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The challenge of well-being and quality of life: A meta-analysis of psychological interventions in schizophrenia

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ABSTRACT

Well-being is a critical outcome in the recovery from psychosis and the prevention of symptoms. Previous reviews of the effectiveness of psychological interventions have focused on psychotic symptoms and general psychopathology, not recognising well-being as an essential outcome. This study conducted a meta-analysis of the effects of psychological interventions on the well-being and quality of life (QoL) of people with schizophrenia and analysed some critical moderating factors. A systematic literature search was conducted yielding 12986 published reports, 2043 of which were clinical trials. After a detailed review, 36 articles were included in the analyses. Measures of related concepts, well-being and quality of life were included in the present meta-analysis to reflect the current state of the literature and to ensure the representativeness of RCTs that have evaluated the effect of psychological interventions on the extent to which people with schizophrenia experience a good life. Our findings reflect a significant, small, treatment effect on the outcomes of well-being. Subgroup analysis also suggested a significant moderating effect when the primary aim of the intervention was well-being. These findings suggest that symptom or functional improvement does not necessarily lead to an improvement in well-being and would imply the need to focus specifically on those. We recommend psychological interventions that target well-being as a complementary strategy in mental health promotion and treatment. In addition, we stress the need to include well-being outcome measure in RCT as well as to clearly identify the different domains of well-being being measured.

1. Introduction

The most common treatment for schizophrenia spectrum disorders is antipsychotic medications. Even though their therapeutic advantages are well-known, negative side effects like weight gain and compliance issues have also been noted (Pilling et al., 2002a). The use of psychological interventions such as cognitive behavioural therapy for psychosis (CBTp), family interventions and social skills training is also well documented in the treatment of schizophrenia (Pilling et al., 2002 a & b; Kurtz and Mueser, 2008). In fact, in the recent years CBTp has become an established treatment for the positive symptoms of psychosis, but its effectiveness remains contested. Some meta-analyses report moderate effects on positive symptoms and general psychopathology, (Wykes et al., 2008) whereas others report minimal effects (Jauhar et al., 2014). In particular, for people with early psychosis, systematic reviews of randomised controlled trials have shown that early intervention services, CBTp and family interventions provide more clinical benefits than standard care (Bird et al., 2010). However, meta-analyses of cognitive remediation for people with schizophrenia have reported no clear evidence of any benefits (Pilling et al., 2002b) while those of social skills training have shown moderate to small treatment effects (Kurtz and Mueser, 2008). A reasonable general conclusion is that psychological interventions can have an impact on schizophrenia but they are not as effective as ideally desired. It is clear that additional research is required to assess their efficacy, long-term effects, and their impact on the good life of the people with schizophrenia. In fact, previous reviews regarding the effectiveness of psychological interventions for psychosis have mainly focused on positive symptoms and general psychopathology (Wykes et al., 2008; Jauhar et al., 2014) while ignoring their effect on individuals´ well-being.

Whereas, current interventions are aimed at reducing symptoms and disability, the World Health Organization (WHO) emphasises that health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (Callahan, 1973). This comprehensive definition highlights the need to focus on the well-being beyond treating the symptoms. The so-called complete model of health (Keyes, 2007) has shown that the individual's well-being is conceptually and empirically independent from measures of mental disorders. A fundamental implication of these findings is that effective interventions can significantly reduce clinical problems and

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symptoms, but not necessarily improve the individual's perception of living well. Although the usual goal of psychological interventions is to treat mental disorders, there is no doubt that promoting directly that well-being is a worthwhile initiative makes therapies more accepted and appealing to people with psychosis (Meyer et al., 2012).

Research in the field has used different interrelated concepts to assess well-being (Huta and Waterman, 2014). Subjective well-being is defined as a composite of hedonic elements (i.e., positive affect, negative affect and life satisfaction; Diener et al., 1999). Complementary to this concept, psychological well-being, more akin to a concept of eudaimonic well-being, has been defined by the presence of a number of psychological elements that contribute to have a good life (i.e., environmental mastery, personal growth, self-acceptance, autonomy, purpose in life, positive relations with others; Ryan and Deci, 2001; Ryff, 1989). Around these two broad traditions (i.e., hedonic and eudaimonic well-being) numerous new measures have recently been developed covering different aspects of well-being (Cooke et al., 2016; Linton et al., 2016). Some authors have strongly advocated the use of individual well-being measures, as they capture best how people experience their quality of life (QoL) (Layard, 2011; Helliwell and Wang, 2012). Well-being has been shown to be associated to improved functioning, increased resilience and life satisfaction (Fredrickson and Joiner, 2002), and is a central factor associated with a lower risk of developing mental symptoms (Keyes et al., 2010; Wood and Joseph, 2010). Its role in the recovery and prevention of psychotic symptoms has also been underlined (Schennach-Wolff et al., 2010; Slade, 2010).

The concepts of well-being and QoL are usually used interchangeably in the schizophrenia literature (Schrank et al., 2013a). Although not equivalent, well-being and QoL are closely related constructs that share some common ground around the theme of living well (Cooke et al., 2016). In a broad sense, QoL has been defined as a person's sense of well-being and satisfaction with their life circumstances, as well as his/her health status and access to resources and opportunities (Lehman et al., 2004). QoL's literature on schizophrenia shows disparities in the definitions that researchers have used, while some researchers have largely conceptualised QoL around the topic of having a good life, from a psychological perspective, others have included more objective indicators related to material living conditions and functioning (Eack and Newhill, 2007). Consequently, QoL tools often cover multiple dimensions, including in many occasions psychological aspects of well-being, which increases the validity of their estimates (Schrank et al., 2013a). Using these types of instruments, there is abundant research and meta-analyses that indicate positive and negative symptoms are strongly related to a low QoL in schizophrenia (Eack and Newhill, 2007). In the recent decades, the emphasis to depict the good life has moved from a more environmental QoL to a more subjective appraisal of one's life (Brulé and Maggino, 2017). According to Schrank et al. (2013a) there has been a transition from objectivity to subjectivity that has made subjective or psychological well-being to occupy a more central place in studies of mental health.

Ideally, schizophrenia practice treatment guidelines usually aim to maximise the good life of the affected person (Lehman et al., 2004). It is usually acknowledged by clinicians that recovery from schizophrenia can be enhanced if, in addition to treating the symptoms, there is an emphasis on the topic of living well by building personal resources and skills, identifying personal strengths or developing a positive identity (Schrank et al., 2014). It is likely that such efforts could improve the durability, transfer and generalisation of change, and the acceptability of psychological interventions for schizophrenia. A serious limitation of previous meta-analyses of psychological interventions for schizophrenia is that they have not considered well-being as a primary outcome measure, which may overshadow the importance of the perception of having a good life. Thus, the aim of the present study was to conduct a meta-analysis of the effects of psychological interventions on the well-being of people with schizophrenia spectrum disorders. Like in other reviews on the measurement of well-being (Schrank et al., 2013b; Cooke et al., 2016; Linton et al., 2016), several instruments of well-being and QoL have been incorporated into the study to reflect the current state of the literature and to ensure the representativeness of RCTs. Different potential variables moderating the effectiveness of the interventions were studied; 1. Intervention type (i.e. second vs. third generation), 2. Delivery mode (i.e. group vs. individual vs. combined), 3. type of patient (i.e. outpatient vs. inpatient), 4. Aim of the intervention (i.e. symptom reduction, improvement of functioning vs. increasing well-being), 5. Classification by the study of the well-being or QoL measured as primary or secondary outcome, 6. Whether they study used a measure of well-being or QoL and 7. Duration of the intervention. For the current study, cognitive-behavioural therapies were framed as second generation, while newer procedures mainly integrating first and second-generation change strategies with acceptance and mindfulness interventions were framed as third generation therapies (Spielger and Guevremont, 2010).

2. Methods

2.1. Search strategy

Following the PRISMA guidelines (Moher et al., 2009), a systematic literature search was carried out using PubMed and PsychInfo, databases from 1990 until September 2018. Keyword searches were performed using the following search strings in the title and abstract: “schizophrenia” or “psychoses” or “hallucinations” or “delusions”, combined with “interventions” or “therapy” not “pharmacological treatment”, combined with “well-being” or “quality of life”. The search was restricted to peer-reviewed studies in the English language.

2.2. Selection of studies

These database searches yielded 12,986 published reports, 2043 of which were clinical trials. Retrieved abstracts were then examined by four reviewers (L.M., R.E., A.T. and J.N.), and studies were included for further consideration if they reported quantitative empirical findings from a randomised control trial (RCT) of a psychological intervention, with pre-intervention and post-intervention outcome measures of well-being and/or QoL. To be included in this meta-analysis, psychological interventions had to meet a criteria: 1. They were aimed at patients (e.g. interventions for relatives were not included), 2. They could have a wide range of objectives, but these were not primarily directed to physical health (e.g. weight loss interventions were not included in the study), 3. They had to involve some form of contact with a therapist (e.g. online interventions without therapeutic contact were excluded), and 4. Some studies aimed at the effectiveness of an integrated care programme (e.g. Assertive Community Treatment) were excluded because although the programme included psychological interventions, the aim of the study was the complete programme which included many other care components. In addition, pharmacological or occupational therapy interventions were also excluded. Studies were included if they had a sample containing mostly schizophrenia spectrum disorders (i.e. the sample had to have at least 60% of participants with a schizophrenic spectrum diagnosis). The current meta-analysis includes studies with a wide range of measures of well-being and QoL, but to be considered for the current meta-analysis, studies had to have a formal measure of well-being. Studies were excluded if they provided insufficient statistics to allow for the calculation of standardised effect sizes (i.e. some studies provided effect sizes but did not provide means and standard deviations of their well-being or QoL measure). When possible, authors were contacted for supplementary data.

Data extraction

Data extraction and study quality assessment were performed by four reviewers (L.M., R.E., A.T. and J.N.) and double-checked by a single reviewer (C.V.). Disagreements were resolved by consensus. Data were collected on intervention characteristics (name, duration in minutes and weeks, delivery mode), patient characteristics (type of patient,

mean age and target diagnosis), design characteristics (type of control group, number of subjects analysed at post-test, attrition rates, outcome measures) and effect sizes at post-test.

The methodological quality of the included studies was assessed using a custom-made short scale of five items based on the criteria established by the Cochrane collaboration: 1. Randomisation sequence (if the method was described in sufficient detail to allow for an assessment of whether it should produce comparable groups); 2. Blinding in the evaluation (if those assessing outcomes were blinded); 3. Baseline comparability (if the study groups were comparable at the beginning of the study; was this explicitly assessed or were adjustments made to correct for baseline imbalance using appropriate covariates?); 4. Power analysis or $N \geq 50$ (if there was an adequate power analysis and/or there were at least 50 participants in the analysis); 5. Handling of missing data: the use of intention-to-treat analysis (as opposed to a completers-only analysis). Each criterion was rated as 0 (study does not meet criterion) or 1 (study meets criterion). The quality of a study was assessed as high when five or four criteria were met, medium when three criteria were met, and low when zero, one or two criteria were met. Table 1 shows the quality assessment for each study. The quality of the studies was scored from 1 to 5.

For studies included in the current meta-analysis, five of the studies were rated as low, 20 were rated as medium and 11 were rated as high in methodological quality (M = 3.80; SD = 1.14). All of the studies but two provided adequate details about the procedure used to get their randomisation sequence, and 12 out of 36 did not report using an appropriate evaluator blinding procedure. According to the baseline comparability ratings, most of the studies were comparable at baseline (35 out of 36 studies). Also, most of the studies had an adequate power analysis performed and/or had at least 50 participants in the analysis (25 out of 36 studies scored positive on this criterion). Finally, half of the studies conducted an intention-to-treat analysis (18 out of 36 studies).

Table 1
Supplementary information about quality assessment per study.

Study	1	2	3	4	5	Total
Balzan et al., 2014	1	0	1	0	0	2
Bechdolf et al., 2010	1	0	1	0	0	2
Briki et al., 2014	1	1	1	1	0	4
Bryce et al., 2018	1	1	1	1	1	5
Castelein et al., 2008	1	1	1	1	1	5
Fowler et al., 2009	1	1	1	1	1	5
Freeman et al., 2014	1	1	1	0	1	4
Garrido et al., 2013	1	1	1	1	0	4
Gaughran et al., 2017	1	1	1	1	1	5
Glynn et al., 2002	0	0	1	1	0	2
Goldberg et al., 2013	1	1	1	1	0	4
Gordon et al., 2018	0	0	1	0	0	1
Gray et al., 2006	1	1	1	1	1	5
Halperin et al., 2000	1	0	0	0	0	1
Hansen et al., 2012	1	1	1	1	1	5
Hasan and Musleh, 2017	1	1	1	1	1	5
Kane et al., 2016	1	0	1	1	0	3
Kuipers et al., 2004	1	1	1	1	0	4
López-Navarro et al., 2015	1	1	1	0	1	4
Madigan et al., 2013	1	1	1	1	1	5
Montag et al., 2014	1	1	1	1	1	5
Patterson et al., 2006	1	1	1	1	1	5
Penn et al., 2011	1	1	1	0	1	4
Pitkänen et al., 2012	1	0	1	1	1	4
Priebe et al., 2007	1	1	1	1	0	4
Priebe et al., 2015	1	1	1	1	1	5
Rabovsky et al., 2012	1	1	1	1	0	4
Röhricht and Priebe, 2006	1	1	1	0	0	3
Sachs et al., 2012	1	0	1	0	0	3
Schrank et al., 2016	1	0	1	1	1	4
Shawyer et al., 2012	1	1	1	0	0	3
Sibitz et al., 2007	1	0	1	1	1	4
Thorup et al., 2010	1	0	1	1	0	3
Wang et al., 2015	1	1	1	0	0	3
Wiersma et al., 2004	1	0	1	1	1	4
Zimmer et al., 2007	1	1	1	1	0	4

Note. 1 = Randomisation sequence; 2 = Blinding in the evaluation; 3 = Baseline comparability; 4 = Power analysis or $N \geq 50$; 5 = Handling of missing data: the use of intention-to-treat analysis.

2.3. Meta-analysis

Using the meta-analysis software RevMan-5, for each study we calculated effect sizes subtracting the average score of the experimental group (Me) from the average score of the control group (Mc), and dividing the result by the pooled standard deviations of both groups. This was done at post-test because randomisation resulted in comparable groups across conditions at baseline in all studies. We calculated effect sizes of each study, the overall effect, confident intervals and heterogeneity using Rev-Man 5. We also generated forest plots using a random effects model.

Differences in Cohen's d across subgroups were tested in order to perform subgroup analyses. Seven potential moderators were determined based on previous research and the characteristics of the investigated interventions and studies: 1) Intervention type (second vs. third generation therapies); 2) Delivery mode (group vs. individual intervention); 3) Type of patient (outpatient and inpatient); 4) Aim of the intervention (symptom reduction, improving well-being or functioning); 5) Duration of the psychological intervention (more than 60 min per week vs. less than 60 min per week); 6) classification of well-being as primary or secondary outcome; and 7) type of outcome measure (QoL vs. well-being).

3. Results

3.1. Description of studies

The selection process of studies is shown in Fig. 1. First, a total of 12,986 studies were identified through a comprehensive literature search. 2043 studies were clinical control trials (758 from PsychInfo and 1285 from Pubmed). After reviewing the titles and abstracts, 222 articles were identified as potentially eligible for the inclusion in our meta-analysis.

Upon detailed examination of the full articles, 186 studies were excluded. Finally, 36 studies were included. The characteristics of the included studies are described in Table 2.

The studies evaluated 4349 subjects, 2236 receiving a psychological intervention and 2113 in control condition. As it is shown in Table 2, most of the studies (26 out of 36) compared a psychological intervention with treatment as usual and of those two used a waiting list design, ten studies compared a psychological intervention with an active control condition. In many of these studies (19 out of 36) the psychological intervention was delivered as a group intervention, 15 were delivered individually and two were combined delivery mode. All of the studies applied inclusion criteria to target people with schizophrenia, but 14 of them also included a diagnosis of schizoaffective psychosis, five also included other psychiatric conditions such as bipolar disorder, and two studies specifically targeted people with first episode schizophrenia. All of the studies were aimed at adult populations. Most studies had an outpatient sample (28 out of 36) but, three included outpatients and inpatients and five studies were exclusively targeting inpatient sample. Duration of the intervention in minutes ranged from 30 to 60 min a week for most of the studies (18 out of 36), ten studies had interventions that lasted longer than 60 min a week and eight studies did not provide this information. Duration of the intervention in weeks varied considerably across the studies, from less than one week to 48 weeks. Most studies had interventions that lasted from six to ten weeks (14 out of 36).

Since the concepts of well-being and QoL are used interchangeably in literature (Schrank et al., 2013a) and given their commonalities, the studies included in the current meta-analysis measured

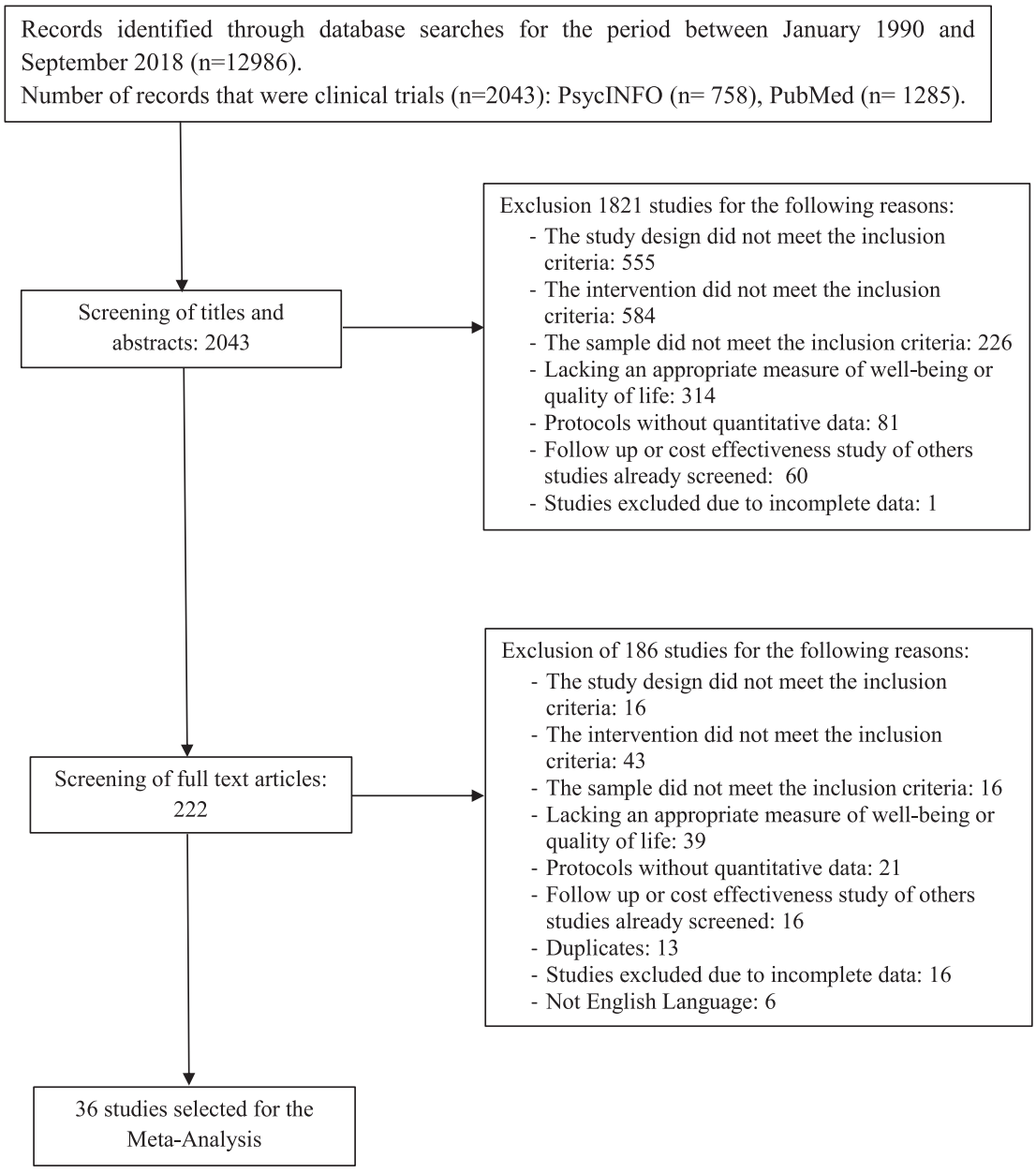

Fig. 1. Flow diagram of systematic search and study selection.

both well-being or QoL and used a wide range of different instruments shown in Supplementary Table 1. All of the studies used measures with good psychometric properties and have been used with serious mentally ill samples. Only one of the instruments had an interview administration format, the rest of the measures were self-report.

3.2. Post-test effects

The studies provided different well-being metrics that could be used in the MA. Thus, in order to choose the metric to be used in the current meta-analysis and given that some studies provided different indexes of well-being (see Supplementary Table 2), we used the following criteria;

Notes to Table 2:

Note. ACT = Assertive community treatment; ACC = Active control condition; AD = Affective disorder; AdhT = Adherence therapy; AT = Art Therapy; BOPT = Body oriented psychological therapy; BP = Bipolar disorder; C = Combined delivery mode; CAT = Cognitive adaptation training; CBT = Cognitive Behavioural Therapy; CBST = Clinic-Based Skills Training; CCMGC=Concurrent chronic general medical condition; CCT = Compensatory Cognitive Training; COAST = Assertive support group; CRT = Cognitive remediation therapy; CSSE = Specific coping with stress self-efficacy; DD = delusional disorder; DIALOG = computer mediated procedure structuring; DIALOG+ = DIALOG with a Solution-Focused Approach; F = Functioning; FAST = Functional Adaptation Skills Training; FPE = First psychotic episode; G = Group intervention; GOALS = CBT intervention targeting a personalised recovery goal; GPSG = guided peer support group; GRIP = Graduated Recovery Intervention Program; HIT = hallucination focused integrative treatment; I = Individual intervention; IMPaCT = Improving Physical Health and Reducing Substance Use in Severe Mental Illness Therapy; IN = Inpatients; IPT = Integrated Psychological Therapy; IT = Educational group; IVAST = In Vivo Amplified Skills Training; LWI = Living Well Intervention; MBI = Mindfulness based intervention; MCT-T = Metacognitive Training; MI = Motivational Interview; ND = Neurotic disorder; NF = Not found; NAVIGATE = Enhanced treatment program; OPUS = Intensive psychological assertive community treatment; OUT = Outpatients; PCPE = Computer based Psychoeducation; PD = Personality disorder; PE = Psychoeducation; PEIS = Patient empowerment intervention for schizophrenia; PMR = Progressive muscle relaxation; PPT = Positive psychotherapy intervention; SAD = Schizoaffective disorder; SCHIZ = Schizophrenia spectrum disorders; SCIT = Social Cognition and Interaction Training; SR = Symptoms Reduction; SRCBT = Social recovery behaviour therapy; TAR = Training affect recognition; TAU = Treatment as usual; TORCH = Treatment of Resistant Command Hallucinations; WL = Waiting list; WR = Related to Well-being. *Did not provide age by group.

Table 2
Details of Included Studies in the MA.

Author	Intervention	Aim	Minutes x week	Weeks (#)	Delivery mode	Type of patient	Age $\bar{X}$ (SD) (e vs. c)	Target diagnosis	Control group	Ne vs. Nc	Attrition (e vs. c)
Balzan et al., 2014	MCT-T	F	60	1	I	OUT	38.0 (8.1), 35.2 (8.2)	SCHIZ	TAU	14, 14	0%, 0%
Bechdolf et al., 2010	CBT	F	60	8	G	IN	32.2 (9.9), 31.4 (10.6)	SCHIZ	ACC	40, 48	22.5%, 16.7%
Briki et al., 2014	MCT	F	120	8	G	IN, OUT	41.1 (8.1), 41.1 (12.4)	SCHIZ	ACC	33, 35	24.2%, 17.1
Bryce et al., 2018	CR	F	120	10	I	OUT	40.3 (9.6), 41.8 (9.4)	SCHIZ, SAD	ACC	29, 27	24.1%, 22.2%
Castelein et al., 2008	GPSG	F	45	32	G	OUT	37.8 (10.5), 39.4 (11.6)	SCHIZ	TAU- WL	56, 50	7%, 10%
Fowler et al., 2009	SRCBT	F	NF	36	I	OUT	27.8 (6.1), 30.0 (7.2)	SCHIZ, SAD	TAU	35, 42	5.7%, 9.5%
Freeman et al., 2014	CBT	WR	NF	8	G	OUT	41.9 (11.5), 41.5 (13.1)	SCHIZ, SAD, DD	TAU	15, 15	0%, 0%
Garrido et al., 2013	CRT	F	120	24	G	OUT	33.3 (8.3), 33.2 (6.8)	SCHIZ	ACC	38, 29	18.4%, 37.9%
Gaughran et al., 2017	IMPaCT	F	NF	48	I	OUT	43.8 (10.1), 44.7 (10.1)	SCHIZ, BD	TAU	213, 193	1.4%, 0.5%
Glynn et al., 2002	CBST IVAST	F	135–255	60	C	OUT	43.9 (9.4), 43.2 (8.3)	SCHIZ, SAD	TAU	31, 32	25.8%, 31.3
Goldberg et al., 2013	LWI	WR	60–75	13	G	OUT	46.7 (6.7), 49.3 (11.1)	SCHIZ, BP & CCGMC	TAU	32, 31	12.5%, 3.2%
Gordon et al., 2018	SCIT	F	60	20–24	G	OUT	35.8 (11.8), 35.1 (9.4)	SCHIZ	TAU	21, 15	14.28%, 0%
Gray et al., 2006	AdhT	SR	30–50	8	I	IN, OUT	40.9 (11.7), 42.1 (11.4)	SCHIZ	ACC	204, 205	12.7%, 5.36%
Halperin et al., 2000	CBT	SR	120	8	G	OUT	39.6 (NF)*	SCHIZ	TAU- WL	10, 10	30%, 10%
Hansen et al., 2012	CAT, ACT	F	NF	24	I	OUT	33.2 (11.4), 32.8 (10.3)	SCHIZ	TAU	31, 31	19.3%, 16.1%
Hasan and Musleh, 2017	PEIS	WR	20–30	6	I	OUT	37.6 (5.6), 36.9 (6.3)	SCHIZ, SAD	TAU	56, 56	3.6%, 7.1%
Kane et al., 2016	NAVIGATE	WR	NF	96	I	OUT	23.1 (5.2), 23.1 (4.9)	SCHIZ, SAD	TAU	223, 181	NF
Kuipers et al., 2004	COAST	WR	NF	NF	I	OUT	27.7 (8.9), 27.9 (6.3)	SCHIZ, SAD, BP	TAU	32, 27	53.1%, 62.9%
López-Navarro et al., 2015	MBI	WR	60	26	G	OUT	38.7 (7.4), 38.7 (8.9)	SCHIZ, SAD, BP	TAU	22, 22	0%, 4.6%
Madigan et al., 2013	CBT, MI	SR	60	12	G	IN, OUT	27.6 (8.4), 28.2 (7.7)	FPE	TAU	59, 29	28.8%, 24.1%
Montag et al., 2014	AT	SR	180	6	G	IN	38.8 (11.9), 39.6 (10.6)	SCHIZ	TAU	29, 29	24.1%, 13.7%
Patterson et al., 2006	FAST	F	120	24	G	OUT	51. 2 (7.7), 50.5 (7.0)	SCHIZ, SAD	ACC	124, 116	33.8%, 34.4%
Penn et al., 2011	GRIP	F	60	36	I	OUT	23.5 (3.9), 21.0 (2.1)	FPE	TAU	23, 23	4.3%, 4.3%
Pitkänen et al., 2012	PCPE	SR	40	4	G	IN	40.4 (12.2)*	SCHIZ	TAU	100, 105	14%, 6.6%
Priebe et al., 2007	DIALOG	WR	30	8	G	OUT	43.8 (1.2), 43.8 (1.0)	SCHIZ	TAU	271, 236	10.3%, 11.8%
Priebe et al., 2015	DIALOG	WR	60	26	I	OUT	41.5 (10.7), 41.7 (9.3)	SCHIZ, SAD	ACC	94, 85	11.7%, 12.9%
Rabovsky et al., 2012	PE	SR	45–60 G	10 G	G	IN	37.7 (9.6), 38.3 (11.3)	SCHIZ, DD, AD, ND, PD	ACC	40, 42	32.5%, 42.9%
Röhricht and Priebe, 2006	BOPT	SR	120–180	10	G	OUT	38.8 (9.3), 37.7 (9.5)	SCHIZ	ACC	24, 21	4.1%, 9.5%
Sachs et al., 2012	TAR	F	120	6	I	OUT	27.2 (7.2), 31.7 (9.3)	SCHIZ	TAU	20, 18	NF
Schrank et al., 2016	PPT	WR	90	11	G	OUT	43.0 (11.0), 42.0 (11.5)	SCHIZ, SAD	TAU	47, 47	8.5%, 12.7%
Shawyer et al., 2012	TORCH	SR	50	15	I	OUT	40.0 (8.5), 39.6 (11.4)	SCHIZ	ACC	21, 22	4.8%, 9.1%
Sibitz et al., 2007	PE	SR	60	1–9	G	OUT	35. 5 (8.9), 36.7 (9.7)	SCHIZ, SAD	TAU	48, 55	22.9%, 9%
Thorup et al., 2010	OPUS	F	NF	12	C	OUT	26.1 (6.1), 26.2 (6.2)	SCHIZ	TAU	128, 127	31.2%, 42.5%
Wang et al., 2015	PMR	WR	60	5	G	IN	38.7 (15.8), 37.6 (15.4)	SCHIZ	TAU	13, 13	18.8%, 18.8%
Wiersma et al., 2004	HIT	SR	NF	36	I	OUT	36.7 (11.4), 36.0 (11.6)	SCHIZ, SAD	TAU	37, 39	16.2%, 17.9%
Zimmer et al., 2007	IPT	F	60	12	I	OUT	36.1 (7.1), 39.3 (8.9)	SCHIZ, SAD	TAU	23, 43	13%, 16.3%

1. The total score of the measure was used when provided, 2. If the total score was not provided, then psychological, emotional or mental components were chosen for the analysis and 3. When studies provided both well-being and QoL measures, the variable that was considered primary outcome in the study was used in the meta-analysis.

For the 36 studies included in the meta-analysis, the random effects model showed that the psychological interventions were effective at improving well-being. The baseline profiles of the participants and results in the studies are presented in Fig. 2. A composite statistically significant small effect size (Cohen's d) was observed for well-being, d = 0.22 (95% CI [0.10, 0.35], $p = 0.0005$). Heterogeneity was medium for well-being studies ($I^2 = 64\%$).

3.3. Moderation analyses of the post-test effects

These analyses were conducted to study the moderating effect of the intervention type, the delivery mode, the type of patient, the aim of the intervention, the duration of the intervention and type of outcome over the effect sizes on well-being outcomes. As shown in Fig. 3, there was a significant moderating effect for the aim of the intervention variable ($Chi^2 = 15.19$, $p = 0.0005$). Interventions whose primary aim was improving well-being had a significant positive effect ($d = 0.51$; $p<0.0001$) in comparison with interventions whose aim was symptom reduction or increased functioning which had not a significant effect over well-being.

The intervention type, the delivery mode, type of patient, the duration of the intervention, type of outcome and type of measure did not produce any significant effect in the moderation analyses ($Chi^2 = 3.36$, $p = 0.07$; $Chi^2 = 0.27$, $p = 0.88$; $Chi^2 = 3.25$, p = 0.07; $Chi^2 = 0.16$, $p = 0.69$; $Chi^2 = 0.01$, $p = 0.92$, $Chi^2 = 0.82$, $p = 0.66$, respectively).

3.4. Publication bias

As Fig. 2 shows, the funnel plot has an asymmetric aspect, suggesting that there could be publication bias in the meta-analyses.

4. Discussion

This meta-analysis synthesised evidence on the effectiveness of psychological interventions for people with schizophrenia on the well-being and QoL. Following a systematic literature search, 36 articles were included in the analyses; two studies with an outcome measure of well-being, 30 studies with an outcome measure of QoL and two studies with both outcome measures. The results show that psychological interventions have a significant effect on well-being and QoL outcomes; the mean effect size on them was 0.22. Most of the studies had a positive effect size, although the effect sizes ranged from −0.99 (indicating a negative effect) to 2.37 (indicating a positive effect). It is noteworthy that the mean effect size in the current meta-analysis for well-being and QoL was similar to the effect size on target symptoms reported in other meta-analysis (Wykes et al., 2008).

Although there was a significant effect on well-being and QoL, there was medium heterogeneity in the efficacy results exhibited by the different empirical studies. This could be due to the fact that these studies had applied different psychological treatment techniques, with a different duration on samples of patients that could vary in age, composition by sex and severity of the disorder, and with different methodological characteristics. For that reason, this study examined the effect of various moderators. Larger effects were found in interventions that specifically aimed to improve well-being and when those outcomes were identified in the study as primary. In line with Keyes (2007) arguments, well-being-specific interventions were more effective in improving the perception of living well, while those aimed at improving symptoms or functioning were not as effective in this realm. This might suggest that symptom or functional improvement does not necessarily lead to an improvement in well-being or QOL and would imply the need to focus specifically on those outcomes. Well-being-specific interventions are more likely to have a positive effect on this important outcome and are well-received by patients (Freeman et al., 2014; Meyer et al., 2012).

Regretfully, although it has been emphasised for some time now the importance of well-being in the recovery process in psychosis (Slade, 2010); well-being seems to still be overshadowed. It is very likely that many of the RCTs excluded in the current study for lack of appropriate measure were interventions aiming at improving symptoms or functioning, and more research is necessary to ascertain the effect of those interventions on well-being. When observing the forest plot and subgroup analysis, it seems that more of those interventions had a negative effect on well-being. It has been shown that reductions in positive symptoms can sometimes be associated with an increase in depression, possibly associated with a loss of identity or to a greater sense of insight (i.e. more aware of the consequences or seriousness of his/her condition) (Birchwood and Iqbal, 1998). Also, interventions to increase functioning are sometimes repetitive and half-hearted, some of them focused on cognitive tasks that may be uninviting to the person at the short term.

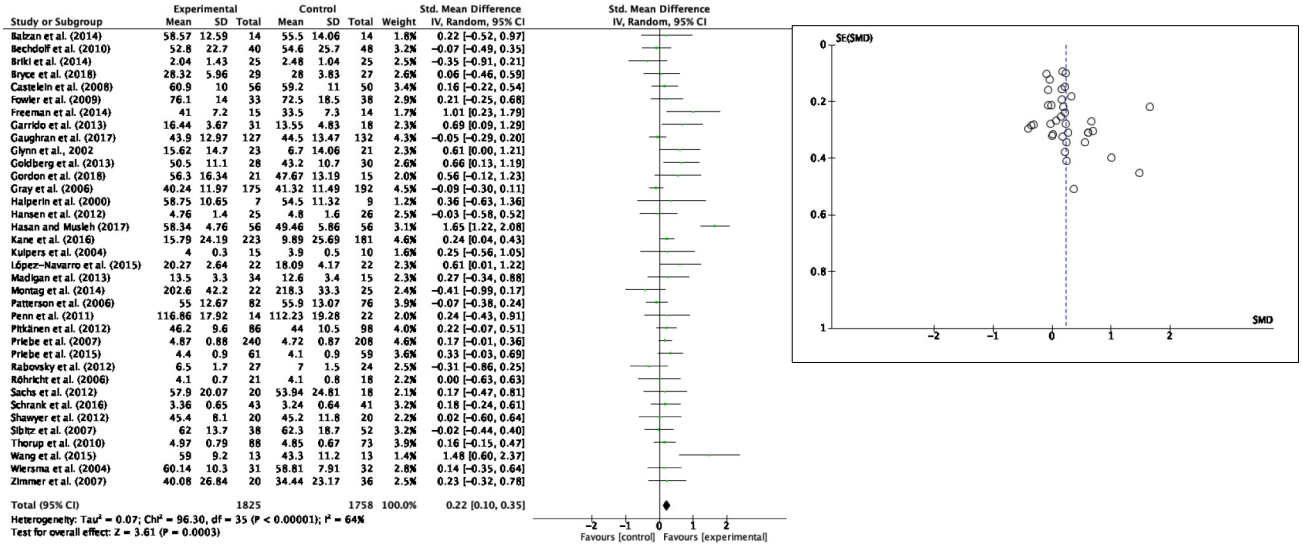

Fig. 2. Forest plot and effect sizes of the quality of life and well-being. The square boxes show effect size and sample size (the larger the box, the larger the sample size) in each study, and the line 95% confidence interval. The diamond reflects the pooled effect size and the width of 95% confidence interval and funnel plot for the study publication bias in quality and well-being studies.

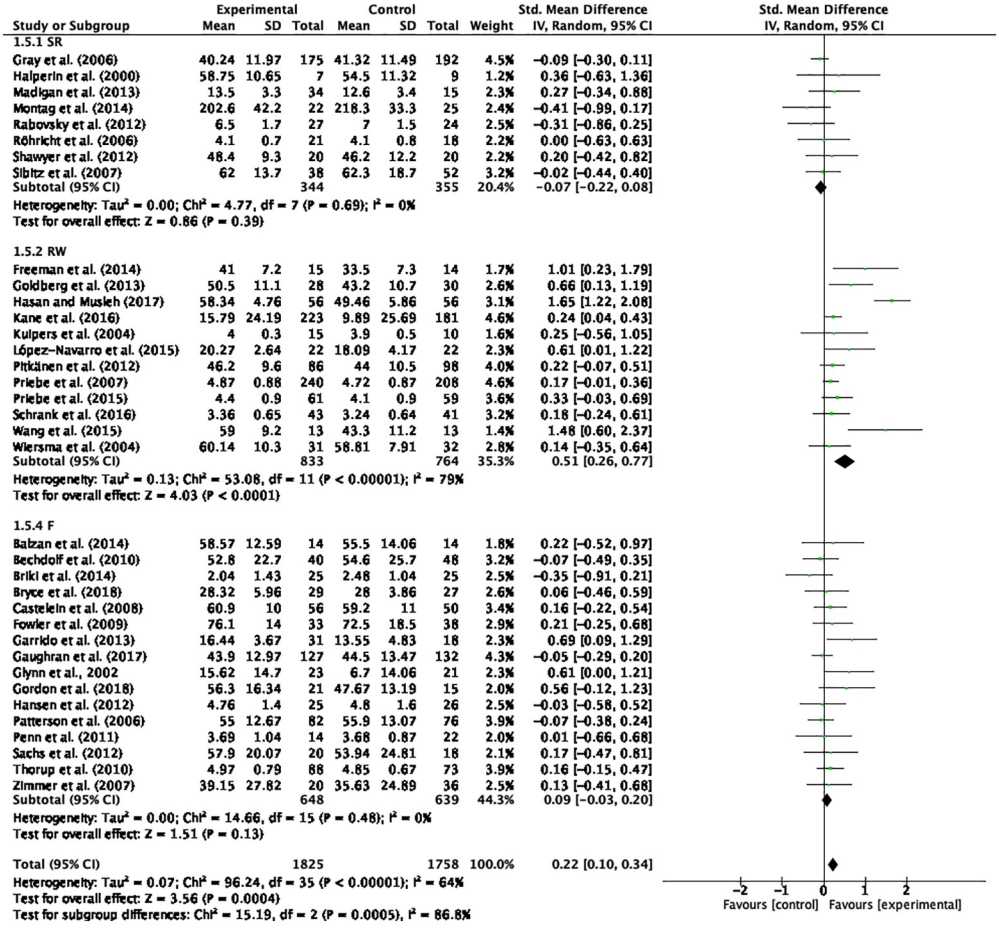

Fig. 3. Moderator effects: subgroup analysis (type of aim).

This study has several limitations. First, this meta-analysis detected a probable publication bias. Very different mechanisms can lead to asymmetry in funnel plots, as selection bias, true heterogeneity, data irregularities and chance. This can be associated with a biased overall estimate of effect when studies are combined in a meta-analysis (Egger et al., 1997).

Second, in some cases the quality of the studies was high but, more than two thirds of the studies included in meta-analysis were rated as medium or low in methodological quality. For example, more than half of these studies conducted completers-only analysis, as opposed to intention-to-treat analysis. This could have seriously biased the results, most likely in the direction of less positive outcomes than those observed here. Further, high-quality randomised-controlled trials are needed to allow for more robust conclusions about the effects of psychological interventions on well-being and QoL.

Third, although the current meta-analyses involved different types of interventions, many RCTs were not included because they did not have a well-being or QoL outcome measure. More than three hundred RCTs of psychological interventions for people with schizophrenia were excluded due to lack of appropriate measure. Therefore, while the comprehensive health definition from the WHO highlights the need to focus on well-being beyond the treatment of symptoms, many studies remain focused on problems and deficits. Also, since there was a fairly high level of heterogeneity in the interventions, it was not possible to make comparisons between different therapeutic approaches. Moreover, no family interventions which were empirically supported interventions for schizophrenia (Bird et al., 2010) met our criteria. In future studies, it might be interesting to investigate the effects of family interventions or antipsychotic medications on the well-being and QoL for this population.

Fourth, the meta-analysis is constrained by conceptual difficulties associated to well-being and QoL. Conceptually, QoL and well-being are both difficult to define and delimit. These constructs are umbrella concepts that end up encompassing many things. The quality of life has generally been understood as the set of conditions (objectively measurable) that contribute to the well-being of people; while well-being is something more subjective that takes place in the realm of the person (Rojas, 2017). We have included a wide range of instruments; many emphasising on physical and mental health aspects (ex. SF-36), while others paid more attention to relational issues (ex. QLS) and still others focused on subjective well-being (ex. WEMWBS), many instruments using a summatory approach (i.e. adding up subjective as well as objective dimensions) (ex. MANSA). The results of our study, as well as that of recent literature reviews, suggests that the remarkable variability among instruments supports the need to pay close attention to what is being evaluated under the umbrella of these concepts (Linton et al., 2016). For this reason, we face the challenge of trying to discern the differential elements of these notions and instruments that are often used interchangeably. Nonetheless, the present study underlies the importance of the use of well-being measures as one of the outcomes in RCT studies of interventions for schizophrenia (Schennach-Wolff et al., 2010; Castelein et al., 2008). Ruut (2000) has suggested as a solution to identify different QoLs; one that has to do with the habitability of the environment, another that has to do with the capability of the individual, another that has to do with the external usefulness of life, and another that has to do with the internal appreciation of life. Along these lines, efforts have been made to identify the relevant well-being domains measured by different instruments both in schizophrenia (Schrank et al., 2013b) and in the general population (Linton et al., 2016). The current meta-analyses are also constrained by the kind of

outcome measures used. For instance, well-being might be difficult to tackle by self-reported questionnaires only. It is essential that researchers make an effort to improve current measures of well-being and to address the different relevant dimensions independently.

On the basis of the subgroup analysis, we would recommend the delivery of psychological interventions that aim directly at well-being. More effort is needed to develop and optimise psychological interventions aimed at the improvement of well-being in people with schizophrenia. A promising approach is positive psychology that directly targets how to live a life that is more meaningful or gratifying and has been shown to be a powerful alternative as a complementary strategy in mental health promotion and treatment (Bolier et al., 2013). Some early work in psychosis has demonstrated that it is feasible and acceptable for people with schizophrenia (Meyer et al., 2012). Although more efforts need to be made to optimise positive psychology for schizophrenia, Schrank et al. (2016) have provided initial positive results of a positive psychology group intervention. Such positive psychology interventions are likely to be acceptable for people and have potential benefits when patients are in the process of recovering (Meyer et al., 2012). Moreover, interventions aimed at well-being can represent a non-stigmatising mean to prevent a relapse of symptoms for those recovering (Schennach-Wolff et al., 2010). Moreover, well-being interventions are likely to build up resilience and have been shown to help people flourish and function better (Fredrickson and Joiner, 2002).

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