Effectiveness of psychosocial interventions on quality of life of patients with schizophrenia and related disorders: A systematic review

Kristiina Puolakka[a,*], Anneli Pitkänen[b]

[a] *Satakunta Hospital District, Sairaalantie 14, 29200 Harjavalta, Finland*
[b] *Tampere University Hospital, Administration Centre, FI-33521 Tampere, Finland*

ABSTRACT

Background: Improving the quality of life of patients with schizophrenia is emphasized all over the world.
Aim: To identify and synthesize the best available evidence on the effectiveness of family interventions, patient education, social skills training and vocational rehabilitation on the quality of life of patients with schizophrenia and related disorders.
Method: A systematic literature review.
Results: There is some but weak evidence that family intervention and vocational rehabilitation may enhance the quality of life of patients with schizophrenia.
Conclusions: More research is needed to determine the effectiveness of psychosocial interventions on the quality of life of patients with schizophrenia.

Introduction

Schizophrenia is a major mental disorder that typically starts in early adulthood or late adolescence (Picchioni & Murray, 2007). It is estimated that schizophrenia is affecting > 21 million people worldwide (WHO, 2018). Schizophrenia is associated with relapses with high hospitalization rates (Almond, Knapp, Francois, Toumi, & Brugha, 2004; Emsley, Chiliza, Asmal, & Harvey, 2013), loss of ability to work and mortality in younger age than the general population (Knapp, Mangalore, & Simon, 2004). Nearly every patient is disabled in multiple functional domains (Harvey et al., 2012) and they have significantly more problems in everyday functioning than the general population (Viertiö et al., 2012). Patients with schizophrenia are stigmatized, which leads to discrimination (Graf et al., 2004; Thornicroft et al., 2009). Schizophrenia has also a considerable impact on families (Knapp et al., 2004). Moreover, the economic costs of schizophrenia are remarkable (Chong et al., 2016; Knapp et al., 2004).

The international schizophrenia guidelines (American Psychiatric Association, 2004; Finnish Medical Society Duodecim and Finnish Psychiatric Association, 2015; National Institute for Health and Care Excellence, 2014; Royal Australian and New Zealand College of Psychiatrists team, 2016) recommend psychosocial interventions such as family interventions, psychoeducation, social skills training and supported employment in conjunction with medication. In recent years,

some Cochrane reviews related to these psychosocial interventions have been conducted. Pharoah, Mari, Rathbone, and Wong (2010) reported that family psychoeducation may reduce the number of relapse events and hospitalizations. Xia, Merinder, and Belgamwar (2011) found that psychoeducation seems to reduce relapse, readmission and length of hospital stays as well as to encourage medication compliance compared to standard care. Zhao, Sampson, Xia, and Jayaram (2015) concluded that brief psychoeducation may also reduce relapse and also promote medication compliance. Based on their review, Almerie et al. (2015) argued that social skills training seems to have positive effects on the social skills of patients with schizophrenia and on the patients' relapse rates. Kinoshita et al.'s (2013) concluded that supported employment is effective to improve some vocational outcomes such as the likelihood of obtaining employment and the length of employment.

Because many research findings have confirmed that the presence of schizophrenia is related to poorer QoL (quality of life) (Bobes, García-Portilla, Bascarán, Saíz, & Bousoño, 2007; Evans, Banerjee, Leese, & Huxley, 2007, Nørholm & Bech, 2006; Su, Ng, Yang, & Lin, 2014), improving the QoL of these patients is important. There is an urgent need to determine the psychosocial interventions by which the QoL is best supported. Based on above described Cochrane reviews (Almerie et al., 2015; Kinoshita et al., 2013; Pharoah et al., 2010; Xia et al., 2011; Zhao et al., 2015), more research is needed to confirm the effects of psychosocial interventions on the QoL amongst patients with

* Corresponding author.
  E-mail addresses: kristiina.puolakka@satasairaala.fi (K. Puolakka), anneli.pitkanen@pp1.inet.fi (A. Pitkänen).
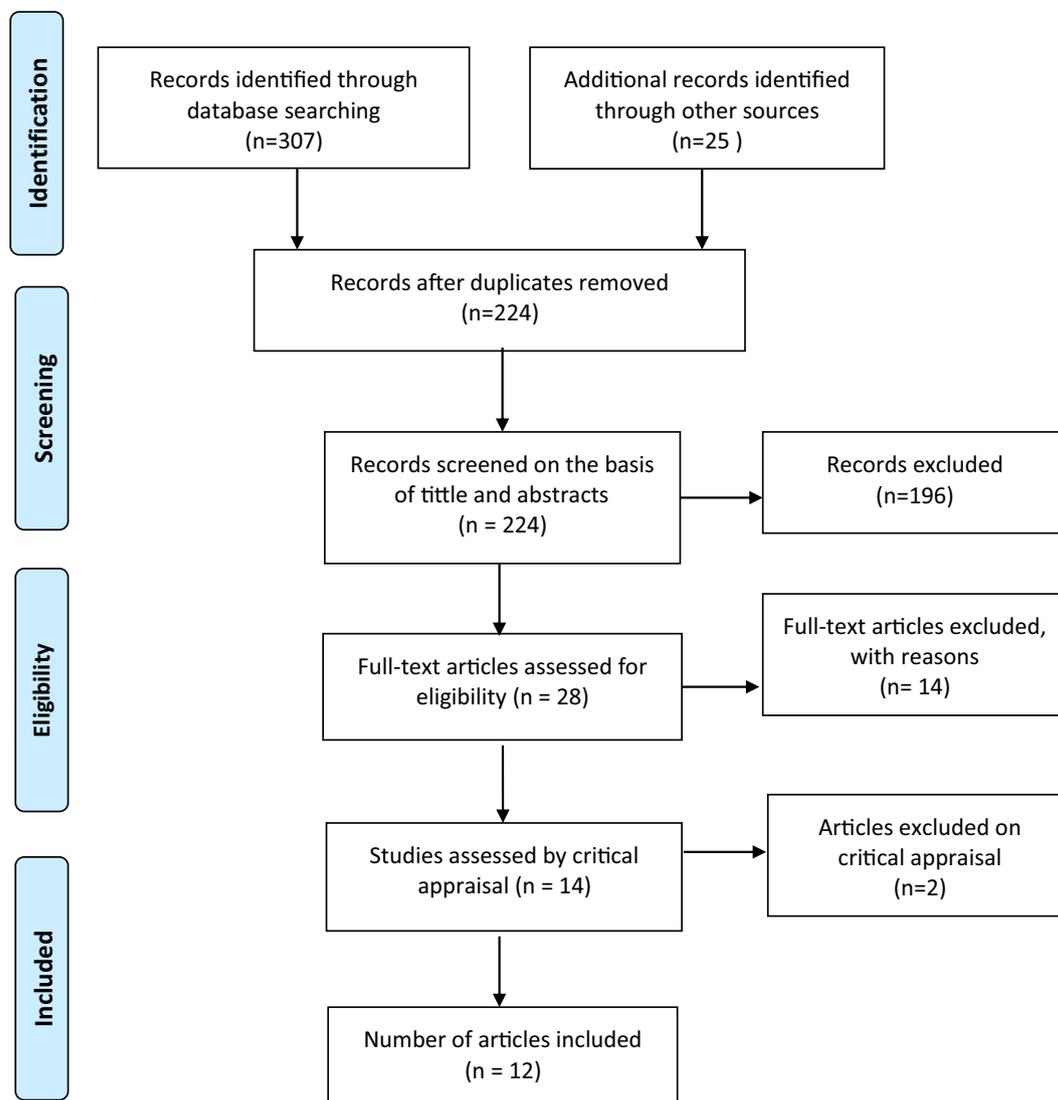
Fig. 1. Flowchart of the study selection and inclusion process.

schizophrenia and related disorders. This review was conducted since psychosocial interventions are recommended in international guidelines and, in recent years, QoL has been increasingly recognized as an important outcome in research as well as in mental health care. The objective of this systematic review was to synthesize the best available evidence on the effectiveness of four psychosocial interventions (family intervention, psychoeducation, social skills training, supported employment) on the QoL of patients with schizophrenia and related disorders.

Method

Inclusion criteria

Types of participants

Studies where the majority of participants had a diagnosis of schizophrenia (F21) or a related disorder (F21-F29) based on the International Statistical Classification of Diseases and related health Problems 10th Revision (ICD-10) and where the majority of participants were also adults (18 years or over) were included.

Types of interventions

This review considered studies that evaluated psychosocial interventions. Included interventions were family interventions,

psychoeducation or patient education, social skills training and vocational rehabilitation. These interventions were recommended in practice guidelines for the treatment of patients with schizophrenia (American Psychiatric Association, 2004; Finnish Medical Society Duodecim and Finnish Psychiatric Association, 2015; National Institute for Health and Care Excellence, 2014; Royal Australian and New Zealand College of Psychiatrists team, 2016). Moreover, we excluded studies that included chosen interventions only as one element of comprehensive treatment programme because it is not possible to disentangle the effects of some individual treatment intervention from other treatment components. Both individual and group-based interventions were accepted. The providers of interventions included nurses, physicians, psychologists, social workers or other allied health providers. The control comparison was any other psychosocial intervention or treatment as usual (TAU) defined as the care a person would normally receive if they would not have been included in the research.

Types of outcomes

The review considered studies that included standardized, valid and reliable QoL as primary or secondary outcome measure.

Types of studies

This review included only randomized controlled trials (RCTs).

Search strategy

The search strategy aimed to find published studies. A three-step search strategy was utilized in this review. An initial limited search of MEDLINE and CINAHL was undertaken. This was followed by an analysis of the text words contained in the title and abstract and of the index terms used to describe the article. A second search using all identified keywords was then undertaken across all included databases in May 2018. Finally, the reference lists of all identified studies were searched for further relevant studies. Studies published in English were chosen for inclusion. Because QoL instruments have been used as an outcome in clinical trials in psychiatry research since the 1990s (Pinikahana, Happell, Hope, & Keks, 2002), studies published from 1990 to 2018 were chosen for inclusion in this review. The databases searched included: CINAHL, Cochrane Library, MEDLINE, PsycArticles and PsycINFO. The following keywords were used: schizophrenia or schizotypal disorder or persistent delusional disorder or schizoaffective disorder; family intervention or family therapy or psychoeducation or patient education or social skills training or skills training or psychosocial treatment or vocational rehabilitation or supported employment or work rehabilitation; quality of life or life quality; randomized controlled trial or randomized controlled trial or random assignment. The search strategy is presented in Fig. 1.

Data extraction

Data were extracted from papers included in the review by two independent reviewers using the standardized data extraction tool from JBI-MAStARI (Joanna Briggs Institute Meta-analysis of Statistics Assessment and Review Instrument). The data extracted included specific details of interventions, populations, study methods and outcomes of significance to the objective of the review and the review questions. The data extraction is presented in Table 1.

Assessment of methodological quality

Papers selected for retrieval were assessed by two independent reviewers for methodological validity prior to inclusion in the review using Joanna Briggs Institute's Standardized Critical Appraisal Instruments (MAStARI). This checklist contains 10 criteria. The reviewers determined that the inclusion of studies in the review required "yes" answers to five criteria. Moreover, because utilizing blinding of participants is difficult in this kind of studies, the reviewers decided that this criterion is non-applicable. Any disagreements between the reviewers were resolved through discussion.

Results

Study identification and selection

Two reviewers independently reviewed a total of 332 potentially relevant citations. Out of 332 studies, 108 were excluded as duplicates. Of the remaining 224 studies, 158 were excluded after title and abstract analysis. From the 28 remaining studies, 14 were excluded as they did not meet the inclusion criteria (not RCT, QoL not as an outcome, results related to QoL described with any numbers, intervention not congruent with inclusion criteria). Of the 14 studies left for critical appraisal, two studies (Atkinson, Coia, Gilmour, & Harper, 1996; Mishra et al., 2017) were excluded on the basis of methodological quality.

Characteristics of the studies

Based on the inclusion criteria, all twelve included studies were RCTs. The studies were published between 1995 and 2016. Most (n = 7) of them were published in 2010 or later. Three studies were undertaken in USA, two in Spain, two in Finland, two in Australia and

single studies were undertaken in Brazil, Vietnam and UK. The details of the included studies are presented in Table 1.

Methodological quality of the studies

Twelve studies were included in the review based on being critically appraised for methodological quality. Two studies had adequate description of "truly random" procedures, where every patient had an equal chance of being in any study group. Only three studies were described to have blind allocation and two studies used Intention to Treat analysis (ITT), whereby participants are compared in the groups to which they were randomly assigned regardless how much treatment they actually received. One study stated that no withdraws occurred. Eight studies described that assessors were blind to treatment allocation. Control and treatment groups were described to be comparable at entry in 11 studies. In 12 studies, groups were described having been treated identically other than for the named interventions and outcomes having been measured in the same way for all study groups in the 12 studies. All studies used valid and reliable tools to assess QoL, and 11 studies also described the instruments adequately. Finally, all twelve studies described appropriate statistical procedures. The methodological quality of the included studies was good (7/9 or above; Aho-Mustonen et al., 2011; Bradley et al., 2006; Girón et al., 2010) or moderate (4–6/9; Bio & Gattaz, 2011; Hayes et al., 1995; Ngoc, Weiss, & Trung, 2016; Patterson et al., 2003; Patterson et al., 2006; Pitkänen et al., 2012; Rus-Calafell, Gutierrez-Maldonado, Ortega-Bravo, Ribas-Sabate, & Caqueo-Urizar, 2013; Vreeland et al., 2006; Walker et al., 2013).

Effectiveness of interventions on QoL

Effectiveness of family interventions

Various family interventions have the design to promote positive family environment and reduce levels of expressed emotions within families. These interventions include such as family therapy, family psychoeducation as well as family counselling groups and family educational lectures (Pitschel-Walz, Leucht, Bäuml, Kissling, & Engel, 2001). Three studies regarding family interventions were included: Bradley et al. (2006) from Australia, Girón et al. (2010) from Spain and Ngoc et al. (2016) from Vietnam. These three studies included 159 participants. Bradley et al. (2006) and Girón et al. (2010) used the Quality of Life Scale (QLS) (Heinrichs, Hanlon, & Carpenter, 1984) to evaluate family interventions' effects on the patients' QoL. Bradley et al. (2006) used the whole scale and Girón et al. (2010) used only the Interpersonal Relations subscale. The whole QLS generates four subscales (Interpersonal Relations, Instrumental Role, Intrapsychic Foundations, and Common Objects and Activities). Ngog et al. (2016) assessed QoL using the Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q) (Endicott, Nee, Harrison, & Blumenthal, 1993), which includes five areas (General activities, Physical activities, Emotional functioning, Recreational activities and Social relationships).

Bradley et al. (2006) studied multiple family-group interventions (n = 25) versus standard case management (n = 25). The patients and their caregivers were recruited from outpatients continuing care settings. The case management intervention every two or three weeks on average and single family contacts on an individual basis were provided in both groups. In the intervention group, two half-day multiple-family psychoeducation sessions were conducted after single family sessions providing information about schizophrenia related matters. Next, the consumer-caregiver pairs participated in a multiple-family group every other week for 12 months. Key components of group discussions included current concerns, a review of problems discussed earlier and a combination of general topics and problem solving with a single family about a particular issue. No significant group differences were found between the two study groups.

Girón et al. (2010) studied family intervention, individual

Table 1
Characteristics of included studies.

Study details	Participants and setting	Intervention A (Group 1)	Intervention B (Group 2); Intervention C (Group 3)	QoL measures	Main study results	Authors' conclusions
Family interventions						
Bradley et al. (2006), Australia	Inclusion criteria Schizophrenia spectrum disorder, age 18–55 years Male gender n (%) Group 1 7 (28) Group 2 8 (32) p = ns Age mean $\pm$ SD Group 1 33.6 $\pm$ 6.7 Group 2 34 $\pm$ 9.6 p = ns Setting of treatment Outpatient care setting	Multiple family-group treatment; 2 half-day psychoeducation sessions and 26 group sessions + standard case management with single family sessions n = 25 pairs (consumer and caregiver)/50	Standard case management with single family sessions n = 25 pairs (consumer and caregiver)/50	Quality of Life Scale (QLS); (Heinrichs et al., 1984)	Mean $\pm$ SD at baseline and post-treatment: Total score: Group 1 Baseline 54.82 $\pm$ 13.67 Post-treatment 58.17 $\pm$ 14.25 Group 2 Baseline 54.39 $\pm$ 14.56 Post-treatment 63.22 $\pm$ 22.34; Change difference between groups: F_1 = 0.68, p > 0.05	No significant group differences were found on QoL between study groups.
Girón et al. (2010), Spain	Inclusion criteria Schizophrenia and schizophreniform disorder, outpatients, age 17–55 years Male gender n (%) Group 16 (64) Group 21 (84) p = 0.107 Age mean $\pm$ SD Group 1 30.92. $\pm$ 6.98 Group 2 32.12 $\pm$ 9.05 p = 0.719 Setting of treatment Mental health centres	Family intervention; every fortnight during 9 months and then monthly for 15 months + individual counselling + treatment as usual n = 25/50	Individual counselling + treatment as usual n = 25/50	Quality of Life Scale (QLS); the Interpersonal relations subscale (Heinrichs et al., 1984)	Mean $\pm$ SD at baseline, 9- and 24-month follow-ups: Total score: Group 1 Baseline 22,12 $\pm$ 10.60 9 month 26.28 $\pm$ 10.00 24 months 29.04 $\pm$ 10.85 Group 2 Baseline 25.12 $\pm$ 11.23 9 month 24.88 $\pm$ 12.00 24 months 22.04 $\pm$ 12.19 Change difference between groups: p = 0.002	QoL improved in the family intervention group while decreased in the control group.
Ngoc et al. (2016) Vietnam	Schizophrenia, age 18–30 years Male gender (%) Group 1 (48,6) Group 2 (51,4) p = 0.67 Age mean $\pm$ SD Group 1 24,87 $\pm$ 5,11 p = 0,67 Group 2 23,69 $\pm$ 4,37 p = 0.35 Setting of treatment Psychiatric hospital	Family schizophrenia psychoeducation programme (FSPP); 3 sessions n = 30/59	Treatment as usual n = 29/59	Quality of Life, Enjoyment and Satisfaction Question-naire (Q-LES-Q); (Endicott et al., 1993)	Mean $\pm$ SD at baseline and at 6-month follow-up: Total score: Group 1 Baseline 3,69 $\pm$ 0.61 6 months 3,95 $\pm$ 0.60 Group 2 Baseline 3,49 $\pm$ 0.53 6 months 3,55 $\pm$ 0.65 Change difference between groups: $F_{1,46}$ = 4.32, ES = 0.09, p < 0.05	Patients in the FSPP showed significantly greater improvement in QoL than in the control group
Psychoeducation/patient education						
Aho-Mustonen et al. (2011), Finland	Inclusion criteria Schizophrenia or schizoaffective disorder; forensic patient status Male gender n (%) Group 1 17 (89.5) Group 2 18 (90.0) p = ns Age mean $\pm$ SD Group 1 38.6 $\pm$ 14.0 Group 2 40.6 $\pm$ 8.5 p = ns Setting of treatment A forensic hospital	Psychoeducation (PE) programme with cognitive-behavioural elements, 8 group sessions + treatment as usual n = 19/39	Treatment as usual n = 20/39	15D (Sintonen, 2001)	Mean change $\pm$ SD at post-treatment and 3-month follow-up: Total score: Group 1 Post-treatment 0.00 $\pm$ 0.08 3 month 0.00 $\pm$ 0.06 Group 2 Post-treatment 0.01 $\pm$ 0.06 3 month 0.04 $\pm$ 0.08; Change difference between groups: Post-treatment p = 0.50, ES = −0.14 3 month p = 0.09, ES = −0.57	PE produced negative treatment effect since positive changes in QoL occurred only in the control group. A pilot study.
Pitkänen et al. (2012), Finland	Inclusion criteria Schizophrenia and related disorders, age 18–65 years Male gender No differences between study groups	Patient education; a computer-based education group + 6 sessions + treatment as usual n = 100/311	Patient education; an education group with written leaflets; 6 sessions + treatment as usual n = 106/311	Quality of Life, Enjoyment and Satisfaction Questionnaire (Q-LES-Q); short form	Mean $\pm$ SD at baseline, post-treatment and 3-, 6-, 12-month follow-ups: Total score: Group 1 Baseline 42.5 $\pm$ 9.3 1 month 46.2 $\pm$ 9.6	Systematic patient education methods demonstrated no advantages over TAU.

(continued on next page)

Table 1 (*continued*)

Study details	Participants and setting	Intervention A (Group 1)	Intervention B (Group 2); Intervention C (Group 3)	QoL measures	Main study results	Authors' conclusions
	($p = 0.651$) Age No differences between study groups ($p = 0.671$) Setting Acute inpatient units in two psychiatric hospitals		Treatment as usual n = 105/311	(Endicott et al.1993)	3 months 45.8 ± 11.1 6 months 46.8 ± 10.7 12 months 47.6 ± 10.2 $p < 0.001$ Group 2 Baseline 42.0 ± 11.6 1 month 47.4 ± 11.0 3 months 47.4 ± 10.7 6 months 47.3 ± 10.8 12 months 49.6 ± 10.6 $p < 0.001$ Group 3 Baseline 40.3 ± 10.7 1 month 44.0 ± 10.5 3 months 45.3 ± 10.5 6 months 46.0 ± 10.6 12 months 47.6 ± 10.4 $p < 0.001$; Change difference between groups $F_{6.7} = 0.9$, $p = 0.503$	
Vreeland et al. (2006), USA	Inclusion criteria Schizophrenia or schizoaffective disorder Male gender n (%) Group 1 20 (50) Group 2 13 (38) Age n (%) Group 1 22–34: 5 (13) 35–64: 34 (85) 65 or older: 1 (3) Group 2 22–34: 4 (12) 35–64: 30 (88) 65 or older: 0 (0) Setting Day treatment	Team Solutions treatment model; 24-week psychoeducational group focused on illness management + treatment as usual n = 40/74	Treatment as usual n = 34/74	Psychologi-cal General Well-Being Scale (PGWB) (Dupuy, 1984)	Mean ± SD at baseline, eight weeks and 24 weeks: Total score: Group 1 Baseline 69,8 ± 21,4 8 weeks 70,9 ± 17,1 24 weeks 75,9 ± 17,0 Group 2 Baseline 69,5 ± 18,1 8 weeks 72,9 ± 17,5 24 weeks 73,1 ± 15,4 $p > 0.05$ PGWB self-concept Group 1 Baseline 9,3 ± 4,4 8 weeks 10,5 ± 3,3 24 weeks 11,2 ± 2,9 Group 2 Baseline 10,2 ± 3,0 8 weeks 10,1 ± 3,6 24 weeks 9,5 ± 3,0 Change difference between groups: $p < 0.05$	Team solutions treatment model demonstrated no advantages over treatment as usual except for the self-concept subscale of the PGWB.
Walker et al. (2013), UK	Inclusion criteria Psychotic disorder, age 19–65 years Male gender n (%) 79 (97.5) Age mean ± SD Group 1 38 ± 9.19 Group 2 35 ± 9.57 Setting Forensic hospital	Group-based psychoeducation programme (Coping with mental illness), 11 weeks + treatment as usual n = 46/81	Treatment as usual n = 35/81	Schizophre-nia Quality of Life Scale Revision 4 (SQLS-R4) (Martin & Allan, 2007)	Mean ± SD and group difference at post-treatment: Total score: Group 1 Post 30.7 ± 19.1 Group 2 Post 30.6 ± 16.1; Change difference between groups $F_{1.74} = 1.65$, $p = 0.203$ Psychosocial subscale: Group 1 Post 23.8 ± 16.6 Group 2 Post 22.4 ± 15.3 Change difference between groups: $F_{1.74} = 1.24$, $p = 0.267$ Vitality subscale: Group 1 Post 16.7 ± 9.1 Group 2 Post 17.9 ± 7.1 Change difference between groups: $F_{1.74} = 1.77$, $p = 0.186$	Group-based psychoeducation programme did not produce benefits on QoL.

Social skills training

(continued on next page)

Table 1 (*continued*)

Study details	Participants and setting	Intervention A (Group 1)	Intervention B (Group 2); Intervention C (Group 3)	QoL measures	Main study results	Authors' conclusions
Hayes et al. (1995) Australia	Inclusion criteria Schizophrenia. Age between 18 and 65 years Male gender n(%) 47 (75) Age mean $\pm$ SD 36 $\pm$ 10 Setting Outpatient services	Social skills training (SST) in groups, 36 sessions during 18 weeks n =?/63	Discussion group, 36 sessions during 18 weeks n =?/63	The Quality of Life Scale (QLS; Heinrichs et al., 1984)	Mean $\pm$ SD at pre- and post-treatment and 6-month follow-up: Total score: Group 1 Pre 60.1 (24.1) Post 66.0 (21.9) Follow–up 69.9 (22.2) Group 2 Pre 64.3 (17.8) Post 69.2 (18.0) Follow-up 73.6 (18.9) Change difference between groups: $F_{2,31} = 0.03$, $p > 0.05$	QoL improved significantly in both groups, but there was no difference between the groups.
Patterson et al. (2003), USA	Inclusion criteria Longstanding psychotic disorder, age 40 or older Male gender n (%) Group 1 11 (69) Group 2 11 (69) Age mean $\pm$ SD Group 1 47.9 $\pm$ 5.3 Group 2 51.7 $\pm$ 8.5 Setting 4 Board-and-Care facilities	Functional Adaptations and Skills Training (FAST), behavioural group intervention, 12 weeks n = 16/32	Treatment as usual n = 16/32	The Quality of Well-Being Scale (QWB) (Anderson et al., 1989)	Mean $\pm$ SD at baseline. Post-treatment and 3-month follow-up: Group 1 Baseline 0.53 $\pm$ 0.08 Post 0.55 $\pm$ 0.10 Follow-up 0.51 $\pm$ 0.07 $p > 0.05$ Group 2 Pre 0.49 $\pm$ 0.08 Post 0.50 $\pm$ 0.07 Follow-up 0.49 $\pm$ 0.07 $p > 0.05$ Change difference between groups: $F2.29 = 0.38$, $p = 0.69$	Neither FAST or treatment us usual condition improved QoL. A pilot study
Patterson et al. (2006), USA	Inclusion criteria Schizophrenia or schizoaffective disorder, age 40 or older Male gender n (%) Group 1 77 (62.1) Group 2 79 (68.1) Age mean $\pm$ SD Group 1 51.2 $\pm$ 7.7 Group 2 50.5 $\pm$ 7.0 Setting 25 Board-and-Care facilities	Functional Adaptations and Skills Training (FAST), behavioural group intervention, 24 weeks n = 124/240	Attention control condition, group sessions providing supportive environment for addressing personal problems, 24 weeks n = 116/240	The Quality of Well-Being Scale (QWB) (Anderson et al., 1989)	Mean $\pm$ SD at baseline and post-treatment: Group 1 Baseline 53.9 $\pm$ 1.5 Post 55.0 $\pm$ 1.4 p > 0.05 Group 2 Pre 56.3 $\pm$ 1.5 Post 55.9 $\pm$ 1.5 p > 0.05 Change difference between groups: $F_{1.2816} = 0.60$, $p = 0.439$	Neither FAST nor attention control group condition improved QoL.
Rus-Calafell et al. (2013), Spain	Inclusion criteria Schizophrenia or schizoaffective disorder, age 18–55 years Male gender n (%) Group 1 15 (83.3) Group 2 10 (76.9) Age mean $\pm$ SD Group 1 42.39 $\pm$ 8.1 Group 2 37.54 $\pm$ 8.0 Setting Mental health outpatient service of the general hospital	Social skills training; 16 group sessions, twice weekly + treatment as usual n = 13/31	Treatment us usual n = 18/31	SF-36 Health Survey (Ware & Sherbourne, 1992)	Mean $\pm$ SD at baseline. Post-treatment and 6-month follow-up: Physical health Group1 Baseline 47.77 $\pm$ 7.76 Post 49.63 $\pm$ 6.06 Follow-up 50.32 $\pm$ 7.85 p > 0.05 Group2 Baseline 47.53 $\pm$ 6.28 Post 47.04 $\pm$ 6.10 Follow-up 48.66 $\pm$ 7.26 p > 0.05 Change difference between groups $F_{2.58} = 0.371$, p > 0.05 Mental health Group 1 Baseline 28.76 $\pm$ 11.12 Post 50.05 $\pm$ 8.91 Follow-up 41.20 $\pm$ 12.97 $p < 0.05$ Group2 Baseline 34.07 $\pm$ 7.77 Post 35.37 $\pm$ 8.47 Follow-up 33.83 $\pm$ 8.7	Significant improvement in mental health subscale after the completion of social skills training. No change in control group. A pilot study

Table 1 (*continued*)

Study details	Participants and setting	Intervention A (Group 1)	Intervention B (Group 2); Intervention C (Group 3)	QoL measures	Main study results	Authors' conclusions
					p > 0.05 Change difference between groups: $F_{2.58} = 24.47$. $p < 0.05$	
Supported employment/vocational rehabilitation						
Bio and Gattaz (2011), Brazil	Inclusion criteria Schizophrenia, age 18 or older, unemployment during past 12 months Male gender n (%) Group 1 35 (61.4) Group 2 37 (67.2) Age mean ± SD Group 1 28.2 ± 7.8 Group 2 30.8 ± 7.0 Setting Outpatient service	Vocational rehabilitation programme, 6 months in one of 42 companies n = 57/112	Waiting list n = 55/112	Quality of Life Scale (QLS) (Heinrichs et al., 1984)	Mean ± SD before and at post-treatment: A total score: Group 1 Before 72.4 ± 14.8 Post 80.7 ± 16.6 Group 2 Before 65.8 ± 19.2 Post 69.2 ± 21.5 Change difference between groups $p = 0.036$	Improvement was significantly higher in the vocational group as compared to controls.

counselling and TAU (n = 25) versus individual counselling and TAU (n = 25). The participants were recruited from mental health centres. Family sessions were held fortnightly for 9 months and then monthly for 15 months. The key elements in the family sessions were providing information, active listening and clarification of emotions, problems and needs, establishing a therapeutic alliance, improving communication, problem-solving techniques, diminishing critical attitudes and over-involvement as well as training in empathy. Girón et al.'s study focused on the Interpersonal Relations subscale and found that social relations improved significantly more in the family intervention group.

Ngog et al. (2016) evaluated the effects of the family schizophrenia psychoeducation programme (FSPP). Participants were recruited from a psychiatric hospital. Fifty nine patients and their families were randomized to an intervention group (n = 30) and a control group (n = 29). The control group received services as usual. The FSPP programme consists of three 1,5 h sessions and included both family members and patients. The sessions were interactive providing information and discussion. The sessions offered information about schizophrenia, how to support the patient and how to help the patient reintegrate into the community and normal life. The participants in the psychoeducation group showed significantly greater improvement in the QoL.

Effectiveness of psychoeducation

Psychoeducation is defined as the education of an individual with mental disorder which aims to help patients cope with their disease by increasing knowledge of their illness and its treatment (Xia et al., 2011). The term patient education has also been used to describe the method to support the information receiving aspect (Dowrick, Blum, & Pfohl, 2008). Four RCTs about psychoeducation met the inclusion criteria. Two studies were from Finland (Aho-Mustonen et al., 2011; Pitkänen et al., 2012), one from the UK (Walker et al., 2013) and one from the USA (Vreeland et al., 2006). The studies included 505 participants of which 311 participants were from one study (Pitkänen et al., 2012) with three study arms. Mean age amongst the forensic participants was 36 years and 95% of the participants were male. In Pitkänen et al.'s (2012) study, RCT concerning acute psychiatric participants gender information was not reported in detail. The other three RCTs, (Aho-Mustonen et al., 2011; Vreeland et al., 2006; Walker et al., 2013), included mainly men (75,8%). Aho-Mustonen et al. (2011) used Sintonen's (2001) 15D instrument of QoL. The 15D is a generic QoL instrument with 15 items. Pitkänen et al. (2012) used the Q-LES-Q (Endicott et al., 1993) short form that includes 16 items. Vreeland et al. (2006) used the Psychological General Well-Being Scale (PGWB) by

Dupuy (1984). The PGWB is a 22-item self-report measure. Walker et al. (2013) assessed the participants' QoL with Schizophrenia Quality of Life Scale Revision 4 (SQLS-R4) by Martin and Allan (2007). The SQLS-R4 is a 33-item measure.

In their pilot RCT, Aho-Mustonen et al. (2011) studied a psychoeducation programme in one inpatient forensic psychiatry unit. Thirty nine patients were randomized either to the intervention group (n = 19) or the TAU control group (n = 20). All patients received TAU, including medication, psychosocial rehabilitation efforts and usual ward activities. The psychoeducation programme consisted of eight group sessions held once a week. The programme contained cognitive-behavioural elements and homework between group sessions. The sessions were 45–60 min long and there were three to eight patients in each group. Negative treatment effect was found since positive changes occurred only in the control group.

Pitkänen et al. (2012) used term patient education in their study. They evaluated three different patient education methods in nine acute inpatient units in two psychiatric hospitals. Patients were randomized to computer-based patient education (n = 100), conventional education with written leaflets (n = 106) and the TAU group (n = 105). Both interventions included five sessions (Illness, Treatment, Well-being, Support and Patients' rights). The sessions lasted in the computer-based group for 40 min on average and in the written leaflets group for 30 min on average. In both study groups, the sessions took the form of one-to-one discussion between a patient and a nurse. In the TAU group, patients received patient education according to usual ward procedures. No significant group differences were found between the three study groups in QoL.

Vreeland et al. (2006) examined efficacy of a comprehensive, modularized, psychoeducational programme called Team Solutions in a day treatment setting. This 24-week psychoeducational group focused on illness management. Team solution participants (n = 40) met two times twice a week for 24 weeks. Sessions offered information and exercises about schizophrenia, recovering from it, medication and preventing relapses. The comparison group (n = 34) continued their TAU. No other significant change differences between groups were observed except for the self-concept subscale of the PGWB.

Walker et al. (2013) examined group-based psychoeducation programme designed for forensic population who suffer from psychosis. The RCT was conducted in four forensic centres. In the psychoeducation group, patients (n = 46) attended two sessions (1 h) per week for the duration of 11 weeks. The programme offered a combination of information giving sessions as well as problem solving and coping skills

sessions. Participants were encouraged to become involved in open discussion during each session and were issued with information relating to the session and supplementary reading material at the close of each session. The control group (n = 35) received TAU. They were able to take part in social and occupational activities. Group-based psychoeducation programme did not produce benefits on the QoL.

Effectiveness of social skills training

Social skills training (SST) utilizes behaviour therapy techniques for teaching patients to communicate their emotions and requests enabling them to acquire interpersonal disease management and independent living skills required for functioning in their communities. It can be conducted in individual bases, with families or in groups (Kopelowicz, Liberman, & Zarate, 2006). Four studies were included in this review. Two studies were from USA (Patterson et al., 2003; Patterson et al., 2006), one from Spain (Rus-Calafell et al., 2013) and one from Australia (Hayes et al., 1995). All RCTs were conducted in outpatient settings. These four studies included 466 participants. In two pilot studies (Patterson et al., 2003; Rus-Calafell et al., 2013), there were only 32 and 31 participants. The majority (68%) of participants were male. Hayes et al. (1995) assessed QoL using the QLS (Heinrichs et al., 1984) and Patterson et al. (2003, 2006) used The Quality of Well-Being Scale (QWB) (Anderson, Kaplan, Berry, Bush, & Rumbaut, 1989). The QWB includes three scales (Mobility, Physical activity, Social activity). Rus-Calafell et al. (2013) assessed the QoL with the MOS 36-Item Short-Form Health Survey (SF-36) (Ware & Sherbourne, 1992) The SF-36 assess eight health dimensions (36 items).

Hayes et al. (1995) recruited 63 patients with schizophrenia who showed social skills deficits and poor community-functioning. Patients were assigned randomly to either SST or a discussion group (DG) condition. Both SST and DG treatments consisted of 36 sessions of 75 min duration each, conducted over 18 weeks in small groups. Nine booster sessions were conducted over a 6-month follow-up period. SST sessions contained training interpersonal skills, social problem solving, positive time-use skills and the use of generalization enhancement techniques. DG groups focused on the topics of interpersonal relations and purposeful use of time but the therapists did not teach or overtly demonstrate social skills. All subjects continued pre-existing treatment. The QoL improved significantly in both groups, but there was no difference between the groups.

Patterson et al. (2003), evaluated in their pilot study Functional Adaptations and Skills Training (FAST) (n = 16), a behavioural group intervention they developed in four board-and-care facilities. The control group (n = 16) was TAU. The manualized social-cognitive intervention focused on improving six areas of everyday functioning: medication management, social skills, communication skills, organization and planning, transportation and financial management. The training included two-hour group-sessions and homework. Intervention lasted for 12 weeks and included 24 semi-weekly group sessions. Both study groups received their usual medication. Neither FAST nor TAU group showed significant change on the QoL.

Patterson et al. (2006) compared above described FAST intervention (n = 124) with attention control (AC) condition (n = 116) in 25 board-and-care facilities. The AC group also participated weekly in supportive group sessions (2 h) for 24 weeks addressing the participants' personal problems. Neither FAST nor AC improved the QoL of participants.

Rus-Calafell et al. (2013) conducted a pilot study to compare a brief cognitive-behavioural SST + TAU (n = 13) versus TAU (n = 18) in the adult mental health service of a general hospital. SST links treatment to seven specific target behaviours: social perception, social information processing, responding and sending skills, affiliative skills, interactional skills, and behaviour governed by social norms. There were 16 group sessions, held twice a week. TAU included outpatient services, including for example case management, medication adherence, psychotherapy, leisure engagement and family support. There was a significant improvement in mental health after the completion of SST but

no improvement in physical health. No change in the control group was observed.

Effectiveness of vocational rehabilitation

The aim of vocational rehabilitation is to help individuals to find work. Traditionally, there is first a pre-vocational training before partaking in competitive employment. Supported employment is one approach to vocational rehabilitation. In supported employment, individuals are placed in competitive employment without any extended preparation (Crowther, Marshall, Bond, & Huxley, 2001). One form of supported employment is the individual placement and support (IPS) model. It is a more specified scheme that includes: finding local jobs; rapid job search; customer choice in what they want from the employment service, long term individual support and close working between employment and mental health teams (Kinoshita et al., 2013). Only Bio and Gattaz's (2011) study related to vocational rehabilitation met the inclusion criteria. The study was conducted in Brazil and included 112 participants. Over half (64,3%) of the participants were male. QoL was assessed with the QLS (Heinrichs et al., 1984).

In the study of Bio and Gattaz (2011), patients were randomly allocated to a vocational rehabilitation programme (n = 57) and to a control group (n = 55). The control group received only out-clinic follow-up treatment including regular consultations every 4–6 weeks. The vocational programme consisted of a 6-months internship in one of 42 companies that signed a partnership. Patients were allocated to each of these different establishments according to their own choices or eventually to their prior experience in the respective business activities. QoL was assessed at the baseline and after six months. Improvement in the QoL was significantly higher in the vocational group when comparing to the control group.

Discussion

Many research findings have confirmed that the presence of schizophrenia is related to poorer QoL (Bobes et al., 2007; Evans et al., 2007; Nørholm & Bech, 2006; Su et al., 2014). Thus improving the QoL of these patients is emphasized in clinical practice guidelines all over the world (American Psychiatric Association, 2004; Finnish Medical Society Duodecim and Finnish Psychiatric Association, 2015; National Institute for Health and Care Excellence, 2014; Royal Australian and New Zealand College of Psychiatrists team, 2016). Based on this background, the current review aimed to examine the effectiveness of psychosocial interventions on the QoL of patients with schizophrenia and related disorders. Inclusion criteria for interventions were that they were recommended in practice guidelines for the treatment of patients with schizophrenia. RCTs included in this review examined family interventions (n = 3), psychoeducation (n = 4), social skills training (n = 4) and vocational rehabilitation (n = 1).

Although there is a lot of RCTs related to these interventions, it seems that QoL as an outcome is used only in some of them. Seven of the 12 included studies were conducted during the current decade, although QoL instruments have been used as an outcome in clinical trials in psychiatry research since 1990s (Pinikahana et al., 2002). Based on this review, it seems that just until the recent years QoL has become more popular when examining psychosocial interventions amongst patients with schizophrenia. Moreover, hundreds of QoL instruments are available for use in research because the lack of conceptual clarity of QoL has led to variation in measurements (Fayers & Machin, 2007). This variation was encountered also in recent systematic review (Nevarez-Flores et al., 2018) as well as in this review. Altogether seven different QoL instruments were used in twelve studies included in this review. This variation in the scales made it difficult to make clear conclusions about the effectiveness of interventions on the QoL of patients with schizophrenia.

Family schizophrenia psychoeducation programme conducted in hospital setting and targeting primarily on stigma appears to improve

the QoL of patients with schizophrenia (Ngoc et al., 2016). Also a long-term individual family treatment may have positive effect on patients' social relations (Girón et al., 2010). However, it should be noted that the decrease in the TAU group may have at least partially caused the positive findings in Girón et al. (2010) study. Multiple family-group treatment does not seem to be favorable when compared to single family sessions (Bradley et al., 2006). We found only three studies concerning family interventions to be included in the review. This is in line with Pharoah et al. (2010) who selected randomized and quasi-randomized studies when estimating the effects of family psychosocial interventions in community settings. They included 53 studies of which only one (Bradley et al., 2006) assessed the family intervention's effect on the patients' QoL. In our review, the samples in all three studies were small. Moreover, settings and QoL instruments varied. Thus, based on this review we conclude that there is some but weak evidence of family interventions on the QOL of patients with schizophrenia.

Based on one large study (Pitkänen et al., 2012), individual based patient education utilizing either computer-based education or written leaflets and conducted education on acute inpatient psychiatric unit does not seem to have advantages over TAU in enhancing the QoL of patients with schizophrenia. It is worth noting that the study intervention included only five education sessions. It might be that more education sessions may generate positive effects on the QoL. Positive effects related to group-based psychoeducaton programme were not found in the studies conducted amongst forensic patients either (Aho-Mustonen et al., 2011; Walker et al., 2013). Only Vreeland et al. (2006) found in their day treatment setting study that 24-week psychoeducational group education may have a positive effect on patients' self-concept. Based on Xia et al.'s (2011) review, psychoeducation seems to be a promising intervention amongst hospital patients for example to reduce relapse and encourage medication compliance. However, they concluded that more research is needed to be confident of the results of psychoeducation on the QoL, as is the case also based on this review.

Group-based SST seems to improve the QoL and more specifically the mental health of the patients (Rus-Calafell et al., 2013). However, the sample in this pilot study was very small and thus any confident conclusions cannot be made. Patterson et al. (2006, 2003) found no benefits of group based behavioural SST programme on patients' QoL neither in their small pilot study nor in the study with 240 participants and longer duration of intervention. According to Hayes et al.'s (1995) findings, SST and discussion group have equal effect in improving QoL. Based on this limited evidence from our review, it seems that some sort of SST may enhance the QoL of patients with schizophrenia. However, evidence from this review is very limited, which is in line with Almerie et al.'s (2015) review, which examined SST's effect primary on social functioning.

Based on the study by Bio and Gattaz (2011), it seems that vocational rehabilitation may have effect on the QoL of patients with schizophrenia. It is somewhat surprising that only one study concerning vocational rehabilitation and having QoL as an outcome could be included in the review although unemployment (Thornicroft et al., 2009) and insufficient financial means (Heider et al., 2007) have been shown to associate with impaired QoL. This limited evidence suggests that QoL of patients with schizophrenia may be improved by vocational rehabilitation.

Limitations of the review

This review has some limitations. Firstly, regarding the search strategy only studies published in English were eligible for inclusion and unpublished studies were not searched. Both these limitations may have caused some publication bias. Secondly, with regard to the methodological quality of the included studies there is a risk of selection bias associated with unclear information about the random allocation methods. Only 16,7% of the papers clearly reported on the use of true randomization. Thirdly, the evidence of this review is limited

based on the small number of studies regarding the interventions of interest for this review. Further, there was diversity in the types of programmes and in durations of interventions. Moreover, the studies used a wide range of control interventions and the outcomes were assessed using different measures. In most studies, QoL was a secondary outcome and was not reported in detail. All these differences in included studies have limited the process of synthesis in the review. Despite these limitations, this review has produced preliminary synthetized results of the best evidence available on the effectiveness of the four often recommended (American Psychiatric Association, 2004; Finnish Medical Society Duodecim and Finnish Psychiatric Association, 2015; National Institute for Health and Care Excellence, 2014; Royal Australian and New Zealand College of Psychiatrists team, 2016) non-pharmacological interventions on the QoL of patients with schizophrenia and related disorders.

Conclusion and recommendations

Although improving the QoL of patients with schizophrenia is emphasized in clinical practice guidelines all over the world, there is surprisingly few studies about the effects of psychosocial interventions on the QoL of these patients. Based on this review, it seems that there is some but very weak evidence that family intervention, psychoeducation, SST and vocational rehabilitation may enhance the QoL of patients with schizophrenia. These interventions may be worth utilizing with this outcome in mind. However, more research is needed to determine the effectiveness of these promising interventions. Studies should include rigorously designed RCTs with bigger samples and longer follow-up times.

References

Aho-Mustonen, K., Tiihonen, J., Repo-Tiihonen, E., Ryynänen, O.-P., Miettinen, R., & Räty, H. (2011). Group psychoeducation for long-term offender patients with schizophrenia: An exploratory randomized controlled trial. *Criminal Behaviour and Mental Health, 21*, 163–176.

Almerie, M. Q., Okba, A. L., Marhi, M., Jawoosh, M., Alsabbagh, M., Matar, H. E. et al. (2015). Social skills programmes for schizophrenia. Cochrane Database of Systematic Reviews, Issue 6. Art. No.: CD009006. DOI: https://doi.org/10.1002/14651858.CD009006.pub2.

Almond, S., Knapp, M., Francois, C., Toumi, M., & Brugha, T. (2004). Relapse in schizophrenia: Costs, clinical outcomes and quality of life. *The British Journal of Psychiatry, 184*, 346–351.

American Psychiatric Association. (2004). Practice guideline for the treatment of patients with schizophrenia. 2nd ed. [Internet]. [cited 2018 March 4]; Available from: https://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/schizophrenia.pdf

Anderson, J. P., Kaplan, R. M., Berry, C. C., Bush, J. W., & Rumbaut, R. G. (1989). Interday reliability of function assessment for a health status measure: The Quality of Well Being Scale. *Medical Care, 27*, 1076–1083.

Atkinson, J. M., Coia, D. A., Gilmour, W. H., & Harper, J. P. (1996). The impact of education groups for people with schizophrenia on social functioning and quality of life. *The British Journal of Psychiatry, 168*, 199–204.

Bio, D. S., & Gattaz, W. F. (2011). Vocational rehabilitation improves cognition and negative symptoms in schizophrenia. *Schizophrenia Research, 126*, 265–269.

Bobes, J., García-Portilla, M. P., Bascarán, M. T., Saíz, P. A., & Bousoño, M. (2007). Quality of life in schizophrenia patients. *Dialogues Clinical Neuroscience, 9*, 215–226.

Bradley, G. M., Couchman, G. M., Perlesz, A., Nguyen, A. T., Sing, B., & Riess, C. (2006). Multiple-family group treatment for English- and Vietnamese-speaking families living with schizophrenia. *Psychiatric Services, 57*, 521–530.

Chong, H. Y., Teoh, S. L., Wu, D. B. C., Kotirum, S., Chiou, C.-F., & Chaiyakunapruk, N. (2016). Global economic burden of schizophrenia: A systematic review. *Neuropsychiatric Disease and Treatment, 12*, 357–373.

Crowther, R., Marshall, M., Bond, G. R., Huxley, P. (2001). Vocational rehabilitation for people with severe mental illness. *Cochrane Database of Systematic Reviews*, Issue 2. Art.No:CD003080. DOI: https://doi.org/10.1002/14651858.CD003080.

Dowrick, C., Blum, N., & Pfohl, B. (2008). Educational interventions. In P. Tyrer, & K. R. Silk (Eds.). *Cambridge textbook of effective treatments in psychiatry* (pp. 116–131). Cambridge: UK. Cambridge University Press.

Dupuy, H. J. (1984). The psychological general well-being (PGWB) index. In N. K. Wenger,, M. E. Mattson,, & C. D. Furberg, (Eds.). *Assessment of quality of life: Clinical trials of cardiovascular therapies*. New York: Le Jacq.

Emsley, R., Chiliza, B., Asmal, L., & Harvey, B. H. (2013). The nature of relapse in schizophrenia. *BMC Psychiatry, 13*(50), https://doi.org/10.1186/1471-244X-13-50.

Endicott, J., Nee, J., Harrison, W., & Blumenthal, R. (1993). Quality of Life Enjoyment and Satisfaction Questionnaire: A new measure. *Psychopharmacology Bulletin, 29*,

321–326.

Evans, S., Banerjee, S., Leese, M., & Huxley, P. (2007). The impact of mental illness on quality of life: A comparison of severe mental illness, common mental disorder and healthy population samples. *Quality of Life Research, 16*, 17–29.

Fayers, P. M., & Machin, D. (2007). *Quality of life. Assessment, analysis and interpretation* (2nd ed.). New York: John Wiley & Sons.

Finnish Medical Society Duodecim and Finnish Psychiatric Association. (2015). (updated 2015 Jan 22). *Schizophrenia Current Care*. (in Finnish, the abstract in English). http://www.kaypahoito.fi/web/kh/suositukset/suositus?id=hoi35050 (Accessed 15 Nov 2017).

Girón, M., Fernández-Yañez, A., Mañá-Alvarenga, S., Molina-Habas, A., Nolasco, A., & Gómez-Beneyto, M. (2010). Efficacy and effectiveness of individual family intervention on social and clinical functioning and family burden in severe schizophrenia: A 2-year randomized controlled trial. *Psychological Medicine, 40*, 73–84.

Graf, J., Lauber, C., Nordt, C., Rüesch, P., Meyer, P. C., & Rössler, W. (2004). Perceived stigmatization of mentally ill people and its consequences for the quality of life in a Swiss population. *The Journal of Nervous and Mental Disease, 192*, 542–547.

Harvey, P. D., Robert, K. H., Carpenter, W. T., Jr., Green, M. F., Gold, J. M., & Schoenbaum, M. (2012). Functional impairment in people with schizophrenia: Focus on employability and eligibility for disability compensation. *Schizophrenia Research, 140*, 1–8.

Hayes, R. L., Halford, W. K., & Varkhese, FT. (1995). Social skills training with chronic schizophrenic patients: Effects on negative symptoms and community functioning. *Behavior Therapy, 26*, 433–449.

Heider, D., Angermeyer, M. C., Winkler, I., Schomerus, G., Bebbington, P. E., Brugha, T., et al. (2007). A prospective study of quality of life in schizophrenia in three European countries. *Schizophrenia Research, 93*, 194–202.

Heinrichs, D. W., Hanlon, T. E., & Carpenter, W. T. (1984). Quality of Life Scale: An instrument for rating the schizophrenic deficit syndrome. *Schizophrenia Bulletin, 10*, 388–397.

Kinoshita, Y., Furukawa, T. A., Kinoshita, K., Honyashiki, M., Omori, I. M., Marshall, M. et al. (2013). Supported employment for adults with severe mental illness. *Cochrane Database of Systematic Reviews*, Issue 9. Art. No.:CD008297. DOI:10.1002/14651858. CD008297.pub2.

Knapp, M., Mangalore, R., & Simon, J. (2004). The global costs of schizophrenia. *Schizophrenia Bulletin, 30*, 279–293.

Kopelowicz, A., Liberman, R. P., & Zarate, R. (2006). Recent advances in social skills training for schizophrenia. *Schizophrenia Bulletin, 32*, S12–S23.

Martin, C. R., & Allan, R. (2007). Factor structure of schizophrenia quality of life scale revision 4 (SQLS-R4). *Psychology, Health & Medicine, 12*, 126–134.

Mishra, A., Krishna, G. S., Alla, S., Kurian, T. D., Kurian, J., Ramesh, M., et al. (2017). Impact of pharmacist-psychiatrist collaborative patient education on medication adherence and quality of life (QoL) of bibolar affective disorder (BPAD) patients. *Frontiers in Pharmacology, 8*, 722. https://doi.org/10.3389/fphar.2017.00722.

National Institute for Health and Care Excellence. Psychosis and schizophrenia in adults: Prevention and management. (2014). https://www.nice.org.uk/guidance/cg178 (Accessed 15 Nov 2017).

Nevarez-Flores, A. G., Sanderson, K., Breslin, M., Carr, V. J., Morgan, V. A., & Neil, A. L. (2018). Systematic review of global functioning and quality of life in people with psychotic disorders. *Epidemiology and Psychiatric Sciences, 1*, 1–14. https://doi.org/10.1017/S2045796018000549.

Ngoc, T. N., Weiss, B., & Trung, L. T. (2016). Effects of family schizophrenia psychoeducation program for individual with recent onset schizophrenia in Viet Nam. *Asian Journal of Psychiatry, 22*, 162–166. https://doi.org/10.1016/j.ajp.2016.06.001.

Nørholm, V., & Bech, P. (2006). Quality of life in schizophrenia patients: Association with depressive symptoms. *Nordic Journal of Psychiatry, 60*, 32–37.

Patterson, T. L., Mausbach, B. T., McKibbin, C., Goldman, S., Bucardo, J., & Jeste, D. V. (2006). Functional adaptation skills training (FAST): A randomized trial of a psychosocial intervention for middle-aged and older patients with chronic psychotic disorders. *Schizophrenia Research, 86*, 291–299.

Patterson, T. L., McKibbin, C., Taylor, M., Goldman, S., Davila-Fraga, W., Bucardo, J., et al. (2003). Functional adaptation skills training (FAST): A pilot psychosocial intervention study in middle-aged and older patients with chronic psychotic disorders. *The American Journal of Geriatric Psychiatry, 11*, 17–23.

Pharoah, F., Mari, J. J., Rathbone, J., Wong, W. (2010). Family intervention for schizophrenia. *Cochrane Database of Systematic Reviews*, Issue 12. Art. No.: CD000088. DOI:https://doi.org/10.1002/14651858.CD000088.pub3.

Picchioni, M. M., & Murray, R. M. (2007). Schizophrenia. *BMJ, 335*, 91–95.

Pinikahana, J., Happell, B., Hope, J., & Keks, N. A. (2002). Quality of life in schizophrenia: A review of the literature from 1995 to 2000. *International Journal of Mental Health Nursing, 11*, 103–111.

Pitkänen, A., Välimäki, M., Kuosmanen, L., Katajisto, J., Koivunen, M., Hätönen, H., et al. (2012). Patient education methods to support quality of life and functional ability among patients with schizophrenia: A randomised clinical trial. *Quality of Life Research, 21*, 247–256.

Pitschel-Walz, G., Leucht, S., Bäuml, J., Kissling, W., & Engel, R. R. (2001). The effect of family interventions on relapse and rehospitalization in schizophrenia – A meta-analysis. *Schizophrenia Bulletin, 27*, 73–92.

Royal Australian and New Zealand College of Psychiatrists team (2016). Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for the management of schizophrenia and related disorders. *Australian & New Zealand Journal of Psychiatry, 50*, 1–117.

Rus-Calafell, M., Gutierrez-Maldonado, J., Ortega-Bravo, M., Ribas-Sabate, J., & Caqueo-Urizar, A. (2013). A brief cognitive-behavioural social skills training for stabilised outpatients with schizophrenia: A preliminary study. *Schizophrenia Research, 143*, 327–336.

Sintonen, H. (2001). The 15D instrument of health-related quality of life: Properties and applications. *Annals of Medicine, 33*, 328–336.

Su, C.-T., Ng, H.-S., Yang, A.-L., & Lin, C.-Y. (2014). Psychometric evaluation of the Short Form 36 Health Survey (SF-36) and the World Health Organization Quality of Life Scale Brief Version (WHOQOL-BREF) for patients with schizophrenia. *Psychological Assessment, 26*, 980–989.

Thornicroft, G., Brohan, E., Rose, D., Sartorius, N., Leese, M., & for the INDIGO Study Group (2009). Global pattern of experienced and anticipated discrimination against people with schizophrenia: A cross-sectional survey. *Lancet, 373*, 408–415.

Viertiö, S., Tuulio-Henriksson, A., Perälä, J., Saarni, S. I., Koskinen, M., Sihvonen, M., et al. (2012). Activities of daily living, social functioning and their determinants in persons with psychotic disorder. *European Psychiatry, 27*, 409–415.

Vreeland, B., Minsky, S., Yanos, P. T., Menza, M., Cara, M., Kim, E., ... Allen, L. (2006). Efficacy of the team solutions program for educating patients about illness management and treatment. *Psychiatric Services, 57*, 822–828.

Walker, H., Tulloch, L., Ramm, M., Drysdale, E., Steel, A., Martin, C., et al. (2013). Randomised controlled trial to explore insight into psychosis; effects of a psychoeducation programme on insight in a forensic population. *Journal of Forensic Psychiatry & Psychology, 24*, 756–771.

Ware, J. E., Jr., & Sherbourne, C. D. (1992). The MOS 36-Item Short-Form Health Survey (SF-36): 1. Conceptual framework and item selection. *Medical Care, 30*, 473–483.

WHO (2018) Schizophrenia. Key facts. http://www.who.int/en/news-room/fact-sheets/detail/schizophrenia. (Accessed 16 July 2018).

Xia, J., Merinder, L. B., Belgamwar, M. R. (2011). Psychoeducation for schizophrenia. *Cochrane Database of Systematic Reviews*. Issue 6. Art. No.:CD002831. DOI:https://doi.org/10.1002/14651858.CD002831.pub2.

Zhao, S., Sampson, S., Xia, J., Jayaram, M. B. (2015). Psychoeducation (brief) for people with serious mental illness. *Cochrane Database of Systematic Reviews*. Issue 4. Art. No.: CD010823. DOI: https://doi.org/10.1002/14651858.CD010823.pub2.