

# Standardization and Investigation of Internal Consistency, Reliability, and Criterion Validity of the Fourth Version of the Millon Test (MCMI-IV)

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## ABSTRACT

**Objective:** The aim of this research was to standardize and investigate the internal consistency, reliability, and criterion validity of the fourth version of the Millon Test (MMCI-IV).

**Materials and Methods:** This study employed an analytical-cross-sectional approach, considering the nature of standardization. The current method focused on the current state and situation, involving both descriptive and correlational methods. The study population consisted of all individuals who referred to counseling centers or clinics in Tehran from June 2022 to September 2022, were at least 18 years old, had a minimum of five years of education, and sought initial treatment or were referred to these centers. In this study, 500 individuals were selected from the population using purposive sampling. The measurement tools included MMCI-IV and the revised form of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF). Statistical analysis was performed using Cronbach's alpha, split-half method, test-retest reliability, Pearson correlation coefficient, and SPSS-26 statistical software.

**Findings:** Cronbach's alpha and internal consistency, assessed using the split-half method with Spearman-Brown correction, indicated acceptable coefficients for all scales and subscales of this test at a 95% confidence level ( $p < 0.05$ ). Additionally, the reliability results of this test, assessed using the split-half method, showed significant coefficients at a 95% confidence level, indicating its suitability for reliability ( $p < 0.05$ ). However, the criterion validity (concurrent validity) of this test with the MMPI-2RF was not confirmed in any of its scales as the correlation coefficient was not significant at a 95% confidence level ( $p > 0.05$ ).

**Conclusion:** It can be concluded that the standardized fourth version of the Millon Test demonstrates good internal consistency and reliability. However, it does not show concurrent validity with the MMPI-2RF. Therefore, caution should be exercised when using this test as a substitute for the MMPI-2RF.

**Keywords:** Standardization, Internal Consistency, Reliability, Criterion Validity, Fourth Version of the Millon Test.

## 1. Introduction

In 1977, the original version of the Millon Clinical Multiaxial Inventory (MCMI) was developed and presented, successfully utilizing the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM) and employing advanced psychometric methods. Moreover, the third edition of the Millon Clinical Multiaxial Inventory (1994) and its fourth edition (2017) possess unique strengths not found in many other tools. One of their strengths is the use of baseline scores instead of standard scores, enabling clinicians to obtain a much more accurate interpretation of test scores. Another strength is the use of both logical and empirical methods in test construction. The use of these methods in constructing the multi-scale questionnaire is considered a strength of the questionnaire, as each method independently affects the tool's validity. Another distinctive feature of this test is its high congruence with the classification system of the Diagnostic and Statistical Manual of Mental Disorders (Briddick, 2004).

The Millon Clinical Multiaxial Inventory-IV (MCMI-IV) is among the unique tests that emphasize personality disorders and symptoms often associated with these disorders. This test was designed to operationalize Millon's model of psychopathology and has been revised three times in line with changes in Millon's biopsychosocial theory and the DSM. These revisions were made to address this scientific and professional need by leveraging statistical science achievements (Chegini, Delavar, & Garrayi, 2013).

Updating diagnostic tools in psychopathology is a necessity. Throughout the history of clinical psychology and psychopathology, three tools - observation, clinical interviews, and psychological testing - have been used for constructs and phenomena like intelligence, personality, and mental disorders. However, these psychological diagnostic tools have much lower credibility compared to medical diagnostic tools that focus on the physical body. Psychiatrists and forensic medical experts' interest in applying the medical model in the realm of psychological phenomena, stemming from their professional needs and academic training, has led researchers to standardize various psychological tests. Another factor significantly influencing this norm-setting process is the development of the Diagnostic and Statistical Manual of Mental Disorders by the American Psychiatric Association and its revised editions. In developing and revising the fifth edition of this manual, working groups were divided into six categories, each focusing on a broad topic. One group focused on

personality and its relationship to disorders. In this manual, Axis II is dedicated to personality disorders (American Psychiatric Association, 2022; Sadock & Sadock, 2010).

In such a context, specialists need continuous updating and standardization of existing questionnaires in various areas, including personality disorders. One of the valid questionnaires in this regard is the Millon Clinical Multiaxial Inventory, which has been revised four times, with the third edition normed for the Iranian population. However, the fourth edition, aligned with the fifth edition of the DSM, has not been standardized for the Iranian society. The latest and most updated version of the DSM used by psychiatrists and clinical specialists is the fifth edition, published in 2013 (1392). A key feature of this edition is its move away from the traditional medical or categorical approach towards a dimensional or spectrum system. Unlike previous versions where a person either had sufficient symptoms to be diagnosed with a disorder or not, this edition of the DSM advocates that mental illnesses are not only distinct from each other but are conditions that exist on a continuum, graded from mild to severe based on the number and severity of symptoms. In this continuum, some conditions show mild symptoms, while others indicate severe illness symptoms (American Psychiatric Association, 2022; Sadock & Sadock, 2010).

Indeed, the results of standardizing the fourth edition of the Millon Clinical Multiaxial Inventory in Iran, a first-time endeavor, provide an effective tool for personality researchers, clinical specialists, and especially family and pre-marriage counselors to identify personality aspects during intervention. The importance and necessity of this research become more apparent when the results align with the revised version of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2), which also focuses on interpersonal relationship aspects. Thus, given the novelty and up-to-dateness of the fourth edition of the Millon Clinical Multiaxial Inventory and the lack of empirical findings on standardizing this questionnaire for the Iranian population, this research has contributed to enriching the psychometric literature in the personality domain, aiming to standardize and evaluate the internal consistency, reliability, and criterion validity (of the concurrent type) of the MCMI-IV. Hence, in this study, while standardizing this test, the following questions have been addressed:

Does the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV) exhibit internal consistency among clients of family counseling centers in Tehran?

Does the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV) exhibit test reliability among clients of family counseling centers in Tehran?

Does the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV) possess criterion validity (of the concurrent type) among clients of family counseling centers in Tehran?

## 2. Methods and Materials

### 2.1. Study Design and Participants

In this research, given its nature of standardization, an analytical-cross-sectional method was used. This method examined the current status and situation, incorporating both descriptive and correlational approaches. The study population included all individuals visiting counseling centers and therapeutic clinics in Tehran from June to September 2022, who were at least 18 years old with a minimum of five years of education, seeking initial or continued treatment. The sample size was 500 individuals from Tehran's counseling centers. The sampling method was convenient and purposive due to the high diversity of the Millon four scales (24 scales), making random sampling practically impossible. In this study, the diversity of diagnostic groups was crucial (based on the 24 scales of the fourth edition of the Millon Clinical Multiaxial Inventory), so a purposive sampling method was used. Additionally, in the sample group, invalid questionnaires were discarded, and finally, questionnaires with sufficient validity criteria were statistically analyzed.

### 2.2. Measures

#### 2.2.1. Millon Clinical Multiaxial Inventory-IV

MCMI-IV is a fundamentally revised version of the Millon 2, consisting of 195 self-report items. One of the changes made was the addition of 20 new items. The primary aim of the Millon 4 test is to identify personality patterns as it is associated with clinical symptomatology, significant problems, and a testing approach for informing about treatment outcomes. Moreover, this revision included updated norms, new test items, renamed scales, and design aligned closely with the criteria of the fourth revised edition of the Diagnostic and Statistical Manual (Sadock & Sadock, 2010). The fourth edition of the Millon Clinical Multiaxial Inventory has twenty-five scales (Millon Theory, 2015): Fifteen clinical personality patterns scales: Schizoid; Avoidant; Depressive; Dependent; Histrionic, Turbulent

(new in the fourth edition); Narcissistic; Antisocial; Aggressive; Turbulent; Compulsive; Negativistic; Self-defeating. Three severe personality pathology scales: Schizotypal; Borderline; Paranoid. Seven clinical syndrome scales: Anxiety, Somatoform, Bipolar Spectrum, Persistent Depression, Alcohol Dependence, Substance Dependence, Posttraumatic Stress Disorder. Three severe clinical syndrome scales: Schizophrenic Spectrum, Major Depression, Delusional Disorder. Three modifying indices, one discordance scale, and one validity scale. These personality scales, while refined by theory, are congruent with the personality disorders listed in the fifth edition of the Diagnostic and Statistical Manual. They are categorized into two levels of severity as clinical personality patterns scales and severe personality scales. The clinical symptomatology scales indicate syndromal conditions frequently seen in clinical settings. These are also categorized into two levels of severity as clinical syndromes scales and severe syndromes scales. The three modifying indices - Disclosure, Desirability, and Debasement - evaluate response orientations related to specific personality patterns or syndromal conditions (Millon, 2015; Millon, Grossman, & Millon, 2015). The questionnaire scoring is true/false, where a correct answer scores one and an incorrect answer scores zero. The Millon Clinical Multiaxial Inventory is a standardized self-assessment questionnaire measuring a wide range of information related to personality, emotional adaptation, and respondents' attitudes towards the questionnaire. It targets individuals over 18 years old with at least a fifth-grade reading ability and is the second most important questionnaire after the Minnesota Multiphasic Personality Inventory. The Millon questionnaire uniquely emphasizes personality disorders and symptoms often associated with these disorders. The original version of the Millon questionnaire was first compiled in 1977 and has been revised three times since then (MCMI – II; Millon 1987; MCMI-III; Millon; 1994; MCMI-IV; Millon 2015) and is one of the most used questionnaires in the clinical profession (Piotrowski, 1997). The new normative sample for the Millon 4 test included 1547 adults from clinical centers aged 18 to 85 years. The new normative sample was diverse in terms of education, geographical area, ethnicity, gender, and marital status. The Turbulent scale 32 was added in the revised version, primarily assessing chronic mood unreliability, often impulsive or reckless by nature. The fourth edition of the Millon Clinical Multiaxial Inventory includes 5 validity scales, 15 personality scales, 45 profile scales, and 10 clinical syndrome scales. Unlike other

versions of the Millon Clinical Multiaxial Inventory, the scoring system with Millon 4 was updated, no longer allowing manual scoring. Test results may be obtained through email response sheets, online responses, or scoring through regional scale survey software (Millon, 2015; Millon, Grossman, & Millon, 2015). Internal consistency estimates were made for 15 personality scales, 45 profile scales, and 10 clinical scales. The 15 personality scales showed high internal consistency (alpha coefficients varied from 0.67 to 0.92). Impulsive (0.67), Narcissistic (0.75), and Antisocial (0.78) personality scales were the only ones with internal consistency coefficients lower than 0.80. The 45 profile scales had logically high internal consistency alpha coefficients from 0.63 to 0.88. Finally, internal consistency for the 10 clinical scales also showed relatively high coefficients from 0.65 to 0.93. The lowest internal consistency estimates were for the Alcohol Use (0.65) and Bipolar Spectrum (0.71) scales. However, test-retest reliability coefficients varied across the scale groupings. Notably, test-retest coefficients for the profile scales were predominantly from 0.56 to 0.94, while the 41 personality scales showed higher correlation coefficients from 0.81 to 0.93 and clinical scales from 0.73 to 0.89 (Reynolds, Altmann, & Allen, 2021).

### 2.2.2. *The Revised Form of The Minnesota Multiphasic Personality Inventory-2*

The Minnesota Multiphasic Personality Inventory was designed by McKinley and Hathaway in 1938 to assess multifaceted personality. This questionnaire consists of 338 items and measures multifaceted personality based on a two-option Likert scale. In this study, the Minnesota Multiphasic Personality score refers to the scores respondents give to the 338-item questionnaire. It includes 50 scales with 8 validity scales, three inadequacy scales, 9 clinical scales, 25 specific problem content scales, and 5 personality pathology scales. The questions related to each component are not specified. Triple inadequacies: Emotional inadequacy; Thinking inadequacy; Behavioral inadequacy. Clinical scales: Low morale - Somatic complaints - Low positive emotions - Pessimism - Antisocial behavior - Harmful and harassing

beliefs - Disruptive negative emotions - Strange and bizarre experiences - Hypomanic activity orientation. Special problems: Unhappiness - Gastrointestinal complaints - Headache complaints - Neuropsychological - Cognitive complaints - Death and suicide beliefs - Desperation - Hopelessness - Self-doubt - Inefficiency - Psychological pressure - Worry - Anxiety - Anger potential - Behavior-limiting fears - Multiple specific fears - Adolescent conduct problems - Aggression - Excitability - Family problems - Interpersonal passivity - Social avoidance - Shyness - Non-bonding - Literary/Aesthetic interests - Mechanical/Physical interests. Personality pathology: Internalized aggression - Psychosis - Irresponsibility - Psychoneuroticism - Introversion. For scoring, this questionnaire is formatted on a two-option scale: Yes (1) - No (0). Also, in the research by Shakrizadeh et al. (2016), the content, face, and criterion validity of this questionnaire were appropriately assessed, and the Cronbach's alpha coefficient calculated for this questionnaire was estimated above 0.7. The reliability coefficients for the subscales of the questionnaire were also calculated as 0.72 (David, Carroll, & Smith, 2022; Reynolds, Altmann, & Allen, 2021; Zimmerman, 1994).

### 2.3. *Procedures and Data Analysis*

Data were collected using the Millon Clinical Multiaxial Inventory (Fourth Edition) for all sample members and the revised form of the Minnesota Multiphasic Personality Inventory-2 for 120 individuals to measure concurrent external validity. The research execution method involved randomly selecting 20 counseling centers in various areas of Tehran, with 25 accessible clients from each center being tested. For statistical data analysis, Cronbach's alpha, split-half, test-retest, Pearson correlation coefficient methods, and SPSS-26 statistical software were used.

## 3. Findings and Results

This section first examined the internal consistency of the test. For this purpose, Cronbach's alpha and the split-half methods were used, and the results are reported in the tables below.

**Table 1**

*Examination of internal consistency of scales related to the dimension of "Clinical Personality Pattern Styles" with emphasis on the "Cronbach's Alpha" and "Split-Half" methods in clients visiting family counseling centers in Tehran*

Clinical Personality Pattern Styles	Cronbach's Alpha	Split-half	Spearman-Brown correction
Schizoid	0.80	0.73	0.84
Avoidant	0.84	0.80	0.89
Melancholia.Depression	0.87	0.80	0.89
Dependent	0.63	0.48	0.65
Histrionic	0.67	0.54	0.70
Confusion	0.76	0.59	0.74
Narcissistic	0.65	0.37	0.54
Antisocial	0.60	0.42	0.60
Sadistic	0.63	0.52	0.68
Compulsivity	0.23	0.15	0.26
Negativistic	0.81	0.65	0.79
Masochistic	0.82	0.69	0.82

According to the table and as observed, all validity coefficients of the scales of the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV), focusing on "Clinical Personality Patterns Styles" in clients of family counseling centers in Tehran, were found to be above 0.60 using Cronbach's alpha method and above 0.60

(except for the Compulsive scale, which is less than 0.60) using the split-half method with Spearman-Brown correction. This indicates the desirable internal consistency and psychometric properties of the "Clinical Personality Patterns Styles" scales, emphasizing internal consistency in clients of family counseling centers in Tehran.

**Table 2**

*Examination of internal consistency of scales related to the dimension of "Severe Personality Pathology" with emphasis on the "Cronbach's Alpha" and "Split-Half" methods in clients visiting family counseling centers in Tehran*

Severe Personality Pathology	Cronbach's Alpha	Split-half	Spearman-Brown correction
Schizotypal	0.86	0.84	0.91
Borderline	0.87	0.76	0.86
Paranoid	0.72	0.49	0.66

Similarly, all validity coefficients of the scales of the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV), focusing on "Severe Personality Pathology" scales, were found to be above 0.72 using Cronbach's alpha method and above 0.66 using the split-half

method with Spearman-Brown correction. This represents the desirable internal consistency and psychometric properties of the "Severe Personality Pathology" scales in clients of family counseling centers in Tehran.

**Table 3**

*Examination of internal consistency of scales related to the dimension of "Clinical Syndromes" with emphasis on the "Cronbach's Alpha" and "Split-Half" methods in clients visiting family counseling centers in Tehran*

Clinical Syndromes	Cronbach's Alpha	Split-half	Spearman-Brown correction
Generalized Anxiety	0.79	0.68	0.82
Somatization	0.79	0.72	0.84
Bipolar Spectrum	0.68	0.56	0.73
Chronic Depression	0.90	0.84	0.91
Alcohol Abuse	0.47	0.46	0.63
Substance Abuse	0.83	0.68	0.81
Post-Traumatic Stress	0.78	0.75	0.86



Furthermore, all validity coefficients of the scales of the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV), focusing on "Clinical Syndromes" scales, were found to be above 0.47 using Cronbach's alpha method and above 0.63 using the split-half method with

Spearman-Brown correction. This represents the desirable internal consistency and psychometric properties of the "Clinical Syndromes" scales in clients of family counseling centers in Tehran.

**Table 4**

*Examination of internal consistency of scales related to the dimension of "Severe Clinical Syndromes" with emphasis on the "Cronbach's Alpha" and "Split-Half" methods in clients visiting family counseling centers in Tehran*

Severe Clinical Syndromes	Cronbach's Alpha	Split-half	Spearman-Brown correction
Schizophrenic Spectrum	0.88	0.79	0.88
Major Depression	0.89	0.84	0.91
Delusional Disorder	0.80	0.62	0.77

Additionally, all validity coefficients of the scales of the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV), focusing on "Severe Clinical Syndromes" scales, were found to be above 0.80 using Cronbach's alpha method and above 0.77 using the split-half method with Spearman-Brown correction. This indicates the

desirable internal consistency and psychometric properties of the "Severe Clinical Syndromes" scales in clients of family counseling centers in Tehran.

After examining internal consistency, test reliability was analyzed using the test-retest method, and the results are presented in the tables below.

**Table 5**

*Examination of the reliability of scales related to the dimension of "Clinical Personality Pattern Styles" with emphasis on the "Test-Retest" method in clients visiting family counseling centers in Tehran*

Clinical Personality Pattern Styles	Test-retest
Schizoid	0.85
Avoidant	0.87
Melancholia.Depression	0.87
Dependent	0.65
Histrionic	0.71
Confusion	0.74
Narcissistic	0.56
Antisocial	0.61
Sadistic	0.69
Compulsivity	0.29
Negativistic	0.78
Masochistic	0.81

According to the table and as observed, all validity coefficients of the scales of the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV), focusing on "Clinical Personality Patterns Styles" scales in clients of family counseling centers in Tehran, were found to be above 0.61 using the test-retest method (except for the

Compulsive and Narcissistic scales, which are less than 0.60). This represents the desirable repeatability of the "Clinical Personality Patterns Styles" scales, emphasizing test reliability in clients of family counseling centers in Tehran.

**Table 6**

*Examination of the reliability of scales related to the dimension of "Severe Personality Pathology" with emphasis on the "Test-Retest" method in clients visiting family counseling centers in Tehran*

Severe Personality Pathology	Test-retest
Schizotypal	0.92
Borderline	0.87
Paranoid	0.68

Likewise, all validity coefficients of the scales of the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV), focusing on "Severe Personality Pathology" scales, were found to be above 0.68 using the

test-retest method. This indicates the desirable repeatability of the "Severe Personality Pathology" scales, emphasizing test reliability in clients of family counseling centers in Tehran.

**Table 7**

*Examination of the reliability of scales related to the dimension of "Clinical Syndromes" with emphasis on the "Test-Retest" method in clients visiting family counseling centers in Tehran*

Clinical Syndromes	Test-retest
Generalized Anxiety	0.83
Somatization	0.85
Bipolar Spectrum	0.71
Chronic Depression	0.89
Alcohol Abuse	0.65
Substance Abuse	0.80
Post-Traumatic Stress	0.84

According to the above table and as observed, all validity coefficients of the scales of the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV), with an emphasis on "Clinical Syndromes" scales in clients of family counseling centers in Tehran, were found to be above

0.65 using the test-retest method. This indicates desirable repeatability for the "Clinical Syndromes" scales, highlighting test reliability in clients of family counseling centers in Tehran.

**Table 8**

*Examination of the reliability of scales related to the dimension of "Severe Clinical Syndromes" with emphasis on the "Test-Retest" method in clients visiting family counseling centers in Tehran*

Severe Clinical Syndromes	Test-retest
Schizophrenic Spectrum	0.87
Major Depression	0.89
Delusional Disorder	0.78

Additionally, all validity coefficients of the scales of the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV), focusing on "Severe Clinical Syndromes" scales in clients of family counseling centers in Tehran, were found to be above 0.78 using the test-retest method. This represents the desirable repeatability for the

"Severe Clinical Syndromes" scales, emphasizing test reliability in these clients.

Subsequently, to assess concurrent criterion validity, the correlation with the MMPI-2RF personality test was calculated, with results reported as follows:

**Table 9**

*Correlation of scales related to the dimension of "Clinical Personality Pattern Styles" with the "Threefold Deficiency Scales" of the revised Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) for concurrent validity assessment in clients visiting family counseling centers in Tehran*

Clinical Personality Pattern Styles	Emotional impairment	Cognitive impairment	Behavioral impairment
Schizoid	0.08	0.06	0.07
Avoidant	0.05	0.07	0.03
Melancholia.Depression	0.04	0.07	0.07
Dependent	0.04	0.07	0.06
Histrionic	-0.02	-0.06	0.04
Confusion	0.01	-0.04	0.01
Narcissistic	0.06	0.07	0.08
Antisocial	0.02	0.05	0.08
Sadistic	0.05	0.04	0.09
Compulsivity	0.03	0.06	0.03
Negativistic	0.07	0.10	0.11*
Masochistic	0.03	0.03	-0.01

It is noted that in clients of family counseling centers in Tehran, there is a significant positive correlation between the "Behavioral Inadequacy" scale and "Negativism" at the 0.05 alpha level. Hence, it can be suggested that the "Behavioral Inadequacy" scale of the revised Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) has concurrent

validity with the "Negativism" scale of the fourth edition of the Millon Clinical Multiaxial Personality Inventory (MCMI-IV). However, no significant correlations were found between other scales of the MMPI-2RF's tripartite inadequacies and the "Clinical Personality Patterns Styles" scales of the MCMI-IV.

**Table 10**

*Correlation of scales related to the dimension of "Severe Personality Pathology" with the "Threefold Deficiency Scales" of the revised Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) for concurrent validity assessment in clients visiting family counseling centers in Tehran*

Severe Personality Pathology	Emotional impairment	Cognitive impairment	Behavioral impairment
Schizotypal	0.10	0.08	0.07
Borderline	0.07	0.06	0.01
Paranoid	0.08	0.07	0.08

Furthermore, no significant correlations exist between scales of the MMPI-2RF and the "Severe Personality Pathology" scales of the MCMI-IV at the 0.05 alpha level. Therefore, these tools do not exhibit concurrent validity in

this regard. Similarly, no significant correlations were found between the MMPI-2RF's clinical scales and the "Clinical Syndromes" and "Severe Clinical Syndromes" scales of the MCMI-IV, indicating a lack of concurrent validity.

**Table 11**

*Correlation of scales related to the dimension of "Clinical Syndromes" with the "Threefold Deficiency Scales" of the revised Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) for concurrent validity assessment in clients visiting family counseling centers in Tehra*

Clinical Syndromes	Emotional impairment	Cognitive impairment	Behavioral impairment
Generalized Anxiety	0.06	0.04	0.08



Somatization	0.01	0.05	0.02
Bipolar Spectrum	0.03	0.04	0.03
Chronic Depression	0.05	0.07	0.06
Alcohol Abuse	0.03	0.03	0.08
Substance Abuse	0.06	0.08	-0.08
Post-Traumatic Stress	0.08	0.06	0.10

Emphasizing the obtained correlation coefficients, it is noted that there is no significant relationship between the scales of the revised form of the MMPI-2RF and the scales of the fourth edition of the MCMI-IV among clients visiting family counseling centers in Tehran at the alpha level of

0.05. Therefore, it can be stated that there is no significant relationship between the triple impairment scales of the revised MMPI-2RF and the "Clinical Syndromes" scales of the MCMI-IV, and the tools in question do not have concurrent validity.

**Table 12**

*Correlation of scales related to the dimension of "Severe Clinical Syndromes" with the "Threefold Deficiency Scales" of the revised Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) for concurrent validity assessment in clients visiting family counseling centers in Tehran*

Severe Clinical Syndromes	Emotional impairment	Cognitive impairment	Behavioral impairment
Schizophrenic Spectrum	0.06	0.02	0.08
Major Depression	0.04	0.06	0.04
Delusional Disorder	0.05	0.06	0.06

Emphasizing the obtained correlation coefficients, it is noted that there is no significant relationship between the scales of the revised form of the MMPI-2RF and the scales of the fourth edition of the MCMI-IV among clients visiting family counseling centers in Tehran at the alpha level of

0.05. Therefore, it can be stated that there is no significant relationship between the triple impairment scales of the revised MMPI-2RF and the "Severe Clinical Syndromes" scales of the MCMI-IV, and the tools in question do not have concurrent validity.

**Table 13**

*Correlation of scales related to the dimension of "Clinical Personality Pattern Styles" with the "Clinical Scales" of the revised Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) for concurrent validity assessment in clients visiting family counseling centers in Tehran*

Clinical Personality Pattern Styles	Demoralization	Somatization	Emotions	Cynicism	Antisocial Behaviors	Ideas of Persecution and Harm	Disruptive Negative Emotions	Unusual Experiences	Hypomanic Activation
Schizoid	0.08	0.04	0.05	0.01	0.06	0.07	0.08	0.06	0.09
Avoidant	0.06	0.08	-0.01	-0.01	0.03	0.06	0.05	0.07	0.08
.Depression Melancholia	0.05	0.01	-0.01	0.04	0.03	0.06	0.04	0.07	0.12*
Dependent	0.05	0.04	0.02	0.04	0.07	0.07	0.03	0.06	0.09
Histrionic	-0.02	-0.08	0.01	0.03	-0.01	-0.06	-0.01	-0.04	-0.02
Confusion	0.02	-0.03	0.02	0.06	0.01	-0.04	0.03	-0.01	-0.01
Narcissistic	0.06	0.06	0.05	0.04	0.08	0.06	0.07	0.07	0.04
Antisocial	0.03	-0.06	-0.01	0.08	0.05	0.03	0.04	0.05	0.08
Sadistic	0.04	0.05	0.03	0.03	0.08	0.05	0.05	0.02	0.06
Compulsivity	0.05	0.02	0.01	0.05	0.01	0.01	0.05	0.09	0.05
Negativistic	0.08	0.04	0.02	0.07	0.08	0.08	0.08	0.11	0.12*
Masochistic	0.03	0.05	0.01	0.01	-0.02	0.01	0.03	0.03	0.03

Moreover, a significant positive correlation exists between the "Hypomanic Activation" scale and the scales of

"Depression" and "Negativism" in the MMPI-2RF and MCMI-IV, respectively, at the 0.05 alpha level. This

suggests concurrent validity between these scales, while no significant correlations were found among other clinical

scales of the MMPI-2RF and the "Clinical Personality Patterns Styles" scales of the MCMI-IV.

**Table 14**

*Correlation of scales related to the dimension of "Severe Personality Pathology" with the "Clinical Scales" of the revised Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) for concurrent validity assessment in clients visiting family counseling centers in Tehran*

Severe Personality Pathology	Demoralization	Somatization	Emotions	Cynicism	Antisocial Behaviors	Ideas of Persecution and Harm	Disruptive Negative Emotions	Unusual Experiences	Hypomanic Activation
Schizotypal	0.12	0.03	0.01	0.08	0.05	0.08	0.08	0.10	0.10
Borderline	0.07	0.04	0.01	0.07	0.01	0.05	0.07	0.04	0.07
Paranoid	0.08	0.01	0.03	0.02	0.07	0.06	0.08	0.08	0.08

Emphasizing the obtained correlation coefficients, it is noted that among clients visiting family counseling centers in Tehran, there is no significant relationship between the scales of the revised form of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) and the scales of the fourth edition of the Millon Clinical Multi-axial Inventory

(MCMI-IV) at the alpha level of 0.05. Therefore, it can be stated that there is no significant relationship between the clinical scales of the revised MMPI-2RF and the "Severe Personality Pathology" scales of the fourth edition of the MCMI-IV, and the tools in question do not possess concurrent validity.

**Table 15**

*Correlation of scales related to the dimension of "Clinical Syndromes" with the "Clinical Scales" of the revised Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) for concurrent validity assessment in clients visiting family counseling centers in Tehran.*

Clinical Syndromes	Demoralization	Somatization	Emotions	Cynicism	Antisocial Behaviors	Ideas of Persecution and Harm	Disruptive Negative Emotions	Unusual Experiences	Hypomanic Activation
Generalized Anxiety	0.04	0.05	0.04	0.01	0.05	0.05	0.04	0.02	0.05
Somatization	0.02	-0.04	-0.04	0.01	-0.03	0.04	0.01	0.03	0.09
Bipolar Spectrum	0.02	-0.01	-0.01	-0.01	0.01	0.01	0.03	0.03	0.06
Chronic Depression	0.05	0.03	0.01	0.03	0.03	0.06	0.05	0.06	0.10
Alcohol Abuse	0.04	0.01	0.02	0.05	0.05	0.01	0.04	0.04	0.05
Substance Abuse	-0.07	-0.01	-0.03	0.08	-0.09	-0.09	-0.07	-0.09	-0.09
Post-Traumatic Stress	0.08	0.03	0.03	0.01	0.07	0.09	0.05	0.04	0.12*

Emphasizing the obtained correlation coefficients, it is noted that there is a significant positive relationship between the "Hypomanic Activation" scale and the "Post-Traumatic Stress" scale at the alpha level of 0.05. Therefore, it can be stated that the "Hypomanic Activation" scale of the revised MMPI-2RF has concurrent validity with the "Post-

Traumatic Stress" scale of the fourth edition of the MCMI-IV. However, for other clinical scales of the revised MMPI-2RF and the "Clinical Syndromes" scales of the MCMI-IV, there is no significant relationship between the two tools' scales.

**Table 16**

*Correlation of scales related to the dimension of "Severe Clinical Syndromes" with the "Clinical Scales" of the revised Minnesota Multiphasic Personality Inventory-2 (MMPI-2RF) for concurrent validity assessment in clients visiting family counseling centers in Tehran*

Severe Clinical Syndromes	Demoralization	Somatization	Emotions	Cynicism	Antisocial Behaviors	Ideas of Persecution and Harm	Disruptive Negative Emotions	Unusual Experiences	Hypomanic Activation
Schizophrenic Spectrum	0.04	-0.01	0.06	-0.03	0.06	0.05	0.01	0.02	0.03
Major Depression	0.05	-0.01	-0.01	0.05	0.01	0.06	0.04	0.05	0.09
Delusional Disorder	0.05	0.03	0.01	0.01	0.07	0.05	0.03	0.06	0.05

Emphasizing the obtained correlation coefficients, it is noted that there is no significant relationship between the clinical scales of the revised MMPI-2RF and the "Severe Clinical Syndromes" scales of the fourth edition of the MCMI-IV among clients visiting family counseling centers in Tehran at the alpha level of 0.05. Therefore, it can be stated that there is no significant relationship between the

clinical scales of the revised MMPI-2RF and the "Severe Clinical Syndromes" scales of the MCMI-IV, and the tools in question do not have concurrent validity.

Lastly, using quartile deviation-based cut-off points, qualitative norms were presented, along with quantitative norms using mean and standard deviation indices.

**Table 17**

*Descriptive statistics indices of scales related to the dimension of "Clinical Personality Pattern Styles" for presenting qualitative norms in clients visiting family counseling centers in Tehran*

Clinical Personality Pattern Styles	Healthy	At risk	Mild	Severe
Schizoid	<17	17 to 52	53 to 70	>71
Avoidant	<35	36 to 58	59 to 73	>74
Melancholia/Depression	<19	20 to 48	73 to 49	>74
Dependent	<47	48 to 63	64 to 72	>73
Histrionic	<52	53 to 68	69 to 78	>79
Confusion	<54	55 to 68	69 to 87	>88
Narcissistic	<57	58 to 69	70 to 77	>78
Antisocial	<50	51 to 63	64 to 70	>71
Sadistic	<52	53 to 64	65 to 70	>71
Compulsivity	<51	52 to 63	64 to 67	>68
Negativistic	<21	22 to 56	57 to 70	>71
Masochistic	<12	13 to 49	50 to 64	>65

Based on the table, cut-off points related to the "Clinical Personality Patterns Styles" scales are indicated, representing the 25%, 50%, and 75% points. It should be

noted that these cut-off points represent qualitative norms in the population of clients visiting family counseling centers in Tehran.

**Table 18**

*Descriptive statistics indices of scales related to the dimension of "Severe Personality Pathology" for presenting qualitative norms in clients visiting family counseling centers in Tehran*

Severe Personality Pathology	Healthy	At risk	Mild	Severe
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Schizotypal	<24	25 to 40	41 to 65	>66
Borderline	<12	12 to 41	42 to 65	>66
Paranoid	<56	57 to 64	65 to 77	>78

According to the above table, the cut-off points based on quartile deviation related to the scales of "Severe Personality Pathology" are indicated, representing the 25%, 50%, and 75% points. Observing these cut-off points for dimensions related to "Severe Personality Pathology" scales in clients of family counseling centers in Tehran, it can be stated that the

cut-off points are focused on quartile deviation (emphasizing the 25%, 50%, and 75% points). It is important to note that these cut-off points represent qualitative norms in the population of clients visiting family counseling centers in Tehran.

**Table 19**

*Descriptive statistics indices of scales related to the dimension of "Clinical Syndromes" for presenting qualitative norms in clients visiting family counseling centers in Tehran*

Clinical Syndromes	Healthy	At risk	Mild	Severe
Generalized Anxiety	<60	61 to 77	78 to 91	>92
Somatization	<10	11 to 30	31 to 68	>69
Bipolar Spectrum	<82	83 to 85	86 to 90	>91
Chronic Depression	<14	15 to 40	41 to 71	>72
Alcohol Abuse	<41	60 <sup>±</sup> 42	61 to 75	>76
Substance Abuse	<41	60 <sup>±</sup> 42	61 to 75	>76
Post-Traumatic Stress	<40	41 to 62	63 to 75	>76

Similarly, the cut-off points based on quartile deviation related to the "Clinical Syndromes" scales are also mentioned, indicating the 25%, 50%, and 75% points. By observing these cut-off points for dimensions related to "Clinical Syndromes" scales in clients of family counseling

centers in Tehran, it can be stated that the cut-off points are focused on quartile deviation (emphasizing the 25%, 50%, and 75% points). These cut-off points indicate qualitative norms in the population of clients visiting family counseling centers in Tehran.

**Table 20**

*Descriptive statistics indices of scales related to the dimension of "Severe Clinical Syndromes" for presenting qualitative norms in clients visiting family counseling centers in Tehran*

Severe Clinical Syndromes	Healthy	At risk	Mild	Severe
Schizophrenic Spectrum	<52	53 to 61	62 to 68	>69
Major Depression	<12	13 to 36	80 <sup>±</sup> 37	>81
Delusional Disorder	<60	61 to 62	63 to 70	>71

Furthermore, the cut-off points based on quartile deviation related to the "Severe Clinical Syndromes" scales are also mentioned, indicating the 25%, 50%, and 75% points. Observing these cut-off points for dimensions related to "Severe Clinical Syndromes" scales in clients of family

counseling centers in Tehran, it can be stated that the cut-off points are focused on quartile deviation (emphasizing the 25%, 50%, and 75% points). These cut-off points indicate qualitative norms in the population of clients visiting family counseling centers in Tehran.

**Table 21**

*Descriptive statistics indices of scales related to the dimension of "Clinical Personality Pattern Styles" for presenting quantitative norms in clients visiting family counseling centers in Tehran*

Clinical Personality Pattern Styles	Mean	Standard deviation
Schizoid	45.65	26.96
Avoidant	53.16	28.45
Melancholia.Depression	44.42	30.20
Dependent	59.66	20.85
Histrionic	65.28	19.34
Confusion	68.53	21.30
Narcissistic	65.86	17.17
Antisocial	55.20	21.11
Sadistic	59.19	17.73
Compulsivity	60.13	14.69
Negativistic	47.19	27.18
Masochistic	42.52	29.26

Regarding the "Clinical Personality Patterns Styles" scales, the mean and standard deviation indices are mentioned, indicating central tendency and dispersion indices. Observing the means of dimensions related to "Clinical Personality Patterns Styles" scales in clients of family counseling centers in Tehran, it can be stated that, based on T-scores of McGall (emphasizing a mean of 50 and

standard deviation of 10), the dimensions "Histrionic," "Turbulence," and "Narcissistic" have means one standard deviation above the average or expected level (above 50). It is important to note that these means and standard deviations represent quantitative norms in the population of clients visiting family counseling centers in Tehran.

**Table 22**

*Descriptive statistics indices of scales related to the dimension of "Severe Personality Pathology" for presenting quantitative norms in clients visiting family counseling centers in Tehran*

Severe Personality Pathology	Mean	Standard deviation
Schizotypal	43.04	26.67
Borderline	41.35	29.74
Paranoid	61.23	18.75

Similarly, for the "Severe Personality Pathology" scales, the mean and standard deviation indices are mentioned, representing central tendency and dispersion indices. Observing the means of dimensions related to "Severe Personality Pathology" scales in clients of family counseling centers in Tehran, it can be stated that, based on T-scores of

McGall (emphasizing a mean of 50 and standard deviation of 10), the dimension "Paranoid" has a mean one standard deviation above the average or expected level (above 50). These means and standard deviations represent quantitative norms in this population.

**Table 23**

*Descriptive statistics indices of scales related to the dimension of "Clinical Syndromes" for presenting quantitative norms in clients visiting family counseling centers in Tehran*

Clinical Syndromes	Mean	Standard deviation
Generalized Anxiety	71.30	28.41
Somatization	38.27	31.10
Bipolar Spectrum	84.94	6.31
Chronic Depression	41.96	30.01
Alcohol Abuse	33.25	32.81
Substance Abuse	46.06	30.16
Post-Traumatic Stress	57.52	25.13

For the "Clinical Syndromes" scales, the mean and standard deviation indices are also mentioned. Observing the means of dimensions related to "Clinical Syndromes" scales in clients of family counseling centers in Tehran, it can be stated that, based on T-scores of McGall (emphasizing a

mean of 50 and standard deviation of 10), the dimensions "Generalized Anxiety" and "Bipolar Spectrum" have means two standard deviations above the average or expected level (above 50). These means and standard deviations represent quantitative norms in this population.

**Table 24**

*Descriptive statistics indices of scales related to the dimension of "Severe Clinical Syndromes" for presenting quantitative norms in clients visiting family counseling centers in Tehran*

Severe Clinical Syndromes	Mean	Standard deviation
Schizophrenic Spectrum	54.32	25.27
Major Depression	46.06	36.29
Delusional Disorder	61.92	17.97

Finally, for the "Severe Clinical Syndromes" scales, the mean and standard deviation indices are mentioned, indicating central tendency and dispersion indices. Observing the means of dimensions related to "Severe Clinical Syndromes" scales in clients of family counseling centers in Tehran, it can be stated that, based on T-scores of McGall (emphasizing a mean of 50 and standard deviation of 10), the dimension "Delusional Disorder" has a mean one standard deviation above the average or expected level (above 50). These means and standard deviations represent quantitative norms in the population of clients visiting family counseling centers in Tehran.

**4. Discussion and Conclusion**

This research aimed to standardize and examine the internal consistency, reliability, and criterion validity of the fourth edition of the Millon test. For standardization, qualitative and quantitative norms of the relevant scales were measured in the statistical population of clients visiting family counseling centers in Tehran. The results showed that the internal consistency and reliability criteria were confirmed, but the concurrent criterion validity was not. Internal consistency refers to the uniform and stable measurement of the test. The results obtained using Cronbach's alpha and the split-half method showed that the standardized Millon test - fourth edition has acceptable internal consistency. This means that different individuals using this test will obtain similar results. Test reliability refers to the repeatability of results at different times. The research results using the test-retest method showed that the fourth edition of the Millon test has acceptable reliability. This means that if a person takes the test at different times,

they will get similar results. Criterion validity refers to the test's ability to measure the intended characteristics. For this purpose, the correlation coefficient of its scales with the scales of the Minnesota Multiphasic Personality Inventory MMPI-2RF was used. The results showed that the standardized fourth edition of the test does not have concurrent criterion validity with the revised Minnesota 2 personality test. This means that these two tests measure different characteristics. These results are consistent with the previous research which examined the validity and reliability of this test (David, Carroll, & Smith, 2022; Reynolds, Altmann, & Allen, 2021).

Based on the results of this research, it can be concluded that the standardized fourth edition of the Millon test has appropriate internal consistency and reliability but does not have concurrent criterion validity with the revised Minnesota-2 test. Given the confirmation of its internal consistency and reliability, this test can be used as a valid tool for measuring psychological characteristics in individuals, but the lack of concurrent criterion validity with the Minnesota-2 test indicates that it should not be used in place of the MMPI-2RF.

**5. Limitations & Suggestions**

Like all other research, this study had limitations. These include limitations in sample selection and the number of participants. The statistical population was limited to clients visiting family counseling centers in Tehran. This limitation may cause the generalizability of the results to be undesirable, and it may not be possible to generalize the results to other communities or different geographical areas. Also, using a purposive sampling method may limit the



sample to specific individuals and restrict the generalizability of the research findings. To increase the generalizability of the results, random sampling methods can be used. For further development of this research, in the future, more participants can be included, and other tests can also be examined for criterion validity to arrive at a more precise comparison among them. Further research can be conducted in the field of test validity and reliability to reach a final verification of its validity and reliability. In conclusion, the results of this research can be used in various fields, including clinical psychology, counseling, career selection, and social research. Indeed, the Millon test can be used in diagnosing mental disorders, career selection, and educational planning, and its results can assist in making more effective and accurate decisions in these areas.

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### References

- American Psychiatric Association, A. (2022). *Diagnostic and statistical manual of mental disorders: DSM-5-TR*. Washington, DC: American psychiatric association. <https://doi.org/10.1176/appi.books.9780890425787>
- Bridgick, H. (2004). *An examination of the operational indices of the noncontent scales in detection of content nonresponsivity on the Millon Clinical Multiaxial Inventory-III*. Kent State University.
- Chegini, M., Delavar, A., & Garrayi, B. (2013). Psychometric Characteristics of Millon Clinical Multiaxial Inventory-III. *Modern psychological research*, 8(29), 135-. <https://www.magiran.com/paper/1170209>
- David, R. M., Carroll, A. J., & Smith, J. D. (2022). Virtual Delivery of Therapeutic Assessment: An Empirical Case Study. *Journal of Personality Assessment*, 104(3), 417-427. <https://doi.org/10.1080/00223891.2021.1929262>
- Millon. (2015). *Millon Theory*. Retrieved 01.08.2021 from <https://millonpersonality.com>
- Millon, T., Grossman, S., & Millon, C. (2015). *Manual for the MCMI-IV*. Bloomington, MN: Pearson Assessments.
- Piotrowski, C. (1997). Use of the Millon Clinical Multiaxial Inventory in Clinical Practice. *Perceptual and Motor Skills*, 84(3\_suppl), 1185-1186. <https://doi.org/10.2466/pms.1997.84.3c.1185>
- Reynolds, C. R., Altmann, R. A., & Allen, D. N. (2021). Assessment of Personality. In *Mastering Modern Psychological Testing: Theory and Methods* (pp. 383-426). Springer International Publishing. [https://doi.org/10.1007/978-3-030-59455-8\\_10](https://doi.org/10.1007/978-3-030-59455-8_10)
- Sadock, B. J., & Sadock, V. A. (2010). *Kaplan and Sadock's pocket handbook of clinical psychiatry*. Lippincott Williams & Wilkins. [https://books.google.com/books?hl=en&lr=&id=EYWyr37ubwsC&oi=fnd&pg=PT61&dq=Sadock,+B.+J.,+Ahmed,+Samoon+%26+Sadock,+V.+A.+\(2019\).+Kaplan+and+Sadock%27s+Pocket+Handbook+of+Clinical+Psychiatry.+6th+Edition+.Wolters+Kluwer,+New+York.&ots=ZKRH7Nq91s&sig=zaZOn4kIkR13huAKHipjhnesvBk](https://books.google.com/books?hl=en&lr=&id=EYWyr37ubwsC&oi=fnd&pg=PT61&dq=Sadock,+B.+J.,+Ahmed,+Samoon+%26+Sadock,+V.+A.+(2019).+Kaplan+and+Sadock%27s+Pocket+Handbook+of+Clinical+Psychiatry.+6th+Edition+.Wolters+Kluwer,+New+York.&ots=ZKRH7Nq91s&sig=zaZOn4kIkR13huAKHipjhnesvBk)
- Zimmerman, M. (1994). Diagnosing Personality Disorders: A Review of Issues and Research Methods. *Archives of General Psychiatry*, 51(3), 225-245. <https://doi.org/10.1001/archpsyc.1994.03950030061006>

### Declaration of Interest

The authors of this article declared no conflict of interest.

### Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

### Authors' Contributions

All authors equally contributed to this study.

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