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MMPI-2 Domain and Psychological Distress in Clinical Medical Students

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ABSTRACT

Introduction: The clinical rotation is a stage of medical education that provides a stressful environment for medical students. Psychological distress in medical students affects the learning output and achievement of clinical competencies. MMPI-2 is a screening tool for mental disorders in clinical medical student admission protocols. Nevertheless, the domain for predicting psychological distress during clinical rotation has not been considered before. The aim of the study is to determine the MMPI-2 domain as a predictor of future psychological distress in clinical rotation students. **Methods:** This study used a cross-sectional and retrospective design using the MMPI-2 data derived from admission protocols and the SRQ (self-reporting questionnaire-29) questionnaire measuring the psychological distress in first-year clinical rotation students. **Results:** 87 data showed that not all MMPI-2 domains were statistically associated with psychological distress in clinical medical students. Domains of psychasthenia (Pt), psychopathic deviated (Pd), neurotic personality (NEGE), introverted personality (Intr), and lower stress resistance (ES) were the best predictors of psychological distress during the clinical process. **Conclusion:** The psychological distress of clinical medical students can be predicted by Pd, Pt, Nege, Intr, and Es scores of MMPI-2 with cut-off points 40T and 50T.

1. Introduction

The medical clinical rotation is a stage of medical education that provides a stressful environment for medical students.¹ The transition from preclinical to clinical learning is a challenge for medical students. In a clinical rotation process, medical students not only need clinical knowledge but also need competence in clinical skills, managing interpersonal communication skills, and balancing teamwork. This is important because medical students are generally at a vulnerable stage to developing mental health problems.² A meta-analysis of 42 studies involving 26,824 determined the prevalence of burnout in medical students showed a rate of 37.23%.³ Another study shows a higher prevalence rate (54.5%), in which the sources of stress were study (75.6%), money (52.3%), and relationships

(30.1%).⁴ Psychological distress in clinical rotation medical students affect the learning output and achievement of clinical competencies. MMPI-2 is used as a mental disorder screening tool in medical students when entering clinical rotations.

However, most of the clinical rotation medical students got significantly worsened in emotional health during 1 year of study.⁵ The domain of MMPI-2 to predict future performance in the clinical rotation has not been evaluated before. Research on police candidates found that the RC6 and RC8 in MMPI could be used as negative performance predictors.⁶ Another study found that lowering the limit at levels 40T and 50T (65t of the general population) had better relative risk ratio to predict problematic behaviors.⁷ Studies in preclinic medical students show Pd, Pt, Sc, and Si

scales have a correlation with the risk of developing psychopathology in preclinical medical students.⁸ There is no reference regarding the domain for predicting psychological distress in clinical rotation medical students. The aim of the study is to determine the MMPI-2 domain as a predictor of future psychological distress in clinical rotation students. Appropriate interventions for medical students at risk could be provided as early as possible.

2. Methods

This study used a cross-sectional and retrospective design using the MMPI-2 data derived from administration protocols and the SRQ (self-reporting questionnaire-29) questionnaire to measure psychological distress in first-year clinical rotation students. Participants were medical students in the first year of the clinical rotation who completed the SRQ measurement, and the data that did not meet the MMPI-2 validity scale ($L > 80$) were excluded. The MMPI-2 Indonesian version is a 567 items self-

reporting questionnaire used for this study. The domain of Clinical scale (Hy, Pd, Sc, Pt, Nege), Interpersonal Difficulty Scale (Si, Int), Problematic Behavior Scale (RC3, RC4, RC6, RC8), Adaptation Scale (Es, Do, Re, Mt, MaCR) obtaining from MMPI-2 data of clinical rotation admission process. MMPI-2 data was categorized using 40t and 50T cutting points. The SRQ-29 is a self-rating screening questionnaire for anxiety, depression, psychotic, and post-traumatic stress disorder (PTSD). Sociodemographic data were described by percentage and mean. The correlation between MMPI-2 and psychological distress was statistically analyzed.

3. Results

In this study, 109 MMPI-2 data were obtained from the admission procedure. Data that did not meet the validity criteria (overreporting) were excluded. A total of 87 data were statistically analyzed. The demographic data are displayed in Table 1.

Table 1. The demographic data (n=87).

Variable	n	%
Gender		
Male	29	33.6
Female	58	66,7
Marriage state		
No	83	95.4
Yes	4	4.6
Living		
Alone	43	49.4
Family	44	50.6
Depression anxiety		
No	58	66.7
Yes	29	33.3
Psychotic		
No	81	93.1
Yes	6	6.9
PTSD		
No	56	64.4
Yes	31	35.6

The bivariate categorical analysis was performed on the MMPI-2 domain and SRQ-29. The MMPI-2 domains obtained in this study were the Clinical Scale domains (Hy, Pd, Sc, Pt, Nege), Interpersonal Difficulty Scale (Si, Int), Problematic Behavior Scale (RC3, RC4, RC6, RC8), Adaptation Scale (Es, Do, Re, Mt, MaCR).

The data were categorized based on the cutoff point lower 40T and upper 50T. The psychological distress variable assessed by SRQ-29 were depression-anxiety, psychosis, and PTSD according to the SRQ-29 criteria. The data were analyzed using chi-square SPSS. The bivariate categorical analysis is displayed in Table 2.

Table 2 shows that the clinical scale (Pd, Pt, and Nege domain) showed a statistically significant relationship ($p < 0.05$) with psychological distress. Hypothesis testing was calculated using a critical value for chi-square statistic and degree of freedom (df). The association is also shown in a variable of interpersonal

difficulty scale (Intr) and psychological distress. There is no association between problematic behavior scales and psychological distress. For the last variable, there is a correlation between the Es domain in Adaptation Scale and psychological distress.

Table 2. Bivariate chi-square of MMPI-2 domain and psychological distress (n=87).

Variable	Depression anxiety		Psychotic		PTSD	
	Chi square	df	Chi square	df	Chi square	df
Hy	0.487	1	0.253	1	2.138	1
Pd	4.731*	1	5.301*	1	0.748	1
Sc	0.401	1	1.011	1	0.000	1
Pt	5.331*	1	1.623	1	0.690	1
Nege	3.948*	1	0.105	1	0.059	1
Si	1.545	1	2.060	1	1.752	1
Int	4.039*	1	4.979*	1	2.595	1
RC3	0.694	1	1.981	1	0.589	1
RC4	0.078	1	0.564	1	0.165	1
RC6	0.229	1	0.905	1	0.021	1
RC8	0.0203	1	1.911	1	0.043	1
Es	4.256*	1	5.488*	1	0.363	1
Do	3.668	1	2.955	1	0.21	1
Re	0.256	1	0.152	1	0.184	1
Mt	1.505	1	1.536	1	0.676	1
McR	2.845	1	0.147	1	0.137	1

* $p < 0.05$.

Notes: Hy: hysteria; Pd: psychopathic deviate; Sc: schizophrenic; Pt: psychasthenic; Nege: neuroticism; Si: social introversion; Intr: introversion; RC3: cynism; RC4: antisocial behavior; RC6: ideas of persecution; RC8: aberrant experiences; Es: ego strength; Do: dominance; Re: responsibility; Mt: maladjustment; McR: alcoholism.

4. Discussion

The MMPI-2 clinical scale in Pd, Pt, and Nege was significantly associated with depressive anxiety and psychotic symptoms in medical students. Psychopathic deviance (Pd) is a domain related to problematic authority, social disorder, and social alienation. Psychopathic deviation became one of the predictors of depression and anxiety in clinical rotation students because of the gap between students and supervisors. The gap between physicians and

students makes clinical medical students more stressed than the referral population because they have difficulty understanding their role and authority in the clinical setting.⁹

Another domain in this study is Pt (psychiatrenia). Students with high anxiety during the admission process are at risk of having anxious symptoms of depression while undergoing clinic rotation. This is in accordance with research on preclinical students in Thailand who found that the Pd, Pt, and Sc domains

were associated with depressive symptoms in medical students⁸. Unlike this study, the Sc domain is not related to distress psychology. This is possible because students with schizophrenia who have been experienced before have undergone therapy with routine antipsychotics during clinical rotation.

Another domain on the clinical scale that is a predictor of psychological distress is neurotic personality (NEGE). Research has found that neuroticism is a "vulnerability" factor for first-onset anxiety and depressive disorders.¹⁰ Meanwhile, other studies have shown that personality traits are not analogous to health threats, how healthy neuroticism and unhealthy neuroticism play out in differing outcomes.¹¹

MMPI-2 scale of interpersonal difficulty scale was assessed in this study. Putting this scale in this study is based on recent studies that have shown clinical students can be extremely stressed because of their knowledge, clinical skills, and interpersonal communication skills.¹² In the interpersonal difficulty scale, the Intr (introversion) domain is associated with depressive and psychotic psychological distress. Introversion is a personality that tends to be social disengagement. The previous study showed that the teaching environment might be differentially impacting the learning and health of introverted and extroverted students.¹³ The clinic situation makes the medical students with introverted personalities have less time to themselves. However, a previous study showed that there are no significant differences in teamwork scores between teams of different personalities in medical student emergency clerkship.¹⁴ These results suggest that clinical rotations may improve teamwork skills in introverted personality students.

On the problematic behavior scale, there was no relationship with psychological distress when undergoing clinical rotation. This is different from previous studies in the police officer sample, which showed that RC6 and RC8 could be used as predictors of problematic behavior⁷. Another study showed that the RC scales (particularly RC3, RC4, RC6, and RC8)

exhibited the best predictive validity for misconduct behavior in police officers.¹⁵ The difference with this study is that clinical medical students do not experience many behavioral problems and misconduct behavior. This result shows that problematic behavior and psychological distress have different predictor domains. The last scale analyzed in this study is Adaptation Scale. Transitioning into clinical training can be a complex problem for medical students.¹⁶ Ego strength (Es) as a stress resilience domain is the only domain that can be used as a predictor of psychological distress in clinical medical students. Medical students with adaptive coping strategies were associated with higher resilience scores.¹⁷ Medical students with lower resilience have higher academic stress.

This study shows that not all domains of MMPI-2 can be used as a predictor of psychological distress in clinical medical students. Psychoasthenia (Pt), psychopathic deviate (Pd), neurotic personality (NEGE), introversion personality (Intr), and lower stress resilience (ES) can be used as a predictor of psychological distress in clinical medical students. Although the rotation of the clinic is not only determined by psychological distress but also by academic competence. In the next study, the relationship between the problems of academic competence, graduation timeliness, and the MMPI-2 domain can be studied further.

5. Conclusion

The psychological distress of clinical medical students can be predicted by Pd, Pt, Nege, Intr, and Es scores of MMPI-2 with the cut-off points 40T and 50T. The appropriate intervention could be provided to predicted medical students before entering the clinical rotation.

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