavioral goals by outlining the process through a step-by-step checklist or an audio tape, and decreasing the number of steps required to complete each task increases the likelihood that a task will be successfully completed. As pointed out by Gard et al. (2014) and Strauss et al. (2014) motivational deficits are a major contributor to negative symptoms. External cues are designed to make behaviors more automatic (answering a ringing phone), bypassing motivational impairments (Velligan, 2012). In addition, by making the task easier with a decreased number of steps, the perceived effort is reduced. Cues are also used throughout treatment to prompt homework assignment.

Table 1
Specific interventions for negative symptoms.

Negative symptom targeted	Intervention strategy
Reduced daily activity	Use of a blank checklist to illustrate to the therapist and client what was actually being done each day. Discussion of the importance of a daily routine; discussion of the importance of increasing daily activity such that she could develop the initiation and stamina to persist with demand of employment; goal setting to determine appropriate daily activities including: medication regimes, hygiene schedule, household chores, exercise, and a leisure activity; use of checklists, signs and an alarm to prompt these; efforts to streamline steps to completing household tasks; initial incentives (\$5 gift card to Walmart) for successful goal achievement with house-keeping tasks.
Reduced affective display and emotional range	Identification and processing of thoughts and emotions related to both reaching and failing to reach weekly goals; practice identifying emotions in role plays with the therapist and in magazine pictures; practice making specific facial expressions in a mirror.
Reduced social drive	Social skills training to include: making greetings, maintaining conversations, closing conversations, reading and demonstrating non-verbal communication, importance of initiation, and practice in assertive communication; goals set to initiate phone calls to family; goal to attend church and to practice greeting people following service
Reduced interests	Development of leisure skills; goals set to attend church regularly, therapist accompanied her on outings to craft store to select hobby supplies, regular visits to family using public transportation, and daily walking for exercise
Reduced sense of purpose	Identification of both short- and long-term goals; practice breaking down large goals into smaller steps; practice with goal-setting and goal modification when necessary

2. *Anticipatory pleasure*—deficits in anticipatory pleasure prevent the individual from perceiving that they will enjoy an activity sufficiently to make it worth the effort, leading to deficits in initiating conversations and social and leisure activities (Gard et al., 2007). In treatment, the degree of pleasure anticipated by the client prior to an activity is elicited on a 10 point scale. The MOVE trainer accompanies the person to the activity and then the client rates the enjoyment during the actual activity. The discrepancy between what the patient anticipated and the level of enjoyment actually experienced enables a discussion of how this problem may interfere with planning activities that may improve the quality of life. Ratings, client's statements of enjoyment during activities and pictures are all saved to visual or digital media which show the entire process from anticipation through enjoyment with a cue to plan the next activity.
3. *Emotional processing and expression*—for clients who have difficulty identifying and expressing their own feeling states, MOVE therapists use a series of graded check-ins in which principles of errorless learning and physiological attunement help clients to develop increasingly fine-grained ability to label their own emotions. To address problems in identifying other's emotion in voice tone and facial expression, computerized emotion perception exercises are adapted from existing social cognition training programs to help individuals to identify the specific facial expressions and voice modulations associated with different emotions and to help the client to make better judgments about the feeling states of others (Roberts and Penn, 2009). To generalize basic emotion processing skills to real life, emotions are explicitly discussed during and immediately following various work, leisure, and social activities. Photographs and tape recorded segments of conversation are used to illustrate various emotions that were displayed during these activities. Clients

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