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Effect of Social Cognitive Skills Training (SCST) on Cognitive and Affective Theory of Mind in Adolescents

Original scientific paper

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Abstract

Social cognitive skills training (SCST) in a therapeutic setup can result in more positive outcomes when incorporated with psychotherapy, especially among adolescents with minor social-cognitive impairments, and it may result in multifarious benefits to mitigate their social-cognitive dysfunction. This research focuses on the effect of SCST on the cognitive and affective theory of mind for adolescents with low social cognition. Quasi-experimental research with a pre-test-post-test design was used. Edinburgh Social Cognition test (ESCoT) was used for pre-and post-testing one week before and post-SCST training. The significant findings reveal a positive impact of SCST on the affective theory of mind and cognitive theory of mind in the experimental group. No significant changes were found in the control group (waitlisted). The results help validate the SCST module to improve an adolescent's cognitive and affective theory of mind in social cognition. Further implications are discussed.

Keywords: *Social cognitive skills training, cognitive theory of mind, affective theory of mind, social cognition, adolescents*

Adolescents in India intensively require mental health interventions and training on increasing cases of psychotic disorders concerning anxiety, depression, and social-cognitive impairments. Several official reports have proved that Indian adolescents aged 13 to 19 years show a prevalence of severe mental illness of 7.3 percent (Sivakami, 2023). Adolescent cognitive and affective impairments have become globally essential in public health discourses (Tohi et al., 2022). Adolescents who have schizophrenia, bipolar disorder, post-traumatic stress disorder, and severe depression show significant social-cognitive impairments in every aspect of their lives. They may experience six or more of the following symptoms, showing significant variations in their previous state of normal psychological functioning: changes in

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expression of emotions or comprehension of emotional impulses, social disinhibition or withdrawal, loss of empathy, reductions in thinking ability, social impairments including affective and cognitive ToM dysfunctions, attributional bias, and low psychological well-being (Calderón-Delgado et al., 2020). These ailments must last six months or more to get diagnosed, according to ICD 11 and DSM 5 (Jo et al., 2019). Social cognitive impairment has a long course and acts as a precipitating cause for developing severe psychopathologies in the future lives of adolescents (Besag & Vasey, 2019). A low level of social cognition severely affects the social life of adolescents in several ways than described in the stated symptoms. Social cognitive skills have much to do with cognitive and affective ToM, and they are concerned with the theory of mind abilities (Jacob & Reddy, 2023). The current study focuses on low social cognition, an expressive symptom of several psychotic disorders on cognitive and affective ToM. A typical SCST intervention can alleviate various ailments of adolescents regarding cognitive and affective ToM. However, an inquiry into this research area started about two decades ago, and very little literature is available on the Indian adolescent population. Multiple benefits of SCST intervention on cognitive and affective ToM have been found in the West, including improvement in the overall performance of social cognition. For example, Granholm et al. (2014) posit in their research study in the United Kingdom that SCST for adolescents to alleviate the negative symptoms of schizophrenia results in a significant reduction in negative symptoms, and they are more engaged in vocational, social, independent, and recreational activities.

Social Cognitive Skills Training (SCST)

Social Cognitive Skill Training (SCST) is an adaptable, cost-effective, and evidence-based model training that has a significant role in fostering social cognitive skills by working on the theory of mind (cognitive and affective), recognition of social emotions, understanding of social norms, inferences, abstract thinking, and planning abilities (Trujillo et al., 2017). SCST is an umbrella term for social-cognitive interventions focused on rehabilitating individuals with social cognition deficits (Nijman et al., 2020). This one-month training entails several goal-oriented activities in each session, with a weekly schedule of 40 to 50 minutes. The SCST addresses social cognition, primarily cognitive and affective ToM, which involves social, cognitive, and emotional processing. The SCST would thus have profound implications for protection and prevention. It can be used for individuals in early, middle, and late adolescence in group or individual settings, including schools, colleges, rehabilitation centers, hospitals, and many more (Fuligni, 2018). SCST may help adolescents navigate their social worlds and excel later in life and has been linked to positive outcomes. For example, adolescents have a greater tendency to take another individual's perspective, which is associated with a more excellent prosocial approach to relationships and more trust during cooperative interactions.

Cognitive and Affective Tom Bond in Social Cognition

Social cognition is a set of psychological processes involved in cognitive ToM, affective ToM, intrapersonal, interpersonal, group, and other social interactions. It is the ability to predict human behavior and act wisely in social interactions (Arioli et al., 2018). Social cognitive skills enable individuals to process, interpret, and use information in social circumstances to explain and predict how individuals behave. These processes stimulate social cognition and related abilities among adolescents. Thus, social cognition in adolescents is controlled by these mental processes involved in identifying emotions, perceiving, memorizing, thinking about, expressing appropriately, and attending to others in our social world (Dolcos et al., 2020). Impairments in any of these factors affect the overall development of social cognitive skills. The theory of mind is generally identified as a branch of cognitive science that investigates how individuals ascribe the mental status of others in social contexts (Dwivedi et al., 2021). This is otherwise known as social cognition, and more accurately, it develops in childhood and peeks in late adolescence. Cognitive ToM is a component of ToM skills that

powerfully connects to social cognition. This is the original mindreading sense of ToM, which concerns false beliefs. Cognitive ToM involves implications about knowledge, intentions, and beliefs (Frith & Frith, 2007; Pedditzi et al., 2022). It also helps to investigate mentalizing, otherwise known as mind-reading abilities. Cognitive Theory of mind deals with those psychological domains that help in realizing the mindset or thoughts of other people about their lives (Allen et al., 2017).

Affective ToM focuses on assertive expressions of emotion in everyday situations. This involves emotion identification, processes, expression, and assertive skills. Affective theory of mind also fosters nonverbal communication skills characterized by eye contact, body posture, and other related skills (Lee et al., 2014). Adolescents need this component of the theory of mind because emotion processing is considered the basic schema of social interaction. Identifying basic and complex emotions enables adolescents to perform better in community settings. Therefore, affective ToM focuses on the attributions about emotional and mental status. Affective ToM is also related to empathy (Salles et al., 2023). The period of adolescence is known for critical changes in the developmental patterns of theory of mind skills. However, some evidence shows differences in adolescents' cognitive and affective ToM developmental trajectories (Backes & Bonnie, 2019). Implications about emotions affect the Theory of Mind, whereas the conative Theory of Mind represents the aspects of social communication. It is defined as perceiving and using emotional information and encompasses simple and complex processes. Further, it is a central component of nonverbal communication. It utilizes the principles of recognizing changes in one’s non-verbal abilities, such as facial expressions, gestures, eye contact, emotional expressions, and movement.

Why SCST for Adolescents?

There are two significant reasons for focusing this study on the adolescent population. First, adolescence (10-19 years) is a significant period for developing cognitive, social, and emotional habits other than early and middle adolescence (Hamidullah et al., 2020). This is the period in which they usually encompass sudden physical and social-cognitive development, unlike any other period in the human lifespan. Cognitive and affective theory of mind develops in Childhood and peeks at adolescence. During this period, they become more aware of their own emotions, feelings, thoughts, and the mental status of others (Li et al., 2017; Gabriel et al., 2019). Secondly, there is precise evidence from previous research that the most common mental disorders like anxiety, affect, mood, attention, and behavior disorders are most likely to onset in adolescence (Scott et al., 2016). Adolescence (10-19 years) in lifespan development is a vulnerable time for the onset of severe mental health conditions. In late adolescence, individuals attempt to find their identity, struggling with social interactions and moral decisions (Kar et al., 2015). Thus, Social-cognitive processes, which include cognitive and affective ToM, are crucial to achieving enhanced mental health during adolescence.

Research Objectives

The main objective of this study was to learn the role of SCST for adolescents in improving cognitive and affective theory of mind.

Rationale and Significance

SCST is a good non-pharmacological training for late adolescents with low social cognition to improve their cognitive and affective ToM. According to existing literature, social cognitive skill training is standard in clinical populations with severe social and cognitive impairment, such as autism, schizophrenia, bipolar disorders, etc. (Horan et al., 2011; Lim et al., 2020). Training for adolescents with low social cognition is rare. In India, very few undertakings have been made to foster the adolescent population's social cognitive skills and psychological well-being, which are the nation's future (Sivakami, 2023). The high magnitude of psycho-pathology among adolescents in India is an alarming sign for the future (Mehra et al., 2022). The current research enables us to know the effectiveness of SCST and its contribution to improving cognitive and affective ToM in adolescents.

It enables mental health professionals to understand the importance of social cognitive skill training in providing a better atmosphere for healthy social development. Incorporating this training into the education system promotes a holistic approach to the social performance of adolescents. The present study establishes the effectiveness of SCST in improving cognitive and affective Theory of mind among adolescents with low social cognition, which may open new horizons in the mental health profession.

Method

Sample

The sample comprised 80 participants with low social cognition aged 10 to 19. The purposive sampling technique determined the participants who fulfilled the criteria. The inclusion criteria for this research study were consenting participants aged 10 to 19 who can read, write, and converse fluently in their native language and have low social cognition below 58 scores on the Need for Social Cognition Scale (NFSC). The exclusion criteria were individuals with severe psychiatric and neurological conditions and other co-morbidity, scoring higher than 58 points on the Need for Social Cognition scale.

Instruments

The Need for Social Cognition Scale-29 items (NFSC) by Carpenter (2009) was used as a screening tool to assess low social cognition among adolescents over time. Low scores indicate low cognitive and affective ToM abilities (Carpenter, 2009). The material used for the pre-test and post-test for measuring affective and cognitive ToM was The Edinburgh Social Cognition Test (ESCoT). The Edinburgh Social Cognition Test (ESCoT) is a new test to assess social cognition in four domains: affective theory of mind, cognitive theory of mind, and inter and intrapersonal understanding of social norms. It uses ten animated interactions (Baksh et al., 2019). Generally, The Edinburgh Social Cognition Test (ESCoT) measures four social cognitive abilities related to social cognition: Cognitive theory of mind (ToM), Affective theory of mind (ToM), Interpersonal understanding of social norms, and Intrapersonal understanding of social norms. The ESCoT proves its inter-rater reliability using intra-class correlation assessment. There is a second independent rater score, a sample of 5 sample participants from each age group. The consistency of ESCoT assessed (ICCs) for the 15 ratings is 0.90, indicating high inter-rater reliability.

Research Design

A quasi-experimental research (Pre-test, Post-test) design was used in this study. The participants were screened based on age, educational qualification, and NFSC scores and assigned to experimental and waitlist control groups. The participants from both groups underwent pre-tests and post-tests to compare the severity of low social cognition, i.e., cognitive and affective ToM, one week before and one week after the SCST administration.

Procedure

Participants in this study were screened and allotted according to the inclusion criteria. They were selected on age, educational qualification, and NFSC scores and divided into experimental and waitlist control groups. Informed consent and assent were obtained, along with a detailed introduction to the study procedure. Training will be piloted based on a SCST manual developed by the researcher based on a literature review, expert opinion, and suggestions (Jacob & Reddy, 2023). The participants from both groups underwent pre-tests in relatively uniform conditions. SCST was administered to the experimental group. SCST is a one-month program with two sections. Each section includes five sessions based on the cognitive and affective theory of mind. The participants in the waitlist control group received no training intervention until they completed the entire cycle of this experiment. The participants in the experimental group were engaged in SCST, a total number of ten sessions for 40 to 50 minutes twice a week for one month. The therapeutic procedure involved in SCST includes goal-directed activities, role play, brainstorming, debate, and other exciting individual and group activities. Some activities were based on mind reading, cognitive empathy, interpretation, yoga,

emotion recognition, emotion assimilation, emotion recognition, and emotional awareness. After the intervention, the researcher waited one week and administered the post-test under relatively standard conditions. There was a debriefing session about the experiment towards the end of the experiment cycle, and the control group was waitlisted and offered the SCST.

Ethical Considerations

The study's objectives were explained well, and informed consent was collected from the participants. Before the study, the researcher obtained ethical clearance from the ethical committee, Department of Psychology. Prior permission was obtained from experts for validation and other contributions to this study. Appointments were fixed earlier and had a structured method for reviewing the literature from various databases.

Participant protection. Detailed informed consent was provided to the participants, and it was clear that those willing to participate could join the SCST. The freedom of withdrawal at any point of the current research was communicated—the debriefing of the data provided towards the end of the study. The entire research experiment was conducted by following the guidelines of APA for conducting typical quasi-experimental research (Lord et al., 2022). Confidentiality was strictly followed and related to the entire study procedure and after.

Results

SCST has been employed to manage and treat adolescents with low social cognitive skills, which may improve their cognitive and affective theory of mind. SCST can be used as a remedy for treating several psychological ailments. We find very few studies to explore this area of research on affective and cognitive ToM. This study measured improvement in cognitive and affective ToM before and after SCST. The experimental group has four dropouts and the waitlist control group has two. The participants were noted if they missed more than one session and excluded from the post-test and further analysis of the study. The Shapiro-Wilk test was conducted on the experimental group's data to analyze the normality. The scores obtained for cognitive ToM indicate normal distribution, and the scores for affective ToM are not normally distributed, as shown in Table 1.

Table 1

Normality Assumption Test - Shapiro-Wilk (W)of the Experimental and Waitlist Control Group

Pairs		Shapiro-Wilk (*W*)	*p-value*
Experimental Group			
Pre-test	Post-test		
Cognitive ToM	Cognitive ToM	0.944	0.070
Affective ToM	Affective ToM	0.938	0.045
Waitlist control group			
Pre-test	Post-test		
Cognitive ToM	Cognitive ToM	0.813	< .001
Affective ToM	Affective ToM	0.875	< .001

Note. A low p-value suggests a violation of the assumption of normality.

A paired sample t-test was conducted to analyze the data's normality on cognitive ToM and affective ToM of the experimental and waitlist control group, as shown in Table 2.

Table 2

Paired Sample t-Test – Cognitive ToM in Experimental Group

Pairs	*N*	Mean	*SD*	Median	*Paired Sample t-Test*			Effect Size (*r*)
					Test Statistic (t)	*Df*	*p-value*	
Cognitive ToM Pre-test	36	19.3	1.14	19.0	-13.8	35	< .001	-2.30
Cognitive ToM Post-test		24.6	2.02	25.0				

Note. For the adolescents in the experimental group (N = 36), the Cognitive ToM after SCST (M = 24.6, SD = 2.02) is significantly higher than the Cognitive ToM before SCST (M = 19.3, SD = 1.14) with a large effect size, t = -13.8, df = 35, p < .001, r = -2.30.

The Paired Sample t-test result (Table 2.) found that for the adolescents in the experimental group *(N* = 36), the Cognitive ToM after SCST (*M* = 24.6, *SD* = 2.02) is significantly higher than the Cognitive ToM Before SCST (*M* = 19.3, *SD* = 1.14) with a large effect size, *t* = -13.8, *df* = 35, *p* < .001, *r* = -2.30.

Table 3

Wilcoxon Sign Ranked Test for Affective ToM in Experimental Group

Pairs	*N*	Mean	*SD*	Median	*Wilcoxon Sign Ranked Test*		Effect Size (*r*)
					Test Statistic (*W*)	*p-value*	
Affective ToM Pre-test	36	20.6	1.40	20.0	0.001	< .001	-11.000
Affective ToM Post-test		25.2	2.13	25.5			

Note. For the experimental group (N = 36), the affective ToM after the administration of SCST (M = 25.2, SD = 2.13, Mdn = 25.5) is significantly higher than the Affective ToM before the SCST (M = 20.6, SD = 1.40, Mdn = 20.0) with large effect size, W = 0.001, p < .001, r = -11.000.

Table 3 shows the Wilcoxon Sign Ranked Test results conducted on affective ToM based on data obtained from the experimental group participants. It is found that for the adolescents in the experimental group (*N* = 36), the affective ToM after the administration of SCST (*M* = 25.2, *SD* = 2.13, *Mdn* = 25.5) is significantly higher than the Affective ToM before the SCST (*M* = 20.6, *SD* = 1.40, *Mdn* = 20.0) with large effect size, *W* = 0.001, *p* < .001, *r* = -11.000.

Table 4

Wilcoxon Sign Ranked Test – Cognitive ToM and Affective ToM in the Waitlist Control Group

Pairs	*N*	Mean	*SD*	Median	*Wilcoxon Sign Ranked Test*		Effect Size (*r*)
					Test Statistic (*W*)	*p-value*	
Cognitive ToM Pre-test	38	19.2	1.20	19.0	51.0	0.221	-0.333
Cognitive ToM Post-test		19.4	1.33	19.0			
Affective ToM Pre-test	38	20.6	1.29	20.0	84.0	0.077	-0.391
Affective ToM Post-test		20.8	1.24	21.0			

Note. For the cognitive ToM of the participants in the waitlist control group, as shown in Table 3. For the adolescents in the waitlist control group (N = 38), the Cognitive ToM after SCST (M = 19.4, SD = 1.33, Mdn = 19.0) does not significantly differ from the Cognitive ToM before administering the SCST (M = 19.2, SD = 1.20, Mdn = 19.0), W = 51.0, p = 0.221, r = -0.333. For the adolescents in the waitlist control group (N = 38), the affective ToM after SCST (M = 20.8, SD = 1.24, Mdn = 21.0)) does not significantly differ from the affective ToM before SCST (M = 20.6, SD = 1.29, Mdn = 20.0), W = 84.0, p = 0.077, r = -0.391.

The Wilcoxon Sign Ranked Test was conducted to analyze the cognitive ToM and Affective ToM of the participants in the waitlist control groups, as shown in Table 4. For the participants in the waitlist control group (N = 38), the Cognitive ToM (M = 19.4, SD = 1.33, Mdn = 19.0) does not significantly differ from the Cognitive ToM on pre and post-tests (M = 19.2, SD = 1.20, Mdn = 19.0), W = 51.0, p = 0.221, r = -0.333. Analyzing these results obtained from participants, it is concluded that SCST significantly affects adolescents' Cognitive theory of mind. Hence, the results indicate that the SCST program positively affects the Cognitive ToM of late adolescents in the experimental group.

Similarly, the Wilcoxon Sign Ranked Test result on affective ToM in the waitlist control group (WLCG) shows that (*N* = 38), the affective ToM on post-test (*M* = 20.8, *SD* = 1.24, *Mdn* = 21.0)) does not significantly differ from the affective ToM pre-test (*M* = 20.6, *SD* = 1.29, *Mdn* = 20.0), *W* = 84.0, *p* = 0.077, *r* = -0.391. These results indicate the positive effects of SCST on improving adolescents' affective theory of mind skills. Hence, the results indicate that the SCST program positively affects the affective ToM of adolescents in the experimental group.

Discussion

Structured training interventions for adolescents have been shown to bring about positive outcomes and improvement among those participating. There are minimal studies on adolescents incorporated with SCST targets to improve their cognitive ToM and affective ToM. These research findings set the ground for future studies focusing on adolescent social cognitive skills and mental health.

Cognitive ToM is a component of ToM skills that powerfully connects to social cognition (Gabriel et al., 2019). The findings of this particular study positively support this argument through clear-cut evidence obtained from the statistical analysis. This is the original mindreading sense of ToM, which concerns false beliefs. Cognitive ToM involves implications about knowledge, intentions, and beliefs (Granholm et al., 2014). As evidenced by the results, there was a significant improvement in Cognitive ToM. There is not much published literature on cognitive ToM about SCST. The limited available literature underscores the current research findings on cognitive ToM.

Cognitive ToM abilities significantly increase in adolescence, characterized by improved working memory, language comprehension, and figural intelligence (Jo et al., 2019). Cognitive ToM's ability to understand and interpret the behavior of adolescents in terms of their psychological states is crucial for a thriving social life. ToM training programs can effectively improve Cognitive ToM skills in children and adolescents (Lee et al., 2014). The intervention among children on ToM improves their first-order false beliefs significantly and positively affects stable ToM interventions (Baksh et al., 2019).

As evidenced by the results obtained from the analysis, there was an improvement in the affective theory of mind post-intervention, underscored with the help of available literature. Affective ToM Skills included in the SCST utilized the principles of recognizing changes in facial expression, eye contact, body posture, and other appropriate skills. As specified in the initial stage of SCST, there is a strong connection between social cognition and affective ToM. Social cognition encompasses a broad range of complex processes involved in understanding and guiding social connections, and the skills to accurately deal with and respond to the primary and complex emotions of others are crucial areas of this (Trujillo et al., 2017). The second section of SCST initially focused on emotion processing, such as defining basic emotions, identifying them on the face, and identifying social situations/contexts in which they are commonly experienced: Affective ToM and assertive expressions of emotion in everyday situations. Affective empathy relates to the recognition of expression in the case of emotion. Affective ToM concerns were positively related to accurate emotion identification.

Theory of mind, along with cognitive and affective aspects, is an essential part of social cognition or social understanding among adolescents. Both components are equally required for their psychological well-being and mental health. SCST supports adolescents with mild social cognitive impairments in regaining their social cognitive wellness and preparing themselves to march toward their future without much difficulty. The major limitation of this study was about generalization. This study focused mainly on late adolescence in India. Expanding this study to adolescents in other countries can benefit them, which is its hope for the future.

Conclusion

Mental health issues among adolescents are increasing day by day in India. It will burden the development and management of future human resource utilization in Indian society. As this study depicts, the challenges due to low social cognition can be effectively addressed through social cognitive skills training (SCST) sessions. This training can be provided early on for those with mild social-cognitive impairments. Thus, it may help to alleviate severe symptoms and prevent the onset of psychopathologies in the future. It also can be used as an effective non-pharmacological method to increase social cognitive skills characterized by cognitive and affective ToM. However, studies related to cognitive and affective ToM in the Indian context are essential to gauge the impact of SCST on adolescents having issues in social interaction and related functioning.

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