Adapting and evaluating a social cognitive remediation program for schizophrenia in Arabic

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ABSTRACT

Although growing evidence supports the efficacy of social cognitive training interventions for schizophrenia, nearly all studies to date have been conducted in Westernized countries. In the current study, we translated and adapted an existing social cognitive skills training (SCST) program into Arabic and conducted a preliminary efficacy evaluation in schizophrenia outpatients in Egypt. Twenty-two patients were randomized to 16 sessions of group-based SCST and 20 were randomized to a format- and time-matched illness management training control condition. Pre- and post-intervention assessments included a primary social cognition outcome measure that assessed four branches of emotional intelligence and a battery of neurocognitive tests. The SCST group demonstrated significant treatment effects on total emotional intelligence scores (F = 24.31, p < .001), as well as the sub-areas of identifying Emotions (F = 11.77, p < .001) and Managing Emotions (F = 23.27, p < .001), compared with those in the control condition. There were no treatment benefits for neurocognition for either condition, and both interventions were well-tolerated by patients. These initial results demonstrate the feasibility of implementing social cognitive interventions in different cultural settings with relatively minor modifications. The findings are encouraging regarding further efforts to maximize the benefits of social cognitive interventions internationally.

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1. Introduction

Social cognition refers to a group of mental operations underlying social interactions, including those needed to perceive, interpret, and generate responses to others’ intentions, dispositions, and behaviors (Green et al., 2005). The main areas of social cognition that are studied in schizophrenia include: emotion processing, mentalizing, social perception, and attributional bias (Penn et al., 2006; Green et al., 2008). Impairments in social cognition are common in schizophrenia and they uniquely contribute to the functional disability associated with this disorder (Couture et al., 2006; Fett et al., 2011). Consequently, there is considerable interest in developing social cognitive training interventions for schizophrenia that can be implemented across a range of treatment settings to help improve community functioning (Horan et al., 2008).

Studies targeting social cognition in schizophrenia can be classified into two types. One category is that of broad treatment studies that incorporate cognitive, both non-social “neurocognition” and social cognition, and general skills training in multifaceted psychosocial treatment packages. A second category includes targeted treatment studies that focus specifically on social cognition training without other interventions. A recent meta-analysis of 19 studies documented the initial efficacy of broad (n = 4) and targeted (n = 15) treatment programs in a total sample that included 692 patients (Kurtz and Richardson, 2012). There were significant overall treatment effects for facial affect recognition (large effect sizes) and mentalizing (small to moderate effect sizes), while effects on social cue perception and attributional style were not significant. In addition, there were moderate to large effects on total symptom levels and community functioning, though the effects for positive and negative symptoms were non-significant. Notably, with only one exception (Choi and Kwon, 2006), the positive findings from this meta-analysis come from studies conducted in Western countries.

Although schizophrenia is associated with considerable functional disability in Egypt (Hassan and Taha, 2011), to our knowledge no validated social cognitive training programs are available in Arabic. To address this very large public health need it is important that the field understand the degree to which social cognitive training programs can be successfully disseminated to different languages and cultures. Social cognitive programs may be particularly dependent on local cultural norms and behaviors for both the intervention materials and the outcome measures. For example, neurocognitive remediation programs often use training stimuli and assessment methods that can be relatively easily adapted cross-culturally, such as simple non-verbal (e.g., tones, geometric figures) or verbal (e.g., letters, numbers) (e.g., Rodriguez-Jimenez et al., 2011; Wykes et al., 2012). In contrast, social cognitive tasks and training...
exercises use stimuli that are distinctly social (e.g., people or faces vs. objects) and involve judgments about other people (e.g., attributing mental states to other people vs. basic tests of attention, speed of processing, or memory). Cultural influences have been documented on various social cognitive processes (Adolphs, 2010; Rodriguez-Jimenez et al., 2011; Rule et al., 2013) and assessments of functioning (Velligan et al., 2012; Gonzalez et al., 2013). In cross-cultural research, social norms in Egypt and other Arabic speaking countries have been found to differ from those of Western cultures in several ways, including religious and political values and gender roles, and even perceptions of non-verbal behavior (Bente et al., 2010; Okasha et al., 2012; Renner et al., 2007; WHO QOL SRPB Group, 2006). Thus, careful consideration of culture context is therefore necessary when adapting social cognitive interventions.

The primary goal of this study was to adapt into Arabic and evaluate the efficacy of a targeted social cognitive training program for outpatients with schizophrenia. We used a modified version of Social Cognitive Skills Training (SCST; Horan et al., 2009, 2011), a group-based intervention program developed in the United States that targets the domains of emotional processing, social perception, attributional bias, and mentalizing. In prior research, SCST resulted in improvements in emotion processing (affect perception and emotion management) that were independent of changes in neurocognitive functioning or symptoms (Horan et al., 2009, 2011). For the current study, the primary outcome measure was the Mayer–Salovey–Caruso Emotional Intelligence Test 2.0 (MSCEIT – Arabic version; Mayer et al., 2003), a performance measure of emotional intelligence that covers several facets of social cognition that are impaired in schizophrenia (Eack et al., 2007; Kee et al., 2009; Lin et al., 2012).

2. Methods

2.1. Subjects

Forty-two patients with schizophrenia or schizoaffective disorder according to the Structured Clinical Interview for DSM-IV disorders (SCID I: First et al., 2002) were recruited from the outpatient clinic of the Psychiatry and Addiction Hospital of Kasr Al-Ainy Hospitals, Cairo University. All patients were living in the community and were receiving antipsychotic medication. All patients were 18–55 years of age, adherent with their medication, and had at least nine years of formal education. Exclusion criteria were evidence of an identified neurological disease, history of head injury (documented loss of consciousness or recurrent related sequelae), history of comorbid substance use disorder, electro-convulsive therapy during the previous six months, and IQ less than 75. All patients signed a written informed consent approved by the Ethical Committee of Kasr Al-Ainy Hospitals that described the purpose of the study and all of the research procedures.

2.2. Procedures

Twenty-two patients were randomized to SCST and 20 were randomized to a skills training control group (CG). All participants completed a baseline assessment that included interview measures of demographic/psychosocial history and current clinical symptom levels, as well as performance measures of social cognition and neurocognition. The assessment took approximately 5 h. An endpoint assessment was administered 8 weeks later on completion of training. This second assessment included the same measures of symptoms, social cognition, and neurocognition, as well as a questionnaire to collect information about the participants’ satisfaction with the groups. Endpoint assessments were completed on all 42 participants and took approximately 3 h. Social cognitive and neurocognitive assessments were conducted blind to group assignment, but the clinical symptom assessments were not.

2.3. Training programs

All participants received two sessions of training per week for 8 weeks (total of 16 sessions). Both of the weekly sessions were given on the same day. All sessions were 1 h in length and the sessions were separated by a break. All groups included 6–8 patients and one group leader (SMG). There were three group cohorts for each type of training program. Participants were not compensated for participation but were reimbursed for travel expenses.

2.3.1. Social cognitive skills training (SCST)

The adapted version of SCST used in this study included 16 sessions from the original 24 session English version of SCST (Horan et al., 2011). These 16 sessions covered three of the four SCST skills areas: emotional perception, social perception, and mentalizing. We excluded the attributional bias domain because it appears to be less relevant for functional outcome in schizophrenia (Fett et al., 2011; Mancuso et al., 2011) and impairment is not consistently detected across studies (Savla et al., in press). The training sessions were translated and adapted into Arabic by the first author who received in-person, supervised training from the developers of SCST (WPH, MFG) in the United States.

Following an introductory session, five sessions were devoted to each of the three skill areas. A summary of the content in each area is presented in Table 1 (see Horan et al., 2011 for further details). Each session included a review of material from the prior session, a didactic presentation on a new topic using Powerpoint slides, practical training exercises, and interactive group activities (e.g., role play exercises). The program was designed to gradually increase in complexity and to minimize demands on attention, memory, and executive functions.

The didactic presentations used the same content and structure as the original SCST program, and we made relatively minor modifications to the training materials and exercises to adapt the material for an Arabic speaking population. We used most of the picture (e.g., faces, social scenarios), video, and auditory stimuli from the original version but excluded some that were not well suited to Egyptian culture. For example, we excluded pictures and videos that depicted unfamiliar recreational activities (e.g., American football or drinking alcohol beverages). Video (segments from American television shows or commercially available videos) and audio materials used in the emotion and social perception modules were presented in their original English with

| Table 1 |
|---|---|
| Social cognition domains | Contents |
| Emotional perception and processing | Definition of the six basic emotions (happy, sad, afraid, surprised, angry and disgusted) |
| | Identifying and discriminating cues for basic emotions through facial expressions, nonverbal gestures and vocal cues |
| Social perception and processing | Appreciating the relationship between emotions and situations |
| | Identifying social contexts that typically lead to different emotions |
| | Non-verbal social cues and different emotions (e.g., social norms, posture, eye contact, hand gestures and emotional intensity) |
| Mentalizing | Understanding feelings of others using empathy |
| | Teaching perspective taking skills |
| | Appreciating the relationship between social contexts and others’ intentions |

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exercises focusing on perception on non-verbal cues (including prosody). For exercises involving written vignettes, we made some translational adjustments to better fit the local vernacular (e.g., using the term “girlfriend” or “boyfriend” instead of “fiancée”) and norms. We modified some written vignettes describing emotions as they relate to pets, as it is not common in Egyptian culture to have a dog or cat in one’s home. Finally, we incorporated additional role play exercises to compensate for the absence of Arabic video materials, especially in the mentalizing section. All the written and role-play materials were translated or developed by the first author and revised by the second and third authors.

2.3.2. Control skills training program

For the control group (CC) we used an adapted version of the skills training program used in prior studies of SCST (Horan et al., 2009, 2011). The program is based on selected modules from the UCLA Social and Independent living Skills Program (Wallace et al., 1992). The first 12 sessions were based on the Symptom Management module, which provides training in how to prevent symptom relapses or minimize their severity by focusing on four areas: identifying warning signs of relapse, managing warning signs, coping with persistent symptoms, and avoiding substance use. The final four sessions were based on the Recreation for Leisure Module, which provides training in taking an active role in planning and enjoying leisure time activities. The purpose of the control group was to have a time and format-matched active condition. Similar to SCST, sessions were divided among didactic activities using Power point slides, videotaped demonstrations, and training exercises. Social role play exercises were excluded to avoid influencing social cognitive test performance.

2.4. Assessments

Social cognition was assessed with the Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT) 2.0 — Arabic version (Mayer et al., 2003). A professionally translated Arabic version was commercially available from the publisher (Multi-Health System, Inc. at www.mhs.com). However, the publisher does not provide norms from Arabic speaking samples. In addition, we searched extensively in the literature but were unable to find any published studies that used an Arabic version of the MSCEIT. Standardized scores were therefore based on the large normative samples for the North American version that were collected by the developers of the test (Mayer et al., 2002).

The MSCEIT is a self-report test consisting of 141 items and 8 ability subscales, which assess four branches of emotion processing (each branch is composed of two subscales). The test is formed of pictures and vignettes. The first branch, “Identifying emotions,” has 2 subscales measuring emotion perception in faces and pictures (e.g., identifying the degree to which certain feelings are expressed by a color photograph of a human face). The second branch, “Using Emotions” (to facilitate cognition), contains 2 subscales examining how mood enhances thinking and reasoning and which emotions are associated with which sensations (e.g., asking subjects to evaluate the usefulness of different emotions that best assisted a specific cognitive task and behavior). The third branch, “Understanding Emotions,” has 2 subscales that measure the ability to comprehend emotional information, including blends and changes between and among emotions (e.g., asking participants to select which 1 of 5 emotions best described a situation). The fourth branch, “Managing Emotions,” has 2 subscales that examine the regulation of emotions in oneself and in one’s relationships with others by presenting vignettes of various situations, along with ways to cope with the emotions depicted in these vignettes. For the current study, we examined the MSCEIT total score, as well as the 4 branch scores, using a general consensus approach (not age corrected).

Neurocognition was assessed with measures that were available in Arabic and used in previous studies of Arab populations (El Yazaji et al., 2002; Hussein et al., 2012; Razzak, 2013). The Trail Making Test (TMT) Part A and Digit Symbol Substitution Test were used to assess speed of processing. From the Wechsler Memory Scale we used the Digit span task (forward and backward) was used to assess working memory and Logical prose and paired-associate learning to assess episodic memory. The Proteus Mazes task was used to assess reasoning and problem solving. A composite neurocognition score was calculated for the baseline and the endpoint assessments by averaging the standard scores (mean = 0; SD = 1.0) from the six measures; standard scores (for both assessment points) were based on the mean and standard deviation of each measure at baseline in the entire sample.

Positive, negative, and total symptom symptoms were assessed with the corresponding scales of the Positive and Negative Syndrome Scale for Schizophrenia (PANSS; Kay et al., 1987; El Yazaji et al., 2002). All PANSS interviews were conducted by a single rater (SMG) who received training on the PANSS including formal didactics, viewing and rating videos with gold standard ratings, co-rated training interviews, and on-going supervision by two senior research psychiatrists (EH, LAE). All the assessments were completed in the same session starting with the PANSS followed by the neurocognitive tests and then the MSCEIT.

At the completion of the interventions, participants provided ratings of their perceptions of how much they enjoyed the treatment, how enthusiastic and knowledgeable they found the trainers, and how effective the training was in helping them deal with daily life. Ratings were provided on each of these three dimensions on Likert scales ranging from 1 (not at all) to 10 (very much).

2.5. Data analyses

Data analyses were conducted with SPSS (Statistical Package for Social Sciences [version 20]; Levesque, 2007) in three stages: (1) preliminary analyses evaluated between group differences on demographic, clinical, and performance measures at baseline, as well as overall attendance levels, using t-tests for continuous variables and X-square tests for categorical variables; (2) cross-sectional correlations between MSCEIT scores and the neurocognitive and symptom scores at baseline were evaluated using Pearson’s correlation coefficients; (3) between-group differences on social cognitive, neurocognitive, and symptom levels at the 8-week endpoint were evaluated using analyses of covariance (ANCOVA) with baseline scores on each measure entered as covariates. All statistical tests were 2-tailed, statistical significance was set at p < 0.05.

3. Results

3.1. Baseline comparisons

Demographic and clinical data for the two groups are shown in Table 2. Most patients were not employed or attending school and were not married. The sample was chronically ill and the groups were well matched and did not significantly differ on any of the measures.

The groups were also well matched on the performance and symptom measures at baseline (see Table 4). There were no significant between-group differences on the baseline measures of social cognition, neurocognition, and symptoms (all ps > .10). Attendance levels (number of session attended out of 16) were also comparable and relatively high in the SCST (M = 13.55; SD = 2.13) and CC (M = 12.90; SD = 2.20) groups (t = 0.96, p > 0.05).

3.2. Correlational analyses at baseline

Intercorrelations among the social cognitive, neurocognitive, and clinical symptom measures are shown in Table 3. We were particularly interested in the associations among the branches of Arabic MSCEIT because we could not find any published literature on this translation of the measure. The branches showed moderate to strong intercorrelations with each other and, as expected, strong associations with the total score. Branches 2 and 4 were slightly more related with each
other than the other branches. The associations between the MSCEIT and the neurocognition composite were lower than expected. There were no significant associations between the MSCEIT branches and symptoms. Overall, the MSCEIT branches showed a sensible pattern of inter-correlations and relatively small correlations with the external variables examined.

### 3.3. Treatment effects

The main treatment results are shown in Table 4. The SCST group showed significant improvements in social cognition compared with the CG. On the MSCEIT, the SCST group demonstrated significant improvements on the Total score and Branches 1 (Emotion perception) and 4 (Managing emotions) and the magnitudes of these differences were large (Cohen, 1988). In contrast, scores on the MSCEIT branches were relatively unchanged in the CG, with the exception of Branch 4 that showed an unexpected decrease. There were no significant treatment effects for Branches 2 or 3 and no significant within-group changes for either group on these branches.

For neurocognition there were no significant treatment effects. Scores in both groups were relatively stable and there were no significant within-group changes for the individual neurocognitive measures (not reported in table) and none were significant.

There were also no significant treatment effects for total, positive, or negative symptoms. We found significant within-group clinical symptoms improvements in both groups (see Table 4) but no differences between groups. Both groups reported a high degree of satisfaction with the treatment procedures. Scores for: 1) how much they enjoyed the treatment, 2) how enthusiastic and knowledgeable they found the trainers, and 3) how effective the training was in helping them deal with daily life were all greater than 8 (out of a possible 10) for both groups, and there were no significant between-group differences (all ps > .10).

### 4. Discussion

In this study, we translated, adapted, and evaluated a targeted social cognitive training program for use with Arabic speaking schizophrenia outpatients. We found that the training intervention appeared to be suitable and well tolerated by our patients. Our initial results show that the training program was efficacious and showed significant improvement, compared to a control skills training condition, on emotion processing in this sample of patients. These findings support the feasibility and usefulness of adapting existing social cognitive training programs for use in non-Western cultures.

Although the primary outcome measure (MSCEIT) was translated into Arabic and commercially available, we did not find previously published data on this version in any clinical sample. Our baseline results on the MSCEIT demonstrated strong intercorrelations among the four branches, consistent with prior findings in schizophrenia (Eack et al., 2007; Lin et al., 2012). Notably, the pattern of performance across MSCEIT branches in this study with Egyptian patients is similar to that found in chronic and first episode patients with schizophrenia in the United States (Kee et al., 2009) — Branches 1 and 2 were the highest and branch 3 was the lowest. In addition, the MSCEIT showed only small, non-significant relations to neurocognition and clinical symptoms. In combination with the intercorrelations among the branches, these results suggest that the translated version of the MSCEIT performed well in this sample, but further psychometric and validity testing is clearly needed. It would also be useful to validate Arabic measures for other social cognitive domains to more comprehensively evaluate the efficacy of social cognitive interventions in Middle-eastern countries.

### Table 3

<table>
<thead>
<tr>
<th>Inter-correlations among measures at baseline.</th>
<th>Total</th>
<th>Branch 1</th>
<th>Branch 2</th>
<th>Branch 3</th>
<th>Branch 4</th>
<th>Composite</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSCEIT Total</td>
<td>1</td>
<td>0.75***</td>
<td>0.64***</td>
<td>0.70***</td>
<td>0.79***</td>
<td>0.16</td>
<td>0.09</td>
</tr>
<tr>
<td>Branch 1</td>
<td></td>
<td>1</td>
<td>0.49***</td>
<td>0.53***</td>
<td>0.64***</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>MSCEIT Branch 2</td>
<td></td>
<td></td>
<td>1</td>
<td>0.14</td>
<td>0.15</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td>Branch 3</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.55***</td>
<td>0.07</td>
<td>0.21</td>
</tr>
<tr>
<td>MSCEIT Branch 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.58***</td>
<td>0.21</td>
</tr>
<tr>
<td>Neurocognition Composite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.07</td>
</tr>
<tr>
<td>Positive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PANSS Total</td>
<td>0.09</td>
<td>-0.03</td>
<td>-0.16</td>
<td>0.10</td>
<td>-0.21</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>0.07</td>
<td>0.09</td>
<td>-0.06</td>
<td>-0.07</td>
<td>-0.06</td>
<td>0.50***</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>0.01</td>
<td>-0.04</td>
<td>-0.23</td>
<td>0.17</td>
<td>-0.21</td>
<td>0.58***</td>
<td>-0.07</td>
</tr>
</tbody>
</table>

** p ≤ .01
*** p ≤ .001.  

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In light of the strong association between social cognitive deficits and functional disability in schizophrenia (Pett et al., 2011), an important contribution of this study concerns the feasibility of adapting existing social cognitive interventions for use in different cultural contexts, in this case for schizophrenia outpatients in Egypt. The overall improvements on the MSCEIT in the SCST group were primarily due to changes in the areas of emotion perception and management, which are both associated with community adjustment in schizophrenia (e.g., Henry et al., 2008; Kee et al., 2009; Pett et al., 2011). Aside from a decrease on MSCEIT Branch 4, the control group did not show significant changes in other branches. We did not expect this decrease and cannot explain it. The benefits of this targeted intervention were relatively specific to social cognitive gain as neither group demonstrated improvement in neurocognition. In addition, the interventions were similar in terms of participants’ ratings of enjoyment and relevance to their daily lives, attendance levels, and symptom changes, suggesting that the differential treatment effects were not attributable to these factors. The overall pattern replicates recent findings that SCST improved the same two aspects of emotional processing, perceiving emotions and managing emotions, independently of neurocognition and symptoms in outpatients with psychotic disorders in the United States (Horan et al., 2011). Thus, the current findings contribute to growing evidence on the usefulness of targeted social cognitive interventions (Kurtz and Richardson, 2012). They also demonstrate the feasibility and potential value of adapting existing programs to help promote functional recovery in schizophrenia internationally.

Cross culture adaptation of social cognitive interventions presents some unique challenges that do not arise with, for example, non-social cognitive remediation programs. The training for social cognition always takes place in a social context and the stimuli are inherently social (Adolphs, 2010; Rodriguez-Jimenez et al., 2011; Rule et al., 2013). Aside from translational adjustments, the selected modules required some additional modifications. As described in the Methods section, adapting and disseminating social cognitive training for use in this cultural context required careful consideration of the religious and cultural context. References to American football, social drinking, and even domestic pets needed to be modified so that the stimuli would be familiar to Egyptian patients. It was clearly possible to make such changes to suit the social context in a way that retains the key training elements.

In summary, the current study supports the efficacy of a targeted social cognitive intervention originally designed in United States and adapted in Egypt for Arabic speaking outpatients with schizophrenia. Limitations of the current study include the small sample size and the use of predominantly male patients. In addition, the ratings of clinical symptoms were not conducted blind to group membership. The range of outcome measures was relatively restricted and did not directly assess each of the targeted social cognitive domains. Finally, community functioning was not assessed. Nonetheless, this study is the first to adapt a social cognitive program in Arabic and to use in schizophrenia a well-established social cognitive assessment. Further psychometric and validation research on the MSCEIT, measures of other social cognitive constructs, and measures of real-world functioning is needed in Arabic speaking and other non-western countries. The key goal of social cognitive training programs is to help individuals with schizophrenia achieve more complete functional outcomes. This study represents a first step toward evaluating and disseminating social cognitive training approaches as a means to ultimately promote functional recovery internationally.

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Contributors
All authors contributed to the study design. Dr. Green, Dr. Horan and Dr. Gohar contributed to the data analysis and interpretation. Dr. Gohar wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

Conflict of interest
None.

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