A multicomponent Positive Psychology group intervention for people with severe psychiatric conditions; a Randomized Clinical Trial

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Abstract

Objective: The aim of this study was to examine the efficacy of a theory-driven multicomponent positive psychology intervention to improve well-being for individuals with severe psychiatric conditions in comparison to treatment as usual. This intervention moves away from the traditional psychiatric perspectives that focused on symptoms and deficits, promoting a broader view of outcomes such as non-critical self-acceptance, strengths, and positive relationships with others, among other things.

Method: A two-arm randomized and outcome-blinded trial with pre-post and 6-month follow-up evaluations was conducted to assess the efficacy of the intervention. A total of 141 participants were allocated to either the experimental condition or the waiting-list group receiving their treatment as usual. A mixed-effect model was used to examine the efficacy of the intervention and a repeated-measures Student's t-test for the follow-up effectiveness analysis.

Results: The intervention protocol was highly acceptable for participants, showing very high participant satisfaction as well as good attendance and adherence rates. At the end of the group therapy, participants reported a significant improvement in self-acceptance and environmental mastery and, these changes were maintained in the follow-up assessment after 6 months**.**

Conclusions and Implications for Practice: The results of this randomised control trial provide further evidence supporting that positive psychology approaches can be a powerful complementary strategy to promote more comprehensive psychiatric rehabilitation services for people with severe psychiatric conditions.

Key words: randomized controlled trial; positive psychology, well-being, recovery, severe psychiatric conditions.

Impact and Implications statement: New psychosocial approaches for people with severe psychiatric conditions pursuing recovery should incorporate practices to promote well-being, as the two are mutually enhancing processes. Our results suggest that the multicomponent positive psychology intervention had a remarkably high level of feasibility and acceptability which might facilitate its implementation in services. Significant improvements in the well-being domains of self-acceptance and environmental mastery were maintained after 6 months, providing evidence that this type of intervention can be a great complementary strategy to traditional psychiatric rehabilitation practices.

Introduction

Meta-analysis studies of psychological interventions for people with schizophrenia reflect a small treatment effect on well-being outcomes, suggesting that improvement in symptoms or functioning does not necessarily lead automatically to an improvement in well-being (Valiente et al., 2019). It has been suggested that specific measures that directly address well-being should be incorporated into mainstream psychiatric rehabilitation practices (Fava & Tomba, 2009). By doing so, services will be more humane and less stigmatizing since these intervention modalities have a wider range of therapeutic objectives that go beyond the disorder, dealing with goals that are central to all human beings such as feeling good (Seligman, 2011; Slade, 2010). In fact, Leamy et al. (2011) have argued that recovery overlaps with elements of well-being and can be improved by intervening directly in them. Regardless of the presence of a mental disorder, according to the PERMA model, given the choice all people yearn to experience positive emotions (Seligman, 2018). Moreover, Slade (2010) has argued that the development of evidence-based interventions to improve well-being could complement the process of recovery from mental disorder by providing an ecological overview of the processes by which people can develop a purposeful and meaningful life.

It has been argued that standard psychosocial services for severe psychiatric conditions (SPC) can clearly benefit from a more positive approach (Jeste et al., 2017; Slade, 2010). Positive Psychological Interventions (PPI), that is, targeted interventions or activities aimed at cultivating positive feelings, positive behaviours or positive cognitions, offer one of the most promising ways to meet this objective and are effective in enhancing well-being and reducing distress in the general population (Bolier et al., 2013; Sin & Lyubomirsky, 2009) as well as in clinical samples (Chakhssi et al., 2018; Geerling et al., 2020; Hendriks et al., 2020). In particular, there is growing and promising evidence that indicates that implementing PPIs in psychiatric services can enhance the

overall mental health of people with severe SPC (Geerling et al., 2020). PPIs have several advantages over other therapies, they appear to be feasible and acceptable to the client, as demonstrated by their high adherence and satisfaction in a wide range of clinical conditions (Huffman et al., 2014; Lopez-Gomez et al., 2017). Moreover, the PPI therapeutic tasks are often perceived as pleasant and easy to perform (Huffman et al., 2014; Kahler et al., 2014). PPIs have emerged on the psychiatric scene as a refreshing and hopeful alternative, although the supporting empirical evidence is still limited for this population. In a pioneering pilot study, Meyer et al. (2012) found that a PPI group significantly improved the levels of well-being, self-esteem, and optimism of participants with schizophrenia. Likewise, in a single centre randomized controlled trial (RCT), Schrank et al. (2016) demonstrated the efficacy of a PPI group in reducing psychotic and depressive symptoms, and improving levels of hope, self-esteem and sense of coherence in people with psychosis.

In the current study, we used a multiple-component protocol that combines third-generation strategies of wider-focused interventions such as PPIs, Acceptance and Commitment Therapy (ACT) and Mindfulness Interventions tailored for people with SPC (see Table 1). Interventions based on mindfulness approaches and ACT are relatively new for this population but are increasingly being used to promote recovery with promising results (Khoury et al., 2013; Shonin et al., 2014, respectively). These interventions complement well with PPIs and have synergistic effects with each other (Kashdan & Ciarrochi, 2013; Valiente et al., 2021). For instance, ACT focuses on how to live a life of valued action while leaving behind the struggle with negative inner experiences (Hayes, 2016). This emphasis is, likely, to have positive effects on people's well-being and therefore, improve the aims of PPIs. While Mindfulness refers to deliberate attention to the present moment (Kabat-Zinn, 1990), fostering mindful acceptance can eradicate struggles to avoid difficult inner experiences and reduce distress. In addition, Mindfulness

can open the door to awareness, enhancing the effects of PPI interventions (e.g., Ivtzan et al., 2016).

The main aim of this study was to examine the efficacy of a theory-driven multi-component PPI to improve well-being in comparison with a waiting list (WL) condition All participants were receiving treatment as usual (TAU) in community outpatient psychiatric rehabilitation resources, specifically designed to help people with severe and long-lasting mental disorders to regain the maximum degree of personal and social autonomy through individualised plans according to their idiosyncrasies. The study also aimed to assess the effectiveness of the intervention 6 months later. Secondly, we measured different dimensions of psychopathology to examine the effect of the intervention on mental health symptoms. We hypothesize that compared to the WL group the PPI group will show a significant increase in well-being from pre-test to post-test and 6-month follow-up. Furthermore, we do not expect to find any adverse effects on psychopathology.

Method

Design

We conducted a two-arm randomized and outcome-blinded trial with pre-post and 6-month follow-up evaluations to assess the efficacy of the intervention. Participants receiving TAU were blindly allocated to either the experimental condition or the WL group. After post-assessment, WL received the intervention. The RCT was registered at ClinicalTrials.gov.

Multi-component Positive Psychology Intervention

The intervention aims to improve well-being without denying the existence of symptoms, while focusing on generating positive emotions through 11 weekly 90-minute group sessions (see Table 1). For a more detailed description of the protocol, please refer to the protocol (Valiente et al., 2019; 2021). The multi-component intervention manual

was composed of evidence-based exercises of PPI, ACT, and Mindfulness and was theory-driven according to the broaden-and-build-theory (Fredrickson, 2001) and the self-serving model of paranoia (Murphy et al., 2018). It was also informed by previous studies carried out on people with paranoid tendencies (Valiente et al., 2020) and with SPC samples (Schrank et al., 2016; Valiente et al., 2021).

-Insert Table 1-

Participants

All participants were currently receiving outpatient psychosocial services at four Non-Profit Human Organizations (NPO) within the National Health System Network that provide comprehensive care for people with SPC. All participants were referred to the study by their key therapist if they met the following inclusion criteria: 1) were aged 18–65 years and 2) had a minimum of motivation and commitment to participate in group therapy. At the discretion of their therapist, participants were excluded if they had: 1) limited cognitive resources or serious formal thinking disorder and/or 2) a concurrent condition (i.e., a current diagnosis of substance dependence or a severe personality disorder) that could interfere with a psychotherapy group.

According to the program G-power 3.1 (Faul et al., 2009) to detect a small to moderate effect size with an alpha error probability of 0.05 and a power of 0.90, a sample size of 126 participants would be required.

A total of 142 participants were assessed for eligibility and consented to take part in the study, excluding 1 participant that did not complete the intake assessment (see Figure 1). Thus, 141 were randomly assigned to the PPI group (n=71) and WL group (n=70). Of these, 22 participants did not have a post-assessment. For the *efficacy analysis,* we excluded participants who did not complete post-assessment (PPI*,* n=13 and WL, n=9) and those that had less than 5 sessions in the PPI group (n=6), resulting in a final sample

of 113 participants. Furthermore, for the *follow-up effectiveness analysis*, we included participants who received the intervention from both groups (PPI or WL) and had completed 5 or more sessions and the 6-month follow-up assessment (*n*=65) (see Figure 1). In line with previous similar studies (Schrank et al., 2016), we estimated that more than 5 sessions would be sufficient exposure to get an intervention effect. Reported reasons for not completing the intervention once allocated (PPI, *n*=6 and WL, *n*=12) were related to mental illness (*n*=3), employment (*n*=4), other training courses (*n*=2), lost interest (*n*=2), and not reported (*n*=7).

-Insert Figure 1-

As depicted in Table 2, for participants included in the *efficacy analyses*, those allocated to the PPI group did not differ in any demographic nor clinical characteristic to the participants allocated to the WL group, except for the single status. A higher proportion of participants in the PPI group than in the WL group were single.

-Insert Table 2-

Likewise, participants without-post-assessment did not differ to those with post-assessment, except for their use of Hypnotics (non-benzo) and Mood Stabilizers that was higher for those without-post-assessment (see Supplementary Table 1). Moreover, non-completers compared with those that attended 5 or more therapy sessions were more likely to be employed and had higher scores of depression, paranoia and psychoticism (see Supplementary Table 2).

Procedure

After the completion of the pilot study (Valiente et al., 2021), eight centres (i.e., 4 psychosocial rehabilitation and 2 psychiatric vocational rehabilitation centres, and 2 psychiatric residential treatment facilities) belonging to National Health System Network were recruited to participate in the study. During 2018 and throughout 2019, a total of 18 therapy groups were implemented. To ensure protocol proficiency, group therapists (n=30) received a 2-day training workshop, 8 hours covering the intervention principles and exercises. They were provided with a manual, a presentation that functioned as a session agenda, and materials necessary for implementing the intervention (Valiente et al., 2021). All groups were led by two therapists, all with clinical experience in conducting psychotherapy groups with people with SPC (M=11.9 years' experience). Most of them were psychologists (n=23) and seven were social workers. All group therapists received regular one-hour sessions of bimonthly supervision to provide support and further guidelines to carry out the protocol exercises and to overcome difficulties during the sessions.

Once the training was completed, all clinical staff from the participating centres recruited participants by approaching patients within their workload. If the potential participant agreed to partake, a member of the research team provided them with full information about the intervention and the study and, after obtaining written informed consent, a pre-assessment was conducted.

Ethical approval of the study was obtained from the Deontological Commission of the Faculty of Psychology at the University and permission to carry out the study was granted from the NPO´s boards. The research was conducted in compliance with the Declaration of Helsinki.

Measures

All participants were evaluated on outcome variables the week before the beginning and the week after the completion of the PPI groups, the WL group had an

additional evaluation (i.e., post-wait-list assessment) (see Figure 1). The assessments were carried out by self-report measures and completed with the help of a trained research assistant, who was not involved in the delivery of the group therapy.

Therapists Protocol adherence form.

At the end of each session, group therapists filled out a 10-item inventory designed for the study in which they jointly assessed the fulfilment of the objectives in each session. Each group objective was rated on a 3-Likert scale (0=not done; 1=partially done; 2=fully completed). A total score was obtained by averaging all ratings, where higher scores meant higher adherence, varying from 0 (no adherence) to 20 (high adherence).

Participants Attendance and exercise engagement form.

At the end of each session, therapists filled out an inventory in which they jointly assessed the participant's attendance (0=absence; 1=attendance), participants´ engagement in the in-session and homework exercises (0=not done; 1=fully completed). A total attendance score is obtained by summing the number of sessions that all participants have attended, where higher scores mean higher attendance, varying from 0 to 11. Two total exercise engagement scores are obtained by summing the number of exercises completed, where higher scores mean higher exercise engagement (in-session rage 0-11; homework range 0-10).

Client Satisfaction Questionnaire (CSQ-8, Larsen et al., 1979).

Participants' general satisfaction with the group was assessed with this 8-item measure using a 4-Likert scale. A total score is obtained by calculating the average of the item's score, ranging from 1 (very low satisfaction) to 4 (very high satisfaction). Two open-ended questions were added to identify what participants liked most about the group and suggestions for changes.

Scales of Psychological Well-Being (SPWB; Ryff & Keyes, 1995).

Eudaimonic well-being was measured with this 54-item questionnaire that has 6 sub-dimensions (i.e., autonomy, environmental mastery, personal growth, positive relationships with others, purpose in life and self-acceptance) with 9 items each and with scores ranging from 9 to 54. Each item is rated using a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Due to the initial low internal consistency found for the autonomy subscale and given that low reliability diminishes the chance of significant findings (Hunter & Schmidt, 1990), items that lowered the final Cronbach's α for this subscale were eliminated. The final internal consistency after dropping items that lower the Cronbach's α in the autonomy subscale were (α=0.66). For the rest of the subscales, all items were maintained with acceptable internal reliability (respectively, α=0.75; α=0.73; α=0.78; α=0.74; α=0.78).

Satisfaction with life Scale (SWLS; Diener et al., 1985).

Hedonic well-being was measured with this 5-item scale tackling the person's global level of satisfaction with their life, using a 7-point Likert scale going from 1 (strongly disagree) to 7 (strongly agree) with a total score ranging from 0 to 35, with higher scores indicating higher levels of satisfaction with one's life. The internal consistency was good (α=0.86).

Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 2002).

Psychological symptoms were measured with this 90-item self-report inventory rated on a 5-point scale of distress ranging from 0 (not at all) to 4 (a lot). The SCL-90R consists of nine primary symptom dimensions. The internal consistency for each subdimensions ranging from good to excellent in each of the 9 subscales: somatisation (α=0.88); obsessive-compulsive (α=0.86); interpersonal sensitivity (α=0.85); depression (α=0.91); anxiety (α=0.88); hostility (α=0.83); phobic anxiety (α=0.84); paranoid ideation (α=0.76) and psychoticism (α=0.84).

Data analysis

Adherence and acceptability of the group intervention and participants'

satisfaction were assessed by descriptive statistics in all participants with a post-assessment. To determine the differences between groups, we used $\chi 2$ tests categorical or qualitative variables and Student *t*-tests when variables were quantitative.

To examine the efficacy of the multi-component PPI group intervention on primary and secondary outcomes, we used a mixed-effect model, including time and treatment group as fixed effects and single participants as a random effect. We explored the effect of single status as a covariable, but we did not find any significant effect on any dependent variable and thus, we dropped the single status variable in the final analyses.

The effect sizes of the treatment on primary and secondary outcomes (mean scores) were calculated by applying Morris's d statistic. Morris (2008) described an effect size for the pre-post change (PPC) design, where the standardized effect of the treatment is defined as the difference between groups in mean PPC values, divided by the common standard deviation. The formula for the Morris' effect size is as follow: [$\delta PPC = (\mu T2 - \mu T1) - (\mu C2 - \mu C1)/\sigma$], where μ_{gt} is the mean of group g at time t, and σ is the standard deviation of the untreated population. The main advantage of this formula is that it considers the mean and standard deviation of the sample both at the final assessment and at baseline, leading to a more representative effect size when the values differed from baseline (Morris, 2008).

Also, we explored if changes after treatment in primary outcomes were maintained over time (*follow-up effectiveness analysis*). In these analyses, there was not a control group and therefore, the pre- and post-assessments were compared with scores obtained 6 months later by Student *t*-tests of repeated measures. In both, efficacy and effectiveness analyses, only participants who had attended a number of sessions greater than or equal to 5 (i.e., *completers*) were included.

Results

Adherence and Acceptability

Adherence to the protocol as rated by group therapists revealed high content coverage across all therapy groups (*n*=18) with a mean score of 19.11 (*SD*=0.69, ranging 0-20).

After the randomised control trial was completed, the WL participants also received the intervention. Mean attendance rate was 77.75% (range 0-100%). Of the 119 participants with pre and post-evaluations (PPI; *n*=58, WL; *n*=61), 30 (25.2%) attended all sessions, 79 (66.4%) attended 6-10 sessions and 10 (8.4%) attended less than 5 group sessions. Moreover, 52 (73.2%) participants out of the 71 PPI intervention group were completers. In relation to exercise engagement, the mean in-session exercise engagement rate was 85.67% (range 0-100%) while the mean homework engagement rate was rate 45.48% (range 0-100%).

The total mean satisfaction rating was 3.43 (range 0-4; *SD*=0.41; *n*=103), indicating high satisfaction. Overall, participants indicated that they liked the content, exercises, and atmosphere of the group as well as the thematic shift towards positivity. Most said they would not change anything about the group, but some would have preferred more time and more detailed explanations.

Efficacy analyses on primary (well-being) and secondary outcomes (psychopathology).

In line with similar previous studies (Schrank et al., 2016), we included in the efficacy analyses with participants with 50% of sessions of treatment (5 or more sessions). Means of the two groups of in the well-being subdimensions and symptoms in pre- and post-assessments are depicted in Table 3 and 4, respectively.

Results showed that there was a significant interaction group x time on Self-acceptance (*F*=6.23; *p*=.014) and Environmental mastery (*F*=5.72; *p*=.018). The intervention group presented significantly higher levels of self-acceptance and

environmental mastery than the WL group, with small to medium effect sizes (Morris's d = 0.28 to 0.35) (see Table 3). However, there was not a significant between-group differences in the other well-being variables at post-treatment (p>.05).

Finally, there was a significant main effect of time on SWLS, that is, both groups showed higher levels of satisfaction with life at post-assessment (F=7.25; p=.006) (see Table 3).

-Insert Table 3-

Considering the efficacy of the intervention on secondary outcomes (see Table 4), the results showed that there was not a significant interaction effect between groups and moment of assessment on psychiatric symptoms (p>.05). However, we found a main effect of time, that is participants of both groups presented lower levels of compulsive obsession (F=5.68; p=.019), interpersonal sensitivity (F=5.10; p=.02), depression (F=5.56; p=.02), and anxiety symptoms (F=4.60; p=.03) at post-assessment compared to pre-assessment) (see Table 4).

-Insert Table 4-

Follow-up Effectiveness Analyses of primary outcomes 6 months later

First, we compared the pre-assessment levels with those at 6 months and participants had significantly higher levels of self-acceptance and environmental mastery 6 months later (t_{63}=-2.09, p=.04; t_{63}=-3.29, p=.002, respectively) (see Figure 2). Secondly, there was no change in the levels of well-being after the intervention and 6 months later. This means that gains achieved after intervention in self-acceptance and environmental mastery were maintained 6 months later.

-Insert Figure 2-

Discussion

The findings of this study provide evidence suggesting that the multicomponent PPI, delivered in a group format, could be beneficial for individuals with SPC. Overall, acceptability results seem to indicate that it can be implemented successfully as a complementary intervention to psychotherapy for people with SPC. Participants seem to be extremely satisfied with the intervention, with higher levels of satisfaction compared to similar RCT of a PPI (Lopez-Gomez et al., 2017). The rate of attendance reported in our program (i.e., 77.7%) could be considered as good when compared to previous PPI studies for people with psychosis with a rate of 54.2% (Schrank et al., 2016). Non-adherence is a main concern related to psychological interventions for people with SPC (Fernandez et al., 2015; Swift & Greenberg, 2014), having schizophrenia is associated with the highest rates of dropout in comparison with other mental health disorders (Hamilton et al., 2011) and with low adherence to homework assignments (Dunn et al., 2002). In this sense, regarding the number of in-sessions and homework exercises completed, the adherence was relatively high. Nonetheless, we believe there is room for improvement in relation to the participants' exercise completion. In general, our findings are in line with those that showed that PPIs are feasible and acceptable to implement in clinical samples (Huffman et al., 2014; Lopez-Gomez et al., 2017) and for people with schizophrenia (Meyer et al., 2012; Schrank et al., 2016).

Participants in the PPI group were found to experience a significant improvement in self-acceptance and environmental mastery. Noteworthy that, as other studies of PPIs have shown, the improvements in both well-being dimensions were maintained after 6 months (Goldberg et al., 2013; Meyer et al., 2012). The effect on self-acceptance is consistent with the overall aim of this intervention and is very important as it potentially

contributes to the individual feeling good about themselves, even if they are aware of the limitations associated with their SPC. In fact, having a positive attitude towards oneself is a fundamental characteristic of positive psychological functioning (Keyes et al., 2002). These positive results are compatible with those of other PPIs for people with SPC that have found similar improvements in self-esteem (Meyer et al., 2012; Schrank et al., 2016) and self-efficacy (Goldberg et al., 2013). This improvement in self-acceptance and environmental mastery may have important clinical repercussions in the context of psychiatric rehabilitation, favouring a better functioning or a more proactive attitude towards the achievement of their personal goals.

The intervention's improvement of environmental mastery is remarkable, because, after a long involvement in the mental health system, people with SPC usually have high levels of powerlessness (Galderisi et al., 2013) and can have a great impact on mental health (Faith et al., 2019). Actually, recovery from a mental disorder is partially built on the basis of empowerment (Slade, 2012) that is also a characteristic of positive functioning (Leonhardt et al., 2017; Van Eck et al., 2018). In line with authors that have stressed the benefits of self-determination (e.g., Deci & Ryan, 2010), this finding highlights the potential of the intervention to enhance recovery by helping people feel more capable of creating favourable conditions for themselves. People with a high level of mastery of their environment are likely to have a greater sense of control over the world and feel more able to influence the context around them and that is likely to have an impact in their future (Bélanger et al., 2019; Ryan et al., 2008). In sum, these positive results are consistent with those that claim that subjective well-being is a viable treatment goal for people with SPC (Palmer et al., 2014) and are in line with integrative models of mental health that indicate that well-being and symptoms are not simply opposite ends of a continuum, but are two separate and, to some extent, independent dimensions (Keyes, 2007; Vazquez & Hervás, 2008).

Nonetheless, we did not find an improvement in life satisfaction and four of the well-being dimensions (i.e., autonomy, positive relationships, purpose in life and personal growth) when compared to controls. Lack of significant effect on satisfaction in life makes sense given that it tends to be stable over time unless life conditions change considerably (Steger & Kashdan, 2007) and because people with SPC often experience multiple unfavourable and durable life circumstances (Beards et al., 2013). The lack of improvement in some of the well-being dimensions could be due to a number of reasons. First, people with SPC usually presents deep-rooted dependency and negative patterns of relationships, difficulties in finding goals related to their meaning in life, as well as few opportunities to develop their full potential. Firstly, people with SPC may have difficulties in maintaining their independence and/or in establishing pro-social relationships, which may hinder the pursuit of goals linked to their meaning in life, as well as their opportunities to develop their full potential (Harvey & Strassnig, 2012). In fact, a version of this PPI intervention for people with high paranoid tendencies, but without SPC, found a large effect on the positive relationships dimension of the SPWB (Valiente et al., 2020). Secondly, this lack of positive results could be due to the PPI intervention itself. This positive approach to psychiatry is very young and, although it is received with great enthusiasm by staff members and patients, there have not been enough time to permeate the team and the service atmosphere. Meta-analytic data indicates that it is more difficult to have an effect on the well-being of people with schizophrenia spectrum disorders (Geerling et al., 2020). Thus, they might require longer-term or more intensive interventions to have a significant effect. Nonetheless, any progress in people who have had a severe clinical condition and/or a long-lasting course represents a clinically important step forward that can catalyse further change and hope. We believe that the effectiveness of these interventions could be increased if the PPI exercises are transferred to the daily functioning of rehabilitation services, incorporating positive

attitudes into the institutional dynamics as has been proposed by positive psychology in other areas (Norrish et al., 2013).

Finally, there were no intervention effects on any of the symptoms assessed. The current intervention did not target symptoms and thus, as expected, there was not a significant effect on symptomology. In this line, Jansen et al. (2020) showed meta-analytic data that indicates that ACT and mindfulness interventions for people with psychosis had little effect on positive symptoms. Likewise, a recent meta-analysis on PPIs has reported a non-significant effect for psychopathology across RCT available (Geerling et al., 2020). It is noteworthy that the majority of participants in this study had a diagnosis of schizophrenia, which usually presents a complex set of symptoms and a persistent course (Heilbronner et al., 2016). It may be more difficult to bring about symptomatic recovery with persistent clinical conditions. In fact, findings indicate that PPIs are more effective in reducing psychopathology in people with affective disorders compared to those with schizophrenia (Geerling et al., 2020).

Although the present study has clear strengths in its innovation and rigour in conducting the protocols in a challenging clinical sample, there are a number of limitations associated; the loss of statistical power due to dropouts, the use of the TAU instead of an active intervention comparison group, and the lack of monitoring of other psychological interventions that were being delivered concurrently. It is possible that there were some self-selection biases that could be affecting the generalisability of the results and have clinical implications. Indeed, as reflected in the supplementary tables, non-completers had significantly higher scores for depression, paranoid ideation and psychoticism than completers, and those without post-assessment were more likely to be using hypnotics and less likely to be using mood stabilisers than those with post-assessment. In addition, we use self-reported measures for the assessments, so it is possible that the results may be biased by social desirability bias.

Conclusions and Implications for Practice

New psychosocial approaches pursuing recovery should incorporate practices to promote well-being. This study evaluates a multicomponent PPI with a controlled blinded randomization design for people with SPC. It had a high level of feasibility and acceptability which can facilitate implementation and be powerful complementary intervention in psychiatric rehabilitation. Significant improvements in self-acceptance and environmental mastery were maintained at follow-up, suggesting it can be a great addition to psychiatric rehabilitation practices.

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Figure 1

Flowchart of participants' progress through the phases of the trial

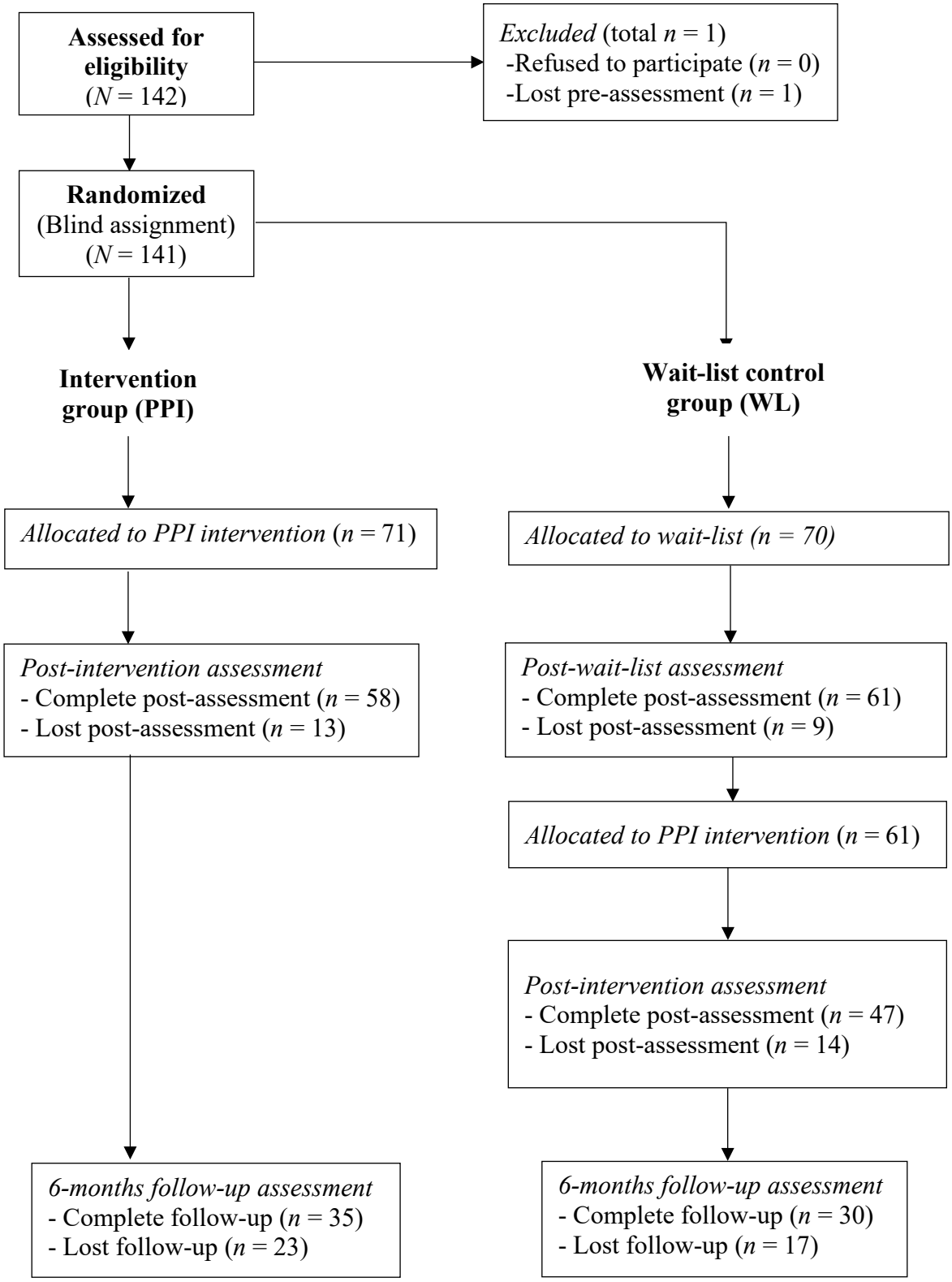
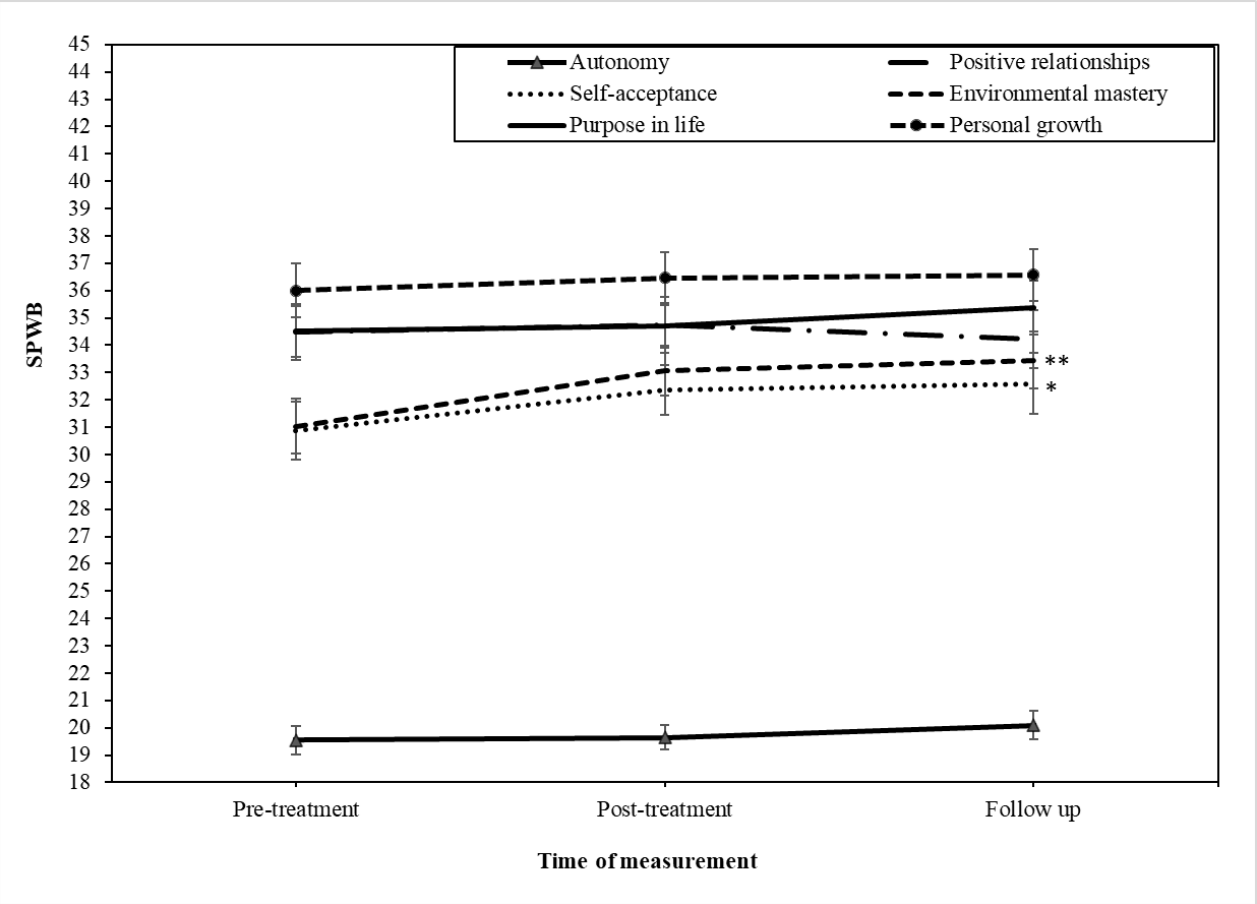


Figure 2

Changes in SPWB over the measurement points in the Follow-up Effectiveness Analyses (N = 64).



Note: SPWB = Scale of Psychological Well-Being; Significance is shown for the comparison between the pre-treatment and the follow up; ** $p < 0.01$; * $p < 0.05$. [1]

[1] Total SPWB scores for each scale range from 9 to 54. However, the Autonomy dimension ranged from 5 to 30 because the items with low reliability were removed from the subscale.

Table 1. Group therapy protocol; modules and sessions.

Module	Description of the session	Examples of Key Contents	Previous empirically-validated studies
Emotions	Session 1: Welcome and Introduction	- Ice breaking exercises - Introducing group's norms, materials and structure - Introducing positive psychology objectives and strategies	
	Session 2: Identification and amplification of positive emotions	- Mindfulness of pleasant vs. unpleasant emotions - Eating with Savouring	Seligman et al., 2006
	Session 3: Regulation of negative emotions	- Acceptance of negative emotions - ACT Metaphors: Chinese trap and unwanted guest	Kabat-Zinn, 1990 Morris, et al., 2013
	Session 4: Gratitude	- Intrapersonal and interpersonal gratitude - Appreciation round	Emmons & McCullough (2003)
	Session 5: Anger and forgiveness	- Letting go of anger. - The Sea of Forgiveness.	Slade et al., 2016
Self-acceptance	Session 6: Self-compassion	- Self-compassion exercises - Components of self-compassion	Gilbert, 2012
	Session 7: Strengths	- Identifying strengths - Putting strengths into practice	Seligman et al., 2006; Peterson & Seligman, 2004
	Session 8: Positive Interpersonal Relationships	- Practicing kindness toward others - Kindness towards others meditation	Lyubomirsky et al., 2005
Values and purpose	Session 9: Values and life purpose	- Values, goals and actions - ACT Metaphor: the garden	Morris, et al., 2013
	Session 10: Resilience	- What is resilience? - ACT Metaphor: the monster	Seligman et al., 2006
	Session 11: Maintenance and farewell	- A letter to future participants - The therapist gift: a trip throughout the program	

Table 2

Demographic and clinical characteristics of group participants in the efficacy analysis

	PPI (*N*=52)	WL (*N*=61)	t/x^2	*p*
Demographic characteristics				
Age in years, mean (SD)	42.4 (9.45)	43.2 (9.73)	-0.40	.68
Sex: Men, n (%)	32 (61.5)	35 (57.4)	0.20	.65
Single status, n (%)	51 (98.1)	49 (80.3)	8.68	.003*
Education, n (%)				
Elementary school	14 (26.9)	11 (18.0)		
Secondary School	20 (38.5)	34 (55.7)	3.97	.26
College Education	15 (28.8)	16 (26.2)		
Employed, n (%)				
Unemployed	47 (90.4)	53 (86.9)	1.03	.59
Part-time employment	4 (7.7)	6 (9.8)		
Full-time employment	--	1 (1.6)		
Clinical characteristics				
Diagnosis, n (%)				
Schizophrenia	38 (73.1)	40 (65.6)		
Affective disorders	3 (5.8)	7 (11.5)		
Anxiety disorders	2 (3.8)	5 (8.2)	2.81	.59
Personality disorders	5 (9.6)	4 (6.6)		
Others	3 (5.8)	2 (3.3)		
Medication, n (%)				
Benzodiazepines	28 (53.8)	40 (65.6)	2.01	.15
Hypnotics (No benzo)	1 (1.9)	3 (4.9)	0.75	.38
Antipsychotics	41 (78.8)	52 (85.2)	2.17	.14
Anti-depressants	19 (36.5)	21 (34.4)	0.11	.74
Mood Stabilizers	9 (17.3)	13 (21.3)	0.15	.69
First psychiatric symptoms, n (%)				
Childhood	--	1 (1.6)		
Adolescence	6 (11.5)	18 (29.5)	7.09	.06
Adulthood	33 (63.5)	27 (44.3)		
Therapy frequency, n (%)				
No therapy	5 (9.6)	1 (1.6)		
Hour per week	17 (32.7)	21 (34.4)		
1 hour each 2 weeks	15 (28.8)	18 (29.5)	11.09	.35
1 hour per month	10 (19.2)	12 (19.7)		
Less	1 (1.9)	1 (1.6)		
SPWB, mean (SD)				
Autonomy	19.48 (4.39)	20.10 (4.23)	-0.76	.45
Environmental mastery	30.65 (7.79)	31.47 (7.15)	-0.58	.56
Personal growth	35.31 (7.46)	35.70 (7.28)	-0.28	.78
Positive relationships	34.69 (8.01)	33.90 (7.56)	0.53	.59
Purpose in life	34.56 (7.73)	34.37 (6.64)	0.13	.89
Self-acceptance	29.98 (8.70)	31.62 (7.80)	-1.05	.29
SWLS, mean (SD)	17.40 (7.09)	18.22 (6.79)	-0.63	.53
AAQ-II, mean (SD)	43.25 (11.18)	42.27 (9.78)	0.49	.62
SCL-90, mean (SD)				
Anxiety	1.12 (0.82)	1.31 (0.97)	-1.10	.27
Depression	1.52 (0.88)	1.47 (0.89)	0.27	.79
Interpersonal sensibility	1.42 (0.82)	1.41 (0.95)	0.06	.96
Paranoid Ideation	1.15 (0.87)	1.29 (0.94)	-0.77	.44
Somatization	1.00 (0.83)	1.02 (0.82)	-0.11	.90
Hostility	0.75 (0.83)	0.63 (0.80)	0.74	.46
Compulsion/obsession	1.66 (0.87)	1.62 (0.93)	0.23	.82
Phobic Anxiety	0.89 (0.77)	1.09 (1.01)	-1.17	.24
Psychoticism	1.15 (0.83)	0.99 (0.83)	0.95	.34

Note. PPI: Multicomponent Positive Psychological Intervention group; WL: Waiting list group; SPWB: Scales of Psychological Well-Being; SWLS: Satisfaction with life scale; AAQ-II: Acceptance and Action Questionnaire - II; SCL-90-R: Symptom Checklist-90-R; *p<0.01

Table 3

Differences between means of two groups of participants on primary outcomes (N =52 vs 61)

Note. SPWB = Scales of Psychological Well-Being; SWLS = Satisfaction with life Scale. *p<.05.

		Multicomponent PPI		Waiting List TAU		Difference
		Pre	Post	Pre	Post	Morris' d and p
SPWB	Autonomy	19.5 ± 4.4	19.9 ± 3.4	20.1 ± 4.2	19.7 ± 4.2	__ p= .354
	Positive relationships with others	34.7 ± 8.0	35.7 ± 7.1	33.9 ± 7.5	34.4 ± 7.6	__ p= .598
	Self-acceptance	29.9 ± 8.7	31.7 ± 7.5	31.6 ± 7.8	31.1 ± 7.8	0.28 p = .014
	Environmental mastery	30.6 ± 7.8	32.7 ± 7.5	31.4 ± 7.1	30.8 ± 7.3	0.35 p= .018
	Purpose in life	34.4 ± 7.7	34.9 ± 6.9	34.4 ± 6.6	34.2 ± 5.9	__ p= .873
	Personal growth	35.3 ± 7.4	35.5 ± 6.8	35.7 ± 7.2	35.5 ± 6.8	__ p= .787
Satisfaction with life (SWLS)		17.4 ± 7.1	19.0 ± 6.6	18.2 ± 6.8	19.2 ± 6.8	__ p= .412

Table 4

Differences between means of two groups of participants on secondary outcomes as measured by the SCL-90-R (N=52 vs 61)

	Multicomponent PPI		Waiting List TAU		Differences
	Pre	Post	Pre	Post	Morris´*d* and *p*
Somatization	1.00 ± 0.83	0.90 ± 0.82	1.02 ± 0.81	0.96 ± 0.84	__ *p* = .736
Obsessive-compulsive	1.66 ± 0.87	1.50 ± 0.86	1.62 ± 0.93	1.48 ± 0.96	__ *p* = .917
Interpersonal sensibility	1.42 ± 0.81	1.28 ± 0.79	1.41 ± 0.95	1.27 ± 0.89	__ *p* = .912
Depression	1.51 ± 0.87	1.30 ± 0.80	1.47 ± 0.89	1.40 ± 0.94	__ *p* = .376
Anxiety	1.12 ± 0.82	1.07 ± 0.84	1.31 ± 0.97	1.14 ± 0.91	__ *p* = .261
Hostility	0.75 ± 0.83	0.71 ± 0.76	0.63 ± 0.80	0.61 ± 0.79	__ *p* = .942
Phobic Anxiety	0.89 ± 0.77	0.91 ± 0.80	1.09 ± 1.01	1.07 ± 0.97	__ *p* = .610
Paranoid Ideation	1.15 ± 0.86	1.18 ± 0.90	1.15 ± 0.86	1.21 ± 0.87	__ *p* = .330
Psychoticism	1.14 ± 0.82	0.99 ± 0.85	0.99 ± 0.83	0.98 ± 0.86	__ *p* = .248

Note. SCL-90-R = Symptom Checklist 90-Revised; **p*<.05; ***p*<.01.

Supplementary Table 1

Participants' demographic and clinical characteristics (with post-assessment vs. without post-assessment)

	With (*N*=119)	Without (*N*=22)	t/x^2	*p*
Age in years, mean (SD)	42.7 (9.50)	44.2 (7.35)	.72	.47
Sex: Men, n (%)	71 (59.7)	9 (40.9)	1.951	.16
Single status, n (%)	105 (88.2)	21 (95.5)	0.40	.52
Education, n (%)				
Elementary school	28 (23.9)	6 (27.3)		
Secondary School	54 (46.2)	12 (54.5)	3.76	.28
College Education	34 (29.1)	3 (13.6)		
Employed, n (%)				
Unemployed	105 (89.7)	20 (95.2)	0.68	.71
Part-time employment	11 (9.4)	1 (4.8)		
Full-time employment	1 (0.9)	---		
Diagnosis, n (%)				
Schizophrenia	82 (71.3)	10 (58.8)		
Affective disorders	12 (10.4)	5 (29.4)		
Anxiety disorders	7 (6.1)	1 (5.9)	5.28	.25
Personality disorders	9 (7.8)	1 (5.9)		
Others	5 (4.3)	---		
Medication, n (%)				
Benzodiazepines	72 (69.9)	14 (82.4)	0.58	.44
Hypnotics (No benzo)	4 (4.2)	4 (23.5)	5.55	.01*
Antipsychotics	99 (89.2)	16 (94.1)	0.38	.84
Anti-depressants	43 (45.3)	5 (29.4)	0.90	.34
Mood Stabilizers	23 (23.7)	10 (58.8)	7.04	.00**
First psychiatric symptoms, n (%)				
Childhood	1 (0.8)	----		
Adolescence	24 (20.2)	5 (22.7)	0.25	.96
Adulthood	66 (55.5)	12 (54.5)		
Therapy frequency, n (%)				
No therapy	6 (5.2)	---		
Hour per week	48 (41.4)	8 (42.1)		
1 hour each 2 weeks	35 (30.2)	5 (26.3)	1.54	.81
1 hour per month	23 (19.8)	5 (26.3)		
Less	4 (3.4)	1 (5.3)		
SPWB, mean (SD)				
Autonomy	19.7 (4.27)	21.2 (5.38)	1.43	.15
Environmental mastery	31.0 (7.59)	33.6 (6.45)	1.50	.13
Personal growth	35.6 (7.31)	37.5 (7.28)	1.12	.26
Positive relationships	34.3 (7.90)	35.0 (6.91)	0.44	.65
Purpose in life	34.4 (7.30)	35.8 (10.04)	0.80	.42
Self-acceptance	30.9 (8.27)	33.0 (8.63)	1.09	.27
SWLS, mean (SD)	17.9 (7.04)	18.4 (9.19)	0.08	.93
SCL-90, mean (SD)				
Anxiety	1.23 (0.89)	1.15 (0.82)	-0.39	.69
Depression	1.50 (0.89)	1.38 (0.99)	-0.57	.56
Interpersonal sensibility	1.43 (0.88)	1.08 (0.74)	-1.76	.07
Paranoid Ideation	1.23 (0.90)	1.25 (0.76)	0.06	.94
Somatization	1.02 (0.81)	0.92 (0.59)	-0.57	.56
Hostility	0.70 (0.80)	0.48 (0.51)	-1.22	.22
Compulsion/obsession	1.66 (0.89)	1.35 (0.76)	-1.51	.13
Phobic Anxiety	1.03 (0.91)	0.86 (0.82)	-0.79	.42
Psychoticism	1.08 (0.83)	0.98 (0.79)	-.057	.57

Note. PPI: Multicomponent Positive Psychological Intervention group; WL: Waiting list group; SPWB: Scales of Psychological Well-Being; SWLS: Satisfaction with life scale; AAQ-II: Acceptance and Action Questionnaire - II; SCL-90-R: Symptom Checklist-90-R; *p<0.05; **p<0.01.

Supplementary Table 2

Participants' demographic and clinical characteristics (completers vs. non completers)

	Completers (*N*=101)	Non-completers (*N*=18)	t/x^2	*p*
Age in years, mean (SD)	43.05 (9.66)	40.89 (8.55)	-0.88	.37
Sex: Men, n (%)	59 (58.4)	12 (66.7)	0.15	.69
Single status, n (%)	89 (88.1)	16 (88.9)	0.00	1.00
Education, n (%)				
Elementary school	24 (24.2)	4 (22.2)		
Secondary School	47 (47.5)	7 (38.9)	1.15	.76
College Education	27 (27.3)	7 (38.9)		
Employed, n (%)				
Unemployed	92 (92)	13 (76.5)	7.71	.02*
Part-time employment	8 (8)	3 (17.6)		
Full-time employment	---	1 (5.9)		
Diagnosis, n (%)				
Schizophrenia	70 (70.7)	12 (75)		
Affective disorders	9 (9.1)	3 (18.8)		
Anxiety disorders	6 (6.1)	1 (6.2)	3.52	.47
Personality disorders	9 (9.1)	---		
Others	5 (5.1)	---		
Medication, n (%)				
Benzodiazepines	63 (70)	9 (69.2)	0.00	1.00
Hypnotics (No benzo)	4 (4.8)	---	0.004	.95
Antipsychotics	83 (87.4)	16 (100)	1.14	.28
Anti-depressants	37 (45.1)	6 (46.2)	0.00	1.00
Mood Stabilizers	20 (23.8)	3 (23.1)	0.00	.95
First psychiatric symptoms, n (%)				
Childhood	1 (1)	----		
Adolescence	22 (21.8)	2 (11.1)	2.53	.46
Adulthood	53 (52.5)	13 (72.2)		
Therapy frequency, n (%)				
No therapy	6 (6.1)	---		
Hour per week	40 (40.8)	8 (44.4)		
1 hour each 2 weeks	31 (31.6)	4 (22.2)	4.29	.36
1 hour per month	17 (17.3)	6 (33.3)		
Less	4 (4.1)	---		
SPWB, mean (SD)				
Autonomy	19.7 (4.28)	20.0 (4.30)	0.28	.77
Environmental mastery	31.5 (7.27)	28.3 (8.95)	-1.61	.10
Personal growth	35.6 (7.30)	35.8 (7.57)	0.12	.90
Positive relationships	34.6 (7.77)	32.6 (8.62)	-0.99	.32
Purpose in life	34.6 (6.97)	33.2 (9.08)	-0.71	.47
Self-acceptance	31.0 (8.06)	30.3 (9.58)	-0.30	.76
SWLS, mean (SD)	18 (6.93)	17.3 (7.82)	-0.33	.73
SCL-90, mean (SD)				
Anxiety	1.17 (0.87)	1.55 (0.93)	1.67	.97
Depression	1.43 (0.86)	1.88 (0.98)	1.98	.04*
Interpersonal sensibility	1.36 (0.83)	1.85 (1.06)	1.85	.07
Paranoid Ideation	1.15 (0.86)	1.70 (0.99)	2.44	.01*
Somatization	0.98 (0.78)	1.26 (0.96)	1.35	.17
Hostility	0.66 (0.80)	0.92 (0.79)	1.27	.20
Compulsion/obsession	1.61 (0.89)	1.92 (0.90)	1.33	.18
Phobic Anxiety	0.96 (0.87)	1.38 (1.04)	1.83	.06
Psychoticism	1.01 (0.80)	1.50 (0.88)	2.34	.02*

Note. PPI: Multicomponent Positive Psychological Intervention group; WL: Waiting list group; SPWB: Scales of Psychological Well-Being; SWLS: Satisfaction with life scale; AAQ-II: Acceptance and Action Questionnaire - II; SCL-90-R: Symptom Checklist-90-R; *p<0.05; **p<0.01