

Meta-analysis of the effect of psychosocial skills training on the quality of life of people with schizophrenia

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Abstract

Purpose: The purpose of this study was to synthesize the studies examining the effects of psychosocial skills training (PSST) on the quality of life of people with schizophrenia using a meta-analysis.

Design and Methods: Fifteen studies were included in the meta-analysis according to the inclusion and exclusion criteria.

Findings: PSST was found to have a moderate effect on the overall score of quality of life of individuals with schizophrenia, a moderate effect on the psychological dimension, and a low effect on the physical dimension.

Practice implications: It can be said that psychosocial skills training is an effective intervention that can be used to improve the quality of life of people with schizophrenia.

KEYWORDS

psychosocial skills training, quality of life, schizophrenia

1 | INTRODUCTION

Schizophrenia is a chronic mental disorder characterized by positive and negative symptoms, including disability, the onset of which typically begins during adolescence or early adulthood, and for which a community-based treatment should be viewed as a way to enhance treatment (Ercan & Demir, 2019; Özçelik & Yıldırım, 2018; Öztürk & Altun, 2021). In a systematic review of the psychosis epidemiology in Turkey, the lifetime prevalence of schizophrenia in general population was reported to be 8.9 per 1000 people (Binbay et al., 2011). Although there have been improvements in treatment in recent years, schizophrenia is one of the diseases that should be prioritized for reasons such as the rising cost of treatment and workforce loss (Atmaca & Durat, 2017; Browne et al., 2020).

In schizophrenia, the side effects of drug treatment, cognitive and psychosocial impairment associated with the illness, negative symptoms, number of hospitalizations, social isolation, comorbid depression, unemployment, low self-esteem, and stigmatization result in varying degrees of deterioration in the quality of life of those affected (Aykut et al., 2017; Dzivota et al., 2018; Öztürk & Altun, 2021; Vrbova et al., 2017). Quality of life, which consists of physical health, mental state, social relationships,

and environmental dimensions, is used as an important tool in the re-integration of people with schizophrenia into society and in the evaluation of treatment and care (Ertekin et al., 2015; Woon et al., 2010).

Psychosocial interventions are important to improve quality of life. Psychopharmacological treatments alone are helpful in alleviating symptoms but cannot produce functional recovery (Arslan et al., 2015; Şükrü et al., 2018). People diagnosed with schizophrenia have difficulty continuing their daily lives after discharge because they lack social skills (Kızıllırmak & Demir, 2021). Psychosocial Skills Training (PSST) aims to eliminate or reduce an individual's deficits in this area (Doğu, 2019). PSST is a set of strategies that teach individuals basic communication and assertiveness skills, behavior management techniques, problem-solving and daily living skills, and aims to improve their quality of life (Perilli et al., 2018; Singh et al., 2018). The most effective way to promote recovery and improve quality of life is to integrate psychosocial interventions into drug treatment (Browne et al., 2020).

There are systematic reviews and meta-analyses examining the effects of psychosocial interventions on quality of life. However, Asher et al. (2017) observed that there is little evidence showing the beneficial effect of community-based psychosocial interventions on quality of life. In another meta-analysis, social functionality was evaluated as a subdimension

of quality of life and quality of life scales were excluded from the meta-analysis (De Silva et al., 2013). Cooper et al. (2020) stated that one of the aims of CBT is to improve quality of life. The aim of this study was to synthesize studies examining the effects of PSST on the quality of life of people with schizophrenia using a meta-analysis. This study is the first meta-analysis in which quality of life is the main outcome. Unlike other studies, only studies that used quality of life scales to assess the quality of life were included in the meta-analysis. It is anticipated that this study will provide evidence of the effect of psychosocial skills training on quality of life.

2 | METHODS

This study, which was a systematic review and meta-analysis, was conducted according to the PRISMA checklist (Page et al., 2021).

2.1 | Inclusion and exclusion criteria

Articles published in Turkish and English between 2010 and 2021 with full texts available were included in this study. The studies included in this systematic review and meta-analysis met the stated PICOS criteria:

Study group (patient): Individuals aged 18 years and above diagnosed with schizophrenia or schizoaffective disorder;

Intervention: Psychosocial skills training;

Comparison: All other psychological and psychosocial interventions, wait list or standard care;

Outcomes: Quality of life;

Study design: Randomized controlled trials and non-randomized pretest–posttest controlled trials.

Studies involving patients with comorbidity, cross-sectional and qualitative studies, study protocols, case reports, and conference papers were not included.

2.2 | Review strategy

A pilot search was conducted to determine the relevance of the keywords. The literature review was carried out between February and November 2021 using the keywords schizophrenia AND (“social skills training” OR “skills training” OR “psychosocial skills training”) in accordance with MeSH. The Cochrane Central Register of Controlled Trials (CENTRAL), EBSCOHOST, CINAHL, PubMed, ScienceDirect, Web of Science, The Library Catalogue of Marmara University and the subscribed databases, Thesis Center of Council of Higher Education (YÖKTEZ), and Turkish Academic Network and Information Center (ULAKBIM) databases were searched independently by two researchers. The reference lists of included studies were also searched as gray literature.

2.3 | Selection process

Two researchers independently evaluated the relevant articles for inclusion in the database based on a piloted review pattern. Titles and abstracts were reviewed in the first phase, and full texts in the second phase. Conflicts were resolved through discussion and conversation with the third researcher.

2.4 | Data extraction

A coding form was created for the data that would be used in the meta-analysis with the information about the studies. The coding form was created by the researchers. The coding form was used to record the author, publication year, country, type of intervention and control trial, sample size, mean age, duration of illness, key findings, and outcome data needed to calculate the effect size. Data extraction was performed independently by two researchers and conflicts were resolved by consensus.

2.5 | Evaluation of the methodological quality of studies

The quality of the studies was assessed independently by two researchers and controlled by a third researcher. The JBI Checklist for Randomized Controlled Trials for randomized controlled trials and the Checklist for Quasi-Experimental Studies for non-randomized controlled trials were used to assess the quality of the studies. The first of the checklists consists of 13 items and the second consists of 9 items. The scoring was based on the answers “Yes”, “No”, “Not stated”, “Not applicable” to each item. The results of the assessment are presented in Table 1.

2.6 | Data analysis

A licensed trial version of the Comprehensive Meta Analysis statistical program was used to synthesize the data. The Cochrane Q test and Higgins I^2 value were used to assess heterogeneity. Fixed effects were calculated when heterogeneity was low and moderate ($I^2 \leq 50$), and random effects were calculated when heterogeneity was high ($I^2 > 50$). Standardized mean difference (SMD) was used since the results were measured with different measuring instruments. Hedges' g , 95% confidence interval (95% CI), Z score, and p value were calculated for all studies. According to Cohen's (1988) classification of effect size coefficient, the effect size is “small” for values between 0.20 and 0.50; “medium” for values between 0.50 and 0.80; and “large” for values of 0.80 or higher.

TABLE 1 Results of methodological quality

The JBI checklist for randomized controlled trials Authors	1. Was true randomization used for assignment of participants to treatment groups?	2. Was allocation to treatment groups concealed?	3. Were treatment groups similar at the baseline?	4. Were participants blind to treatment assignment?	5. Were those delivering treatment blind to treatment assignment?	6. Were outcome assessors blind to treatment assignment?	7. Were treatment groups treated identically other than the intervention of interest?	8. Was follow-up complete and if not, were differences between groups in terms of their follow-up adequately described and analyzed?	9. Were participants analyzed in the groups to which they were randomized?	10. Were outcomes measured in the same way for treatment groups?	11. Were outcomes measured in a reliable way?	12. Was appropriate statistical analysis used?	13. Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?	Quality Score
Bechi et al. (2015)	NS	NS	Y	NA	NS	Y	NS	Y	Y	Y	Y	Y	Y	8/13
Bucci et al. (2013)	NS	N	Y	NA	Y	Y	Y	Y	Y	Y	Y	Y	N	9/13
Davis et al. (2010)	NS	Y	N	NA	Y	Y	Y	Y	Y	Y	Y	Y	N	9/13
Kang et al. (2016)	Y	Y	Y	NA	Y	Y	NS	Y	Y	Y	Y	Y	Y	11/13
Roberts et al. (2014)	NS	Y	Y	NA	NS	NS	Y	Y	Y	Y	Y	Y	N	8/13
Sungur et al. (2011)	Y	NS	Y	NA	NS	Y	Y	Y	Y	Y	Y	Y	Y	10/13
Tas et al. (2012)	Y	Y	N	NA	Y	Y	Y	Y	Y	Y	Y	Y	N	10/13
Zhang et al. (2017)	Y	NS	Y	NA	N	Y	NS	Y	Y	Y	Y	Y	Y	9/13

TABLE 1 (Continued)

The JBI checklist for quasi-experimental studies	1. Is it clear in the study what is the "cause" and what is the "effect"?	2. Were the participants included in any comparisons similar?	3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	4. Was there a control group?	5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	6. Was follow-up complete and if not, were differences between groups in terms of their follow-up adequately described and analyzed?	7. Were the outcomes of participants included in any comparisons measured in the same way?	8. Were outcomes measured in a reliable way?	9. Was an appropriate statistical analysis used?
Authors	Y	Y	Y	Y	Y	Y	Y	Y	9/9
Bilge et al. (2016)	Y	Y	Y	Y	Y	Y	Y	Y	9/9
Rus-Callafel et al. (2013)	Y	Y	Y	Y	Y	Y	Y	Y	9/9
Lim et al. (2020)	Y	Y	Y	Y	Y	Y	Y	Y	9/9
Sogutlu et al. (2017)	Y	NS	Y	Y	Y	Y	Y	NS	7/9
Štrkalj-Ivezić et al. (2013)	Y	Y	Y	Y	Y	Y	Y	NS	8/9
Yıldız et al. (2018)	Y	Y	Y	Y	Y	Y	Y	Y	9/9
Zhou et al. (2015)	Y	Y	Y	Y	Y	Y	Y	Y	9/9

Abbreviations: N, no; NA, not applicable; NS, not stated; Y, yes.

3 | FINDINGS

This section presents the characteristics of the studies, the effect sizes, and the results of the publication bias analysis.

3.1 | Selection of the studies

A total of 2058 studies were found as a result of the review. One hundred and twenty-two of the studies reached were evaluated in detail. Fifteen studies were included in the systematic review and meta-analysis according to the inclusion and exclusion criteria. The process of study selection is detailed in Figure 1.

3.2 | Characteristics of the studies

Eight of the studies were randomized controlled and seven were quasi-experimental. It was noted that the countries where the studies were conducted were Turkey (Bilge et al., 2016; Sogutlu et al., 2017; Sungur et al., 2011; Tas et al., 2012; Yildiz et al., 2018), China (Kang et al., 2016; Zhang et al., 2017; Zhou et al., 2015), Italy (Bechi et al., 2015; Bucci et al., 2013), South Korea (Lim et al., 2020), Hong Kong

(Davis et al., 2010), Croatia (Štrkalj-Ivezić et al., 2013), Spain (Rus-Callafel et al., 2013), and the USA (Roberts et al., 2014). It was found that the total sample of the studies consisted of 1130 participants with schizophrenia and schizoaffective disorder. It was seen that 9 of the 15 studies compared PSST with standard treatment and 6 with different interventions (MCT, SS, TOMI, TVR, TAU, RCM, MTA, NIT). While 14 studies used the intervention in the form of group treatment, one study used the intervention in the form of individual treatment. It was observed that six different quality of life scales were used (The Quality of Life Scale [QLSS], Personal Wellbeing Index [PWI], Manchester Short Assessment of Quality of Life [MAN-SA], Generic Quality of Life Inventory-74 [GQOLI-74], The World Health Organization Quality of Life Scale-Brief version [WHOQOL-BREF], SF-36 Health Survey [SF-36]; Table 2). The subtypes of PSST are seen in Table 3.

3.3 | Findings on effect sizes

The total score of quality of life was evaluated in 11 studies with a total sample size of 731. In nine studies the effect size was positive (in favor of the treatment group) and in two studies the effect size was negative (control group). While the study of Zhang et al. (2017)

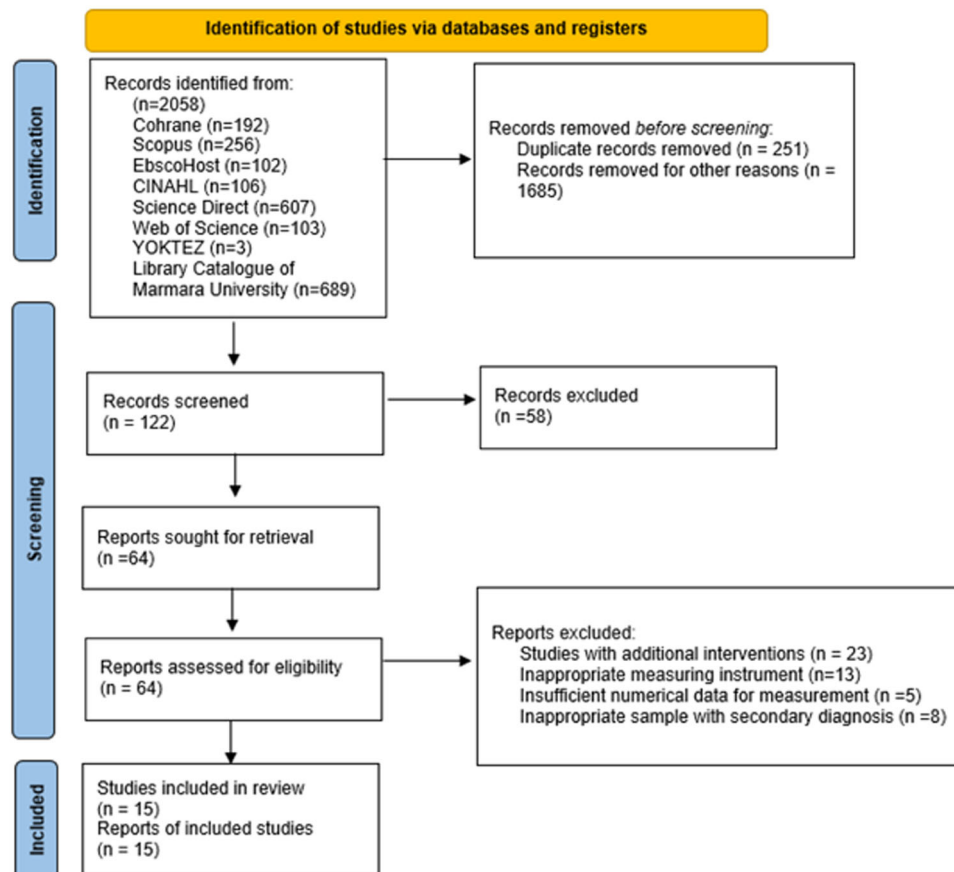


FIGURE 1 PRISMA flow diagram. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses

TABLE 2 Characteristics of studies included in systematic review and meta-analysis

Authors (year)	Country	Diagnostic criteria/ sample characteristics	Average age	Duration of illness	Clinical status	Intervention and number of participants	Scales used	Format (group/ individual)	Duration of the intervention	Follow-up
Bilge et al. (2016)	Turkey	Unspecified/ schizophrenia	PSST: 37.8 ± 8.1 TAU: 43.9 ± 13.3	Unspecified	Outpatient	PSST (8) TAU (8)	QLSS	Group	4 weeks	None
Sogutlu et al. (2017)	Turkey	DSM IV/schizophrenia	Unspecified	Unspecified	Outpatient	PSST (30) TAU (30)	QLLS	Group	5 months	None
Yıldız et al. (2018)	Turkey	DSM IV/schizophrenia Schizoaffective disorder	PSST: 37.4 ± 10.7 MCT: 33.1 ± 4.6	PSBE: 13.2 ± 8.4 MCT: 13.6 ± 6.1	Outpatient	PSST (10) MCT (10)	QLSS	Group	5 months	None
Tas et al. (2012)	Turkey	DSM IV/schizophrenia	FSCIT: 12.63 ± 9.99	FSCIT: 33.32 ± 11.57	Inpatient stable	FSCIT (19)	QLSS	Group	20 weeks	None
Lim et al. (2020)	South Korea	DSM IV/schizophrenia Schizoaffective disorder	SCST: 48.14 ± 7.02 TAU: 44.95 ± 11.10	SCST: 25.29 ± 7.40 TAU: 20.00 ± 9.64	Outpatient	SCST (21) TAU (24)	QLSS	Group	12 weeks	None
Sungur et al. (2011)	Turkey	DSM IV/Schizophrenia	OCM: 28.8 ± 7.4 RCM: 28.5 ± 7.7	OCM: 5.2 ± 3.2 RCM: 5.5 ± 3.6	Inpatient stable	OCM (50) RCM (50)	QLSS	Group	14 weeks	None
Bechi et al. (2015)	Italy	DSM IV/Schizophrenia	SCT: 38.08 ± 10.50 TOMI: 40.34 ± 10.33	SCT: 13.87 ± 8.88 TOMI: 16.25 ± 9.14	Outpatient	SCT (24) TOMI (32)	QLSS	Group	12 weeks	None
Davis et al. (2010)	Hong Kong	ICD-10/Schizophrenia	CBCSM: 44.48 ± 9.88 TAU: 43.22 ± 10.41	CBCSM: 18.32 ± 11.96 TAU: 18.93 ± 10.58	Outpatient	CBCSM (35) TAU (36)	PWI	Group	6 months	3 months 6 months
Zhang et al. (2017)	China	DSM IV/Schizophrenia	ISE: 32.26 ± 8.03 TVR: 31.48 ± 8.84	Unspecified	Outpatient	ISE (54) TVR (54)	PWI	Group	3 months	15 months
Štrkalj-Ivezić et al. (2013)	Croatia	ICD-10/Schizophrenia	Unspecified	Unspecified	Outpatient	RDC: 50 WL: 48	MANSA	Group	6 months	None
Zhou et al. (2015)	China	ICD-10/Schizophrenia	RT: 39.2 ± 7.9 TAU: 38.8 ± 7.5	RT: 18.8 ± 7.6 TAU: 9.0 ± 8.0	Outpatient	RT (56) TAU (56)	GQOLI-74	Group	12 months	None
Kang et al. (2016)	China	ICD-10/Schizophrenia	CBII: 46.4 ± 11.9 MTA: 45.4 ± 12.3	CBII: 21.3 ± 11.7 TAU: 19.8 ± 12.1	Outpatient	CBII (118) MTA (126)	WHOOQL-BREF	Group	12 months	12 months
Rus-Callafel et al. (2013)	Spain	DSM IV-TR/ Schizophrenia	SST: 37.54 ± 8.054	SST: 13.5	Outpatient	SST (13)	SF-36	Group	16 weeks	6 months

(Continues)

TABLE 2 (Continued)

Authors (year)	Country	Diagnostic criteria/ sample characteristics	Average age	Duration of illness	Clinical status	Intervention and number of participants	Scales used	Format (group/ individual)	Duration of the intervention	Follow-up
		Schizoaffective disorder	TAU: 42.39 ± 8.1	TAU: 13.15		TAU (18)				
Roberts et al. (2014)	USA	DSM IV/Schizophrenia Schizoaffective disorder	SCIT: 40.0 ± 12.2 TAU: 39.4 ± 10.8	Unspecified	Outpatient	SCIT (33) TAU (33)	QLSS	Group	6 months	3 months
Bucci et al. (2013)	Italy	MINI PLUS/ Schizophrenia Schizoaffective disorder	SSIT: 37.27 ± 8.18 NCIT: 39.48 ± 9.49	SSIT: 15.39 ± 8.68 NCIT: 19.36 ± 7.57	Outpatient	SSIT (33) NIT (25)	QLSS	Individual	6 months	12 months

Abbreviations: CBII, Community-Based Integrated Intervention; CBCSM, Chinese Basic Conversation Skill Module; FSCIT, Family-Assisted Social Cognitive Training; GQOLI-74, Generic Quality of Life Inventory-74; ISE, Integrated Supported Employment; MANSAs, Manchester Short Assessment of Quality of Life; MCT, Metacognitive Training; MTA, Medication Treatment Alone; NIT, Neurocognitive Individualized Training; OCM, Optimal Case Management; PSST, Psychosocial Skills Training; PWI, Personal Wellbeing Index; QLSS, The Quality of Life Scale; RCM, Routine Case Management; RDC, Rehabilitation Day Centre Program; RT, Rehabilitation Training; SCT, Social Cognitive Training; SCIT, Social Cognition and Interaction Training; SCST, Social Cognitive Skills Training; SF-36, SF-36 Health Survey; SS, Social Stimulation; SSIT, Social Skills Individualized Training; SST, Social Skills Training; TAU, Treatment As Usual; TOMI, Theory of Mind Intervention; TVR, Traditional Vocational Rehabilitation; WHOQOL-BREF, The World Health Organization Quality of Life Scale-Brief version; WL, Waiting List.

TABLE 3 Definitions of subtype of psychosocial skills training

Psychosocial Skills Training (PSST): It uses the symptom management, medication management, and recreation for leisure modules of UCLA Social and Independent Living Skills training as a reference. It provides training in several areas such as improving communication skills, improving problem solving skills, understanding psychosis and schizophrenia, learning antipsychotic drug therapy, learning and coping with drugs side effects, evaluating the treatment, learning to cope with persistent symptoms, learning to cope with stress, enhancement of self-confidence, leisure time and daily living activities, developing friendship, and participation in social activities (Yildiz et al., 2004; Yilmaz et al., 2020).

Family-Assisted Social Cognitive Training (FSCIT)/Social Cognitive Skills Training (SCST)/Social Cognitive Training (SCT): It covers the components of neurocognitive enhancement, social skills training, and cognitive behavioral therapy. It focuses on learning skills needed in social interactions (Fiszdon & Reddy, 2012).

Social Cognition and Interaction Training (SCIT): It is a skills training that enables individuals to apply social cognitive skills in their daily lives by using social cognitive strategies to interpret the problematic situations they face, solve them, and plan appropriate steps (Hasson-Ohayon et al., 2014; Penn et al., 2005).

Social Skills Training (SST)/Social Skills Individualized Training (SSIT): It is based on social learning theory, which incorporates the principles of modeling, behavioral practice, shaping, and reinforcement to teach basic communication and other functional skills (Granhölm & Harvey, 2018).

Chinese Basic Conversation Skill (CBCSM): This was translated and validated from the UCLA Basic Conversation Skills Module, which covers five skills areas including: verbal and nonverbal communication behavior, starting a friendly conversation, keeping a friendly conversation going, ending a conversation pleasantly, and putting them together.

Integrated Supported Employment (ISE): It is an evidence-based training that combines an employment program and social skills training for schizophrenia and improves social communication, social problem solving, and social functioning (Tsang et al., 2009).

Rehabilitation Day Centre Program (RDC)/Rehabilitation Training (RT): This is a skills training program that includes modules on symptom management, medication management, basic communication skills, and community reintegration (Gun & Leong, 2016).

was positive and had the largest effect (SMD: 2.32; $p = 0.000$), the study of Davis et al. (2010) was positive and had the smallest effect (SDM: 0.15; $p = 0.522$). The results showed that PSST had a moderately significant effect on the total quality of life score (SMD: 0.67; $p < 0.01$, CI: 0.23, 1.12). It was noted that the studies evaluated were heterogeneous ($Q = 79.07$, $p = 0.000$; $I^2 = 87.35$) (Table 4).

It was found that the social relations dimension of quality of life was assessed in eight studies. It was seen that the effect of PSST on the social dimension was statistically insignificant (SMD: 0.17; $p > 0.05$, CI: -0.12, 0.46). The included studies were heterogeneous ($Q = 18.01$, $p = 0.012$; $I^2 = 61.14$) (Table 4).

The occupational role dimension of quality of life was assessed in seven studies. Consistent with the studies included

TABLE 4 Quality of life meta-analyses

Total score of quality of life							
Study name	Statistics for each study						
	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Bilge et al 2016	1,318	0,552	0,304	0,236	2,399	2,389	0,017
Sogutlu et al 2017	0,957	0,273	0,074	0,423	1,491	3,511	0,000
Yildiz et al 2018	-0,121	0,448	0,200	-0,998	0,756	-0,270	0,787
Tas et al 2012	0,251	0,303	0,092	-0,343	0,845	0,829	0,407
Lim et al 2020	-0,213	0,322	0,104	-0,844	0,419	-0,660	0,509
Sungur et al 2011	0,332	0,201	0,041	-0,062	0,727	1,651	0,099
Bechi et al 2015	0,212	0,271	0,073	-0,319	0,743	0,784	0,433
Davis et al 2010	0,152	0,238	0,057	-0,314	0,618	0,640	0,522
Zhang et al 2017	2,322	0,249	0,062	1,834	2,810	9,326	0,000
Strkalj-Ivezic et al 2013	1,372	0,225	0,050	0,932	1,812	6,110	0,000
Zhou et al 2015	0,774	0,196	0,038	0,390	1,159	3,953	0,000
	0,674	0,229	0,052	0,225	1,122	2,943	0,003

Social relations dimension							
Study name	Statistics for each study						
	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Bilge et al 2016	0,999	0,530	0,281	-0,041	2,038	1,883	0,060
Sogutlu et al 2017	0,801	0,268	0,072	0,275	1,327	2,983	0,003
Tas et al 2012	0,273	0,303	0,092	-0,321	0,868	0,902	0,367
Lim et al 2020	-0,174	0,322	0,104	-0,805	0,456	-0,542	0,588
Roberts et al 2014	0,088	0,252	0,064	-0,406	0,582	0,349	0,727
Bucci et al 2013	-0,477	0,269	0,072	-1,004	0,050	-1,774	0,076
Bechi et al 2015	0,425	0,273	0,075	-0,110	0,960	1,557	0,120
Kang et al 2016	-0,043	0,128	0,016	-0,295	0,208	-0,339	0,734
	0,172	0,150	0,023	-0,123	0,466	1,144	0,253

Occupational role dimension							
Study name	Statistics for each study						
	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Bilge et al 2016	1,119	0,538	0,289	0,065	2,173	2,081	0,037
Sogutlu et al 2017	-0,022	0,258	0,067	-0,528	0,484	-0,084	0,933
Tas et al 2012	-0,280	0,303	0,092	-0,875	0,314	-0,924	0,355
Lim et al 2020	-0,789	0,333	0,111	-1,443	-0,136	-2,368	0,018
Roberts et al 2014	-0,141	0,252	0,064	-0,635	0,354	-0,558	0,577
Bucci et al 2013	0,355	0,267	0,071	-0,169	0,878	1,327	0,185
Bechi et al 2015	-0,189	0,271	0,073	-0,719	0,341	-0,698	0,485
	-0,064	0,166	0,028	-0,390	0,261	-0,388	0,698

Psychological dimension							
Study name	Statistics for each study						
	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Bilge et al 2016	1,534	0,569	0,324	0,420	2,649	2,698	0,007
Sogutlu et al 2017	1,211	0,281	0,079	0,661	1,762	4,312	0,000
Tas et al 2012	0,437	0,305	0,093	-0,161	1,035	1,431	0,152
Lim et al 2020	0,362	0,324	0,105	-0,273	0,997	1,118	0,263
Bucci et al 2013	-0,493	0,269	0,072	-1,021	0,034	-1,833	0,067
Bechi et al 2015	0,204	0,271	0,073	-0,326	0,735	0,755	0,450
Kang et al 2016	-0,030	0,128	0,016	-0,281	0,221	-0,233	0,816
Callafel et al 2013	1,696	0,423	0,179	0,867	2,525	4,010	0,000
	0,531	0,241	0,058	0,058	1,003	2,202	0,028

Physical dimension							
Study name	Statistics for each study						
	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Bilge et al 2016	0,735	0,517	0,267	-0,277	1,748	1,424	0,155
Sogutlu et al 2017	0,937	0,272	0,074	0,404	1,470	3,445	0,001
Tas et al 2012	0,499	0,306	0,094	-0,102	1,099	1,628	0,104
Lim et al 2020	-0,008	0,321	0,103	-0,637	0,622	-0,025	0,980
Kang et al 2016	-0,020	0,128	0,016	-0,271	0,231	-0,156	0,876
Callafel et al 2013	0,426	0,368	0,135	-0,295	1,147	1,157	0,247
	0,375	0,189	0,036	0,004	0,746	1,983	0,047

in the analysis, PSST was found to have no effect on occupational role (SMD: 0.06; $p > 0.05$, CI: -0.39, 0.26). The included studies were heterogeneous ($Q = 12.85$, $p = 0.045$; $I^2 = 53.31$) (Table 4).

Eight studies included in the analysis assessed the psychological dimension of quality of life. The results showed that PSST had a medium significant effect on the psychological dimension (SMD: 0.53; $p < 0.05$, CI: -0.06, 1.00) The included

studies were heterogeneous ($Q = 41.42$, $p = 0.000$; $I^2 = 83.10$) (Table 4).

It was seen that the physical dimension was assessed in six studies. PSST was found to have a small significant effect on physical size (SMD: 0.38; $p < 0.05$, CI: 0.04, 0.75). The included studies were heterogeneous ($Q = 13.09$, $p = 0.023$; $I^2 = 61.81$) (Table 4).

3.4 | Findings on publication bias

The trim-and-fill method by Duval and Tweedie showed that there were two missing studies (fixed random effects: SDM: 0.12; CI: -0.17, 0.41) in the social relations dimension and three (fixed random effects: SDM: 0.05; CI: -0.33, 0.44) in the physical dimension. Egger's test revealed no publication bias in the overall assessment of quality of life ($t = 0.42$, $p = 0.68$), social relationships ($t = 1.18$, $p = 0.27$), occupational role ($t = 0.77$, $p = 0.47$), and psychological ($t = 2.17$, $p = 0.07$) and physical dimensions ($t = 1.80$, $p = 0.14$) (Figure 2).

3.5 | Findings on moderator analyses

According to the results of the analysis, clinical status ($Q_b = 2.001$, $p = 0.157$), duration of illness ($Q_b = 0.400$, $p = 0.819$), and education ($Q_b = 2.646$, $p = 0.104$) are not important moderator of the average effect size calculated for the overall score of quality of life. Although the duration of the intervention is not an important moderator of the average effect size calculated for the overall score of quality of life ($Q_b = 0.822$, $p = 0.663$), the social relationships dimension ($Q_b = 1.669$, $p = 0.434$), the occupational role dimension ($Q_b = 0.001$, $p = 0.976$), and the psychological dimension ($Q_b = 4.597$, $p = 0.100$), it is an important moderator of the average effect size calculated for the physical dimension ($Q_b = 10.227$, $p = 0.006$), which is statistically significant. While the format of intervention variable is not an important moderator of the average effect size calculated in the occupational role dimension ($Q_b = 2.363$, $p = 0.124$), it is an important moderator of the average effect size calculated in the social relationships dimension ($Q_b = 6.073$, $p = 0.014$) and the psychological dimension ($Q_b = 10.580$, $p = 0.001$) and is statistically significant (Table 5).

4 | DISCUSSION

Quality of life is an important tool for evaluating psychosocial interventions for schizophrenia. This study examined the evidence on the impact of PSST on quality of life and different dimensions of quality of life in people with schizophrenia. The total sample size of the 15 studies that met the inclusion criteria was 1130 and it was found that 6 different scales were used to assess quality of life. It was found that total quality of life score was assessed in 11 studies, interpersonal dimension of quality of life in 8 studies, occupational role dimension in 7 studies, psychological dimension in 8 studies, and physical dimension in 6 studies. Overall, it can

be said that PSST has a positive impact on quality of life, the psychological and physical dimensions of quality of life. The discussion was conducted accordingly.

The studies included in the analysis were found to be heterogeneous. It is suggested that the heterogeneity may be caused by different diagnostic criteria, and different scales used.

In this study, PSST was found to have a medium effect on the total quality of life score and the psychological dimension of quality of life, and a low significant effect on the dimension of physical dimension. Valiente et al. (2019) observed that psychosocial interventions had a low significant effect on quality of life. In their systematic review, Almerie et al. (2015) found that PST improves quality of life compared to standard treatment. In another systematic review, it was noted that people with schizophrenia acquired many skills such as communication and problem-solving strategies thanks to social skills training (Morin & Franck, 2017). Puolakka and Pitkänen (2019) stated that some types of psychosocial skills training can improve the quality of life of people with schizophrenia. In contrast to the results of our study, Pilling et al. (2002) found in their meta-analysis that social skills training had an insignificant effect on quality of life and that there was no clear evidence of a difference between social skills training and other treatments when compared. The finding of such different results in meta-analysis studies suggests that more randomized controlled and experimental studies are needed in this area.

This study revealed that psychosocial skills training had no significant effect on the occupational role and social relationships dimensions of quality of life. There is no meta-analysis in the literature examining the effect of PSST on the occupational and interpersonal dimensions of quality of life. It is suggested that the small number of included studies and methodological factors (control trial, blinding) may have led to this result.

It was found that the format of intervention is an important moderator of social relationships and psychological dimension of quality of life. It can be said that participation in the group allows interaction, exchange, mutual modeling, and feedback for patients, facilitating the achievement of the program goal (Yildiz, 2001).

Quality of life encompasses many broad aspects, such as personal values and living spaces, and reflects an individual's perception of his or her position in life (Lu et al., 2018). Standard quality of life scales such as WHOQOL-BREF and Short Form-36 Health Survey (SF-36) are used to measure overall quality of life in individuals with any medical condition or in a healthy sample. Although general measurement instruments allow comparison between different conditions, they are not sensitive enough to detect small changes in quality of life (Dong et al., 2019). The use of such different measurement tools to measure quality of life has made comparison difficult (WHO, 1995).

4.1 | LIMITATIONS

There are some limitations related to methodological considerations such as differences in study design, risk of bias, the use of

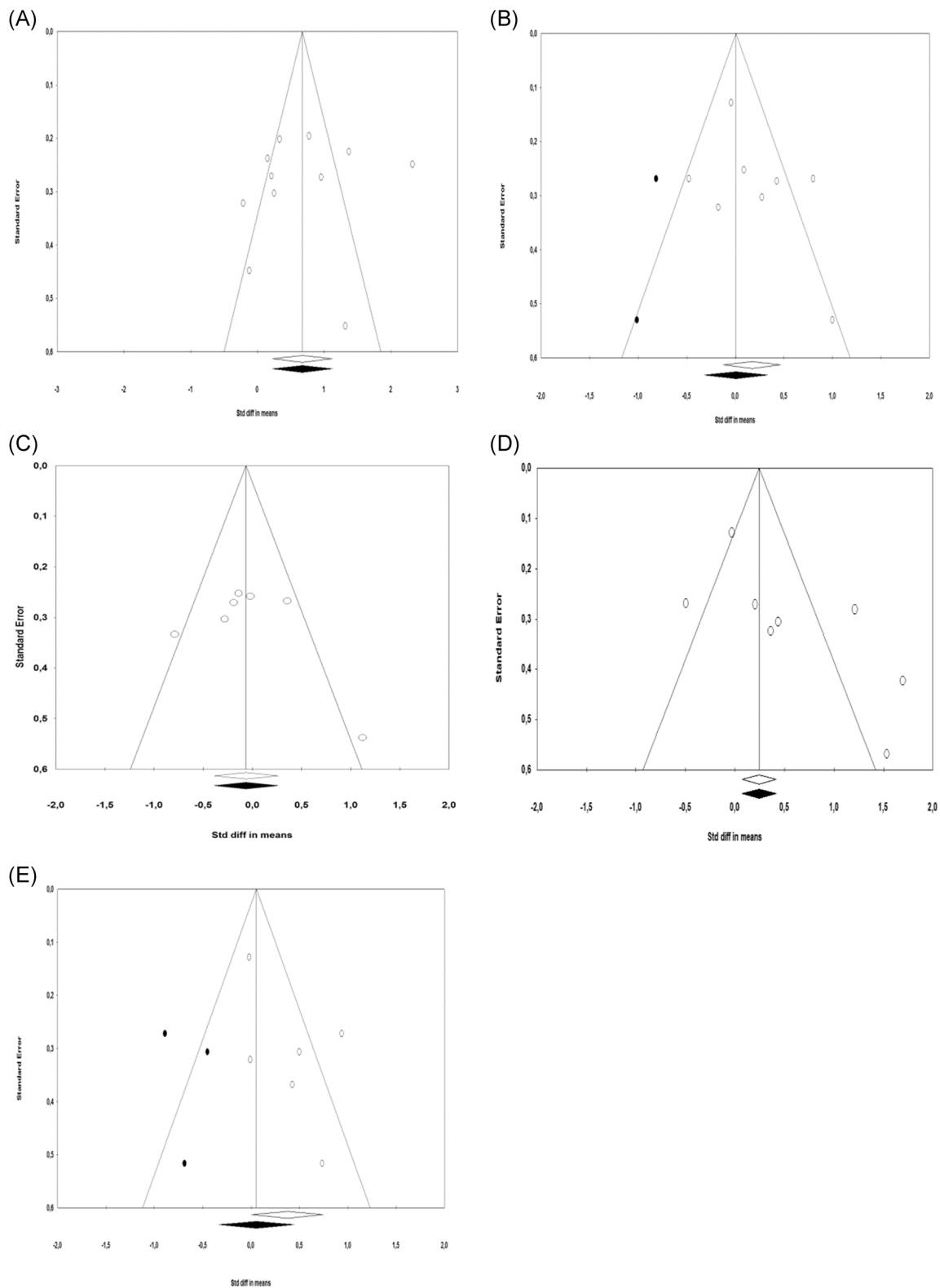


FIGURE 2 Total score of quality of life (A), social relations dimension (B), occupational role dimension (C), psychological dimension (D), physical dimension (E) and publication bias funnel plots

different measurement tools, and the assessment of different dimensions of quality of life in the included studies. Second, the issues related to intervention such as the duration and format of intervention, length of intervention sessions, and participants can

be mentioned. These differences led to a reduction in the number of studies included in the meta-analysis. Another limitation is that only articles in Turkish and English were included in the analysis. It might lead to a rise in publication bias in this study.

TABLE 5 Moderator analyses

	Moderator	k	Point estimate	SE	Z	Q _{between}	p
<i>Clinical status</i>							
Total score of quality of life							
	Inpatient	2	0.307	0.165	1.861	2.001	0.157
	Outpatient	9	0.760	0.275	2.765		
<i>Duration of illness (years)</i>							
Total score of quality of life							
	1–5 years	1	0.332	0.199	1.670	0.400	0.819
	11–15 years	3	0.166	0.178	0.930		
	Above 15 years	3	0.273	0.292	0.937		
<i>Education</i>							
Total score of quality of life							
	11 years and below	2	0.307	0.165	1.861	2.646	0.104
	11 years below	2	−0.180	0.250	−0.721		
<i>Duration of the intervention (months)</i>							
Total score of quality of life							
	1–3	4	0.906	0.652	1.389	0.822	0.663
	3–6	6	0.523	0.230	2.272		
	12	1	0.774	0.194	3.989		
Social relations dimension							
	1–3	3	0.341	0.300	1.139	1.669	0.434
	3–6	4	0.169	0.267	0.634		
	12	1	−0.043	0.128	−0.337		
Occupational role dimension							
	1–3	3	−0.026	0.461	−0.057	0.001	0.976
	3–6	4	−0.012	0.133	−0.089		
Psychological dimension							
	1–3	3	0.569	0.328	1.733	4.597	0.100
	3–6	4	0.689	0.476	1.447		
	12	1	−0.030	0.127	−0.235		
Physical dimension							
	1–3	2	0.278	0.362	0.770	10.227	0.006
	3–6	3	0.666	0.173	3.852		
	12	1	−0.020	0.127	−0.157		
<i>Format (group/individual)</i>							
Social relations dimension							
	Group	7	0.267	0.149	1.801	6.073	0.014
	Individual	1	−0.477	0.263	−1.813		
Occupational role dimension							
	Group	6	−0.133	0.181	−0.738	2.363	0.124
	Individual	1	0.355	0.261	1.358		

TABLE 5 (Continued)

	Moderator	k	Point estimate	SE	Z	Q _{between}	p
Psychological dimension							
Group		7	0.697	0.254	2.774	10.580	0.001
Individual		1	-0.493	0.263	-1.872		

Abbreviations: k, number of studies; SE, standard error.

4.2 | FUTURE RESEARCH

With this study, it is understood that there is a need for standardization in the evaluation of the quality of life and in the implementation of PSST. The quality of life scales used in the studies included in this meta-analysis evaluate the quality of life with different dimensions. The use of standardized scales that evaluate total scores will provide a more comprehensive measure of the quality of life. It is seen that the duration and the content of the PSST applied in the studies in this meta-analysis are different. It can be recommended to apply the same standard social skills training (such as the duration of the intervention, the duration of the sessions, the number of participants) to improve the quality of life. It is important for treatment trials to include follow-up assessments. If the long-term effects of PSST on quality of life will be examined, follow-up measures should be performed at least 12 months.

4.3 | IMPLICATIONS FOR NURSING PRACTICE

In conclusion, psychosocial skills training is an effective intervention that can be used to improve the quality of life of people with schizophrenia. The scales used to assess quality of life consider quality of life in different dimensions. Therefore, it is hypothesized that the addition of different training modules to psychosocial skills training may have positive effects on different dimensions of quality of life. There are only a limited number of psychiatric nursing practices in this area. Planning and implementing psychosocial interventions are one of the responsibilities of the psychiatric nurse (Sağlık Bakanlığı, 2011). Psychiatric nurses can integrate psychosocial skills training into routine treatment in both inpatient and outpatient settings. Also, they can take a role in the implementation, evaluation, and follow-up studies of psychosocial skills training to improve the quality of life of patients with schizophrenia. It is considered that this study provides evidence for psychosocial interventions that can be used by psychiatric nurses.

4.4 | Registration and protocol

The purpose and methodology of this study were registered in the database PROSPERO on May 18, 2021. The methodology of the study can be accessed at the following address: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42021235868

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

All authors contributed equally to the preparation of the manuscript.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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