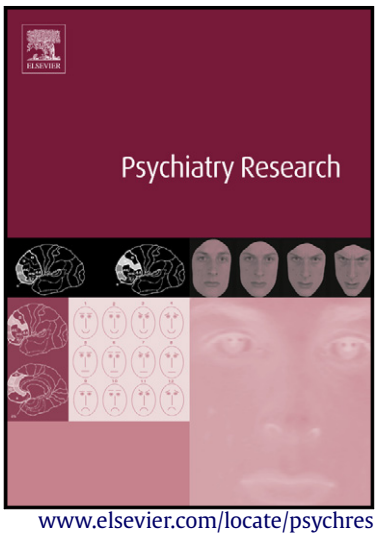

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PSYCHIATRY RESEARCH

Test-retest reliability, feasibility and clinical correlates of the Eurofit test battery in people with bipolar disorder

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Abstract

The physical health of people with bipolar disorder is poorer in comparison to the general population, with an increased prevalence of cardiovascular and metabolic diseases. Due to the established beneficial effects, there is growing interest in the promotion of physical activity and in particular the accurate measurement of physical fitness in this population. Currently, no existing measures of physical fitness used in the general population have been tested for validity and reliability among people with bipolar disorder. Therefore, we examined the reproducibility, feasibility and correlates of the Eurofit test battery in people with bipolar disorder. From 24 men (43.0±13.0 years) and 22 women (43.9±10.2years) with bipolar disorder two trials of the Eurofit test, administered within three days, were analyzed. All Eurofit items showed good reproducibility with intraclass correlation coefficients ranging from 0.71 for the whole body balance test to 0.98 for the handgrip force test. Significant correlations with Eurofit test items were found with age, illness duration, body mass index, smoking behaviour, mean daily lithium dosage, and depressive and lifetime hypomanic symptoms. The current study demonstrates that the Eurofit test can be recommended for evaluating the physical fitness of inpatients with bipolar disorder.

Keywords: Physical Fitness; Physical Activity; Exercise; Mood; Bipolar Disorder

1. Introduction

There are great concerns that the physical health of people with bipolar disorder is significantly poorer in comparison to the general population, leading to a considerably shortened life (Osby et al., 2001, Hoang et al., 2011). Of particular concern is the increased risk for cardiovascular diseases (CVD), with research demonstrating that people with bipolar disorder have a nearly five times increased age-, race-, and gender-adjusted CVD risk (Goldstein et al., 2009). The underlying mechanisms for this increased CVD-risk are multifactorial and include adverse effects of pharmacological treatments (Vancampfort et al., 2013a), poorer access to and quality of physical health care (Mitchell et al., 2009; De Hert et al., 2011) and an unhealthy, sedentary lifestyle exacerbated by psychiatric symptoms (Killbourne et al., 2009; Vancampfort et al., 2013b).

Low levels of physical fitness is a strong and independent predictor of CVD and all-cause mortality of comparable importance with other CVD risk factors (Wei et al., 1999; Bull and Bauman, 2011). Physical fitness is a multi-factorial concept comprising a set of more or less independent attributes that are related to the ability to perform physical activities. Some of these components are more closely related to health, while others are rather related to performance (Pate, 1988). Health-related physical fitness has been defined as the ability to perform daily activities with vigor and to demonstrate capacities that are associated with a lower risk of premature development of hypokinetic diseases (i.e., those associated with physical inactivity) (Bouchard and Shephard, 1994). Performance-related physical fitness refers to those components that are necessary for optimal work or sport performance (Bouchard and Shephard, 1994). Physical fitness includes several components: cardio-respiratory fitness, muscular endurance, muscular strength, flexibility, coordination, and speed.

To the best of our knowledge, data on the health- and performance related physical fitness in people with bipolar disorder are scare. To date, only one study assessed the health- and performance related physical fitness in this population and found that patients with bipolar disorder have a reduced speed of limb movement (15.8±5.7 vs. 11.8±2.2 sec; $p<0.001$), explosive leg muscle strength (134.9±49.0 vs. 167.6±32.3 cm; $p=0.003$) and abdominal muscular endurance (11.5±7.8 vs. 18.3±7.6; $p<0.001$). The current lack of research might, in part, be due to lack of appropriate physical fitness measures in many mental health care settings (De Hert et al., 2010). For example, laboratory-based incremental exercise testing protocols that use breath-by-breath gas analysis and measure the maximum level of oxygen consumption (VO_2max) are considered the gold standard measurement (Vanhees et al., 2005). However, such test protocols only assess cardiorespiratory fitness and no other health-related physical fitness components, are time-consuming, costly and need highly sophisticated equipment (Vanhees et al., 2005), which is often not available or feasible within mental health care settings. Field test batteries assessing all components of physical fitness have been developed (Vanhees et al., 2005). Within mental healthcare studies and programs, the Eurofit test battery for adults (Oja and Tuxworth, 1995) has been used previously (Van de Vliet et al., 2002; Vancampfort et al., 2012). This test battery is designed to assess all components of physical fitness of individuals, communities, sub-populations and populations (Oja and Tuxworth, 1995) including balance, speed, muscular strength and muscular endurance. The reproducibility and feasibility of the Eurofit test battery has however never been assessed in persons with bipolar disorder.

Considering the lack of appropriate measures to assess the physical fitness of people with bipolar disorder, the primary aim of the present study was to investigate the test-retest reliability of the Eurofit test battery in this population. Secondary aims were: (a) to describe the feasibility of the Eurofit in people with bipolar disorder, and (b) to assess clinical and demographic characteristics associated with the performance on the Eurofit.

2. Methods

2.1. Participants

Over an 8-month period, inpatients with a DSM-V diagnosis of bipolar disorder (American Psychiatric Association, 2013) of the bipolar disorder observation unit of the UPC KU Leuven campus Kortenberg in Belgium were invited to participate by their treating psychiatrist in the second week of admission. Reasons for admission were primarily often due to either depressive or manic symptoms thus the individuals were deemed in need of observation within a specialist service. Only patients with a clinical global impression severity scale (Guy, 1976) score of five or less, as assessed by a trained psychiatrist during a semi-structured interview, and who were able to concentrate for at least half an hour were included. Patients admitted to the emergency psychiatric ward were excluded. Participants were excluded if they had a co-morbid DSM-V diagnosis of substance abuse during the previous 6 months. The somatic exclusion criteria included evidence of significant cardiovascular, neuromuscular and endocrine disorders which, according to the American College of Sports Medicine (2013), might prevent safe participation in the study. All participants received a physical examination and baseline electrocardiogram before testing by a specialized physician. Participants were also requested to refrain from eating, drinking coffee or smoking during a two-hour period prior to the tests. The study procedure was approved by the Scientific and Ethical Committee of the UPC KU Leuven, campus Kortenberg, Belgium and conducted in accordance with the principles of the Declaration of Helsinki. All participants gave their informed written consent. There was no compensation for participation in the study.

2.2. Test-retest of the Eurofit test battery

A test-retest design was applied to test the reproducibility of several Eurofit test battery items (Oja and Tuxworth, 1995). Supervision and measurement of the Eurofit test battery was performed by one trained mental health physical therapist following a standardized procedure. The Eurofit test battery included 7 items and involved the assessment of the following measures: whole body balance, speed of limb movement, flexibility, explosive strength, static strength, abdominal muscular endurance and running speed.

Whole body balance (flamingo balance) was measured as the number of trials needed by individuals to achieve a total duration of 30sec in balance on their preferred foot on a flat firm surface. While balancing on the preferred foot (shoes removed), the free leg is flexed at the knee and the foot of this leg held close to the buttocks. Lower flamingo balance scores indicate a better whole body balance.

Speed of limb movement (plate tapping) was assessed using a table on which two discs at 80cm distance had to be touched alternately with the preferred hand as fast as possible, completing 25 cycles. Higher scores indicate lower speed of limb movement.

Flexibility was measured using the sit-and-reach test. Participants sat on the floor with straight legs and reached forward as far as possible (shoes removed). The knees were held in extended position by the investigator throughout the test. The feet were placed against a test box with a ruler placed on the top of the box. The ruler had to be pushed with the fingertips and this in a smooth and slow movement. Higher scores indicate better flexibility.

Explosive strength was measured by a standing broad jump, using a tape measure on a foam mat. Participants were asked to stand behind a line drawn perpendicular to the tape measure and jump forward as far as possible using arm swing and knee bending before jumping. The distance jumped was recorded from the take-off line to the farthest point backward of the participant. Higher scores indicate a better explosive strength.

Handgrip strength was assessed using a handgrip dynamometer (Lafayette Instruments Hand Dynamometer) to be squeezed as forcefully as possible with the preferred arm fully extended slightly away from the body, and palm facing inward. Higher scores indicate better handgrip strength.

Abdominal muscle endurance was measured as the number of correctly completed sit-ups in 30seconds. Sit-ups were performed with the hands placed at the side of the head, knees bent at 90 degrees, and the feet secured by the investigator. A full sit-up is defined as touching the knees with the elbows and returning the shoulders to the ground. A higher number of completed sit-ups indicates greater abdominal muscle endurance.

Running speed was assessed using a 10 by 5m shuttle run. Each participant was required to sprint 10 times between two lines placed 5m apart over a 1.3 m wide track. The sprint was followed by immediately turning and running back. Lower scores indicate better running speed. Except for the flamingo balance test, the sit-ups test and the shuttle run, each test was done twice and the better score was recorded.

2.3. Anthropometric assessments

Anthropometric measurements includedbody weight and height.Body weight was measured in light clothing to the nearest 0.1kg using a SECA beam balance scale, and height to the nearest 0.1cm using a wall-mounted stadiometer.

2.5. Quick Inventory of Depressive Symptomatology self-report (QIDS -SR)

QIDS-SR (Rush et al., 2003) consists of 16 items each ranging from 0 to 3. It is scored by summing the highest response in each of a set of questions relating to sleep, weight and psychomotor symptoms and then adding the remaining items. Scores range from 0 to 27 with higher scores indicative of

higher symptom severity. The QIDS-SR is a standardized measure of depressive symptoms and has demonstrated adequate psychometric validity in people with bipolar disorder (Trivedi et al., 2004).

2.6. Hypomania Checklist - 32

The HCL-32 (Angst et al., 2005) consists of 32 yes/no statements regarding a period when the patient remembers being in a high mood. Items ask whether specific behaviors (e.g., "I spend more money/too much money"), thoughts (e.g., "I think faster"), or emotions (e.g., "my mood is significantly better") were present in such a state.Scores range from 0 to 32. Higher scores reflect more severe hypomanic states. The HCL-32 has been cross-culturally validated including a Belgian sub-sample (Angst et al., 2010).

2.7. Medication use

We recorded the use of antipsychotic medication, antidepressants, mood stabilizers, benzodiazepines and anti-cholinergic, anti-epileptic, sleep and somatic medication. Antipsychotic medication was recorded and converted into a daily equivalent dosage of chlorpromazine according to the consensus of Gardner and colleagues (2010). Mean dosages of specific mood stabilizers, antidepressants, benzodiazepines and anti-cholinergic, anti-epileptic, sleep and somatic medication were reported when they were used by at least 10 participants.

2.8. Smoking habits

Smoking behavior was determined at the day of the first test performance. Participants were asked whether they smoked or not, and if so, how many cigarettes they smoke per day on average.

2.9. Statistical analyses

Continuous data were assessed for normality using the Shapiro-Wilk test and found to be normally distributed. Descriptive statistics are therefore presented as mean ± standard deviation (SD). The intraclass correlation coefficient (ICC) between the two Eurofit tests using a one-way random single measures intraclass correlation analysis and its associated **95**% CI (confidence interval) was calculated to objectively assess reliability between the two tests. An acceptable level of reliability was defined, acknowledging that such limits are essentially arbitrary. ICC values greater than 0.70 indicated acceptable reliability (Portney and Watkins, 2000) and were used to determine which Eurofit items might be retained or discarded. Pearson correlations were used to compute associations between the Eurofit scores and demographical data and other variables. Gender differences were assessed using an unpaired t-test. The significance level was set at 0.05. Statistical analyses were performed using the statistical package SPSS version 22.0 (SPSS Inc., Chicago, IL).

2.9. Sample size calculation

An a-priori sample size calculation was conducted following the recommendations of Donner and Eliasziw (1987) and Walter et al. (1998). With a more than acceptable intraclass correlation coefficient (ICC) of 0.80, and alpha of 0.05 and power of 0.8 ($\beta = 0.2$) it was established 46 participants were required in the final analysis. Based on similar research in people with severe mental illness (Vancampfort et al., 2012), it was anticipated that approximately 15% of patients needed to be excluded, 10% would refuse for motivational reasons and 10% would dropout from the testing for both motivational and practical reasons. Therefore, a pre-specified sample size of 65-70 participants was utilized to account for these factors in order to ensure the final analysis was adequately powered.

3. Results

3.1. Participants

A total of 69 persons with bipolar disorder were initially recruited. Seven persons with co-morbid substance abuse during the previous 6 months were excluded. Three persons were excluded as a consequence of a cardiovascular or neuromuscular disorder that might prevent safe participation. Of the 59 included persons with bipolar disorder, 8 declined to participate (6 were not interested, 2 could not be motivated to participate in both occasions). Reasons for additional drop-out were discharge from the hospital (n=2), transfer to another hospital (n=1), acute decompensation between both test occasions (n=1) and other medical appointments at conflicting times (n=1). Forty-six (42 with bipolar – I and 4 with bipolar – II disorder) participants were included in the final analysis. Within the final sample 24 men (age=43.0±13.0years; illness duration=16.7±12.8years; body mass index, BMI=26.0±3.9) and 22 women (43.9±10.2years; illness duration=18.2±9.8years; body mass index, BMI=26.6±3.5) were represented. All of the sample apart from one were Belgian natives and nineteen (41.3%) of the participants smoked. Men (7/24; 29.2%) smoked 23.6±13.0 cigarettes per day, women (12/22; 54.5%) 18.2±9.8. Mean daily equivalent dosage of chlorpromazine (n=45) was 476.2±301.9mg/day, of lithium carbonate (n=15) 903.1±597.6 mg/day and of valproic acid (n=14) 1703.6±560.7 mg/day. An overview of the medication of the entire sample (n=46) is presented in Table 1. The mean QIDS-SR and HCL-32 score were respectively 7.5±5.0 and 15.6±6.6.

[Insert Table 1 about here]

3.2. Eurofit test battery scores

A summary of the Eurofit test scores is presented in Table 2 according to gender. Male participants had significantly higher explosive muscle strength as measured with the standing broad jump and a significantly greater handgrip strength.

[Insert Table 2 about here]

3.3. Test-retest reliability of the Eurofit items

The means and standard deviation scores for the first and second Eurofit tests and the associated ICC's with 95% CI's are presented in Table 3. All Eurofit items demonstrated a minimal acceptable ICC above 0.70. The ICC ranged from a minimum of 0.71 for the flamingo balance test to a maximum of 0.98 for handgrip strength.

[Insert Table 3 about here]

3.4. Feasibility of the Eurofit test

Except for the sit-and-reach and the sit-ups test, all Eurofit test items could be completed by all participants without any adverse events. Three participants were not able to perform the sit-and-reach test (see Table 3). Eight participants couldn't perform the sit-ups (see Table 3).An exploratory t-test revealed a significant ($p<0.05$) older age (52.1±11.3 versus 41.8±11.1 years, $p=0.029$), longer illness duration (27.5±12.1 versus 15.6±10.3 years, $p=0.009$) and a higher level of depression (QIDS score of 11.4±5.3 versus 6.8±4.6, $p=0.023$) in non-completers compared to completers. No other significant differences between completers and non-completers were found.

3.4. Correlates for Eurofit parameters

The r- and *p*-values for all associations between Eurofit items and demographical and clinical variables are presented in Table 4. Except for the scores obtained on the sit-and-reach test and handgrip strength test, all Eurofit items were significantly associated with age. Younger patients performed better than older patients. A longer illness duration was consistently significantly associated with a poorer performance on all Eurofit tests. A higher body mass index was significantly correlated with a worse performance on the sit-and-reach test, the sit-ups test and the shuttle run. Except for the sit-and-reach test, higher QIDS-SR scores were significantly related to worse test performances, while higher HCL-32 scores were only significantly associated with less sit-ups in 30sec. We did not find significant associations between the dose of antipsychotic medication and Eurofit test battery performance. In contrast, the daily dose of lithium carbonate was negatively associated with whole body balance. More cigarettes smoked per day was, except for the sit-and-reach test, significantly related to a poorer performance on the Eurofit.

Following the correlation analyses, variables significantly correlated with the Eurofit test items performances were included in separate regression analyses.

4. Discussion

4.1. Reliability and feasibility of the Eurofit test battery

To our knowledge, this is the first study investigating the reliability of the Eurofit test in people with bipolar disorder. Our findings demonstrate that the Eurofit test may prove useful to assess physical fitness in the studied sample and all items demonstrated an acceptable ICC indicating it is reproducible and reliable. Except for the whole body balance test and the abdominal muscle endurance test, no Eurofit item had to be terminated prematurely and no patient required a rest, which is comparable with previous findings in clinical and non-clinical populations (Vancampfort et al., 2013d). Given the present observations and its safety profile based on previous studies in people with severe mental illness (Van de Vliet et al, 2002; Vancampfort et al., 2012) physician attendance is not required if the Eurofit test can be supervised by an experienced physical therapist.

4.2. Correlates of the Eurofit test battery

In accordance with previous research in people with severe mental illness (Vancampfort et al., 2013d) a higher BMI was significantly associated with a poorer performance on physical fitness tests requiring propulsion or lifting of the body mass (i.e., sit-ups and shuttle run tests). A second reason for the poorer performance in more overweight people with bipolar disorder might be the high prevalence of physical complaints and pain during physical activities in this sub-population (Stubbs et

al., 2015). The observation that male patients perform better than women on most Eurofit test items has been reported previously (Van de Vliet et al., 2002; Vancampfort et al., 2012) and is in line with the general population (Suni et al., 1996). Interestingly, illness duration was a stronger correlate for the Eurofit test performance than biological age. It might be hypothesized that a cumulative long-term effect of poor health behaviors, and longer lifetime exposure to depressive and (hypo)manic symptoms and to medication use translate into a poorer physical fitness. In accordance with previous research in people with psychotic disorders (Vancampfort et al., 2011), smoking behavior was significantly related to a reduced physical fitness. A hypothesis for this association might be that people with bipolar disorder who smoke are less physically active than non-smokers due to smoking-induced respiratory symptoms (e.g. shortness of breath) when being physically active. Less physical activity participation may result in impaired muscle strength and endurance. Of particular interest was the finding that smoking appears to be highly correlated with reduced balance in this population. This may predispose a participant to experience falls and when this is considered alongside the likely reduced bone mineral density as seen in other severe mental illness populations (e.g. schizophrenia; Stubbs et al 2014), it could mean that this group is at an increased risk of osteoporotic fractures. This reduced body balance could lead to self-imposed activity restriction due to concerns about experiencing a fall, and may contribute to the low levels of physical activity and further increased sensorimotor deconditioning. Whilst this hypothesis seems plausible, further research is required.

In contrast to people with schizophrenia (Vancampfort et al., 2011) exposure to antipsychotic medication was not related to poorer performance on the Eurofit in our bipolar disorder sample. A possible explanation might be the lower mean daily equivalent dosage of chlorpromazine equivalents in the current study (476±302 mg/day versus 637±434 mg/day). A higher mean daily dosage of lithium carbonate was however significantly associated with poorer whole body balance. More research in a larger sample is also required here to confirm this finding and to explore any underlying mechanisms for the association. The fact that the mean daily dosage of lithium carbonate was not associated with speed of limb movement (e.g., plate tapping) was in accordance with previous meta-

analytic data (Wingo et al., 2009). Lastly, related to the psychiatric symptoms associated with the Eurofit battery performance, we found that in particular a higher level of depressive symptoms was associated with a worse performance, although also higher levels of hypomanic symptoms were associated with worse muscle endurance (as measured with the sit-ups tests). It is possible that a reduced physical fitness in more depressed participants may be a manifestation of a longstanding sedentary lifestyle, while for hypomanic patients it might be the manifestation of a chaotic and unhealthy lifestyle. A second reason for the association between feelings of depression and poorer performance on the Eurofit might be the fact that feelings of depression are associated with lower energy levels, psychomotor retardation, a lower self-efficacy and increased negative outcome expectations when having the intention to engage in physical activity (Vancampfort et al., 2011). Third, also the low-grade inflammation associated with the manifestation of depressive and hypomanic symptoms (Leboyer et al., 2012) might be a hypothesis which should be tested more in detail in future research.

4.3. Study limitations and future research

Whilst this is the first study of its kind, a number of limitations should be considered. First, the internal validity could have been improved by adding an age- and gender matched control group. Future research comparing Eurofit-scores in people with bipolar disorder with an age and gender matched control group from the general population would also provide a valuable point of reference. Second, we only included inpatients from one center and questions regarding the generalizability are unclear. However, the sample size was adequately powered and calculated a-priori. Future studies should replicate our study to determine whether present results are also applicable to outpatients as to inpatients with more acute symptomatology or poorer functioning. Third, we did not include the amount of daily physical activity nor an assessment of the current manic symptomatology. Fourth, we did not investigate the role of lower motivation towards performing physical activity during the

Eurofit test battery performance. Fifth, more research is also needed to understand better the influence of mood stabilizers such as lithium carbonate and benzodiazepines on a person's physical fitness. Finally, a few items of the Eurofit-test battery, namely the flamingo balance test, the sit-up test and the shuttle run test, were only repeated once at every test occasion. Differences between the first and second test might in these cases also represent an effect of familiarization to the test-item. This might especially explain the relatively low, though acceptable, intraclass correlation coefficient of the flamingo balance test.

Although with limitations, the present study demonstrates that the Eurofit test is a reliable and feasible test battery to assess several physical fitness components in inpatients with bipolar disorder. Because it is easy to perform and safe, the Eurofit test could be used by experienced clinicians (e.g. physical therapists) to assess the important construct of physical fitness in people with bipolar disorder.

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Table 1.

Medication use among among people with bipolar disorder (n=46) screened prior to participation

Type of medication	**n**
Antidepressants	
Mirtazapine	1
Trazodone	3
Selective Serotonin Reuptake Inhibitors	6
Escilatopram	1
Sertraline	3
Venlafaxine	2
Mood stabilizers	
Valproic acid	14
Lithium carbonate	15
Antipsychotic medication	
Amisulpride	3
Aripiprazol	8
Clozapine	2
Olanzapine	9
Paliperidone	4
Quetiapine	14
Risperidone	2
Other medication	
Anticholinergic	2
Anti-epilectic (lamotrigin)	4
Benzodiazepine	22
Sleep medication	3
Somatic medication	12

Table 2.

Gender differences in Eurofit-scores (retest-trial).

Physical fitness component	**Test**	**Men**	**Women**	***p***
		n=24	**n=22**	
Whole body balance	FBA (number/30sec)	14.4±6.8	15.1±8.6	0.76
Speed of limb movement	PLT (sec)	15.3±5.9	16.3±5.8	0.59
Flexibility	SAR (cm)	17.5±8.8	23.3±11.0	0.07
Explosive muscle strength	SBJ (cm)	152.7±38.0	106.0±47.3	0.001*
Handgrip strength	HGR (kg)	47.4±10.2	30.6±10.9	<0.001*
Abdominal muscle endurance	SUP (number/30sec)	13.4±7.2	11.8±6.1	0.46
Running speed	SHR (sec)	25.5±4.6	29.4±8.1	0.06

Data are expressed as mean ± SD, *significant (unpaired t-test), FBA=flamingo balance, PLT= plate tapping, SAR= sit-and-reach, SBJ=standing broad jump, HGR= handgrip strength, SUP=sit-ups, SHR=shuttle run.

Table 3.

Descriptive statistics and intraclass correlation coefficients (ICC) and 95% confidence intervals (CI) for the Eurofit test.

Subtest	**Completers (n)**	**First test**	**Retest**	**ICC**	**95%CI**
FBA (number/30sec)	46	14.8±7.7	14.9±8.3	0.71	0.54-0.83
PLT (sec)	46	15.8±5.8	14.9±5.7	0.92	0.86-0.96
SAR (cm)	43	20.4±10.2	20.0±10.5	0.96	0.93-0.98
SBJ (cm)	46	128.8±48.6	132.8±52.6	0.92	0.86-0.96
HGR (kg)	46	38.8±13.4	39.3±12.9	0.98	0.97-0.99
SUP (number/30sec)	38	12.6±6.7	13.5±6.6	0.96	0.94-0.99
SHR (sec)	46	27.8±6.8	26.9±6.3	0.94	0.89-0.97

test-retest data are expressed as mean ± SD, FBA=flamingo balance, PLT= plate tapping, SAR= sit-and-reach, SBJ=standing broad jump, HGR= handgrip strength, SUP=sit-ups, SHR=shuttle run

Table 4.

Correlations between Eurofit test items (retest-trial) and psychiatric and demographic characteristics.

	FBA	**PLT**	**SAR**	**SBJ**	**HGR**	**SUP**	**SHR**
Age (yrs) (n=46)	0.39*	0.57***	-0.22	-0.53**	-0.26	-0.58***	0.41**
Illness duration (yrs) (n=46)	0.62***	0.68***	-0.34*	0.63***	-0.33*	-0.68***	0.58***
BMI (kg/m²) (n=46)	0.24	0.11	-0.54**	-0.23	0.08	-0.36*	0.33*
QIDS-SR score (n=46)	0.54***	0.34*	-0.18	-0.45**	-0.36*	-0.39*	0.49**
HCL-32 score (n=46)	-0.007	-0.04	-0.27	-0.01	0.13	-0.33*	-0.16
Daily AP dose[a](mg) (n=42)	0.18	0.10	0.07	0.11	0.28	-0.03	-0.06
Lithium dose (mg/day) (n=16)	0.59*	-0.24	-0.44	-0.06	0.25	-0.42	0.23
Valproic acid (mg/day) (n=14)	0.04	0.25	-0.31	0.008	0.35	0.47	0.16
Smoking (cig/day) (n=19)	0.79***	0.62**	-0.25	-0.56*	-0.49*	-0.50*	0.56*

*p<0.05, **p<0.01,***p<0.001, [a]expressed in chlorpromazine equivalents, BMI=body mass index, QIDS= Quick Inventory of Depressive Symptomatology, HCL-32= Hypomania Checklist - 32, AP= antipsychotic medication, FBA=flamingo balance, PLT= plate tapping,

SAR= sit-and-reach, SBJ=standing broad jump, HGR= handgrip strength, SUP=sit-ups, SHR=shuttle run.

Highlights

- The Eurofit test is a reliable test battery to assess physical fitness in inpatients with bipolar disorder admitted to an observation unit.
- Significant correlations with the Eurofit test items were found with age, illness duration, body mass index, smoking behaviour, mean daily lithium dosage, and depressive and lifetime hypomanic symptoms.