

# Impact of Brief Protocol Based on Principles of ACT on Patients with Chronic Schizophrenia

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## Abstract

**Background:** Although various pharmacological treatments are available for persons suffering with positive psychotic symptoms, symptoms often continue to occur even when medications are taken. Traditional psychosocial methods such as family therapy and cognitive-behavioral alleviate symptoms in this population, but interventions are often lengthy and difficult. Furthermore, directly targeting the reduction of psychotic symptoms could produce paradoxical effects; acceptance, cognitive defusion, and valued action could therefore serve as valuable coping methods. At the level of process, ACT is characterized by a rapid reduction in the believability of negative thoughts or the unacceptability of negative feelings, even if these thoughts and feelings continue at some frequency and thus seems well suited for addressing chronic problems.

**Aim:** The present study intended to study the impact of brief protocol based on principles of Acceptance and Commitment Therapy (ACT) on patients with Chronic Schizophrenia.

**Method:** 60 patients suffering from Schizophrenia for at least 2 years, were selected through purposive sampling from Central Institute of Psychiatry, Ranchi. Out of them, 30 each were randomly allotted to the experimental group (receiving ACT+TAU), and control group (Treatment As usual - TAU). All participants were assessed on Ryff Psychological Wellbeing Scale, Acceptance and Action Questionnaire 2, at 3 points in time: Before intervention, at time of discharge and at 1 month follow up.

**Results:** The results show a significant intervention effect on the psychological well being of the patients, and in the process variable of psychological flexibility.

**Conclusion:** ACT may provide an alternative mode of managing distress faced by people with Schizophrenia, facilitate coping with symptoms and may also be given in booster sessions after discharge.

**Keywords:** Acceptance and Commitment Therapy, ACT, Schizophrenia management, Chronic psychiatric illness, Psychological flexibility, Mindfulness, Therapy

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## I. INTRODUCTION

Schizophrenia is a chronic and severe mental disorder that affects how a person thinks, feels, and behaves. Schizophrenia usually develops in late adolescence or early adulthood, and often has a profound effect on daily functioning. People with Schizophrenia frequently have difficulties living independently and caring for themselves, working or attending school, fulfilling role obligations and enjoying close relationships and leisure activities. It is ranked as the second highest contributor to overall burden of diseases, behind Cardio Vascular Disease (Murray and Lopez, 1996). The majority of persons with Schizophrenia, even those who benefit from medication, continue to have disabling residual symptoms and impaired social functioning and will most likely experience a relapse despite medication adherence (Bustillo et al., 2014). Hence, it seems necessary to integrate the empirically validated psychosocial treatments into the standard care for this population.

Psychosocial modes of treatment target domains of cognitive performance, social skills, adjustment, overall quality of life, competitive employment, comorbid substance abuse, associated depression, distress caused by the symptoms of Schizophrenia like delusions, hallucinations etc (Lieberman, 1994). Bustillo et al., in 2014 reviewed methodologically sound studies over last fifty years of various forms of psychosocial interventions in Schizophrenia, covering a wide range of outcome measures. Traditional psychosocial methods such as family therapy and cognitive-behavioral approaches alleviate symptoms in this population, but interventions are often lengthy and difficult. Furthermore, directly targeting the reduction of psychotic symptoms could produce paradoxical effects; acceptance, cognitive defusion, and valued action could therefore, may serve as valuable coping methods.

Mindfulness has its roots in Eastern tradition. The vast diversity seen in defining mindfulness is also reflected in a diversity of mindfulness based interventions. While some focus on attention and awareness aspects of

it, like meditation based practices, some are based on acceptance and detachment like Acceptance and Commitment Therapy, or on compassion like Loving Kindness Meditation (Khouri et al., 2013). This family of interventions is often known as the 'third wave' of Cognitive Behavioral interventions, in contrast to the first wave that focused on principles of classical and operant condition, and second focusing on information processing and cognition (Hayes, 2004). The rationale for the wave was that cognitive change can occur through means other than explicitly challenging maladaptive cognitions; cognitions can mediate treatment change even when cognitions are not explicitly addressed in treatment" (Hofman et al., 2010). The concepts of acceptance and mindfulness may be newly integrated to psychotherapy but date back centuries to Buddhist traditions.

Developing mindfulness qualities can be particularly helpful in alleviating distress associated with psychosis rather than focusing solely on controlling psychotic symptoms such as voices, paranoid intrusions etc. (Chadwick et al., 1996). Such interventions are thus based on their focus on how patients relate with, and respond to the symptoms rather than identifying or challenging the thoughts and beliefs underlying such experiences. A meta-analysis of mindfulness based interventions was done by Khouri et al in 2013 to evaluate the efficacy of such interventions in Schizophrenia or psychosis. The effect sizes were found to be 0.52 using the Hedge's *g*. Also, in studies where the follow up data was available, the results were noticed to be maintained (0.62). Small sample size, high heterogeneity among study groups reduced the scope of obtained results. More studies are still needed to identify the components of such interventions that are most effective.

Created in 1986 by Steve Hayes, Acceptance and Commitment Therapy or ACT was the first of the third wave therapies, and it has been found to be effective in both short and long protocols, delivered individually or in groups, for a wide variety of problems. At the level of process, ACT is characterized by a rapid reduction in the believability of negative thoughts or the unacceptability of negative feelings, even if these thoughts and feelings continue at some frequency (Zettle & Hayes, 1986) and thus seems well suited for addressing chronic problems. From ACT perspective, the wasted time and energy clients spend avoiding or escaping from their aversive private experiences, such as feelings, thoughts, memories, and physiological reactions, keeps them from engaging in vital actions (Hayes, et al., 1996). So ACT encourages individuals to accept and experience private events nonjudgmentally while simultaneously working toward the pursuit of personally defined behavioral goals or values (Herbert, 2002). This therapeutic philosophy promotes a "second-order change," attempting to change the function and not the form of the symptoms, modifying the verbal context and the person's perspective.

The ACT treatment model consists of six sub-processes that are organized into a 'hexaflex'- Acceptance, Defusion, the present moment, a transcendent sense of self, values and committed action. Each sub-process has its own specific methodology, exercises, homework and metaphors. The ACT practitioner targets these six processes in order to build psychological flexibility. The techniques consist of a variety of strategies, including mindfulness and acceptance exercises, clarification of values and goals, and the use of metaphors (Bach et al., 2006). Rather than following a manualized protocol, ACT allows the therapist to create and individualize their own mindfulness techniques, or even to co- create them with clients. An important cornerstone of ACT therapy is the use of metaphors and metaphorical language in order to undermine language-induced struggle. Metaphors can have an impact without invoking the client's normal verbal defenses (Herbert, 2002).

ACT has been applied in various clinical and non-clinical settings so far – Social phobia (Ossman et al., 2006), smoking (Gifford et al., 2004), Panic Disorder (Levitt et al., 2005), depression (Zettle & Hayes, 1986; Zettle & Rains, 1989), Borderline Personality Disorder (Gratz & Gunderson, 2006), Epilepsy (Lundgren, 2004; Lundgren & Dahl, 2005), poly substance abuse (Bisett et al., 2004), work stress (Bond & Bunce, 2000), End stage Cancer (Feros et al., 2013), burnout (Hayes et al., 2004) etc and was found to have moderate effect sizes. Many researchers have attempted to find ACT's efficacy in psychosis conditions as well like ACT in auditory hallucinations (Garcia and Perez, 2001), psychotic disorders (Guadiano and Herbert, 2006), ACT in Schizophrenia as part of routine activity in Public Mental Health Center (Veiga-Martinez et al., 2008), first blind RCT of ACT in emotional recovery following psychosis which was a 12-month Prospective Randomised Open Blind Evaluation (PROBE) clinical trial (White et al., 2011), single blind RCT on Acceptance based CBT in command hallucinations in psychotic conditions (Shawyer et al., 2012). There have also been studies which have made an attempt to study if brief protocols of ACT are effective. According to these studies: (1) ACT is better than control and TAU conditions; (2) more evidence is needed in order to determine if ACT is better than established treatments.

According to the review of outcome studies, we can conclude that ACT is showing to be efficacious in a wide range of problems in which a common pattern of experiential avoidance is present. In general, the effect sizes are large and typically even better at follow-up. Also, it is worthy to note that a good number of the ACT studies have applied extremely short interventions that have showed relevant effects (example Bach & Hayes, 2002). In India, there has been only one published study yet by Poddar and Sinha (2015) which used a longer protocol of ACT. Although, shorter protocols have been implemented and studied in populations outside India, there have been

no prospective studies assessing the effectiveness of short protocols. With patients dropping out of therapies due to reasons of time and expense, it is an important research endeavor to see if ACT may provide an alternative form of management for patients with chronic disorders like Schizophrenia. So, the present study was a step towards finding whether shorter protocols of ACT would be effective as well as feasible with such chronic disorders, in Indian population.

The objective for the present study was to see if Acceptance and Commitment Therapy based brief protocol could have any effect on the level of psychological flexibility and psychological wellbeing of individuals diagnosed with chronic Schizophrenia. The consequent hypotheses outlined, were:

- There will be an increase in the level of psychological flexibility in patients in experimental as compared to the control group, after the intervention.
- There will be an increase in the level of perceived psychological wellbeing in patients in experimental as compared to the control group, after the intervention.

## II. METHOD

**Venue:** Central Institute of Psychiatry, Ranchi, India.

**Participants:** 60 patients diagnosed with Schizophrenia as per ICD-10-DCR, out of which 30 each were included in experimental and control group.

**Sampling:** Purposive sampling was used for selection of participants, followed by random assignment of participants to experimental and control group. Inclusion criteria for selection of participants was a diagnosis of Schizophrenia as per ICD – 10 – DCR, illness duration of more than 2 years, patients receiving inpatient treatment at CIP, of both sexes, within the age group of 18-55 years, with minimum 5<sup>th</sup> grade education. Patients with any neurological disorder, mental retardation, or substance use disorder, who received Electro Convulsive Therapy anytime in 6 months prior to selection, who were actively suicidal, aggressive or uncooperative, or had predominant catatonic features were not included in the study.

**Design:** It was a hospital based, comparative and prospective study. A before and after intervention design was used.

**Materials/tools:** The following tools were administered on the participants - Socio-Demographic and Clinical Data Sheet (SDCS) (Developed for the study), the 10 item 7 point Likert type Acceptance and Action Questionnaire 2 (AAQ – 2) (Hayes et al., 2004) to assess level of psychological flexibility and the 42 item, 6 point rated Ryff's Psychological wellbeing scale (Ryff, 1989) to assess the level of perceived psychological wellbeing. All tools were administered at 3 points in time: Before Intervention, At time of discharge, and at 1 month follow up.

**Procedure:** Patients diagnosed as Schizophrenia were screened using the aforementioned inclusion and exclusion criteria and patients meeting the criteria were selected as participants for study. Then, baseline measures (signified as T1 readings in later sections) on the following assessment tools were taken: AAQ 2, Ryff's Psychological Wellbeing Scale. Each of the participant was randomly assigned to either of the two groups i.e. Experimental (Those receiving the Acceptance and Commitment Therapy based brief intervention along with treatment as usual), and Control group (with treatment as usual); using lottery system. Patients in Experimental group received the 8 hour brief intervention, along with TAU. Follow up assessments were done at two time points: The time of discharge (T2) and at the time of 1 month follow up in OPD (T3). For the control group participants, assessments on the same measures were done at T1, T2 and T3.

### Therapeutic program

The course of ACT spanned over a period of ten days, in 8 sessions including assessments. Sessions lasted roughly an hour. The intervention incorporated cognitive techniques derived from traditional cognitive behaviour therapies along with the core ACT techniques. These included psychoeducation about Schizophrenia symptoms and the connections between thoughts, mood and behaviours. The treatment emphasized on explaining the core concepts of ACT. They were explained how faulty use of language leads to distress and experiential avoidance leads to further problems. They were also told about the importance of acceptance and valuing behaviour. Further they were encouraged to commit to their values and take action. The intervention incorporated the use of various relevant metaphors to make them understand these concepts. Experiential exercises were also done with the patients especially those teaching mindfulness. Other activities were aimed at helping them realize their valued goals and the discrepancy between them and current pursuits, and experiential avoidance. Final session was conducted for review of the previous sessions along with feedback and therapy was terminated.

Repeated measures ANOVA were used to assess the treatment effects in the three time points on both the groups. This was done separately for the process variable as well as the outcome variable.

### III. RESULTS

**Table 1A: Comparison Of Socio-Demographic Variables Across Both Groups (N=60) [continuous variables]**

Variables	Group 1 (ACT+TAU) N = 30	Group 2 (TAU only) N = 30	t df = 58	p
	(Mean ± SD)			
Age	30.77 ± 7.70	33.33 ± 8.37	0.21	0.65
Family Size	5.9 ± 2.53	5.6 ± 1.47	6.05	0.17
Family Income	11150 ± 8074	12466 ± 5986	2.53	0.117

**Table 1B: Comparison Of Socio-Demographic Variables Across Both Groups (N=60) [Discrete variables]**

Variables		Group 1 (ACT + TAU) N = 30 n (n%)	Group 2 (TAU only) N = 30 n (n%)	χ <sup>2</sup> df = 58	P
Sex	Male	23 (77%)	23 (77%)	0.00	1
	Female	7 (23.3%)	7 (23.3%)		
Religion	Hindu	27 (90%)	27 (90%)	0.00 <sup>f</sup>	1
	Muslim	3 (10%)	3 (10%)		
	Others	0	0		
Residence	Rural	21 (70%)	15 (50%)	2.5	0.114
	Urban	9 (30%)	15 (50%)		
Education	Secondary	6 (20%)	15 (50%)	6	0.052
	Intermediate	13 (50%)	10 (33.3%)		
	Graduate and above	9 (30%)	5 (16.7%)		
Occupation	Skilled	20 (66.7%)	19 (63.3%)	0.073	0.787
	Unskilled	10 (33.3%)	11 (36.7%)		
Marital Status	Unmarried	11 (36.7%)	11 (36.7%)	3.257 <sup>f</sup>	0.196
	Married	16 (53.3%)	19 (63.3%)		
	Other	3 (10%)	0		
Handedness	Right	29 (96.7%)	30 (100%)	1.017 <sup>f</sup>	0.313
	Left	1 (3.3%)	0		

<sup>f</sup> = fisher exact test used.

**Table 1C: Comparison Of Clinical Variables Across Both Groups (N=60) [continuous variables]**

Variables	Group 1 (ACT+TAU) N = 30	Group 2 (TAU only) N = 30	t	p
	(Mean ± SD)	(Mean ± SD)	df = 58	
Age Of Onset	23.33 ± 6.90	25.80 ± 6.31	0.001	0.981
Duration Of Illness	7.50 ± 4.70	7.60 ± 4.62	0.001	0.976

**Table 1D: Comparison Of Clinical Variables Across Both Groups (N=60) [categorical variables]**

Variables		Group 1 (ACT + TAU) N = 30 n (n%)	Group 2 (TAU only) N = 30 n (n%)	χ <sup>2</sup> df = 58	P
Family History	Absent	23 (76.7%)	25 (83.3%)	0.417	0.519
	Present	7 (23.3%)	5 (16.7%)		
Mode Of Onset	Abrupt	0	0	2.069 <sup>f</sup>	0.150
	Acute	2 (6.7%)	0		
	Insidious	28 (93.3%)	30 (100%)		
Course	Continuous	18 (60%)	17 (56.7%)	0.069	0.793
	Fluctuating	12 (40%)	13 (43.3%)		

Previous Admissions	Absent	22 (73.3%)	21 (70%)	0.083	0.774
	Present	8 (26.7%)	9 (30%)		
Past History	Absent	29 (96.7%)	30 (100%)	1.017 <sup>f</sup>	0.313
	Present	1 (3.3%)	0		
	Present	0	0		

<sup>f</sup> = fisher exact test used.

Table 1A & 1B give comparative information about socio-demographic characteristics of experimental and healthy control groups. Continuous variables were compared using t test, where as other variables were compared using Pearson chi square or Fisher's exact test, wherever applicable. Table 1C and 1D present the comparison of both groups on clinical variables. As can be seen by the p values, no significant differences were found between the groups across all variables.

**Table 2A and 2B: Effect of treatment on AAQ 2 Scores within subjects (time = pre, post) and between subjects (group = experimental and control) and time \* group**

**Table 2A - Mean scores ± SD**

AAQ 2		EXPERIMENTAL N = 30 (Mean ± SD)	CONTROL N = 30 (Mean ± SD)
	Baseline		37.5 ± 6.724
Discharge		28.63 ± 5.027	34.733 ± 5.50
Follow up		24.866 ± 5.029	32.466 ± 6.295

**Table 2B – Main effects**

AAQ 2		F Wilk's Lambda	P	Partial Eta squared Effect size	Observed Power
	TIME	0.164	<0.001	0.836	1
	GROUP	8.890	0.004**	0.133	0.834
	TIME * GROUP	0.375	0.012*	0.125	0.987

\*p<0.05, \*\*p<0.01

Table 2A and 2B show that there was a significant reduction in AAQ 2 scores within subjects over time (p <0.001; effect size – 0.836); significant difference between subjects (i.e. significant effect of group: p <0.01; effect size = 0.133), and the reduction in scores of AAQ 2 was significantly greater in experimental group than the control group over time (significant effect of time\*group: p <0.05; effect size = 0.125).

**Table 3A and 3B: Effect of treatment on RPWB scale Scores within subjects (time = pre, post) and between subjects (group = experimental and control) and time \* group**

**Table 3A: Mean scores ± SD**

RPWB		EXPERIMENTAL N = 30 (Mean ± SD)	CONTROL N = 30 (Mean ± SD)
	Baseline	146.43±12.593	137.73±13.98
	Discharge	163.066±13.945	142.6±14.06
	Follow up	172.33±15.309	145.56±13.60

**Table 3B: Main effects**

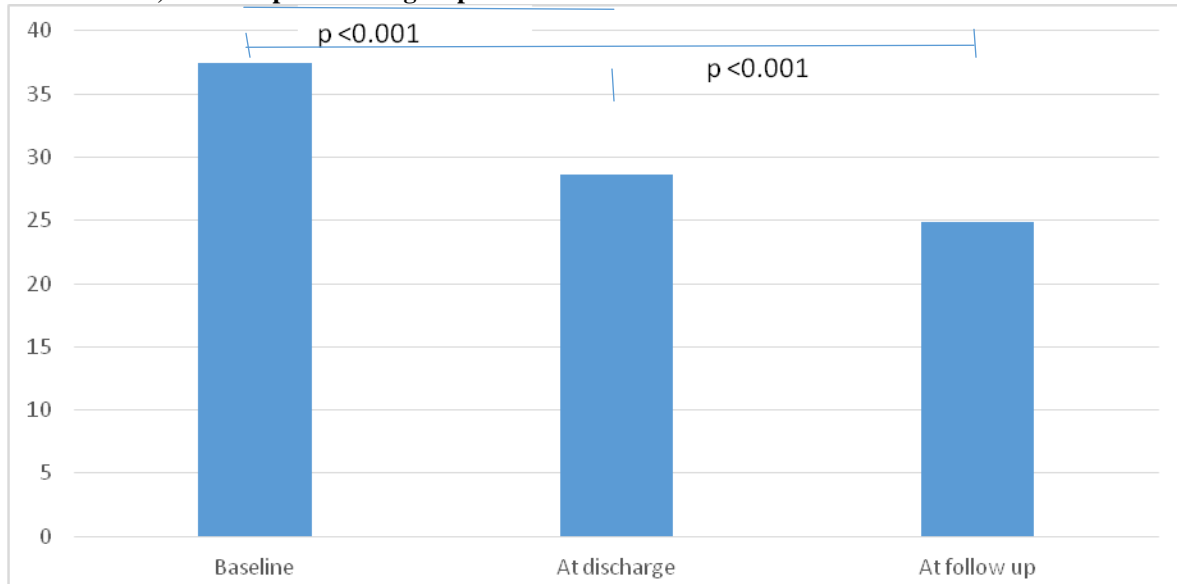
RPWB		F Wilk's Lambda	P	Partial Eta squared Effect size	Observed Power
	TIME	0.55	0.012*	0.845	0.983
	GROUP	28.645	<0.001	.311	1
	TIME * GROUP	0.385	0.009**	0.615	0.987

\*p<0.05, \*\*p<0.01

Table 3A and 3B show that there was a significant increase in scores of Ryff Psychological Wellbeing Scale, within subjects, over time (p <0.05; effect size – 0.845); significant difference between subjects (i.e. significant effect of group: p <0.001; effect size = 0.311), and the increase in scores of RPWB was significantly

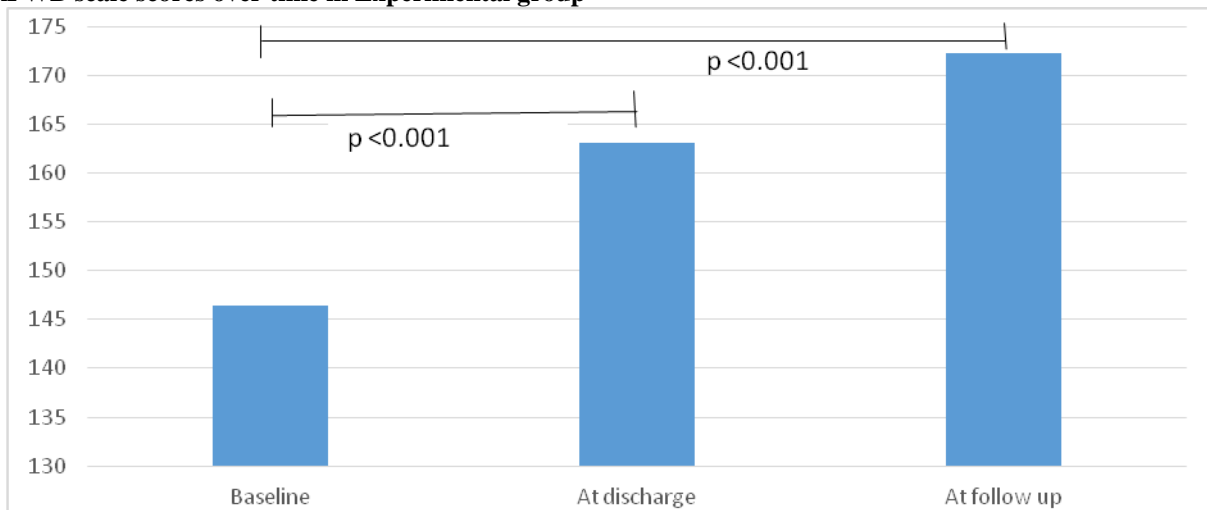
greater in experimental group than the control group over time (significant effect of time\*group:  $p < 0.01$ ; effect size = 0.615).

**Graph 1: Pairwise comparisons on Repeated measures using Bonferroni method: Improvements in AAQ 2 scores over time, in the Experimental group**



Graph 1 shows that there was a significant reduction in scores of AAQ 2 in experimental group from baseline to time of discharge ( $p < 0.001$ ), and from baseline to one month follow up ( $p < 0.001$ ).

**Graph 2: Pairwise comparisons on Repeated measures using Bonferroni method: Improvements seen in RPWB scale scores over time in Experimental group**



Graph 2 shows that there was a significant increase in scores of RPWB, in experimental group from baseline to time of discharge ( $p < 0.001$ ), and from baseline to one month follow up ( $p < 0.001$ ).

#### IV. DISCUSSION

The present study was a hospital based prospective, comparative study. The purpose of the current study was to evaluate the effectiveness of ACT based intervention on patients with chronic Schizophrenia. Based on combined findings from the ACT literature and psychotherapeutic intervention in general, it was hypothesized that the intervention would impact patients in a number of ways. Overall, the results from the study support the hypotheses. The results show a clear intervention effect on the perceived psychological wellbeing of the patients and also in the process variable of psychological flexibility.

### **Methodological considerations**

Out of the 60 participants of study, 30 were randomly taken up for the experimental group, and they received the brief intervention based on principles of acceptance and commitment therapy. The control group was matched by age, sex and educational qualification. Control group received TAU according to the institute's protocol which mainly consisted of psychoeducational programs and pharmacological treatment. Due to time constraints, a modest sample size was taken for the study.

### **ACT and psychological flexibility**

It was hypothesized that ACT intervention would increase psychological flexibility in the experimental group. It was hypothesized that AAQ 2 scores would decrease between pre - test and post-test, with change either maintained or decrease at follow - up. Mean AAQ 2 scores were found to decrease from pre - test to post -test, and from pre test to follow – up in case of the experimental group whereas the mean scores of the control group did not vary significantly across time, and none of these changes were large enough to assume that they did not occur merely by chance. The statistical analysis showed that there is significant change in the mean scores across time in case of the experimental group and the experimental group differed significantly from the control group with respect to the mean scores of psychological flexibility throughout the different phases of treatment. Time and group interactions were found to be significant for AAQ 2 scores, suggesting both groups changed differently over time with respect to psychological flexibility as assessed by AAQ 2. (Table 2A, 2B). Decrease in the process measure of AAQ 2 scores is an expected finding for any ACT intervention study.

As Murrell and colleagues in 2005 explained and hypothesized, increased familiarity with the concepts of acceptance and experiential avoidance might be a confounding factor. That is, prior to treatment, patients have little to no understanding of acceptance and experiential avoidance, which would affect the way they comprehend the items on the AAQ - II. After treatment, their level of comprehension changes, thus fundamentally changing the way they interpret the measure. Although there are studies where after intervention, AAQ scores remained same or in fact increased, instead of decreasing, the authors explained their findings in terms of an incubation effect, that is, that acceptance skills require time to be developed and practiced (Blackledge & Hayes, 2006). In a study by White et al, 2011, experiential avoidance as assessed by AAQ 2 was not found to reduce. However, such a case was not found in this study. Before any meaningful conclusions can be drawn about the impact of ACT interventions on experiential avoidance, then, researchers need to first clarify the differences among the existing measures and improve measurement of experiential avoidance in general. Ideally, experiential avoidance and psychological flexibility would be measured behaviourally.

### **ACT and psychological wellbeing**

It was hypothesized that there would be an increase in the perceived psychological wellbeing in the experimental group after the intervention. Mean RPWB scale scores were found to decrease from baseline to discharge and from baseline to follow up, in both groups. The experimental group differed significantly from the control group with respect to the mean scores of psychological wellbeing throughout the different phases of treatment. Time and group interactions were also found to be significant, suggesting both groups changed differently over time with respect to psychological wellbeing as assessed by RPWB scale. (Table 3A, 3B). Although, a study on clinical population assessing psychological wellbeing couldn't be found, as most studies included the general health, or quality of life variable, there was a study by Moghanloo et al. in 2015, assessing the impact of ACT on depression, feelings of guilt and psychological wellbeing in children. They found ACT to cause significant increase in subjective psychological wellbeing and decrease in depression in the experimental group, as compared to the control group. In a study conducted on population of university students, Rasanen et al. in 2016 found improved psychological wellbeing after giving 10 sessions of online ACT therapy.

Increase in the psychological flexibility is an indication for reduction in the avoidance across time for the experimental group, which may have subsequently contributed to an increased rating given to psychological wellbeing as perceived by the patients. It is difficult to say with certainty which component of ACT mediates changes in which outcome variables, unless specific components are studied separately, which were not in the scope of this study. In the previous literature, the correlational studies of the ACT model to date have generally not focused on single ACT processes. The actual model by which ACT impacts psychosis is still a bit unclear. It does appear that the processes targeted by ACT are at least in part responsible for the outcomes ACT produces.

Bach et al. 2011, showed that after brief 4 session intervention on ACT with inpatients with psychosis, there were reduced rates of rehospitalization found in the experimental group, and this change was maintained even at 1 year follow up. This lends support to the current findings of the study where the significant effects achieved post intervention, were also seen to be significant at one month follow up.

The study was limited in its scope of generalizations by factors such as modest sample size and short follow up duration. Also, the researcher was not blind to the treatments, so there may have been rater bias. Finally, a

debate remains ongoing around the measures used in this study. As psychologists, we are always measuring hypothetical constructs, so our measurement is only as good as our operational definitions. In the ACT literature in particular, there have been calls for more behavioural observations and measures, particularly given that ACT is a behavioural intervention. There have been many controversies in ACT literature around what exactly AAQ measures – psychological flexibility, or experiential avoidance, and how far are they interlinked.

In spite of the limitations however, these are important findings that justify the need for replication and more work on ACT with patients of chronic mental illnesses. Also, measures seemed to maintain at the one month follow up. Although, this is not a sure indicator of long term effects of brief protocols, but it was a very important finding. Probably, ACT in the form of booster sessions may be helpful for this particular population, particularly given that many of the outcome measures used in this study have previously shown incubation effects – acceptance in particular. Doubtless, ACT requires adequate cognitive functioning to understand its concepts and metaphors. Even so, the practical experience is as important as or more important than cognitive functioning for ACT. The therapeutic change probably depends more on the experience lived than on intellectual understanding. Many of the metaphors can be found in the client's own repertoire, even though they may not be particularly aware of their use.

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