Review Article

Token Economy for People With Severe Mental Illness: A Narrative Review of the Literature

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Conflict of interest

The authors declared no conflict of interest.

ABSTRACT

Background: People with chronic mental illness have long been rejected from society and lost their self-identity and self-efficacy due to individual obstacles, such as continuous negative symptoms, lack of motivation, or social obstacles, like stigma, which reduce their self-confidence and prevent them from engaging in healthy activity patterns. One of the behavioral therapy methods used to increase the motivation of people with severe mental illness is token economy.

Objectives: The purpose of this narrative review was to review and investigate the impact of the token economy on people with severe mental illness.

Methods: A search for studies published from 2002 to 2022 in PubMed and Google Scholar databases was conducted using the keywords "token economy", "token reinforcement", "contingency management", "severe mental disorder", "serious mental illness", "chronic psychiatric disorder", and "participation".

Results: In the initial search, 92 articles were obtained, and after reviewing and rejecting duplicates, 44 articles related to severe mental illness and token economy remained. Finally, 15 articles met the inclusion criteria and were selected for review. token economy can be an effective method in improving the performance of daily life activities, reducing the symptoms of mental illnesses and avoiding drugs, reducing alcohol consumption, and quitting smoking

Conclusion: token economy can be an effective method in improving the performance of daily life activities, reducing the symptoms of mental illnesses, drug abstinence, reducing alcohol use, and quitting smoking, but in reducing violence, the results of the studies were contradictory. It is recommended to carry out wider studies on the impact of the token economy method on the occupational performance and participation of chronic mental patients.

Keywords: Severe mental illness, Token economy, Motivation, Participation, Review

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↑ *What is "already known" in this topic:*

Token economy systems as behavior-management and motivational tools have been employed in residential, in patient, school, and correctional settings including severe mental illness since at least the early 1800s.

→ *What this article adds:*

For people with severe mental illness token economy can be an effective method alongside other therapies in improving performance of daily life activities, reducing symptoms of mental illness, and drug abstinence, reducing alcohol use and smoking secession.

Introduction

If a person has a recognizable mental, behavioral, or emotional disorder during the past year that leads to a significant functional impairment in one or more of his daily activities, he is called a chronic mental patient. The most common diagnoses of chronic mental disorders that cause serious impairment of occupational performance include schizophrenia spectrum disorders, bipolar disorders, and major depressive disorders. Psychological symptoms cause the deviation of mental, emotional, social, perception, cognitive, thinking, and motor functions, which are required to participate in daily activities and provide mental health to humans [1]. Lack of motivation changes lifestyle routines increases self-harming behaviors, and decreases mobility and physical activity leading to substance dependence, obesity, and following an unhealthy diet [2]. These people experience homelessness, lack of employment, arrest more than others, and cause huge economic and social costs to society. They also have a shorter life expectancy. The unwillingness of chronic mental patients to participate in daily activities has destructive effects on their autonomy and self-identity and reduces their quality of life. However, people with chronic mental disorders can still manage their chronic symptoms and engage in a healthy and meaningful life. Positive mental health is seen in people who participate in social and productive activities, face daily demands, and participate in society [1].

Assertive community treatment, supported employment, cognitive behavioral therapy, family-based services, token economy, skills training, psychosocial interventions for alcohol and substance use disorders, and psychosocial interventions for weight management are eight evidence-based interventions recommended for long-term hospitalizations or residential care where most people live with chronic mental illness. Among these, the token economy intervention has been effective in improving personal health, social interactions, and other adaptive behaviors related to daily life skills [3]. The token economy is an intervention based on social learning and operant conditioning, which is governed by the two principles of the law of effect and contiguity so that reinforcers are systematically used to reinforce positive behavior or eliminate negative behavior, Reinforcers are used systematically to reinforce positive behavior or eliminate negative behavior, and tokens that are simple, accessible, and affordable are considered immediate reinforcers conditioned on the performance of the behavior, and later, they are exchanged with back-up reinforcers [4]. Just like the economy in the world, where people receive a generalized conditional reinforcer of money in exchange for performing their job duties, which they later use to buy various desirable reinforcers, and with this hope, they continue to perform their duties to make money again and spend it and this cycle goes on [5]. Contingency management, which is similarly based on operant conditioning, is an intervention that reinforces appropriate behavior with vouchers or prizes or punishes deviant behaviors. This intervention has the largest effect on substance abuse management compared to other psychosocial treatments [6]. Another intervention, behavioral activation, deposits that increasing a person's activity and confronting him with the pleasant consequences of his action can increase positive behavior in that person [7].

In 2016, APA & Jansen. in a review article examined the impact of the token economy on the management of symptoms and behavior of people hospitalized in the psychiatric ward. They concluded that the token economy is effective in behavioral changes to reduce violence and aggression, but due to the lack of studies on the effect on negative symptoms, the effect of the token
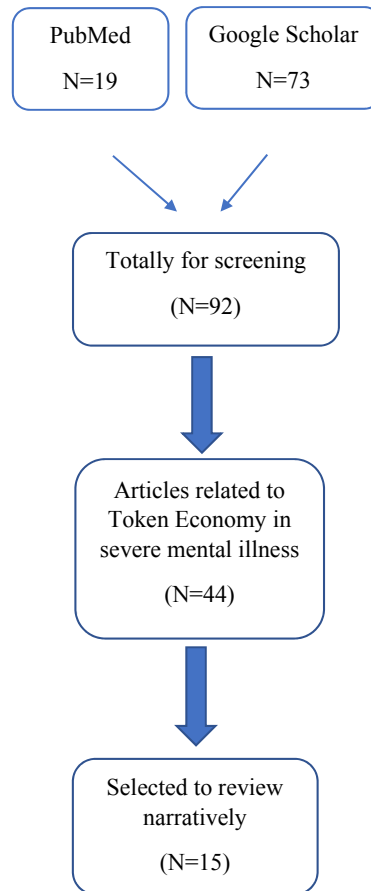
Figure 1. Included studies

economy on negative symptoms cannot be generalized. There is a need for more studies not only on the impact of the token economy on behavior but also on the participation of people with mental illness [8].

In this study, we tried to review the studies that investigated the impact of token economy intervention on people with chronic mental illness.

Materials and Methods

This study was conducted to review the studies related to token economy intervention in people with chronic mental illness.

Search strategy

In this study, a search was made in PubMed and Google Scholar databases using the keywords "token economy" OR "token reinforcement" OR "contingency management", AND "severe mental disorder" OR "serious mental illness" OR "chronic psychiatric disorder", AND participation in the articles published from 2002 to 2022.

Inclusion criteria

Controlled clinical trials, quasi-experimental studies with a pre-test and post-test design, pilot studies, and case reports that used behavioral reinforcement intervention in the form of token economy or approaches originating from token economy (contingency management and short-term behavioral activation) on people with severe mental illness were included to review.

Results

In the initial search, 92 articles were obtained. After reviewing and removing duplicates, 44 articles related to token economy in people with severe mental illness remained. However, 15 studies met the inclusion criteria and were selected for review (Figure 1). Table 1 summarized the study results.

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Table 1. A summary of the included studies

Author, Year	Kawaguchi et al. 2022 [9]	Yuping et al. 2021 [10]	Nasution et al. 2021 [11]	Syahdiba et al. 2021 [12]
Design	Single subject	RCT*	Quasi-experimental	Quasi-experimental
Setting, population	Home, schizophrenia	Inpatient, SMI*	Inpatient, SMI	Hospital, SMI
N	1	40	31	25
Intervention	Occupation-based therapy + behavioral reinforcement	occupational therapy under the MOHO* model + token economy	Token economy	Token economy
duration	34 weeks (baseline: 1st to 20th weeks + Intervention phase: 21st to 34th weeks)	Unknown	6 sessions	Unknown
Outcomes	Showering (assessing with COPM*), and participation in workshops based on the ADL* checklist	Working ability (MOHO-ST*, NOSIE-30*, SANS*, ADL)	Personal Hygiene Questionnaire (bathing, dressing up, eating, and toileting)	Level of Self-care Ability (bathing, dressing, decorating, eating, toileting)
Result	The number of attendances per week and working time in the workshop increased. The frequency of bathing per week increased significantly in the intervention phase compared to the baseline phase. Although the bathing performance score and satisfaction score in the COPM assessment decreased from 10 and 9 to 6 and 4	After treatment, the SANS score of the intervention group decreased and the score was lower than that of the control group; the ADL score of the intervention group decreased, the total positive factor score of NOSIE-30 was higher than that of the control group, and the total negative factor score was lower than that of the control group	The use of economic tokens was found to improve the ability of patients to carry out personal hygiene, with a mean difference of 1.19 after the token economy intervention	Token economy significantly affected self-care ability.

Author, Year	Meyeres et al. 2018 [13]	Hopko, 2003 [7]	McDonnell, 2014 [14]	Ramakrishnan et al. 2014 [15]
Design	Quasi-experimental	RCT	RCT	Single subject
Setting, population	Prison, SMI	Outpatient, SMI	Outpatient, SMI	Occupational therapy department, schizophrenia
N	58	79	126	1
Intervention	Contingency management, psychotherapy, and group and individual psychoeducational counseling	ethyl glucuronide-based Contingency management	Contingency management	Occupational therapy (scheduling activities: ping pong and walking exercise) + token reinforcement
Duration	1 year, 30 days for step one, at least 30 days for step two, and 30 days for step three (based on participants' acuity level)	A 12-week intervention (EtG-negative samples three times a week) and 3 months of follow-up	12 weeks (urine and breath samples three times per week)	Therapy sessions were one hour in the morning, two hours in the evening/Day, and 24 hours/week for 12 Weeks

Author, Year	Meyeres et al. 2018 [13]	Hopko, 2003 [7]	McDonnell, 2014 [14]	Ramakrishnan et al. 2014 [15]
Outcomes	AIMS* to record inmate's mental health history, risk of suicide or self-harm, number of protective custody requests, step reductions according to Arizona Department of Corrections, program refusals, number of visits, list of minor or major violations acquired over the entire length of the inmate's prison stay, drug violations, number of assaults on staff, and number of assaults on inmates, was used	Alcohol, drug, and cigarette use (EtG*-negative urine samples), psychiatric symptoms, HIV* risk behavior (self-report), and treatment attendance	Psycho-stimulant on cigarette smoking (Rates of smoking-negative carbon monoxide breath-samples)	Catatonic features (clinical features of stupor, waxy flexibility with mute behavior and not listening to family members and the hospital staff, poor self-care, poor physical activity, poor communication, and poor socio-occupational functioning)
Result	The number of requests for custody and supervision decreased and drug and substance abuse reduced. The number of visits increased, but mental health scores slightly increased due to minor violence.	Contingency management participants were 3.1 times more likely to submit an EtG-negative urine test, attaining nearly 1.5 weeks of additional abstinence, lower mean EtG levels, less drinking, and fewer heavy drinking episodes, more likelihood of submitting stimulant-negative urine and smoking-negative breath samples, relative to controls.	Individuals who received CM* targeting psycho-stimulants were 79% more likely to submit a smoking-negative breath sample and longer abstinence periods relative to controls.	After therapy sessions, the client started initiation in smiling face, self-care, and the simple task and also prevented pre-occupation.

Author, Year	McDonell, 2013 [16]	Kokaridas et al. 2013 [17]	Gholipour et al. 2012 [18]	Adams et al. 2012 [19]
Design	RCT	Pilot study	RCT	Case report
Setting, population	Outpatient, SMI with stimulant dependence	Residential, schizophrenia	Hospital, schizophrenia	Outpatient, schizophrenia, alcohol dependence, and cocaine dependence
N	176	30	45	1
Intervention	Contingency management	Economy system program and physical activity	Token Reinforcement Therapeutic Approach	Contingency Management
Duration	three-month treatment (3 urine tests submitted per week, for 12 weeks) and three-month follow-up	8 weeks, three training sessions per week, each session 45 minutes	two-hour sessions, three sessions a week, for three months	3 months (reward exchange occurred weekly)
Outcomes	stimulant drug abstinence and use of other substances (urine test), psychiatric symptoms and HIV-risk behavior, and inpatient service utilization based on self-report and clinician report	SF-36* Quality of Life Questionnaire	Comparison of the token economy and exercise effect on negative symptoms (scale for the assessment of negative symptoms (SANS))	weekend admissions, outpatient attendance, drug screens
Result	Contingency management groups were 2.4 times more likely to submit a stimulant-negative urine test during treatment. They experienced significantly lower levels of alcohol use, injection drug use, and psychiatric symptoms, and were five times less likely than the control group to be admitted for psychiatric hospitalization.	Token economy and physical activity group experienced fewer problems with daily activities and felt more energetic and vigorous leading to an improved mental component score.	Analyses showed that the token reinforcement approach was highly and significantly more effective than exercise for reducing negative symptoms in schizophrenic patients.	The contingency management intervention marginally reduced unnecessary hospital admissions, resulting in cost savings to the medical center of over $5,000 in three months for this individual. However, contingency management did not affect outpatient attendance and drug use.

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Author, Year	Park et al. 2012 [20]	Hopko et al. 2003 [7]	LePage et al. 2003 [21]
Design	Quasi-experimental	Pilot study	Follow-up after two years
Setting, population	Inpatient, SMI	Inpatient, major depression disorder	acute psychiatric unit, chronic mental illness, severe personality disorders, and dual diagnoses
N	44	25	Average monthly admission per month in the follow-up = 23
Intervention	Short-Term token economy	BATD*	Token economy
Duration	8 weeks (sticker was provided if the aggressive behaviors were not observed for 24 hours)	three times per week for approximately 20 minutes, for 2 weeks or until discharge	2 years
Outcomes	Severe Violent and Aggressive Behavior (verbal attack, property damage, and physical attack assessed with Overt Aggression Scale)	Comparison of depression symptoms (Beck Depression Inventory) between the BATD group and supportive psychotherapy (SP) group	staff injuries from patients and intentional patient-to-patient injuries that required any form of medical attention
Result	The aggressive behavior scores for verbal attack decreased from 87% to 63% and physical attack and property damage decreased from 91% to 87% in the experimental group, while those of the control group showed an increase in scores after eight weeks.	Patients who received BATD exhibited decreases in their mean BDI score from 35.1 at pretreatment to 19.1 at posttreatment, which was significantly greater than the change observed among patients in the SP group. The effect size for this sample was large (d = .73), suggesting that the difference between the treatment groups was clinically meaningful, despite the limited sample size.	Results showed a significant reduction in total assaults as well as fewer staff injuries resulting in loss of working time.

*RCT: Randomized clinical trial, SMI: Severe mental illness, MOHO: Model of human occupation, COPM: Canadian occupational performance measure, ADL: Activities of daily living, MOHO-ST: Model of human occupation- short form, NOSIE-30: The nurse`s observation scale for inpatient evaluation, SANS: Scale for the assessment of negative symptoms, AIMS: Adult inmate management system, EtG: Ethyl glucuronide, HIV: Human immunodeficiency virus, CM: Contingency management, SF-36: 36-Item short form questionnaire, BATD: Brief Behavioral activation treatment for depression

Participants

People with severe mental illness, schizophrenia, bipolar disorder, anxiety, and major depression, as well as people with substance abuse co-occurring with severe mental illness in the contexts of inpatient in hospital or residential settings, outpatient, home, and prison, were examined. The age range of participants was 17-81 years and most of them were in their late 40s and early 50s. The sample size of the articles ranged from 1 to 176, and the number of male participants was more than female counterparts (67%).

Interventions

In the reviewed studies, first, the target behaviors that should be developed and maintained or removed were determined. Then, the type of token and backup reinforcer was determined, which is desirable for the client.

The quality and quantity of the person's performance, for which tokens are awarded, is stated. The program for producing and exchanging tokens was developed in a time-based or response-based manner, and the number of tokens required for exchange with the desired backup reinforcer was determined. Behavioral interventions in the form of token economy, contingency management, and short-term behavioral activation based on the principles of token economy, alone or combined with psychotherapy intervention, occupation-based intervention, psychoeducation, and individual counseling were implemented.

Outcomes

The examined results included self-care skills, such as bathing, dressing, eating, hygiene, grooming, toileting [9-12, 17], reducing alcohol use [6], drug absti-

nence, and smoking secession [13, 14, 19], symptoms of diseases, such as catatonia [15], negative symptoms of schizophrenia [18], depression [7], and violence and aggression [13, 20, 21].

Discussion

Token economy is a behavioral modification system based on operant conditioning, which modifies and shapes behavior using worthless tokens that can be exchanged for valuable reinforcers as an external motivator for clients who are unmotivated and should be hospitalized. This method can increase patients' participation in treatment by increasing their motivation [22].

According to the mentioned studies, the impact of the token economy on the symptoms of diseases, occupation, drug and alcohol abstinence, smoking cessation, and violence has been investigated [7, 9-21] In the basic daily life activities, Token economy alone [11, 12, 17] or in combination with occupation-based interventions [9] and occupational therapy based on the MOHO model [10] showed significant changes in bathing, dressing, toileting, eating, and grooming of people with severe mental illness compared to other interventions implemented for the control groups.

Regarding mental illness symptoms, the short-term behavioral activation intervention showed a significant reduction with a high effect size compared to other interventions in the control group [7]. Gholipour et al. (2012) concluded that the token economy is more effective than exercise in reducing the negative symptoms of schizophrenic patients [18]. The combined interventions of token economy and activity-based occupational therapy reduced the symptoms of catatonia in a schizophrenic patient and occupational therapy based on the Moho model showed a reduction in the symptoms of depression and psychosis in chronic mental patients [10, 15]. McDonnell et al. (2013) suggested that contingency management along with abstinence from drugs, can reduce the psychological symptoms of addicts with co-occurring severe mental illness [16].

The results obtained in violence and aggression are contradictory. Park and Lee (2012) stated that the token economy caused a significant reduction in aggression in the form of verbal and physical attacks and property damage compared to the control group, which showed an increase in these behaviors [20]. In LePage et al.'s study (2003) on psychiatric patients hospitalized in the acute ward, harm to other patients and the severity of harm to staff decreased significantly, but no significant

changes were found in self-harm behaviors and frequency of harm to staff [21]. Meyers et al. (2018) assessed chronically mentally ill prisoners and showed that minor violence, including failure to maintain grooming requirements, being out of place, littering, clowning, smoking, or the use of tobacco in an unauthorized area increased with contingency management intervention [13].

The contingency management intervention, which is implemented with the aim of drug abstinence, smoking, and alcohol use reduction for addicts with severe mental illness, caused more abstinence in the intervention group than the control group in alcohol usage, smoking, and psycho-stimulant drugs. The period of abstinence from alcohol and smoking was maintained longer in comparison to the control group [6, 13, 14, 16]. The only study by Adams et al. (2012) on the schizophrenic soldier with alcohol and cocaine abuse did not show this effect, which according to the authors' statement, abstinence behavior was not their direct goal [19].

Using the token economy method can be a means to reduce the symptoms of mental illness and drug abstinence and improve performance in the basic daily living activities of people with chronic mental illness. This method increases the client's life skills and independence by improving the motivation to participate in functional activities and causes reorientation of the lost sense of identity and self-efficacy due to the occurrence of the disease, which leads to improvement of the client's quality of life. However, the correct implementation of this method is very important, and if the principles are not followed, it may be misused and undesired behaviors may be reinforced [19].

Considering that only five of the 15 reviewed studies were randomized clinical trials mostly on drug abstinence, it is recommended that higher quality research be done on basic activities of daily living, mental psychological symptoms, and violence management. Also, the ability to maintain the results obtained from the intervention and transfer them to society should be investigated. For violence management, the necessary changes in the protocol implementation should be considered to increase the motivation to make the token economy more effective. It is also recommended to conduct wider studies on the effect of this method in combination with other interventions on occupational performance and mental illness symptoms.

Conclusion

The review of studies in this research supports the effectiveness of the token economy in improving self-

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care activities, reducing disease symptoms, and smoking, alcohol, and drug abstinence in people with chronic mental illness. However, the effect of this method on the management of violence has not been achieved. This reward-based approach should be considered by practitioners who work with people with mental illness to improve adaptive behavior and performance in everyday life. During the implementation of the token economy method, the client-centered approach should be considered to recover from the client's point of view [9]. because there have been few studies on the impact of the token economy on basic daily living activities, disease symptoms, and violence, the results indicated the need for higher-quality research on these factors and the occupational performance of people with chronic mental illness.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Authors' contributions

Conceptualization and supervision and methodology: Elahe Hojati Abed and Mitra Khalafbeigi; Investigation, writing-review & editing and writing original draft: Fatemenh Ghojoghi.

Conflict of interest

The authors declared no conflict of interest.

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مقاله مروری

اقتصاد ژتونی برای افراد با اختلالات روانی مزمن: مروری حکایتی از مطالعات

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چکیده

مقدمه افراد با بیماری روانی مزمن به دلیل موانع فردی مانند علائم مستمر منفی و فقدان انگیزه، یا موانع اجتماعی مانند استیگما که باعث کاهش خودباوری در الگوهای فعالیتی سالم می‌شود، مدت‌هاست که از جامعه طرد شده‌اند و هویت خود را از دست داده‌اند. یکی از روش‌های رفتاردرمانی که برای افزایش انگیزه افراد با بیماری روانی مزمن استفاده می‌شود، اقتصاد ژتونی است. هدف از این مطالعه مرور حکایتی، مرور و بررسی تأثیر اقتصاد ژتونی بر افراد با بیماری روانی مزمن بود.

مواد و روش‌ها جست‌وجوی مطالعات در پایگاه‌های اطلاعاتی گوگل‌اسکالر و پابمد با استفاده از کلیدواژه‌های «اقتصاد ژتونی»، «تقویت ژتونی»، «کنترل وابستگی»، «اختلال روانی مزمن»، «اختلال روانی شدید»، «بیماری روانی مزمن» و «مشارکت» در بازه زمانی ۲۰۰۲ تا ۲۰۲۲ صورت گرفت.

یافته‌ها در جست‌وجوی اولیه ۹۲ مقاله به دست آمد که پس از بررسی و رد موارد مشابه، ۴۴ مقاله مرتبط با اختلال روانی مزمن و اقتصاد ژتونی باقی ماند. درنهایت، ۱۵ مقاله با معیارهای ورود همخوانی داشت و برای مرور انتخاب شد.

نتیجه‌گیری نتایج به‌دست‌آمده از مطالعات نشان می‌دهد اقتصاد ژتونی می‌تواند در زمینه فعالیت‌های روزمره زندگی، علائم بیماری روانی و کنترل سوءمصرف مواد، الکل و سیگار تأثیرگذار باشد؛ اما در زمینه کنترل خشونت نتایج مطالعات متناقض بودند. توصیه می‌شود مطالعات گسترده‌تر و با کیفیت بالاتر جهت بررسی تأثیرگذاری روش اقتصاد ژتونی بر عملکرد اجرایی و مشارکت بیماران روانی مزمن صورت گیرد.

کلیدواژه‌ها:

بیماری روانی مزمن، اقتصاد ژتونی، انگیزه، مشارکت، مرور

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