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Testing the Reliability and Validity of Suicide Risk Assessment for Drug Abusers

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Abstract:- The increasing incidence of suicidal behaviour among drug abuser highlights the pressing need for early detection to prevent potentially fatal consequences. This study focuses on the Drug Abuser Suicide Risk Assessment (DASRA), an instrument developed to assess suicide risk levels in individuals struggling with drug abuser. DASRA consists of two integral psychological components-Psychosocial Disorder and Psychopathology Disorder-comprising a total of 40 items. A sample of 321 drug abuser residing in rehabilitation centres on the East Coast of Malaysia participated as respondents to evaluate the accuracy and effectiveness of the instrument. The construction of DASRA utilized Rasch's Four-level scale approach, supplemented by an Exploratory Factor Analysis (EFA) to establish the validity and reliability of each item within the components. Results revealed a robust Cronbach's Alpha value of 0.909 for the entire component, confirming the high reliability of DASRA. Validity assessments, as indicated by factor loading values ranging from 0.556 to 0.880, confirm the acceptability and suitability of the items for the instrument. Pearson's correlation results fell within the range of 0.626 to 0.801, indicating a moderate to strong and positive relationship of the components. DASRA is poised to significantly contribute to addressing the specific needs of drug abuser exhibiting suicide risk, facilitating early intervention, and improving their access to support services. In conclusion, DASRA proves to be a comprehensive assessment tool for detecting suicide risk among drug abuser in rehabilitation centres.

Keywords*:* Drug Abuser, Instrument, Reliability, Exploratory Factor Analysis, Suicide Risk.

1. Introduction

Every year, nearly 700,000 people worldwide lose their lives to suicide, making it the 10th most common cause of death globally. Suicide rates vary among nations, with the highest incidence observed in low- and middle-income countries [1]. Globally, suicide constitutes 1.4% of premature fatalities, exhibiting variations influenced by factors such as gender, age, socioeconomic status, suicide methods, and healthcare accessibility. Additionally, it is estimated that there may be 10 to 20 suicide attempts for every completed suicide. Each suicide has a profound impact, affecting approximately 135 other individuals, encompassing family members, friends, and the broader community. One of the key objectives for mental health outlined in both the United Nations Sustainable Development Goals (SDGs) and the WHO's Comprehensive Mental Health Action Plan 2013-2030 is to reduce the global suicide mortality rate by one-third by 2030. This target is also incorporated into the WHO's 13th General Program of Work for 2019-2023, to achieve a 15% reduction by 2023 [2].

According to a 2014 report by the Centers for Disease Control and Prevention [3], suicidal risk includes thoughts, deliberations, or intentions of committing suicide. Moreover, when a person harbours the desire to engage in actions that may lead to death without inflicting harm to oneself, it can be classified as an intention to engage in suicidal behaviours. As of 2018, National Institute of Mental Health (NIMH), engaging in suicidal behaviour can result in self-inflicted damage. The onset of substance use disorder is occurring at progressively younger ages, contributing to the growing incidence of this expanding societal issue. According to current research, it has been established that this problem often stems from life events, which may be observed in many behavioural patterns and interpersonal interactions [4]. Aside from age, gender, income level, and cultural differences, substance usage has wide-ranging consequences that encompass sociological, physiological, psychological, administrative, and economic aspects [5]. These issues transcend age, gender, socioeconomic status, and cultural disparities. Noting

the global trend of initiating substance use at younger ages, it is acknowledged as a widely recognized global concern [6].

To effectively mitigate the suicide rate, it is crucial to develop an instrument for detecting suicide risk. This initiative will also empower the government in its efforts to decrease the incidence of suicide cases. Early detection of suicide risk is important to prevent individuals from taking further actions that could lead to death. In Malaysia, all instruments for detecting suicide risk among people with mental health issues, including drug abusers, are sourced from abroad. However, they often fail to effectively capture the intricate dynamics of these concurrent challenges [7]. Suicide risk is believed to be influenced by local culture and factors, rendering foreign instruments less accurate for measuring suicide risk among Malaysians. Therefore, there is a pressing need for an instrument that takes into account cultural and local factors to assess suicidal risk among Malaysians, especially for drug abusers.

2. Literature Review

In the realm of psychosocial and psychopathological disorders among drug abuser, current research illuminates a complex landscape, underscoring the imperative for a tailored instrument designed to comprehensively measure the intricate interplay of these issues. A scrutiny of the literature reveals a substantial gap in understanding the psychosocial and psychopathological dimensions among individuals struggling with substance abuse. Existing studies primarily concentrate on isolated aspects, creating a void in holistic measurement tools. Noteworthy among these studies are those by Hawton et al. (2015) [8], where psychosocial disorder and psychopathology can be significant risk factors for suicide risk among addicts. Therefore, individuals experiencing psychosocial disorders and psychopathology have a higher risk of suicidal thoughts or behaviours [9]. It is important to recognize that those with psychosocial disorders and psychopathology may also face challenges related to mental health. Therefore, it is important to immediately seek professional help when someone experiences psychosocial and psychopathological disorders, as this can help prevent the risk of suicide. This underscores the significance of addressing psychosocial risk factors and psychopathology related to suicide prevention. Recognizing these symptoms and providing appropriate and timely treatment can help prevent the tragedy of suicide [10], [11], [12].

In the studies conducted, examples of psychosocial addiction associated with drug abuser and emotional addiction have been identified. Individuals struggling with drug abuser may exhibit distorted cognitive patterns, characterized by an inability to forget the drug, a compelling urge to persist in its use, and a lack of remorse associated with drug involvement [13]. Emotional satisfaction and happiness linked to drug use, along with the conviction that being a drug abuser is not an error, can signify a profound emotional attachment to substance use. Some individuals may articulate a perceived necessity for drugs to navigate life challenges, revealing a dependence on substances as a coping mechanism [14]. Nevertheless, emotional disruptions may manifest as frequent agitation triggered by life challenges, often resulting in the simultaneous expression of tears and laughter. A pervasive sense of worthlessness in interpersonal interactions, coupled with a lack of acknowledgment from others, may contribute to emotional distress. These disturbances can encompass the perception of hatred and criticism from one's environment, profoundly impacting overall emotional well-being [15].

In the context of psychopathological addictions related to drug abuser, which often coexist with depression and anxiety, numerous studies highlight this condition as a significant risk factor for substance abuser. A psychopathological disorder refers to a type of mental or psychological condition that impacts a person's thoughts, emotions, and actions. This disorder encompasses alterations in thinking, such as depression and anxiety, as well as changes in individual behaviours that can influence daily life and social relationships. Various types of psychopathological disorders have been identified, encompassing but not limited to anxiety, mood disorders, eating disorders, sexual disorders, personality disorders, schizophrenia, and other psychotic disorders. Each type of psychopathological disorder has different symptoms and characteristics and can affect individuals with varying degrees of severity [16], [17]. However, existing literature points out the limitations of current measurement tools in effectively addressing the intricate nature of psychopathological disorders within the drug abuser population [18]. Furthermore, the alarming rise in suicide risk among individuals with a history of drug abuser raises critical concerns about the adequacy of current assessment methods [19].

In recent years, there has been a notable increase in the prevalence of psychosocial disorders, particularly among individuals struggling with substance abuser. This issue has emerged as a prominent public health concern, not only in Malaysia but also in various other nations. Paudel et al. (2016) [20] found that the complex connection between drug abuser and emotional problems poses numerous challenges for those affected by it, as well as for their families and society at large. Simultaneously, the presence of psychopathological disorders such as anxiety and depression further complicate the already intricate terrain of mental health issues experienced by individuals grappling with drug abuser. Moreover, the concerning increase in suicide risk among individuals with substance abuse issues emphasizes the immediate requirement for comprehensive evaluation instruments to quantify and understand the intricate complexities of these interconnected challenges [21], [22].

In Malaysia and beyond, there is a notable lack of research on the psychosocial and psychopathological dimensions among drug abuser, unlike the well-explored topic of suicide risk in the Malaysian context [23], [24]. To address this gap, our study focuses on developing and analysing an instrument tailored to comprehensively measure these dimensions. Drawing on healthcare professionals' experiences with suicide risk, this study emphasizes the importance of a robust measurement tool for targeted interventions and enhanced clinical assessments, contributing to a nuanced understanding of challenges faced by individuals dealing with the complex intersection of drug abuser and mental health disorders The increasing concerns regarding the adequacy of current assessment methods underscore the necessity for instruments capable of effectively measuring the interplay of psychosocial and psychopathological disorders, particularly with a focus on suicide risk. This instrument aims to assist individuals grappling with drug abuser in the early identification of suicide risk, enabling timely interventions to reduce suicide cases both domestically and abroad.

3. Methods

This study aims to develop a new instrument or provide a detailed explanation for analysing suicide risk assessment among drug abusers. The main objective of this study is to analyse the development of an instrument for assessing suicide risk, following Rasch's (1960) [25] model, tailored for use in Malaysia. To achieve this, the study employed a quantitative descriptive research method, utilizing a survey approach to collect data. A total of 321 drug abuser from rehabilitation centres on the East Coast of Malaysia actively participated in the research. Permission was obtained from the Department's Research Ethics Committee, and participants' consent was secured before distributing the questionnaire for data collection. The selected sample for this study comprised drug abuser who were residents within the rehabilitation centre. The collected data were subjected to statistical analysis using the Statistical Package for Social Sciences (SPSS) version 29.0 to examine patterns and trends. The construction of the scale followed Rasch's (1960) [25] four-level scale approach. The development process adhered to a deductive approach, involving the following stages:

3.1 Stage 1- Analysis Sources for Instrument Development

The researcher conducted a comprehensive literature review, analysing over 60 sources, to tailor an instrument to the research objectives. Suicide risk among drug abusers was examined across a variety of sources, including study papers, articles, journals, magazines, and other publications. Consequently, the identified components include psychosocial disorders (drug dependence and emotional disorders) and psychopathological disorders (depression and anxiety), serving as major contributors to suicide risk.

3.2 Stage 2- Item Generation

A total of 41 items were generated based on the literature review, with each item representing a distinct component in the scale. Table 1 illustrates the grouping of important and salient statements according to the identified component. The component underwent scrutiny to identify any repetition. Following the creation of an initial draft containing all selected items, a panel of experts reviewed and approved them. Subsequently, the items underwent further refinement and simplification, leading to the removal of one item and the revision of two others. In the final stage, 40 items were confirmed. This instrument comprises 40 items divided into four sub-components: drug dependence (10 items), emotional disturbance (10 items), depression (10 items), and anxiety (10 items).

Respondents provided their answers on a 4-point Likert-type scale, ranging from 0 = strongly disagree to 3 = strongly agree, with a total score range of 0 to 30. A higher score indicates a higher risk of suicide.

Table 1: Components, Sub-Components, Items and Statements

	Components	Sub-Components	Number of items	Statements
1	Psychosocial Disorders	Drug Dependence	10	1. I can't forget about drugs. 2. I can't live without drugs. 3. I don't regret being involved with drugs. 4. I feel that being a drug addict is not a mistake. 5. I'm not sure if I can continue this life without drugs. 6. I still have a strong desire to take drugs. 7. I feel satisfied and happy when I can take drugs. 8. I'm not strong enough to overcome the problem of drug abuser. 9. I need drugs to forget life's problems. 10. If given the choice, I don't want to recover or be in a drug rehabilitation centre.
		Emotional Disorders	10	11. Frequent restlessness characterizes my soul. 12. Facing life's challenges triggers unstable emotions, leading to simultaneous tears and laughter. 13. Contemplating fate often induces sadness and tears. 14. A pervasive sense of uselessness affects my interactions with others and myself. 15. Lack of appreciation is a common experience from those around me. 16. Perceived resentment and criticism from people in my surroundings are prevalent. 17. Blame is commonly attributed to me during unfortunate events. 18. Frequent feelings of weakness and powerlessness arise from mistreatment by others. 19. Difficulty controlling anger is a recurring issue. 20. Damaging possessions is a common response during moments of anger or stress.
2	Psychopathological Disorders	Depression	10	21. I am often reprimanded for talking to myself. 22. I have been advised to undergo a mental health examination due to peculiar behaviour. 23. I constantly feel healthy and see no need to take care of my health. 24. I constantly feel clean and see no need to maintain personal hygiene. 25. I feel disturbed and stressed when in the company of others. 26. I prefer to isolate or distance myself from others. 27. I often feel guilty and ashamed of the bad things I have done. 28. My mind easily gets distracted or tangled when facing even small problems. 29. I often feel weary, weak, and lacking in energy.

		30. I frequently experience uncontrollable mood swings and irritability.
Anxiety	10	31. I am profoundly disappointed and feel that my life has lacked meaning for a long time. 32. I often feel restless, reflecting on the shattered life of the past. 33. I frequently cry and worry about continuing life beyond this point. 34. I am excessively anxious when contemplating the life problems I face. 35. I often feel restless, anxious, and have no desire to live any longer. 36. I am afraid to rise again with the aim of a better life. 37. I feel hopeless about continuing this life further. 38. I often contemplate death because I feel that this life has failed. 39. When experiencing extreme unrest, I feel incapable of living any longer. 40. I see death as the best way to resolve the problems I am facing.

3.3 Stage 3- Reliability Test

The instrument underwent a pilot test for reliability assessment. Table 2 demonstrates Cronbach's alpha to determine the internal consistency of the items. The Cronbach's alpha for the instrument was 0.909, falling within a high and acceptable range. The instrument generated overall mean scores and standard deviations for all items, ranging from 0.69 to 1.40, all within an acceptable range and suitable for the instrument.

Table 2: Reliability Test

No.	Components	Sub- components	No of Item	Cronbach's Alpha Based on Standardized Items
1.	Psychosocial Disorders	Drug Dependence	10	0.936
		Emotional Disorders	10	0.940
2.	Psychopathological Disorders	Depression	10	0.892
		Anxiety	10	0.947
	Overall Reliability		40	0.909

3.4 Stage 4- Exploratory Factor Analysis

As a next step, the data and sample size adequacy for conducting EFA were checked. This was achieved by measuring the Kaiser-Meyer-Olkin (KMO) sample adequacy and Bartlett's test for sphericity. Table 3 indicates that the KMO measure of sample adequacy was 0.915, and Bartlett's sphericity was significant at 0.000. This allowed factor analysis to measure the instrument's appropriateness. The assessment of the four-factor structure showed that all items strongly loaded on the four components, with values above 0.5 and within an acceptable range. Table 4 indicates that item means, and standard deviations are within an acceptable range, based on descriptive statistical analysis for each item. After conducting factor analysis and descriptive statistical analysis on all variables in the instrument, it became essential to examine the correlation matrix of all items constituting the four components or sub-components. Strong correlations were identified among all the sub-components in the instrument, as indicated in Table 5. Please refer to the table for detailed information on the relationships observed.

Table 3: Exploratory Factor Analysis

Item	Components			
	Psychosocial Disorders		Psychopathological Disorders	
	Drug Dependence	Emotional Disorders	Depression	Anxiety
Item 1.	0.557			
Item 2.	0.756			
Item 3.	0.764			
Item 4.	0.785			
Item 5.	0.786			
Item 6.	0.794			
Item 7.	0.795			
Item 8.	0.804			
Item 9.	0.818			
Item 10.		0.714		
Item 11.		0.731		
Item 12.		0.771		
Item 13.		0.775		
Item 14.		0.788		
Item 15.		0.811		
Item 16.		0.801		
Item 17.		0.812		
Item 18.		0.813		
Item 19.		0.823		
Item 20.			0.556	
Item 21.			0.564	
Item 22.			0.746	
Item 23.			0.818	
Item 24.			0.850	
Item 25.			0.885	
Item 26.			0.668	
Item 27.			0.646	
Item 28.			0.602	
Item 29.			0.808	
Item 30.			0.668	
Item 31.				0.688
Item 32.				0.700
Item 33.				0.766
Item 34.				0.795
Item 35.				0.820
Item 36.				0.829
Item 37.				0.844
Item 38.				0.848

Item 39.	0.855
Item 40.	0.880
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.915
Bartlett's Test of Sphericity:	
Approx. Chi-Square	14550.722
Df	780
Sig.	.00
Eigen value	19.825
Cumulative %	49.561

Extraction Method: Exploratory Factor Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 7 iterations [26].

Table 4: Statistical Overview of Item Distribution

Descriptive Statistics	Mean	Std. Deviation	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
Item 1.	1.3458	.95298	.044	.136	-.978	.271
Item 2.	1.1464	.94888	.565	.136	-.531	.271
Item 3.	1.0467	.94588	.486	.136	-.758	.271
Item 4.	.9782	.99506	.714	.136	-.574	.271
Item 5.	1.0623	.96299	.445	.136	-.868	.271
Item 6.	1.0374	.88309	.502	.136	-.497	.271
Item 7.	.9938	.85511	.585	.136	-.260	.271
Item 8.	1.0654	.95464	.411	.136	-.898	.271
Item 9.	1.0374	.92458	.570	.136	-.526	.271
Item 10.	1.2804	.99493	.238	.136	-1.004	.271
Item 11.	1.1994	.97346	.512	.136	-.676	.271
Item 12.	1.0374	.94133	.627	.136	-.478	.271
Item 13.	1.1371	1.00928	.621	.136	-.660	.271
Item 14.	1.0125	.86594	.557	.136	-.344	.271
Item 15.	1.4050	1.01451	.026	.136	-1.118	.271
Item 16.	1.2897	.95534	.279	.136	-.842	.271
Item 17.	1.3801	1.01186	.203	.136	-1.042	.271
Item 18.	1.1340	.96053	.623	.136	-.488	.271
Item 19.	1.0810	.93189	.374	.136	-.859	.271
Item 20.	1.0592	.99038	.464	.136	-.928	.271
Item 21.	1.2087	.88214	.239	.136	-.705	.271
Item 22.	1.3645	.92256	-.041	.136	-.921	.271
Item 23.	1.3738	.85356	-.193	.136	-.788	.271
Item 24.	1.2991	.91735	.178	.136	-.805	.271
Item 25.	1.2679	.92019	.194	.136	-.825	.271
Item 26.	1.3240	.92922	.135	.136	-.860	.271
Item 27.	1.0530	.91190	.567	.136	-.461	.271

Item 28.	1.1558	.97822	.489	.136	-.739	.271
Item 29.	1.1713	.96108	.501	.136	-.656	.271
Item 30.	.8598	.85639	.874	.136	.234	.271
Item 31.	.8287	.89018	1.012	.136	.387	.271
Item 32.	.9626	.94133	.821	.136	-.148	.271
Item 33.	1.0436	.90724	.571	.136	-.446	.271
Item 34.	1.0498	.91036	.401	.136	-.790	.271
Item 35.	.8598	.93657	.857	.136	-.217	.271
Item 36.	.8287	.89018	1.012	.136	.387	.271
Item 37.	.8879	.91509	.815	.136	-.173	.271
Item 38.	.8847	.91981	.788	.136	-.273	.271
Item 39.	.8692	.93291	.728	.136	-.533	.271
Item 40.	.6854	.79691	1.148	.136	1.012	.271

Table 5: Correlations Among Sub- Components

Sub-components	Drug Dependence	Emotional Disorders	Depression	Anxiety
Drug Dependence	1.000	.801**	.626**	.834**
Emotional Disorders	.801**	1.000	.679**	.723**
Depression	.626**	.679**	1	.653**
Anxiety	.834**	.723**	.653**	1.000

**. Correlation is significant at the 0.01 level (2-tailed).

4. Discussion

Given the considerable global challenge posed by psychosocial and psychopathological disorders among those facing drug abuser, there arose an urgent need to develop and validate a comprehensive measurement tool for this complex issue [27], [28]. This study focuses on assessing the level of suicide risk among drug abuser and early interventions to detect signs of suicide. The aim of this research is to shift the focus towards evaluating the psychosocial and psychopathological challenges faced by drug abuser who are at risk of suicide. The relevance of this exploration extends to comprehending the intricate dimensions of mental health issues in the context of drug abuser, including the crucial aspect of addressing suicide risk among this vulnerable population [29].

Utilizing data gathered from a comprehensive literature review, a specialized instrument was developed to measure the multifaceted issues associated with psychosocial and psychopathological disorders among drug abuser [30], [31]. The four-factor structure, identified through varimax rotation, encompassed Drug Dependence, Emotional Disorders, Depression, and Anxiety. This instrument was designed to fill the existing gap in valid and robust measurement tools specifically tailored to address the challenges faced by individuals dealing with both substance abuser and mental health disorders [31], [32].

The unique contribution of this study lies in its attempt to bridge the gap in the literature related to the lack of valid instruments to measure suicidal behaviour through psychosocial and psychopathological disorder among drug abusers. Unlike previous studies that do not emphasize early detection to prevent suicide cases from occurring, this research provides strong evidence to address the specific issue of suicidality related to psychosocial disorders and psychopathology among individuals struggling with substance abuse.

The instrument's construct was carefully developed by incorporating key elements of suicide risk such as psychosocial and psychopathological aspects, to ensure its comprehensive coverage [33]. Different analyses, including descriptive statistics and correlations among items and sub-components were conducted to ascertain the

psychometric properties of the component. The use of exploratory factor analysis identified the underlying factor structure based on 40 items, showcasing the instrument's reliability and validity [34].

Despite the pioneering efforts of this study, there are limitations that need acknowledgment. The sample size was relatively small and confined to a specific geographical region within the province of Malaysia. The non-random nature of the sampling method limits the generalizability of the findings. Therefore, future research endeavours should aim to replicate the study with larger and more diverse samples to test the universal application of the instrument [29]. While the reliability analysis indicated good internal consistency, future studies may explore additional tests, such as test-retest reliability [35], to further verify the stability of the instrument's construct over time.

Despite these limitations, the present study significantly contributes to the development of valid and robust measures for understanding and addressing psychosocial and psychopathological disorders among individuals struggling with drug abuser, particularly in the context of suicide risk in Malaysia. Consequently, the newly developed instrument can serve as a valuable tool to enhance researchers' understanding and awareness of psychosocial challenges among drug abusers. The information gathered from data analysis using this instrument may lay the groundwork for formulating relevant policies to guide interventions and support services, ultimately aiding in the prevention and management of suicide risk in this population. Therefore, this instrument was successfully produced and named Drug Abuser Suicide Risk Assessment (DASRA) through the best instrument construction steps.

5. Conclusion

In conclusion, this study has successfully developed and validated an instrument designed to measure challenges and issues related to psychosocial and psychopathological aspects among drug abusers, especially those at risk of suicide. The components of the instrument, identified through exploratory factor analysis, revealed a four-factor structure consisting of drug dependence, emotional disorder, depression, and anxiety. Confirmatory analysis provided strong evidence of the instrument's reliability and validity, with initial assessments showing reliability above 70% and an overall correlation between sub-components exceeding 0.70, considered acceptable. The instrument demonstrated internal consistency within an acceptable range, registering an overall reliability of .909.

Despite the valuable contributions of this study, it is crucial to acknowledge certain limitations, including a relatively small sample size confined to a specific geographic region on the east coast of Malaysia. The use of a non-random sampling method restricts the generalizability of the findings. Future research endeavours should replicate the study with larger and more diverse samples to enhance the universal applicability of the instrument. Additionally, although the reliability analysis demonstrated good internal consistency, further studies could explore additional tests, such as test-retest reliability, to affirm the instrument's component stability over time.

The DASRA instrument has a significant contribution to aiding drug abusers with suicidal behaviour, ensuring they receive better attention and support services. Additionally, the instrument can contribute to the further development of interventions and more effective prevention strategies to address mental health problems and suicidal tendencies among drug abusers. Instrument prove to be a valuable tool for mental health practitioners and researchers, enabling them to better understand, detect, and address the challenges faced by individuals struggling with drug abuser and the risk of suicide.

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