The effect of Token Economy on Negative Symptoms and Non Vocational Domains on Institutionalized Patients with Chronic Schizophrenia: A Prospective Study

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Abstract:

The token economy is a form of treatment intervention based on principles of operant conditioning developed for the patients with schizophrenia and other chronic mental illnesses. With the help of a rehabilitation program, non-vocational domains such as self esteem and quality of life have shown improvement in patients with schizophrenia. Work was related to higher self-esteem which increases the motivation to engage in self-care behaviors that ultimately reduce negative symptoms. The present study aimed to examine the effect of vocational rehabilitation using token economy principle on negative symptoms and non functional domains of patient with schizophrenia. This was a hospital based longitudinal study conducted at Central Institute of Psychiatry, Ranchi and purposive sampling was used. The sample consisted of 15 patients with chronic schizophrenia according to ICD-10 DCR criteria. After taking informed consent from the patient, Socio-demographic and clinical data sheet, Work Behavior Assessment Scale, The Positive and Negative Syndrome Scale (PANSS), Social Adaptive Functioning Evaluation (SAFE) Scale, The Quality of life- BREF, The Subjective Well Being Inventory, Self Esteem Scale, were administered for all the patients (Pre and Post intervention) After that the patient's were involved in the vocational rehabilitation training using token economy principles, for six months. Data was analyzed using SPSS 16.0 version. Paired 't' test was used to see the efficacy of intervention. Result showed that vocational rehabilitation significantly improved patient's work behaviour negative symptoms, quality of life, self esteem, subjective well being and socio adaptive functioning.

Keywords: *Schizophrenia, Vocational Rehabilitation, quality of life, self esteem, subjective well being, Token economy*

I. INTRODUCTION

The token economy program is a treatment intervention based on the principles of operant conditioning developed for the patients with schizophrenia and other chronic mental illnesses (Dickerson, Tenhula and Green Paden., 2005). Token economy which functions on the two laws of operant behaviour (Skinner, 1953) the law of effect and the law of association by contiguity, these principles are combined with vocational rehabilitation and applied to all kinds of patients in psychiatric hospitals (Dickerson et al., 2005). In a study by Maley, Feldman, & Ruskin (1973) randomly assigned 40 patients with chronic schizophrenia to token economy program. They found that the patients in the token economy program were more cooperative and communicative, more socially desirable, and exhibiting less psychotic behaviour. Schizophrenia is a chronic psychosis which affects the patient's employment condition gradually disabling functional and non-vocational domains of the patients. One of these classes of symptoms in these patients is "negative symptoms", it has gained considerable attention over the last few years. Negative symptoms, includes blunted affect, withdrawal or apathy, are particularly crucial for recovery and are associated with negative functional outcomes in these patients, such as incapability to get an employment and conduct normal daily living activities. Whilst positive symptoms are usually treated by antipsychotic drugs, negative symptoms are usually residual, which indicates the need for better treatment. Some work has suggested that negative symptoms are inversely correlated with functional outcomes (Rabinowitz et al., 2012) such as dressing, eating and toileting (McGurk et al., 2000). Additionally, the goal of psychiatric rehabilitation is to enable individuals to achieve the highest feasible quality of life (Browne, 1999). In a study by Rosenheck et al. (2006) evaluated more than 1400 patients with schizophrenia and reported that Quality of life was better in competitive employment and other kind of employment than those who were not working (Browne, 1999). Researchers have identified that lack of social participation and inability to fulfil social roles is a significant factor to low self-esteem for schizophrenic population (Petryshen, Hawkins, & Fronchak, 2001; Bracke, Christiaens & Verhaeghe, 2008). Interestingly, lack of work seems to give rise to an increase in negative self-appraisal rather than a decrease in positive self-appraisal (Warr & Jackson, 1983). Moreover, in a study by Sing et al. (2010) evaluated 50 patients with chronic schizophrenia who were undergoing rehabilitation and reported improvement in subjective well being.

There is a proclivity that improvements in vocational functioning are correlated with improvements in other outcomes, such as reduced symptoms and gain in self esteem, quality of life and subjective well being, but it is not clear that there is any causal relationship between this correlation and vocational rehabilitation interventions (Lehman 1995). Therefore the present study aimed to examine the effect of vocational rehabilitation using token economy principle on negative symptoms and non functional domains of patients with chronic schizophrenia (Kumari et al., 2010)

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II. METHOD

Participants and Procedure

This was a hospital based longitudinal study conducted at Central Institute of Psychiatry, Ranchi and purposive sampling was used. The sample consisted of 15 patients with chronic schizophrenia fulfilling the inclusion and exclusion criteria were taken up for the study. Written informed consent was taken from the patient after explaining the objectives and procedure of the study in detail. Socio-demographic data was also collected. After that, Work Behavior Assessment Scale, The Positive and Negative Syndrome Scale, Social Adaptive Functioning Evaluation (SAFE) Scale, The Quality of life-BREF, The Subjective Well Being Inventory and Self Esteem Scale, were administered for all the patients. The patient's were on medication as prescribed by the clinician. After that the patient's were involved in the vocational rehabilitation training, the training consist of book binding for six months in the book binding section of sheltered workshop situated in CIP, the vocational rehabilitation was done on daily basis, that is the patient's were working in the sheltered workshop daily from 10:00am to 12:00noon, and were involved in book binding activity, they worked on all days except Sundays and government holidays. The patients were under supervision by the clinical psychologist and also by the representative of shelter workshop. Token economy principle was applied during this period and patient was reinforced on his work performances like punctuality, remains on work station, adaptability, work standard, attitude towards work, attitude towards work mates, taking responsibilities and initiative. A point symbol of star was given to each work performances, if the patients got more than two stars in a day he was given a token of 5 rupees and if it continues for one week, a token of 10 rupees was given, and further, if it continues for one month a token of 20 rupees was given as bonus. In exchange of token from the staff of shelter workshop the patient's received biscuit, pen, diary note, hair oil, soap, and tooth brush, chocolate, tongue cleaner and comb. After six months of vocational rehabilitation program all the above mentioned tests were administered again and the improvements were noted.

Measures:

Socio Demographic and clinical Data Sheet:

A socio demographic and clinical data sheet was specifically designed for the study to record relevant details of each case. The semi-structured Performa contained socio-demographic and clinical characteristics which include age and duration of continuous stay in hospital.

Work Behaviour Assessment Scale (Ciompi et al., 1977)

This scale assesses the areas of punctuality, remains on work station, adaptability, work standard, attitude towards work and work mates, taking responsibilities and initiative.

Social Adaptive Functioning Evaluation (SAFE) Scale (Harvey et al., 1997)

The SAFE scale contains 17 items assessing self care, social competence and adjustment and miscellaneous skills including impulse control and co-operativeness. Higher score reflects more severe impairment in social adaptive functioning (Harvery et al., 1997).

Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987)

It assesses positive and negative symptoms of schizophrenia and other psychotic disorders. It includes 30 items on 3 subscales: 7 items covering positive symptoms, 7 items covering negative symptoms and 16 items covering general psychopathology (Kay et al., 1987).

WHO Quality of Life - BREF (WHOQOL-BREF 1996).

It is a 26 item rating scale developed to assess quality of life. The items are scored on a continuum of 1 to 5. WHOQOL-BREF assesses quality of life in four domains such as Physical, health, psychological, social relationships and environment.

Self–Esteem Scale (Rosenberg, 1965)

The scale contains ten questions each answered on a 4 point array, low score means that the individual lacks respect for himself, considers himself unworthy, inadequate or otherwise, seriously deficient as a person. A high score indicates that the individual feels himself or herself to be a person of worth, but not necessarily superior to others.

Subjective Well Being Inventory (Sell & Nagpal, 1992)

Subjective well being inventory has been designed to measure the extent of well being or ill- being experienced by an individual or a group of individuals in various day to day life. There are 40 items in it. Each item is to be rated on a three points scale.

Data Analysis

The statistical package for social sciences (SPSS) 16.0 for windows was used for statistical analysis. Descriptive statistics calculated for variables. We have checked the data for normality and applied Paired't' test to see the efficacy of intervention

III. RESULTS

Table-1: Comparison of pre and post scores of Work Behaviour Assessment in schizophrenia patient group (N=15)

	Pre- Intervention	Post-Intervention	t	df	p
	Mean ± SD	Mean ± SD			
Work Behaviour	3.53±0.74	5.27±0.88	7.59	14	.000***

***p<.001

Table 1: shows comparison of pre and post scores of work behaviour assessment in schizophrenia patient group using paired samples t test. Post scores of work behaviour were significantly higher (p<.001) than the pre scores.

Table-2: Comparison of pre and post scores of Social Adaptive Functioning Evaluation Scale (SAFE) in schizophrenia patient group (N=15)

	Pre-Intervention	Post-Intervention	t	df	p
	Mean ± SD	Mean ± SD			
SAFE	28.20±6.11	20.47±3.22	7.99	14	.000***

***p<.001

Table 2: shows comparison of pre and post scores of SAFE in schizophrenia patient group using paired samples t test. Post scores of SAFE were significantly lower (p<.001) than the pre scores.

Table-3: Comparison of pre and post scores of Positive and Negative Syndrome Scale (PANSS) scores in schizophrenia patient group (N=15)

	Pre-Intervention	Post-Intervention	t	df	p
	Mean ± SD	Mean ± SD			
PANSS- Positive	7.73±1.10	7.13±0.35	1.96	14	.070
PANSS- Negative	11.20±3.51	8.67±2.92	3.71	14	.002**
PANSS- General Psy	20.07±2.74	18.00±2.17	4.20	14	.001**

**p<.01

Table 3: shows comparison of pre and post scores of PANSS scores in schizophrenia patient group using paired samples t test. Post scores of PANSS negative and general psychopathology scales were significantly lower (p<.01) than the pre scores. No significant difference in the scores over time with intervention was found in positive scale.

Table-4: Comparison of pre and post scores of WHO-Quality of Life (QOL) in schizophrenia patient group (N=15)

	Pre-intervention	Post-intervention	t	df	p
	Mean ± SD	Mean ± SD			
WHO-QOL	78.33±8.05	92.60±8.75	6.55	14	.000***

***p<.001

Table 4: shows comparison of pre and post scores of WHO-QOL scale in schizophrenia patient group using paired samples t test. Post scores of WHO-QOL were significantly higher (p<.001) than the pre scores.

Table-5: Comparison of pre and post scores of Self Esteem in schizophrenia patient group (N=15)

	Pre-Intervention	Post-Intervention	t	df	p
	Mean ± SD	Mean ± SD			
Self Esteem	22.13±1.73	24.13±1.55	9.16	14	.000***

***p<.001

Table 5: shows comparison of pre and post scores of self esteem in schizophrenia patient group using paired samples t test. Post scores of self esteem were significantly higher (p<.001) than the pre scores.

Table-6: Comparison of pre and post scores of Subjective Well Being in schizophrenia patient group (N=15)

	Pre-Intervention	Post-Intervention	t	df	P
	Mean ± SD	Mean ± SD			
Subjective Well Being	87.00±5.68	95.07±6.08	5.97	14	.000***

***p<.001

Table 6: shows comparison of pre and post scores of subjective well being in schizophrenia patient group using paired samples t test. Post scores of subjective well being were significantly higher (p<.001) than the pre scores.

IV. DISCUSSION

The present study found that vocational rehabilitation significantly improved patient's work behaviour. These findings are in accord with previous research (McGurk, 2003; Kumar, 2008; Lysaker et al., 2009). In a study by Hoffmann & Kupper (1996) documented that differences in work performance became obvious only after 2-3 months in the rehabilitation program (Hoffmann & Kupper 1996). Similarly, other earlier study reported, those participant who remained in the psychosocial program for at least one year experienced increase in work skills (Anthony, 1995). One possible explanation for this effect is simple instructions and monetary reinforcement were sufficient to increase performance on a measure of span of apprehension, a presumed trait marker of schizophrenia that is thought to be highly stable (Bellack, Gold, & Buchanan, 1999). However, these practice-related changes typically fall short of full normalization of performance and may not be long lived (Bellack, Gold, & Buchanan, 1999).

The present study observed that Vocational Rehabilitation significantly improved patient's socio adaptive functioning. These findings are in agreement with other earlier research's (Lysaker & Bell, 1995) indicate that participation in rehabilitation has been shown to improve the social Skills, cooperativeness, personal hygiene significantly over time (Lysaker & Bell, 1995; Bell & Bryson, 2001). Previous research has indicated that the ability to get along with others in the work place is a significant predictor of successful vocational functioning (Anthony & Jansen, 1984) and improved social functioning has been associated with a variety of clinical improvements including decreased likelihood of relapse (Benton & Schroeder, 1990). One possible explanation for this effect can be, being productive in a well defined worker role may have been intrinsically rewarding for participants and led to enhancements of self-esteem and self-confidence. These might have helped participants to overcome fears of rejection and more willingly socialize with co-workers. Secondly, our observations suggest that participants' job sites (sheltered workshop) expected appropriate social behaviour and encouraged (token economy) withdrawn participants to engage more openly in conversation (Lysaker & Bell, 1995).

In this longitudinal study we found that vocational rehabilitation showed reduce in patient's negative symptoms and general psychopathology. Our findings are in concordance with many earlier researches (Bell, Lysaker, & Milstein,1996; Torrey, Mueser, & Drake, 2000; Srinivasan & Tirupati, 2005; Kumar, 2008; Bio & Gattaz, 2011). In another study by Kilian et al. (2012) showed being in competitive work has a positive influence on the level of psychopathology in people with schizophrenia (Kilian et al., 2012). This finding's is also supported by some Indian studies a study by Ajmol (2001) documented a higher degree of overall functioning and reduce symptoms in rehabilitated patients compared to those not vocationally rehabilitated (Kumar and Mohanty 2013). This effect can be explained by the powerful role of work in organizing the lives of people in modern society. As stated by Di Masso et al. (2001) ''work requires people to concentrate on the tasks at hand while blocking out any distressing thoughts''((Kilian et al., 2012).

The Current study found significant improvement in the patient's quality of life after 6 months of vocational rehabilitation; this finding was consistent with earlier studies (Mueser et al., 1997; Browne, 1999; Drake et al., 1999; Torrey et al., 2000; Bryson et al., 2002; Prouteaua et al., 2005; Rosenheck et al., 2006; Bio & Gattaz, 2011). Participation in vocational rehabilitation program is associated with improvement in quality of life of the patients and was independent of the type of medication prescribed, illness duration. One possible explanation could be that, when the positive and negative symptoms decrease, the quality of life

increases which is accord with previous research (Romney, 1995). Vice versa it could be that improvement in vocational functioning are related with improvement in reduce symptoms (Bond et al., 2001).

In this 6 months study, scores on the Rosenberg self esteem scale changed over time and there was significant improvement in self esteem. Our study results are in accord with previous research (Drake et al., 1999; Salyers et al., 2004; Latimer et al., 2006 Lysaker et al., 2012) that has shown participation in vocational rehabilitation program is associated with improvement in self esteem of the patients. Furthermore, we have found that vocational rehabilitation significantly improved patient's subjective well being. These findings are in harmony with earlier research by Sing et al. (2010) evaluated 50 patients with chronic schizophrenia and documented improvement in subjective well being. In contrast, Iraurgi et al. (1999) studied 27 patients with schizophrenia and enrolled in a social and socio skill program which lasted for 6 months. The author reported that improvement in psychological well-being during the first 3 months, but diminished as time progressed. One possible explanation is that participants showed an improved self-awareness of own-daily-situation after 3 months, which they gained through the rehabilitation program, which has repercussions in their objective judgments about themselves (Iraurgi et al., 1999).

V. CONCLUSION

The present study confirms the essential role of vocational rehabilitation and Token economy in patients with chronic schizophrenia. It came in the right time, when there is no employment goal in the patients mind. Sheltered workshop provides a cooperative type of work environment and usually the work is repetitive and monotonous, patients initially required assistance from the sheltered work shop staff and also from the clinical psychologist in completing the given task. The patient all learned the skill of book binding during the 6 months. Token economy based on the principles of operant conditioning improved the patient's socio adaptive function. Non vocational domains such as quality of life, self esteem and subjective well being also showed improvement. Furthermore there was a decrease in negative symptoms and general psychopathology, indicates improvement in work performance and the success of the token economy program (Saleem et al., 2013). However, methodological limitations in study design need to be highlighted. Importantly, the lack of random assignment of patients adds considerable risk of selection bias to these findings. Bearing in mind the limited sample sizes, the absence of control data and only male participants restricts the generalisability of these findings (Browne 1999).

VI. LIMITATIONS

- Only instituonlaized patients from the institute were taken up for the study
- The study design did not include an control group
- All the patients were male
- The design lacks the randomization of the sample

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