The Validity and Reliability of the Turkish Version of Miller Forensic Assessment of Symptoms Test (M-FAST)

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ABSTRACT

Introduction: The aim of this study was to show the validity and reliability of the M-FAST Turkish Version.

Methods: Translation and back-translation of the M-FAST was done, then the M-FAST Turkish Version was created with linguistic equivalence. The study was performed with 97 detainees and convicts sent from penal institutions who were internalized at our hospital forensic psychiatry service. M-FAST Turkish Version was applied to evaluatees and as a result of clinical interview according to DSM-IV-TR diagnostic criteria and various data explorations the evaluatee was examined for malingering. To investigate the internal consistency of the scale, Cronbach's alpha and test-retest methods were used. In order to check the validity of the scale, in addition to the clinician's diagnosis, participants were requested to fill the Minnesota Multiphasic Personality Inventory (MMPI) F and K validity scales.

Results: The mean age of participants was 31.8±9.3 (SD) years. 47 evaluatees (48.5%) were diagnosed as malingering. In the internal

consistency analysis, Cronbach's alpha Coefficient was found to be .93. Test-retest relationship that was applied to 22 evaluatees was found to be highly significant and strong ($r=.89$, $p<.001$). M-FAST scores were significantly high at the malingering group ($n=47$) ($z=-8.02$, $p<.001$). ROC curve analysis suggested a score of ≥ 7 points as the optimal cut-off for a malingering level for the M-FAST. Kappa coefficients of malingering $\pm$ groups were found to be, M-FAST ≥ 7 Kappa: .83; F >16 Kappa: .29; F-K >16 Kappa: .30. For diagnosis of malingering, M-FAST Scale and the MMPI inventory scales were evaluated with the Binary Logistic Regression analysis and only M-FAST scores were found to be significant in prediction of malingering.

Conclusion: The findings of this study support that, M-FAST Turkish Form represents the structure of the original scale and can be used as a reliable and valid instrument.

Keywords: M-FAST scale, malingering, validity, reliability

INTRODUCTION

Malingering (simulation or the behavior of feint the physician) means; showing himself or herself as a patient, behaving as a sick person although not really being ill, simulating or imitating diseases (1). Malingering is defined in the 4th edition Text Revision of Diagnostic and Statistical Manual of Mental Disorders–IV (DSM-IV-TR) as "intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives" under "Conditions not associated with a mental illness" (2). Historically, the term "malingering" was used for defining persons feigning ill as a method to avoid military duty (3). Currently, malingering is not accepted as a mental illness and it is solely a clinically definition. Malingering is intentionally creating non-existing physical or psychological symptoms or exaggerating existing symptoms for a specific purpose. This purpose is generally to obtain unfair compensation, move away from prison environment, transfer to treatment centers, obtain psychotropic drugs, avoid prosecution, avoid duty or unfair incrimination (4).

The DSM-IV-TR includes four criteria that are described as highly suggestive of malingering. These criteria are: (a) discrepancy between the reported impairment and objective findings, (b) insufficient cooperation during the interview and evaluation and/or noncompliance with treatment, (c) a medico-legal context of presentation and (d) the presence of antisocial personality disorder. These criteria are included in the widely used DSM-IV diagnostic system, but still available data shows that these criteria are inadequate for diagnosis malingering and in the absence of a comprehensive evaluation this may result in significant false-positive or false-negative diagnoses (5).

Although the incidence of malingering differs across settings, the base rate of occurrence is considerable (6). Rogers reported the rate of malingering as 20.8% in the accused who were suspected of or believed to be malingering (7). The rate of malingering in general psychiatric cases evaluated by forensic psychologists was 7.4%; and it was 15.7% among forensic cases (8); the rate of malingering was reported to be 7.8% in general psychiatric cases and 17.4% at forensic cases in a continuation of the same study (9). In the research that was conducted in 1998, Rogers had concluded that this rate may change between 1-50% according to the content of malingering (10). McDermott and Sokolov found the rate of malingering as 66% in convicts referred from prison to be hospitalized at the forensic psychiatry ward (11). The rate of malingering was 15-17% at forensic cases in a study in 2003 (12). The prevalence of malingering may varies

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widely across forensic settings, but it is likely to occur in approximately one sixth of all forensic cases (6). Unfortunately, these are underestimates of the actual prevalence of malingering and it should be remembered that actual rates of malingering may be higher due to successful cases who could not be detected.

Malingering may be comorbid with alcohol and substance abuse, factitious disorder such as Ganser and Munchausen Syndromes, conversion disorder and especially antisocial personality disorder (13). Malingering differs from factitious disorder and conversion disorder by the presence of conscious symptoms aimed at benefit, not aiming secondary gains. In clinical practice, the most powerful tools of the physician are basic clinical knowledge, interviewing skills and experience in order to avoid the traps of deceptive persons. On the other hand, even most experienced clinicians may be mistaken by cases of malingering (1). In this context, availability and reliability of scales that can be used in cases of malingering are important.

The Miller Forensic Assessment of Symptoms Test (M-FAST) is a scale developed by Miller (14) in 2001, to screen malingering faster and more reliably. This test includes 25 items and applied in approximately 5-10 minutes. M-FAST is a practical scale that can be used in hospitals and institutions with a heavy work burden. It is formed as a structured interview where questions are asked by the interviewer. M-FAST was developed from items of The Structured Inventory of Reported Symptoms (SIRS) Scale which was developed by Rogers in 1992 (15). Miller evaluated 79 of these items in 1996 and created the original scale including 25 questions after two consequent studies. The validity studies have shown that M-FAST can be used as a valid tool in the field of psychiatry to differentiate malingering (14,16,17,18,19).

M-FAST Scale consists of seven subscales. These are not solely used as scales. Miller had defined these subscales when he had developed the scale, but had not applied a factor analysis or any different statistical methods on them. The subscales are used in defining the context in which inquiry is made. The M-FAST includes; 3 items for "Reported or Observed" (RO), 7 items for "Extreme Symptomatology" (ES), 7 items for "Rare Combinations" (RC), 5 items for "Unusual Hallucinations" (UH), 1 item for "Unusual Symptom Course" (USC), 1 item for "Negative Image" (NA) and 1 item for "Suggestibility" (S). The scale is evaluated with a total of 25 points, where >6 shows the presence of malingering for forensic and clinical samples (14).

M-FAST is correlated with SIRS and The Minnesota Multiphasic Personality Inventory-II (MMPI-2) tests in the diagnosis of malingering (16). It is an effective tool as Structured Inventory of Malingered Symptoms (SIMS), which is a comprehensive test for malingering (20). M-FAST was shown to be able to differentiate simulators feigning psychiatric disorders such as schizophrenia, major depression, bipolar mood disorder and post-traumatic stress disorder from bona fide patients diagnosed with the same disorder. (21). This test is effective in screening exaggerated symptoms of patients hospitalized at psychiatric and forensic wards (22) and especially differentiate malingering within prison populations (19).

Self-report type scales were used in most of the studies examining diagnostic specific malingering and they have yielded mixed results. Some of these studies are MMPI-2 studies by Bury & Bagby 2002; Rogers et al. 1993; Walters & Clopton 2000 (23,24,25); PAI studies by Calhoun et al. 2000; Rogers et al. 1993; Rogers et al. 1996 (26,27,28) and SIMS studies

by Edens et al. (29). Significant results were obtained only in two studies that use an interview-based assessment scales such as M-FAST or SIRS in screening for malingering. In the study of Rogers et al. (30) in 1992, the SIRS was relatively strong in its ability to distinguish diagnostically mixed groups of psychosis, post-traumatic stress disorder and mood disorder from simulators of each of the three diagnostic conditions. Gurriel et al. (31) after their research in 2004, reported that the M-FAST detected at least two-thirds of malingerers in post-traumatic stress disorder.

The aims of this study may be summarized as follows:

1. Creation of a Turkish version of M-FAST Scale,
2. Determining the internal consistency and test-retest reliability of M-FAST Scale,
3. The criteria validity of M-FAST Scale.

METHODS

Translation process

The process of translation and back-translation of M-FAST was first done by 3 bi-lingual psychiatrists translating the scale from English to Turkish, after which 3 different psychiatrists translating Turkish versions to English again. The most appropriate Turkish translation was aimed to be selected with this method. Turkish and English translations of M-FAST were shared with Psychological Assessment Resources (PAR), who own the publishing rights of this scale and approval was obtained from them for the final Turkish version to be used in our study.

Sample

One of the important criteria of this investigation method was Cronbach alpha as an internal consistency coefficient. An alpha coefficient of 0.80 or higher was targeted in the calculation of sample size. The alpha coefficient was also 0.80 or higher in the reliability studies of M-FAST (14). The lower limit of alpha coefficient was selected as 0.60, based on the literature from the general use of alpha coefficient (32). The minimum number of individuals for sample size was calculated as approximately 40 individuals per group, with a targeted Cronbach alpha of 0.80, 95% confidence interval and 0.80 power (33).

This study was conducted at the detainee and convicted ward of the forensic psychiatry department of a research and training hospital. Convicts and detainees are hospitalized and treatment and expertise service is provided at this ward. The ward includes 42 male and 8 female beds. The study sample included 97 individuals who were hospitalized between December 2012 and April 2013 and gave their consent to participate in this study. The diagnostic distribution of the sample were as follows: antisocial personality disorder 55.7%, psychotic disorder, mood disorder and adjustment disorder 44.3% (according to DSM-IV-TR). The sample included 48 detainees (49.5%) and 49 convicts (50.5%); and 50 (51.5%) cases had a history of prior imprisonment. The participants were aged between 18-65 years, who were lettered and were competent to fill the scale. Cases with an acute psychotic excitation and mental retardation were not included in the study. Approval for this study was obtained from the Ethics Committee of our hospital.

Measures

M-FAST Turkish Form: was developed by translation and back-translation of M-FAST. A detailed information on M-FAST is presented in the introduction.

K and F subscales of Minnesota Multiphasic Personality Inventory (MMPI): MMPI is a self-assessment tool developed by Hathaway and McKinley in 1940 in order to use in routine evaluation (34). MMPI was proved to be an effective and reliable psycho-diagnostic classification scale, based on continuing clinical applications, interviews and observations (35). The Turkish standardization of this scale was done by Savaşır (36) in 1981. A study on a large sample of patients conducted by Erol (37) in 1982 showed that, MMPI was an appropriate tool in differentiating normal adults from those having psychiatric problems. MMPI includes 3 profile validity scales (L-lie, F-infrequency and K-defensiveness) and 10 clinical scales.

Graham (38) reported that a raw score over 16 at F scale of MMPI, which we used as a validity criteria in our study, is in favor of malingering. Gough (39), on the other hand, reported that the difference between F and K scales raw scores (F-K) is a marker that can be used to differentiate malingering individuals. To detect attempts at faking bad (people who are trying to appear worse), Meehl suggested a cut-off score of $F-K > 9$ (40); and Carson suggested $F-K > 11$ (41). As the F raw score gets higher than the K score, the probability of one individual to show himself/herself as bad also increases. In this study a raw score of $F-K > 16$ is used (42).

Socio-demographic Data Form: This is a form that was developed by the investigators to obtain socio-demographic and judicial history data.

Procedure

Data collection was started after written informed consents were signed voluntarily by the individuals. M-FAST Turkish Form was applied 10 days later to 22 of the participants for a second time, in order to determine the reliability of the test. A psychiatrist from the forensic psychiatry department applied the M-FAST Turkish Form to the evaluatees, blinded in terms of the conditions and forensic histories of them. Another psychiatrist from the same department applied other investigation tools subsequently (socio-demographic data form, MMPI F and K validity scales) and performed a clinical interview with evaluatees based on DSM-IV-TR diagnostic criteria. Investigators diagnosed malingering based on the observations done at the convict/detainee ward, past medical records, psychometric investigations, social survey, interview with the family and examination of the forensic records. The groups "malingering (+)" and "malingering (-)" were formed according to this diagnosis. In this way, a single blind research design was planned and the diagnosis of the clinician was accepted as the gold standard in determining the malingering $\pm$ groups.

Statistical Analysis

Descriptive statistics were presented as mean, median, standard deviation and percent.

The total M-FAST internal consistency and the internal consistencies of the subscales (although they were not used in practice) were calculated by Cronbach alpha coefficient. Spearman correlation coefficient was calculated as a repeatability criteria for test-retest correlation. The indifferent of test and retest were shown with Wilcoxon test.

The test results of malingering ($\pm$) groups were evaluated by Mann-Whitney U test. The selection of non-parametric method for hypothesis tests and correlation coefficients were done based on the Kolmogorov Smirnov test. The differentiation of malingering ($\pm$) groups by M-FAST was predicted with sensitivity and specificity criteria and area under the curve obtained by ROC analysis. The obtained cut-off value was verified with

In the original research of M-FAST Scale, Miller did not use factor analysis and also in statistical terms, subscales scores do not have objective characters, so the correlation between the MMPI quantitative scores and M-FAST total scores was calculated by Spearman correlation coefficient. The superiority of the M-FAST and MMPI tests was shown as the magnitude of Kappa coefficients.

The differentiation of malingering by M-FAST and MMPI validity scales were evaluated with logistic regression analysis and the superiority of these tests for interpreting the diagnosis was tested.

The level of significance is defined as $p < .05$ for all tests.

RESULTS

Of a total of 97 participants of this study, 90 were males and 7 females, with a mean age of 31.8 ± 9.3 years. Thirty four (35.1%) of the male participants had completed their military duty without any problems, while 35 (36.1%) were punished or were excused from military duty due to psychiatric causes. A past history of drug abuse was present in 50 (51.5%) of the evaluatees. Forty one (42.3%) of the evaluatees had reported having a psychiatric illness on admission at the hospital; 59 (60.8%) participants reported psychiatric symptoms. The age at the onset of the first crime of the evaluatees was 21.92 ± 9.00 (median=20) years, the mean number of the past crimes was 5.30 ± 8.24 (median=2), the mean duration of stay at prison was 3.01 ± 3.14 (median=2) years. The socio-demographic data are summarized at Table 1.

Forty seven (48.5%) participants had the diagnosis of malingering. There was no significant difference between the detainees and convicts in terms of the frequency of malingering ($\chi^2 = .70$; $p = .70$).

Reliability Findings

The items of the inventory were analyzed and internal consistency and test-retest reliability analysis were done.

Table 1. The socio-demographic characteristics of the study sample

	n=97	%
Age ($\bar{x} \pm sd$)	31.8 $\pm$ 9.3	
Educational status (year)	7.5 $\pm$ 3.7	
Gender		
Males	90	92.8
Females	7	7.2
Marital status		
Married	24	24.7
Single	48	49.5
Divorced	18	18.6
Widowed	7	7.2
Profession		
None	21	21.6
Working	57	58.8
Student	4	4.1
$\bar{x}$: Mean, sd: Standard deviation		

Table 2. M-FAST Turkish Form internal reliability analysis and Cronbach alpha coefficients

Number of Items	Cronbach's Alpha
25	.93
M-FAST items	Cronbach's Alpha value (when every item is excluded)
ROI	.92
ESI	.92
RCI	.92
UHI	.92
ES2	.93
UH2	.92
RO2	.92
ES3	.92
UH3	.92
ES4	.92
RO3	.92
RC2	.92
ES5	.93
USCI	.92
ES6	.92
RC3	.92
RC4	.92
RC5	.92
ES7	.92
UH4	.92
UH5	.92
RC6	.92
NII	.93
RC7	.92
SI	.92

ROI: Reported or Observed, ES: Extreme Symptomatology, RC: Rare Combinations, UH: Unusual Hallucinations, USC: Unusual Symptom Course, NA: Negative Image, S: Suggestibility.

The Cronbach alpha coefficient of whole of the scale was found as .93 at the reliability analysis of M-FAST (Table 2). When each items were excluded one by one and Cronbach alpha coefficients were calculated again in order to examine the contribution of each item to the total reliability, it determined that none of the item decreased the reliability. The Cronbach alpha coefficient was .68 for the ES subscale (7 items); .63 for the RO subscale (3 items); .82 for the RC subscale (7 items) and .80 for the UH subscale (5 items).

In order to verify the test to yield the same results after an acceptable period of time (considering the cognitive factors), Spearman coefficient was calculated as $r_s = .89$ and $p < .001$ at the test-retest done after 10 days. The absence of a difference of M-FAST Turkish Form test-retest was shown by Wilcoxon test ($n=22$, measurement mean score= 7.73 ± 6.78 (min=0;

Table 3. Cut point evaluation of Roc analysis of M-FAST Turkish Form and sensitivity and specificity values of original M-FAST Scale (Miller)

Score	Results of this study		Miller's Results	
	Sensitivity	Specificity	Sensitivity	Specificity
5	1.00	.70	.93	.78
6	1.00	.78	.93	.83
7	.98	.86	.93	.86
8	.91	.90	.79	.89
9	.89	.90	.73	.95
10	.85	.94	.67	.98
11	.77	.96	.57	1.00
12	.70	.96	.47	1.00

max=23; median=7), retest mean score= 8.18 ± 6.83 (min=0; max=22; median=8), $z = -.79$; $p = .43$).

Validity Analysis

M-FAST scores of the malingering ($\pm$) groups is anticipated to be different, in order to test if the M-FAST score is also a valid criterion for malingering in Turkey. Malingering ($\pm$) groups were compared in this respect and nonparametric test was used due to the absence of a normal distribution of M-FAST scores in the malingering (-) group. The malingering (+) group had a mean M-FAST score of 14.89 ± 4.93 (min=6; max=25; median=15) ($n=47$) and malingering (-) group had a mean M-FAST score of 3.42 ± 3.28 (min=0; max=15; median=2) ($n=50$). M-FAST scores were found to be significantly higher in the malingering (+) group with Mann-Whitney U Test and it was shown as one of the validity criteria of the scale ($z = -8.02$; $p < .001$).

The AUC (area under curve) values of ROC analysis were determined, in order to detect the validity of differentiating of M-FAST and some subscales (AUC for total M-FAST=.97, total RO=.89, total ES=.88, total RC=.93, total UH=.92). The ROC analysis revealed sensitivity as .98 and specificity as 0.86 for a cut-off score of ≥ 7 (Table 3).

This cut-off value is preferred, as by the original Miller article of the M-FAST scale, where to detect true positives rather than true negatives were taken into consideration. The cut-off score was also selected statistically according to Youden criteria [maximal (sensitivity + (1 - specificity))] (43).

In the evaluation of cut-off score of ≥ 7 using the contingency table, sensitivity was 97.9%; specificity 86%; positive predictive value 86.8% and negative predictive value was 97.7%. Thus, the obtained cut-off score revealed a robust AUC value and robust diagnostic criteria (Figure 1).

A moderately significant association between the quantitative scores of M-FAST and MMPI validity scales (F, F-K) was detected with Spearman test (M-FAST vs MMPI F: $r_s = .54$; $p < .001$, M-FAST vs MMPI F-K: $r_s = .57$; $p < .001$). Also, the Kappa coefficients were Kappa=.83 for M-FAST ≥ 7 , Kappa=.29 for $F > 16$ and Kappa=.30 for $F-K > 16$, in the evaluation of appropriateness according to malingering (+/-) groups, with M-FAST ≥ 7 , $F > 16$ and $F-K > 16$ classifications. M-FAST scores correlated much more strongly with the malingering groups than the MMPI validity scales. When

Table 4. Logistic Regression results of M-FAST and MMPI validity scales (F, F-K)

	β	SE β	p	OR	95% confidence interval	
					Lower	Upper
F>16	.22	.80	.78	1.24	.26	5.93
(F-K)>16	-.13	.48	.79	.88	.35	2.23
M-FAST $\geq$ 7	2.80	.59	<.001	16.49	5.19	52.44

The total correct classification percent of the model=91.8%; significance of the model chi-square=83.56, p<.001,
 β : Beta, OR: ODDS ratio, SE β : Standard Error of Beta

malinger was chosen as the dependent variable, only M-FAST scale was found to be statistically significant at the logistic regression analysis containing (F, F-K)>16 categoric classifications as the MMPI validity scales and M-FAST $\geq$ 7 (Table 4).

DISCUSSION

The importance of this study is to be the first one investigating the reliability and validity of a scale used to detect malingering in Turkey. M-FAST scale has been translated to Turkish and M-FAST Turkish Form validity and reliability procedure has been done with this study.

According to these findings of our investigation, malingering was detected in 48.5% of our sample. This rate seems to be high in comparison with other studies results in the literature (7,8,9,12). But malingering prevalence may show dispersion across a rather large spectrum between 1-50% according to the findings of the most recent study of Rogers who have many researches on malingering (10). Another reason for this high malingering prevalence may be due to the research sample homogeneity that was consisted of only convicts and detainees. McDermott and Sokolov had investigated a similar sample in 2009 and found the rate of malingering as 66% (11).

The internal consistency was calculated in order to determine the reliability of the Turkish form of the scale and test-retest method was used.

300 M-FAST has a considerably high reliability coefficient as a whole. This find-

ing is similar to the internal consistency coefficient which was obtained by Miller (14) in his original M-FAST study at the forensic psychiatry ward (Cronbach alpha coefficient=.93 when all items are included). Although the reliability coefficients of subscales are lower than the whole of the scale, subscales were not used as a scale alone in the original M-FAST study. Moreover, when the related items were excluded one by one and Cronbach alpha coefficients were calculated again, none of the items were found to decrease the reliability. In our population, the highest reliability was determined at "Unusual Hallucinations" and "Rare Combinations" among M-FAST subscales. In the context of these results, exclusion of any items or subscales was not considered, as the first priority was the total reliability.

Miller have shown a Spearman coefficient of $r_s=.92$ and $p<.001$ with test-retest that done in 1-3 weeks interval in the developmental study of M-FAST Scale (14). The findings of this study are also parallel to high Spearman coefficient values obtained at the original research. Consequently, intra-scale integrity, inter-item consistency and measurement sensitivity have been shown in the application of M-FAST Turkish Form in our country.

In the present study, one researcher explicated the diagnosis of malingering, while another researcher, blinded in terms of the clinical features and forensic admission types of the evaluatees, applied M-FAST. In this way, a single blind study design was planned and the diagnosis of the clinician was considered as the gold standard. Currently, there is no scale developed for detection of malingering which is valid and reliable for a Turkish application. Whereas, scales such as SIMS and SIRS which were frequently used in the field of studies on malingering have been used in original scale validity and reliability researches. In order to overcome this limitation, F and K validity scales of the MMPI inventory were applied.

Miller found the area under the curve for M-FAST as .95, $p<.001$ in his validity studies on cases hospitalized at the forensic psychiatry wards. Miller also found the ROC-AUC value as .99 and $p<.001$ in the study with a non-clinical sample. High ROC-AUC values between .92-.95 were reported in validity studies, where a cut-off score of >6 was accepted to classify malingering in forensic and clinical samples (14,16,17,18). Comparing with these results, M-FAST Turkish Form has a high diagnostic efficacy in differentiating malingering.

False positive/negative results are one of the instances where scales put clinicians in a tight position. The M-FAST scores of seven participants were high, although they were not diagnosed to be malingering (the mean M-FAST score of the false positive participants=10.00). The common characteristic of the false positive cases was the absence of antisocial personality disorder in any of them. The mean duration of application of M-FAST was 6.38 minutes in this study. While mean M-FAST application length was 10 minutes in 3 false positive cases who were diagnosed to have psychotic disorder. It should be kept in mind that when both, the score of the test is high and the duration of application is long, false positivity may be considered. Two cases with false negative results were detected in this study. Both were diagnosed to have antisocial personality disorder; whose M-FAST scores were six and one. The possibility of malingering should be considered in cases with antisocial personality disorder, even when their M-FAST scores are low.

A moderate correlation was detected between M-FAST total scores and F scale and F-K index quantitative values. But F>16 and F-K>16 Kappa

coefficients were found to be low for detection of malingering sufficiently. MMPI inventory is a tool for evaluation of personality, that actually was not specifically developed to differentiate malingering cases, thereby it has not frequently used in forensic psychiatric practice (44). Erol (37) in his MMPI Turkish validity study in 1982, interpreted the elevation in the MMPI F scale scores (conditions where F score was > 16) as; malingering, symptom exaggeration, falsely answering all questions and resistance to the application of the test. But after this MMPI study for the Turkish population, although researches were made on neurotic, psychotic, personality disorder and borderline disorder cases, not any research specifically conducted on malingering cases (37). Another issue is that, MMPI and similar self-report inventories are not so much successful in differentiating malingering (23,24,25,26,27,28,29). Due to the absence of a study comparing the appropriateness of MMPI validity scales and M-FAST Scale to detect malingering, the findings of our study need to be supported by future studies.

There is a highly significant numerical difference between male and female evaluatees in this research sample. But actually this difference is in accordance with the literature (45,46) and it is due to the low number of females hospitalized at the detainee and convict forensic wards. The validity of our research findings in females is controversial and further studies with samples including more female participants are needed.

The findings of this study show that, M-FAST Turkish Form represents the structure of the original scale and it is valid and reliable. This scale will be beneficial by forensic psychiatry and also for routine clinical applications and further researches in Turkey.

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