

## Original Research

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## Effectiveness of Structured Social Skills Training versus Conventional Occupational Therapy in Enhancing Social Performance and Skill Retention in Chronic Schizophrenia: A Randomized Controlled Trial

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### ABSTRACT:

**Background:** Social performance deficits are core disabling features of chronic schizophrenia that respond poorly to pharmacotherapy alone. This trial compared a structured Social Skills Training (SST) programme with Conventional Occupational Therapy (COT) in improving social performance and its retention after treatment cessation.

**Methods:** In an assessor-blinded randomized controlled trial, 80 clinically stable patients with chronic schizophrenia (18-50 years) were block-randomized to SST (n = 40; 45 minutes of six-component SST plus 45 minutes of COT, twice weekly for 12 weeks) or COT (n = 40; 90 minutes of COT on the same schedule). Social performance was assessed with the culturally validated Vellore Assessment of Social Performance (VASP) at baseline, 12 weeks (post-intervention) and 4 weeks post-intervention (follow-up). Mann-Whitney U, Friedman and Bonferroni post-hoc tests were used.

**Results:** Groups were comparable at baseline (VASP p = 0.367). Overall VASP scores improved from  $45.98 \pm 6.35$  at baseline to  $54.03 \pm 7.16$  post-intervention and  $52.70 \pm 6.97$  at follow-up. The SST group significantly outperformed the COT group post-intervention (mean rank 52.08 vs 28.93; U = 337.0; p < 0.001) and at follow-up (49.01 vs 31.99; U = 459.5; p = 0.001). Within-group gains were significant in both groups, but stronger in SST (pre vs post, p = 0.001) than COT (p = 0.016), and post-test gains were retained at follow-up in both groups without significant decline.

**Conclusion:** Structured SST integrated with occupational therapy is superior to conventional occupational therapy alone in improving social performance in chronic schizophrenia, and the gains are retained at least four weeks after treatment cessation.

## INTRODUCTION

Schizophrenia affects approximately 23 million people worldwide, with a point prevalence of about 0.28-0.43% and a lifetime morbidity risk of around 0.7%, and it ranks among the leading causes of years lived with disability in young adults [1,2]. In India, the National Mental Health Survey reported a lifetime prevalence of 1.41% with a treatment gap of 72-83%, underscoring the enormous unmet rehabilitation need in this population [3]. Although antipsychotic medication effectively controls positive symptoms, a large proportion of patients with chronic schizophrenia remain profoundly impaired in interpersonal functioning, employment and community participation, and it is these social deficits — rather than psychotic symptoms per se — that most strongly determine real-world disability and quality of life [4].

Deficits in social skills in schizophrenia span non-verbal communication, verbal interaction, social perception and social problem-solving, and they persist even when symptoms are pharmacologically stabilised [4,5]. Social Skills Training (SST), grounded in social learning theory, addresses these deficits through psychoeducation, therapist modelling, graded role-play, positive reinforcement and problem-solving practice [5,6]. Meta-analyses have shown that SST produces moderate improvements in social skill acquisition, assertiveness and community functioning, and more recent pooled analyses confirm its superiority over treatment as usual and active comparators for social outcomes [7,8]. Combined cognitive-behavioural and social skills approaches have further demonstrated durable functional benefit in randomized trials [9,10]. Controlled trials dating back to Wallace and Liberman have also suggested that skills learned in structured training generalise, at least partially, to everyday settings [11].

Occupational therapy is a standard component of psychosocial rehabilitation for chronic schizophrenia, addressing activities of daily living, fine motor and cognitive skills, physical conditioning and sensory integration; however, social skills are usually touched upon only informally within conventional occupational therapy (COT), and caregivers frequently report that social life remains the most impaired domain after routine therapy [12,13]. Two further gaps motivated the present trial. First, most SST evidence derives from Western populations, whereas social norms, communication styles and family structures in India differ substantially; the Vellore Assessment of Social Performance (VASP), developed and validated for the Indian context with excellent inter-rater (0.941) and test-retest (0.928) reliability, now permits culturally appropriate measurement of social performance [14,15]. Second, relatively few Indian randomized trials have examined whether gains from SST are retained after the treatment period ends — a critical question, since maintenance of skills, not merely their acquisition, determines rehabilitation value [7,16].

The present study therefore compared a structured, six-component SST programme integrated with occupational therapy against COT alone in patients with chronic schizophrenia, with two specific objectives: to compare improvement in social performance (VASP) between the SST and COT groups at the end of a 12-week intervention, and to determine retention of social skills at four weeks post-intervention. We hypothesised that SST would produce significantly greater improvement in social performance than COT at both the post-intervention and follow-up assessments.

## MATERIALS AND METHODS

**Study design and setting.** This was a prospective, parallel-group, assessor-blinded randomized controlled trial (RCT) with 1:1 allocation, conducted over 18 months at Santosh Deemed to be University, Ghaziabad. The protocol was approved by the Institutional Study Review Board and the Institutional Ethics Committee, and written informed consent was obtained from all participants. Patients, caregivers and social workers were involved at the design stage; caregiver feedback that social life remained the most impaired domain after routine occupational therapy directly informed the development of the structured SST module. Participants were recruited through referrals from mental health professionals and public advertisement.

**Participants.** Patients of either gender, aged 18-50 years, with chronic schizophrenia diagnosed by both ICD-10 and DSM-5 criteria were eligible. Only clinically stable patients receiving consistent antipsychotic medication for at least three months, demonstrating mild to moderate social impairment on the Vellore Assessment of Social Performance (VASP), and able to comprehend study information and give written informed consent were included. Patients with severe cognitive or memory

impairment on neuropsychological assessment, active psychosis, suicidal ideation or severe mood fluctuations, concurrent participation in other occupational therapy or rehabilitation programmes, or uncontrolled systemic disease with unstable vital signs were excluded.

**Sample size, randomization and blinding.** Using G\*Power with a medium effect size ( $d = 0.5$ ), alpha of 0.05, power of 0.80 and 1:1 allocation, 64 participants (32 per group) were required; after adding 20% for attrition, 80 participants (40 per group) were enrolled. Participants were selected by random-table sampling and allocated by block randomization (block size four; 20 blocks), stratified for age, gender, illness duration, baseline social performance, medication and cognitive status, using a computer-generated sequence. Allocation was performed by an independent, blinded person not involved in the study. The trial was single-blinded: outcomes were assessed by an occupational therapist with more than ten years of experience who was unaware of group allocation; each assessment took 20-25 minutes.

**Interventions.** Both groups received 90-minute sessions twice weekly (with at least two days between sessions) for 12 consecutive weeks, in three fixed weekday batches, delivered in small groups of up to five participants with one-to-one attention when required. The SST group received a structured module of six components — psychoeducation and patient empowerment, modelling, role-play, positive reinforcement, social problem-solving, and relaxation/stress management — for 45 minutes per session, combined with 45 minutes of conventional occupational therapy (COT). The COT group received 90 minutes of conventional occupational therapy per session, comprising activities of daily living training, fine motor skills, cognitive exercises, physical rehabilitation, sensory integration, informal ad-hoc social skills and goal-setting/problem-solving. Interventions were delivered by experienced occupational therapists, participants continued their usual medication, and concurrent confounding therapies were prohibited.

**Outcome measures.** The primary outcome was social performance measured with the VASP, a scale developed and culturally validated for the Indian population that assesses non-verbal skills, verbal interaction, receptive and expressive social activity and social processing ability, with excellent inter-rater reliability (0.941) and test-retest reliability (0.928) in chronic mental illness [14]. Higher scores indicate better social performance. Assessments were performed at baseline (pre-test), at the end of the 12-week intervention (post-test), and four weeks after treatment cessation (follow-up), the last assessment serving as the measure of skill retention.

**Statistical analysis.** Analyses were performed in SPSS version 23. Baseline homogeneity was tested with the independent t-test (continuous data) and chi-square test (categorical data). As the outcome scales were ordinal, non-parametric tests were used throughout: the Mann-Whitney U test for between-group comparisons at each time point, and Friedman's two-way analysis of variance by ranks for within-group comparisons across the three time points (baseline, post-intervention at 12 weeks, and follow-up at 4 weeks post-intervention), with Bonferroni-adjusted pairwise post-hoc comparisons. A two-tailed  $p < 0.05$  was considered statistically significant.

## RESULTS

All 80 randomized participants (40 per group) completed the study and were analysed. The mean age of participants was  $35.8 \pm 7.2$  years in the SST group and  $36.4 \pm 6.9$  years in the COT group (overall  $36.1 \pm 7.0$  years), with the largest number of participants aged 36-45 years. Males predominated (46 of 80), most participants were single and unemployed, and 32 participants (40%) had an illness duration exceeding ten years, indicating a predominantly long-standing, chronic sample (Table 1). None of the demographic variables differed significantly between groups (all  $p > 0.05$ ), confirming baseline comparability, so that post-intervention differences can reasonably be attributed to the interventions (Table 2).

**Table 1.** Demographic characteristics of participants in the SST and COT groups

| Variable    | Category | SST (n=40) | COT (n=40) | Total (n=80) |
|-------------|----------|------------|------------|--------------|
| Age (years) | 18-25    | 6          | 5          | 11           |
|             | 26-35    | 12         | 13         | 25           |
|             | 36-45    | 14         | 12         | 26           |

|                     |                                               |                 |                 |                   |
|---------------------|-----------------------------------------------|-----------------|-----------------|-------------------|
|                     | 46-50                                         | 8               | 10              | 18                |
|                     | Mean $\pm$ SD                                 | 35.8 $\pm$ 7.2  | 36.4 $\pm$ 6.9  | 36.1 $\pm$ 7.0    |
| Gender              | Male / Female                                 | 24 / 16         | 22 / 18         | 46 / 34           |
| Marital status      | Single / Married / Divorced-widowed           | 18 / 15 / 7     | 20 / 14 / 6     | 38 / 29 / 13      |
| Education           | Primary / Secondary / Higher sec. / Graduate+ | 10 / 14 / 9 / 7 | 11 / 13 / 8 / 8 | 21 / 27 / 17 / 15 |
| Employment          | Employed / Unemployed / Homemaker             | 8 / 25 / 7      | 7 / 26 / 7      | 15 / 51 / 14      |
| Duration of illness | 1-5 y / 6-10 y / >10 y                        | 9 / 15 / 16     | 10 / 14 / 16    | 19 / 29 / 32      |
| Residence           | Urban / Rural                                 | 26 / 14         | 25 / 15         | 51 / 29           |
| Family type         | Nuclear / Joint                               | 22 / 18         | 21 / 19         | 43 / 37           |

**Table 2.** Baseline comparison between the SST and COT groups on demographic variables

| Variable            | Test used          | Test statistic   | p-value |
|---------------------|--------------------|------------------|---------|
| Age (years)         | Independent t-test | $t = -0.377$     | 0.702   |
| Gender              | Chi-square         | $\chi^2 = 0.094$ | 0.756   |
| Marital status      | Chi-square         | $\chi^2 = 0.167$ | 0.687   |
| Education level     | Chi-square         | $\chi^2 = 0.016$ | 0.893   |
| Employment status   | Chi-square         | $\chi^2 = 0.100$ | 0.771   |
| Duration of illness | Chi-square         | $\chi^2 = 0.048$ | 0.827   |
| Residence           | Chi-square         | $\chi^2 = 0.028$ | 0.861   |
| Family type         | Chi-square         | $\chi^2 = 0.026$ | 0.862   |

For the pooled sample, VASP scores improved from  $45.98 \pm 6.35$  at baseline to  $54.03 \pm 7.16$  post-intervention, with a marginal decrease to  $52.70 \pm 6.97$  at follow-up that nevertheless remained well above baseline, indicating that social performance gains were largely maintained after treatment cessation (Table 3).

**Table 3.** VASP scores of the pooled sample (n = 80) at pre-test, post-test and follow-up

| Time point       | N  | Mean $\pm$ SD    | Minimum | Maximum | Median |
|------------------|----|------------------|---------|---------|--------|
| VASP - Pre       | 80 | $45.98 \pm 6.35$ | 34.00   | 61.00   | 46.50  |
| VASP - Post      | 80 | $54.03 \pm 7.16$ | 37.00   | 69.00   | 55.00  |
| VASP - Follow-up | 80 | $52.70 \pm 6.97$ | 33.00   | 77.00   | 52.50  |

Between-group comparison (Table 4) showed no significant difference at baseline (mean rank 42.84 vs 38.16;  $U = 706.5$ ;  $p = 0.367$ ), confirming homogeneity. Post-intervention, the SST group achieved a significantly higher rank profile than the COT group (52.08 vs 28.93;  $U = 337.0$ ;  $Z = -4.464$ ;  $p < 0.001$ ), and this superiority persisted at follow-up (49.01 vs 31.99;  $U = 459.5$ ;  $Z = -3.282$ ;  $p = 0.001$ ), demonstrating that SST was more effective both during treatment and after its cessation.

**Table 4.** Between-group (Mann-Whitney U) comparison of VASP scores at each time point

| Time point | Mean rank SST | Mean rank COT | Mann-Whitney U | Z      | p-value |
|------------|---------------|---------------|----------------|--------|---------|
| Pre-test   | 42.84         | 38.16         | 706.5          | -0.901 | 0.367   |
| Post-test  | 52.08         | 28.93         | 337.0          | -4.464 | <0.001  |
| Follow-up  | 49.01         | 31.99         | 459.5          | -3.282 | 0.001   |

Within-group analysis using Friedman's test with Bonferroni post-hoc comparisons (Table 5) showed that in the SST group VASP scores improved significantly from pre-test to post-test ( $p = 0.001$ ) and from pre-test to follow-up ( $p = 0.001$ ), with no significant change between post-test and follow-up ( $p = 0.240$ ) — that is, no further gain but, importantly, no decline, indicating retention of acquired skills. The COT group also improved significantly, but with weaker effects (pre vs post,  $p = 0.016$ ; pre vs follow-up,  $p = 0.014$ ) and likewise no change between post-test and follow-up ( $p = 0.955$ ).

**Table 5.** Bonferroni pairwise (post-hoc) analysis of VASP scores within each group

| Group | Comparison        | Test statistic | Std. error | Std. test statistic | p-value |
|-------|-------------------|----------------|------------|---------------------|---------|
| SST   | Pre vs Post       | -1.238         | 0.224      | -5.534              | 0.001   |
| SST   | Pre vs Follow-up  | -0.975         | 0.224      | -4.360              | 0.001   |
| SST   | Post vs Follow-up | 0.262          | 0.224      | 1.174               | 0.240   |
| COT   | Pre vs Post       | -0.538         | 0.224      | -2.404              | 0.016   |
| COT   | Pre vs Follow-up  | -0.550         | 0.224      | -2.460              | 0.014   |
| COT   | Post vs Follow-up | -0.012         | 0.224      | -0.056              | 0.955   |

## DISCUSSION

This assessor-blinded RCT demonstrates that a structured, six-component SST programme integrated with occupational therapy produces significantly greater improvement in social performance than conventional occupational therapy alone in chronic schizophrenia, and that this advantage is retained four weeks after treatment cessation. The magnitude and direction of our findings agree with the meta-analysis of Kurtz and Mueser, which reported moderate effect sizes of SST on social and daily-living skill acquisition and community functioning [7], and with the pooled analysis of Turner et al., in which SST outperformed both treatment as usual and active comparators for social outcomes [8]. Trials of combined cognitive-behavioural social skills training by Granholm et al. similarly showed functional gains sustained beyond the treatment period [9,10].

The COT group also improved significantly from baseline, though far less strongly. This is consistent with earlier reports that conventional occupational therapy confers measurable but modest psychosocial benefit in chronic schizophrenia [12], and with the Cochrane review of life-skills programmes, which found insufficient evidence that non-specific skills activities alone improve social functioning [13]. The most plausible explanation is that COT addresses social behaviour only informally, whereas SST deliberately targets the behavioural components of social competence — modelling, rehearsal through role-play, reinforcement and social problem-solving — in line with social learning theory [5,6,11].

A key contribution of this trial is the demonstration of skill retention. Neither group showed significant deterioration between post-test and follow-up, and the SST group's superiority over COT persisted at follow-up ( $p = 0.001$ ), indicating that acquired skills did not simply dissipate once sessions stopped. Retention and generalisation have historically been the weakest links of SST [7,16]; our finding of stable four-week retention supports the view that embedding SST within an occupational therapy framework, using real-life Indian social scenarios and caregiver involvement, favours consolidation of learning. The use of the VASP, a scale developed and validated for the Indian cultural context with excellent reliability [14,15], strengthens the ecological validity of these results, since Western instruments may misclassify culturally normative Indian social behaviour.

Strengths of the study include randomized block allocation with baseline homogeneity, assessor blinding, a culturally validated primary outcome, structured manualised interventions matched for therapist contact time, and complete follow-up of all 80 participants. Limitations include the single-centre design, the relatively short four-week retention window, the absence of participant blinding inherent to behavioural trials, and the fact that the SST group received SST in addition to a reduced dose of COT, so the independent contribution of each element cannot be fully separated. Longer multi-centre trials with 6-12-month follow-up and assessment of generalisation to community role functioning are warranted [8,16].

## CONCLUSION

Structured Social Skills Training integrated with occupational therapy is significantly more effective than conventional occupational therapy alone in enhancing social performance among patients with chronic schizophrenia, and the gains achieved over 12 weeks are retained at four weeks after treatment cessation. SST is a feasible, culturally adaptable and durable addition to routine psychosocial rehabilitation of chronic schizophrenia in Indian settings and merits incorporation into standard occupational therapy practice.

## REFERENCES

- [1] Charlson FJ, Ferrari AJ, Santomauro DF, Diminic S, Stockings E, Scott JG, et al. Global epidemiology and burden of schizophrenia: findings from the Global Burden of Disease Study 2016. *Schizophr Bull.* 2018;44(6):1195-203.
- [2] McGrath J, Saha S, Chant D, Welham J. Schizophrenia: a concise overview of incidence, prevalence, and mortality. *Epidemiol Rev.* 2008;30:67-76.
- [3] Gururaj G, Varghese M, Benegal V, Rao GN, Pathak K, Singh LK, et al. National Mental Health Survey of India, 2015-16: prevalence, patterns and outcomes. Bengaluru: NIMHANS; 2016.
- [4] Harvey PD, Strassnig M. Predicting the severity of everyday functional disability in people with schizophrenia: cognitive deficits, functional capacity, symptoms, and health status. *World Psychiatry.* 2012;11(2):73-9.
- [5] Bellack AS. Skills training for people with severe mental illness. *Psychiatr Rehabil J.* 2004;27(4):375-91.
- [6] Kopelowicz A, Liberman RP, Zarate R. Recent advances in social skills training for schizophrenia. *Schizophr Bull.* 2006;32 Suppl 1:S12-23.
- [7] Kurtz MM, Mueser KT. A meta-analysis of controlled research on social skills training for schizophrenia. *J Consult Clin Psychol.* 2008;76(3):491-504.
- [8] Turner DT, McGlanaghy E, Cuijpers P, van der Gaag M, Karyotaki E, MacBeth A. A meta-analysis of social skills training and related interventions for psychosis. *Schizophr Bull.* 2018;44(3):475-91.
- [9] Granholm E, Holden J, Link PC, McQuaid JR. Randomized clinical trial of cognitive behavioral social skills training for schizophrenia: improvement in functioning and experiential negative symptoms. *J Consult Clin Psychol.* 2014;82(6):1173-85.
- [10] Granholm E, Harvey PD. Social skills training for negative symptoms of schizophrenia. *Schizophr Bull.* 2018;44(3):472-4.
- [11] Wallace CJ, Liberman RP. Social skills training for patients with schizophrenia: a controlled clinical trial. *Psychiatry Res.* 1985;15(3):239-47.

- [12] Foruzandeh N, Parvin N. Occupational therapy for inpatients with chronic schizophrenia: a pilot randomized controlled trial. *Jpn J Nurs Sci*. 2013;10(1):136-41.
- [13] Tungpunkom P, Maayan N, Soares-Weiser K. Life skills programmes for chronic mental illnesses. *Cochrane Database Syst Rev*. 2012;1:CD000381.
- [14] Thamaraiselvi S, Priyadarshini PP, Sundararajan P. Development and validation of the Vellore Assessment of Social Performance (VASP). *Indian J Psychiatry*. 2020;62(1):74-81.
- [15] Baskaran M, et al. Application of the Vellore Assessment of Social Performance in evaluating social skills among patients with chronic schizophrenia. *Indian J Psychol Med*. 2023 (in press/volume to be verified).
- [16] Mueser KT, Deavers F, Penn DL, Cassisi JE. Psychosocial treatments for schizophrenia. *Annu Rev Clin Psychol*. 2013;9:465-97.