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Original Article

Reliability and Validity Study of Life Balance Inventory in Schizophrenia

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Abstract

Objectives: Managing daily routines and life balance is difficult for people diagnosed with schizophrenia. It is important for professionals who wish to intervene to have assessment and intervention tools. This study examines the reliability and validity of the life balance inventory (LBI) for assessing life balance in individuals with schizophrenia.

Methods: A sample of 52 patients (aged 26–64) from a community mental health center participated. Construct validity was evaluated through factor analysis, and reliability was assessed through test–retest and internal consistency analyses.

Results: Significant correlations were found between LBI subscales and measures of psychopathology, with moderate correlations for the health subscale and strong correlations for the relationships, identity, and challenge/interest subscales. Internal consistency was satisfactory, with Cronbach's alpha ranging from 0.695 to 0.842, and test–retest reliability was high (r=0.89).

Conclusion: These findings support the LBI as a valid and reliable tool for occupational therapy interventions in schizophrenia.

Keywords: Life balance inventory, performance patterns, reliability, schizophrenia, validity.

Schizophrenia has a profound impact on people's daily lives, causing challenges in organizing daily routines and participating in meaningful activities. These challenges result in complex time use patterns, frequent social isolation, and impaired role and occupational performance. [1] Research has shown that people with schizophrenia often spend more time in passive activities, with social engagements typically initiated by others, and struggle to maintain a balanced daily routine. These patterns can have a negative impact on well-being and life satisfaction.[2,3]

Life balance, defined as the perception of having the right amount and type of activity, is essential for health and well-being.[4] Occupational therapists emphasize life balance as harmony in activities that are aligned with personal values and interests.[5] It is associated with functional daily routines, a meaningful variety of activities, social interaction, and community participation, all of which are essential for people with mental disorders.[6,7] For people with schizophrenia, a balanced activity routine supports improvements in illness insight, participation in physical and social activities, and management of side effects. Occupational therapists therefore have a crucial role to play in helping patients to re-engage in meaningful daily activities and to explore new ways of using their time productively.[8,9]

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The life balance inventory (LBI), developed by Matuska, measures the perceived balance of daily activities across four subscales: health, relationships, identity, and challenge/interest.[10] It has been validated in a variety of populations, including healthy people,[11] people with multiple sclerosis,[12] and people with chronic stroke.[13] These studies found moderate to strong correlations between the LBI subscales and quality of life measures, demonstrating its utility in assessing life balance. In Türkiye, the LBI has been adapted and validated for healthy populations.[11] However, its use in patients with schizophrenia remains underexplored.

This study aims to adapt and validate the LBI for individuals with schizophrenia in the Turkish community. Given that schizophrenia causes significant occupational and social dysfunction, understanding life balance in this population is critical. By confirming the reliability and validity of the LBI, this research will provide occupational therapists with a culturally sensitive assessment tool to analyze life balance and design tailored interventions to improve the well-being of people with schizophrenia in Türkiye.

Materials and Methods

The study was conducted in a local community mental health center, and approval was obtained from the hospital management. The assessment of individuals was carried out in accordance with ethical procedures. The interviews were conducted in the interview rooms of this center, in a quiet environment away from distracting stimuli. People with a diagnosis of schizophrenia and their caregivers were interviewed in the interview rooms and given detailed information about the research. People who volunteered were invited to take part in the study.

The Turkish version of the LBI used in this context was first developed and administered to healthy adults in Turkish society.[11] The scale was checked to ensure the applicability of the inventory to people with schizophrenia. A group of experts in the field of mental health, consisting of two occupational therapists, a psychiatrist, and a psychologist, evaluated the suitability of the inventory. Comprehensibility was considered so that the items on the inventory could be understood by the patients. No changes were made to any of the items, as the applicability of the original inventory items to patients with schizophrenia was accepted. No items were added or deleted. In the research, the validity of the current inventory was tested using the construct validity method. Construct validity tests the result obtained from a scale and the factors related to the result. The reliability of the

scale was assessed using the test–retest method and the calculation of Cronbach's alpha coefficient. This reliability coefficient indicates the consistency between the items in a measurement tool and the ability of the items to measure the variable to be measured.[14] Factor analysis was used to assess the construct validity of the LBI. Principal component analysis was used as the extraction method to identify the underlying dimensions of the inventory. Factor analysis revealed distinct clusters of items that corresponded well with the predefined subscales of the LBI, supporting its construct validity. Items contributing significantly to each factor were identified and reported. Items with weaker contributions were noted but retained as they still provided valuable insight into specific areas of activity. This approach provided a comprehensive understanding of the dimensionality of the inventory and contributed to the validation of its construct. All the data obtained from the research carried out using these methods has been recorded.

Participants

The sample size was calculated using G*Power software and construct validity, test-retest reliability, and internal consistency analysis methods were taken as reference. [15–17] The power analysis resulted in a sample size of 47 with a significance level of 0.05, an intraclass correlation coefficient of 0.90, and a power assumption of 90%. For the study group, all people with schizophrenia (n=68) who sought treatment at the hospital's community mental health center and who met the study criteria were informed about the study and invited to participate. Informed consent forms were read and signed separately by both people with schizophrenia (n=59) and their relatives who volunteered to participate in the study. Participants (n=7) who did not give consent were excluded from the study. Inclusion criteria were meeting DSM-V diagnostic criteria for schizophrenia, being in regular medical treatment, scoring 75 and below on the positive and negative syndrome scale (PANSS), scoring a maximum of 5 points on the clinical global impression (CGI) scale, and being between the ages of 18 and 65. Patients with a diagnosis of intellectual disability, who were in a period of active illness and who were illiterate were excluded from the study.

Measurements

Demographic characteristics of the individuals such as age and gender were recorded with a form prepared by the researchers. Clinical psychopathology evaluations of the individuals were assessed by a psychiatrist using PANSS

and CGI scale. In addition, activity patterns and life balance were assessed and recorded with LBI. The assessments were conducted in a quiet environment without distracting stimuli, and all data were recorded. The research was initiated after ethical approval and the whole process took about 8 months to complete.

Sociodemographic data form

A form was designed by the researchers to record the demographic data of the individuals. This form recorded information such as age, sex, educational level, and marital status.

PANSS

The PANSS is a semi-structured interview. It is a 7-item assessment tool that measures 30 symptoms common to schizophrenia and other mental disorders. The scale consists of 30 items and these items define 30 symptoms. Each item is scored from 1 (no symptoms) to 7 (very severe). The total score obtained from 30 items is defined as the PANSS total score and ranges from 30 to 210 points. Both the PANSS positive and PANSS negative subscales consist of 7 items each and their scores are obtained by scoring 14 out of 30 PANSS items. The scores of both subscales range from 7 to 49. The third subscale, PANSS General Psychopathology Score, includes 16 of the 30 PANSS items and the score range is 16–112.[18] The scale is adapted to Turkish culture.[19]

CGI scale

It is a scale for the general assessment of improvements in the symptoms of a disease or the severity of the disease. The clinician rates the degree of improvement or the severity of the illness from 0 (not ill) to 7 (most severely ill) based on his/her general experience with the illness in question. 1 – normal, not ill; 2 – borderline ill; 3 – mildly ill; 4 – moderately ill; 5 – markedly ill; 6 – severely ill; and 7 – most severely ill.[20]

LBI

The LBI measures the match between desired and actual time use across four subscales: health, relationships, identity, and challenge/interest. It assesses whether individuals engage in certain activities and how well their time use matches their preferences, scoring life balance from very unbalanced (1.0) to highly balanced (3.0). With 53 items, it provides insight into activity patterns and helps occupational therapists assess and improve patients' well-being. The LBI, adapted for Turkish culture, is also a useful tool for promoting satisfying activity patterns.[11]

Data Analysis

The data collected through the LBI was analyzed using the Statistical Package for the Social Sciences version 25.0. To evaluate data normality, the Shapiro–Wilk test was applied, with statistical significance set at $p<0.05$. Continuous variables were summarized using the mean (M) and standard deviation, whereas categorical data were expressed as frequencies and percentages. The validity of the LBI was examined by considering both internal and structural validity aspects. Internal validity was assessed using a bidirectional random correlation coefficient to determine the relationships between subscales. Cronbach's alpha was employed to evaluate internal consistency, while Pearson's correlation coefficient analysis was conducted for item-level analysis. In addition, confirmatory factor analysis was performed to validate the structural model. Pearson correlation coefficient was used for item analysis and independent t-test for item discrimination.

Ethical Approval

The study was evaluated bu the Hacettepe University Non-interventional Clinical Research Ethic Committee and was approved with the application number GO 19/779. The assessment tools used are instruments available to professionals working in the field. All participants read and signed the informed consent form. All procedures performed were in accordance with the ethical standards of the national research standards and the Helsinki Declaration of 1964 and its subsequent amendments.

Results

Descriptive Statistics of Participants

The study was completed with 52 individuals diagnosed with schizophrenia. The age range of people with schizophrenia in this study was wide. The youngest participant was 26 years old, the oldest was 64 years old and the mean age was 44.71±9.36 years. Other demographic characteristics are shown in Table 1.

Psychopathology assessments of the individuals indicated that they were all moderately ill, with symptoms of moderate severity (Table 2).

People with schizophrenia were the most likely to participate in activities related to LBI health (86%). While the participation rate was approximately the same for the LBI identity (58%), and LBI relationships (53%) subscales, the participation rate was lowest for the LBI challenge/interest subscale (39%).

Table 1. Demographic findings of the participants

Demographic variables	n	%
Gender		
Female	15	28.8
Male	37	71.2
Marital status		
Single	32	61.5
Married	20	38.5
Working status		
Working	4	7.7
Not working	48	92.3
Education level		
Primary school	10	19.2
Secondary school	5	9.6
High school	32	61.5
Bachelor's degree	5	9.6

n: Number of patients.

Table 2. Psychopathological findings of participants

	Mean±SD	Min-max
Clinical global impression scale	3.27±1.21	1–5
PANSS		
PANSS negative	16.44±6.07	7–30
PANSS positive	11.65±4.82	7–25
PANSS general psychopathology	28.09±8.26	16–28
PANSS total	56.17±16.52	30–103

SD: Standard deviation, min: Minimum, max: Maximum, PANSS: Positive and negative syndrome scale.

Table 3. Life balance inventory findings of participants

Sub-scales	Mean	SD	n
Health	2.23	0.36	52
Relationships	1.13	0.47	52
Identity	1.36	0.4	52
Challenge/Interest	0.75	0.37	52

According to the LBI scoring system, a score range of 1.0–1.5 indicates "very unbalanced," 1.5–2.0 indicates "unbalanced," 2.0–2.5 indicates "moderately balanced," and 2.5–3.0 indicates "very balanced" daily life. These ranges indicate that people have a very balanced participation in self-care activities in the health subscale. It can be assumed that they have a daily routine that is not balanced in the identity and relationships subscales and not balanced at all in the challenge/interest subscale (Table 3).

Result of Internal Validity

According to the total scores obtained from the LBI, the LBI was found to have a moderate correlation with the LBI health subscale, a high correlation with the LBI relationships and LBI Identity subscales, and a very high correlation with the LBI challenge/interest subscale. Correlations between subscales and the inventory indicate how well the subscales represent the main construct being measured. A high correlation indicates that the subscale is consistent with the overall scale and measures the same conceptual construct. A low correlation indicates that the subscale does not adequately represent the overall structure of the scale and may be measuring an independent construct. Moderate and high correlations between the LBI and its subscales indicate that the subscales are valid and reliable for assessing the domains of activity they represent.

The LBI was reported to correlate negatively with the PANSS negative subscale at a moderate level and negatively with the PANSS positive subscale at a very weak level. The LBI has been reported to correlate negatively and weakly with the PANSS general psychopathology and the PANSS total. There is a moderate negative correlation between the LBI and the CGI. These correlations indicate that the scales are related but do not measure the same construct. Demographic characteristics such as age, gender, educational level, and employment status of individuals did not have a significant relationship with life balance (Table 4).

When factor analysis was carried out on the original form of the inventory, it was found that some items

Table 4. Internal validity findings

	LBI health	LBI relationships	LBI identity	LBI difficulty/ interest	PANSS negative	PANSS positive	PANSS general psycho-pathology	PANSS total	Clinical global impression scale
LBI total									
r	0.563**	0.727**	0.795**	0.804**	-0.456**	-0.195	-0.342*	-0.385**	-0.405**
p	0.000	0.000	0.000	0.000	-0.001	-0.167	0.013	-0.005	0.003

LBI: Life balance inventory, PANSS: Positive and negative syndrome scale.

Table 5. Factor analysis results

Item	Item no	Factor loadings
Making art	40	0.734
Doing housework	33	0.589
Relaxing	4	0.576
Doing outdoor activities (hunting and fishing)	27	0.538
Sewing/needlework	42	0.525
Taking care of children or family members	14	0.524
Composing, writing, (music, poetry, etc.)	47	0.513
Doing things with spouse/significant other	12	0.449
Having an intimate sexual relationship	15	0.442
Making music	39	0.441
Participating in traditional rituals, holidays	22	0.407
Participating in groups (clubs, classes. etc.)	16	0.404
Playing games of skill (cards, electronics, etc.)	49	0.403

contributed significantly to the subscales: health (item 4); relationships (14, 12, 15, and 16); identity (33 and 22), and challenge/interest (items 40, 27, 42, 47, 39, and 49). Some items may contribute less to the inventory than others. However, it is not appropriate to remove these items as each item, i.e., each activity, can be individually valuable to the overall scale. The items with the highest factor loadings are shown below (Table 5).

Reliability Results with the Test-Retest Method

The alpha reliability coefficient was used to assess internal consistency. To assess the internal consistency of the LBI, the total inventory score and Cronbach's alpha coefficient for each subscale were calculated. The internal consistency coefficients for the subscales were as follows health (α=0.706), relationships (α=0.695), identity (α=0.723), and challenge/interest (α=0.723). The overall Cronbach's alpha coefficient for the inventory was α=0.842. These results indicate that the scale has a high degree of internal consistency, which supports its reliability (Cronbach's alpha of the original scale was 0.939). The high Cronbach's alpha coefficient confirms that the items in the scale consistently measure the same construct. This consistency ensures that the scale will produce stable and reliable results on repeated administration, thus confirming its suitability for the intended measurement purpose.

A retest was conducted to determine invariance over time. In the retest, the people who took part in the study were given a second assessment 8–10 days later. When the data from the first and second applications were analyzed, the correlation coefficient was found to be 0.89. These results show that the internal consistency and time

invariance of the LBI are high. These results show that the inventory gives similar results when used at different times. It also shows that the inventory is reliable and that the measurements have validity.

Discussion

People with schizophrenia often experience functional impairment in daily activities, which can prevent them from participating and engaging in these activities. Difficulties in organizing daily routines often lead to ineffective time management, highlighting the important relationship between life balance and time use.[21] Participation in activities and satisfaction with the time spent on activities are known to be closely related to well-being and life balance. National policies that are being planned with reference to this important issue for occupational therapists argue that changes to the routines of people diagnosed with schizophrenia will support their well-being. [22,23] To do this, it is important for occupational therapists to have measurement tools that assess the relationship between life balance and time use. The inclusion of the LBI in the assessment and measurement tools used by occupational therapists in the national context will be useful in providing more comprehensive assessments and supporting intervention plans.[24,25] The cultural adaptation of the LBI for people with schizophrenia involved review by a multidisciplinary panel to ensure the appropriateness and use of the instrument for this center. No items were added or deleted but were reviewed for comprehensibility and clinical applicability to individuals.

In our study, validity assessment included examining the internal consistency and contribution of items to the scale, as well as construct validity. Construct validity was assessed by correlating the inventory with psychopathological assessments. Internal consistency and test–retest procedures were used to assess the reliability of the inventory. The emphasis on internal consistency and reliability underlines the universal applicability of the inventory across different cultures. The results of the validity and reliability assessment of the LBI show that this inventory is suitable for assessing people diagnosed with schizophrenia in our country.

The moderate-to-low correlations observed between the health subscale of the (LBI) and PANSS scores provide an opportunity to explore the relationship between life balance and psychopathology. These findings may indicate that the health subscale captures dimensions of life balance that are relatively independent of the psychopathological symptoms measured by the PANSS, reflecting the

multidimensional nature of health and well-being in people with schizophrenia. However, this interpretation warrants further investigation, as such correlations may also indicate areas where the subscale could be refined to increase its sensitivity or alignment with other constructs. The adaptation of the LBI to the Turkish context, ensuring its cultural sensitivity while retaining its original structure, enhances its utility for clinical practice. This adaptation underlines the importance of using instruments that resonate with the cultural values and activity patterns of the target population. For example, the high correlation observed in the relationships subscale may reflect the importance of social and family roles in Turkish culture, a factor that occupational therapists need to consider when developing intervention plans.

The LBI calculates a total score for all items and this score provides information about life balance. The subscales of the inventory help to identify the problems experienced by individuals in different areas of activity performance.[26] For example, if an individual is not satisfied with maintaining personal hygiene or participating in social activities, the occupational therapist can tailor the intervention plan accordingly.[27] In this sense, the fact that the inventory includes different performance areas and has broad activity categories offers significant advantages.

To sum up, life balance is a concept characterized by a satisfactory arrangement of daily activities that are meaningful, healthy, and sustainable within the context of an individual's current life circumstances. It aims to promote integrity, well-being, and health and serves as a link between these core concepts. The concept of life balance and related research has received considerable attention in the literature. However, occupational therapists in Türkiye still lack adequate tools to assess the life balance of people diagnosed with schizophrenia. The results of this study confirm that the (LBI) is a reliable and valid instrument for assessing life balance. It is anticipated that this inventory will serve as a valuable and practical resource in occupational therapy practice. Occupational therapists can use the LBI to identify specific areas of imbalance in clients' daily routines and tailor interventions accordingly. For example, the strong correlations between the identity subscale and overall life balance suggest that promoting activities that are consistent with personal values and roles can significantly improve well-being. Similarly, the ability to assess life balance across multiple domains allows therapists to address complex needs comprehensively, supporting not only symptom reduction but also the promotion of meaningful and fulfilling lives.

Although the sample size in this study was determined by power analysis to ensure statistical robustness, it is important to acknowledge its limitations in terms of generalisability. The relatively small sample, drawn from a specific community mental health center, may not be fully representative of the wider population of people with schizophrenia. Future research should aim to include larger and more diverse samples to increase the external validity and applicability of the findings across different settings and demographic groups.

Conclusion

This study validates the LBI as a reliable and culturally adapted tool for assessing life balance in people with schizophrenia in Türkiye. With strong internal consistency, high test–retest reliability, and significant correlations with psychopathological measures, the LBI effectively identifies activity imbalances to guide tailored occupational therapy interventions. Future research could explore the applicability of the LBI in other mental health conditions, such as bipolar disorder or depression, to assess its broader utility. In addition, testing the inventory in larger and more diverse samples could improve its generalizability and provide further insight into its psychometric properties across different populations and settings.

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