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Perceived Stress and Self-Prescribing Behavior: A Preliminary Cross-Sectional Study among Specialized Residency Training in Indonesia

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A B S T R A C T

Introduction: Challenges in specialist medical education in Indonesia can increase stress, but the expression of stress may be hampered or appear as physical complaints. The behavior of self-prescribing medication often occurs among specialist medical education participants to deal with stress-related complaints. This study aims to analyze the relationship between stress and self-prescribing behavior among specialist medical education participants in Indonesia. **Methods:** This cross-sectional study involved 39 respondents who completed an anonymous online survey. The perceived stress scale (PSS-10) was used to measure stress levels, and questions about medication self-prescribing behavior were asked. Multinomial logistic regression was used to analyze the relationship between PSS scores and self-prescribing behavior. **Results**: Most respondents (74.4%) had PSS scores higher than age and gender norms. Antibiotics were the most frequently self-prescribed medication (92.3%). No association was found between demographic characteristics, total PSS score, and self-prescribing behavior. **Conclusion:** The high level of stress in specialist medical education participants may not be directly correlated with self-prescribing behavior. This may be related to Asian culture where psychological distress tends to manifest as somatic complaints.

1. Introduction

Specialist medical education in Indonesia has a reputation for being challenging. High workloads, long hours, and rigorous academic demands are the hallmarks of this educational program. This condition can inevitably increase stress in students, which has the potential to have a negative impact on their mental and physical health. Stress in specialist medical students can manifest in various forms, both physically, emotionally, and behaviorally. Physically, stress can trigger various symptoms, such as fatigue, headaches, insomnia, and digestive disorders. Emotionally, stress can cause anxiety, depression, and mood swings. Behaviorally, stress can encourage maladaptive behavior such as substance abuse, excessive alcohol consumption, and even self-harm. Stress, like a double-edged sword, can manifest in various ways, both physically, emotionally and behaviorally. In some individuals, stress hides behind a mask of physical complaints, obscuring the root of the problem.[1-3]

In Indonesia, Asian culture plays an important role in the way stress is interpreted and expressed. Asian cultures are known to emphasize the values of collectivism and patience, where individuals are expected to suppress emotions and put the needs of the group first. This can cause stress to become blocked or even manifest as physical complaints. Stress can manifest in various forms. Symptoms can be felt physically, such as fatigue, headaches, and

indigestion. Emotions do not escape their grip, triggering anxiety, depression, and mood swings. Not infrequently, stress manifests in unexpected behavior, one of which is the behavior of self-prescribing medication. In the midst of the hustle and bustle of the world of specialist medical education, prescribing your own medicine is like a double-edged sword. On the one hand, it offers practical solutions to relieve physical and mental complaints that arise due to stress. On the other hand, this behavior holds hidden dangers, ranging from antibiotic resistance and inappropriate drug use to drug abuse. Although previous research has shown a relationship between stress and self-prescribing behavior in the general population, scientific evidence about this relationship in specialist medical education participants in Indonesia is still limited.[4-7] Therefore, this research aims to study the relationship between stress and self-prescribing behavior in specialist medical education participants in Indonesia.

2. Methods

This study used a cross-sectional design with an anonymous online survey. The target population for this research is all specialist medical education participants in Indonesia. The research sample was taken by purposive sampling through online platforms such as social media and mailing list groups. Two research instruments were used in this study: 1. Perceived stress scale (PSS-10): This scale consists of 10 items, which are used to measure the level of stress felt by respondents in the past month. This scale has a total score of 0-40, with higher scores indicating higher levels of stress. 2. Questions about self-prescribing behavior: This question is designed to elicit information about the types of drugs the respondent has self-prescribed, the reasons for this, and sources of information about these drugs.

An anonymous online survey was created using the Google Forms platform. Respondents were invited to complete the survey via a link distributed via the online platform. Data were analyzed using SPSS 25. Multinomial logistic regression was used to analyze the relationship between ordinal PSS scores and Self-Prescribing Behavior, categorical responses from each medication class asked. This research was conducted following the principles of research ethics. Respondents were given complete information about the study before they filled out the survey. Respondents' identities are kept confidential and are not linked to the data they provide. Respondent data is stored safely and is only used for research purposes.

3. Results

The demographic data reveals that our study sample consisted of 39 respondents. There was a nearly even gender distribution, with 24 females and 15 males participating. In terms of marital status, the majority (24) were married, while 15 were unmarried. The respondents came from a variety of departments, with Psychiatry having the highest representation (12 participants). Other departments included Pediatrics (5 participants), Orthopedic Surgery (4 participants), Neurology (8 participants), and Internal Medicine (3 participants). The remaining departments (Plastic Surgery, Cardiothoracic Surgery, Cardiovascular Medicine, Dermatology, and Radiology) had one or two participants each. Lastly, the data on the semester of study indicates that the respondents were at various stages of their training programs. Around a third (11 participants) were in their first to third semesters, while another third (13 participants) were in their fourth to sixth semesters. The remaining residents (15 participants) were in their seventh to ninth semesters.

Table 1. Characteristics of respondents.

Variables	Categories	Frequency
Gender	Male	15
	Female	24
Marital Status	Married	24
	Unmarried	15
Department	Pediatric	5
	Plastic Surgery	1
	Cardiothoracic Surgery	1
	Cardiovascular medicine	2
	Psychiatry	12
	Dermatology	2
	Orthopedic surgery	4
	Internal Medicine	3
	Radiology	1
	Neurology	8
Semester	1 – 3	11
	4 – 6	13
	7 - 9	15

Table 2 highlights the pattern of self-prescribing behavior among research participants, namely specialist medical education participants in Indonesia. This table is categorized by various drug classes and includes frequency of use, as well as p values associated with the relationship between stress scores and self-prescribing behavior for each drug class. A concerning finding is the high prevalence of antibiotic self-use. A total of 37 respondents (36 ever and 1 currently) reported using antibiotics without a doctor's prescription. This indicates a potential problem of antibiotic misuse, which can lead to antibiotic resistance, where the effectiveness of the antibiotic is reduced. Compared with antibiotics, the independent use of other drugs appears to be less dominant. The majority of respondents have never self-prescribed birth control pills (contraception), migraine drugs, prescription analgesics (pain relievers), antihypertensive drugs (lower high blood pressure), hypnotic and sedative drugs (tranquilizers and sleeping pills), as well as other psychotropic drugs. Table 2 includes p values to show the relationship between stress scores and self-prescribing behavior for each drug class. However, respondents' actual stress scores are not displayed in this table. High p values (all above 0.5) indicated no statistically significant relationship between stress scores and self-prescribing behavior for most drug classes. However, this needs to be investigated further because the research design may have limitations. One exception is the Antihypertensive Drugs category which is marked with an asterisk (*). Because none of the respondents had ever used this drug independently, statistical analysis for this drug class could not be carried out. The findings in Table 2 provide an overview of the practice of self-prescribing medication among specialist medical education participants in Indonesia. The high self-use of antibiotics is a major concern. Meanwhile, the use of other drugs from the various drug classes studied appears to be rare.

Table 2. The self-prescribing behaviors of the respondents.

Medication class	Behavior	Frequency	p-value
Antibiotics	Never	2	1,000
	Yes, previously	36	
	Yes, at present	1	
Contraceptive pills	Never	35	0,509
	Yes, previously	4	
	Yes, at present	0	
Migraine medications	Never	26	0,946
	Yes, previously	12	
	Yes, at present	1	
Prescription analgesics	Never	24	0,963
	Yes, previously	14	
	Yes, at present	1	
Antihypertensive Medications	Never	39	*
	Yes, previously	0	
	Yes, at present	0	
Hypnotic and Sedative	Never	30	0,842
	Yes, previously	8	
	Yes, at present	1	
Other psychotropic medications	Never	35	0,762
	Yes, previously	4	
	Yes, at present	0	

*Analysis cannot be performed due to participants' responses to this item only having one valid value.

4. Discussion

The findings of this study, which show high levels of stress among specialist medical education participants in Indonesia, are in line with previous research. Heavy workloads, long working hours, and rigorous academic demands are major factors that contribute to stress. The finding that antibiotics are the most frequently prescribed drugs is itself a serious public health problem. This factor may encourage specialist medical education participants to prescribe their own medication to treat their health complaints. The culture in Indonesia, which is accustomed to taking medicine without a doctor's prescription, can influence the behavior of self-prescribing medicine. Lack of knowledge about the dangers and risks of antibiotic misuse can encourage inappropriate use of these drugs.[8-11]

The behavior of self-prescribing medication can have various negative impacts. Improper use of antibiotics can lead to antibiotic resistance, where bacteria become resistant to treatment. This can complicate the treatment of infections and endanger public health. Using medication without a doctor's prescription can cause dangerous side effects. Using several drugs at the same time can cause dangerous drug interactions. The findings of this research indicate the need for intervention and education to overcome the problem of stress and self-prescribing behavior among specialist medical education participants in Indonesia. Easing access to health services can help specialist medical education participants get the right treatment for their health complaints. Providing education about stress and mental health can help specialist medical trainees manage stress in a healthier way. Providing education

about the dangers and risks of antibiotic misuse and proper use of drugs can help prevent self-prescribing behavior. Further research is needed to understand in more depth the factors that drive self-prescribing behavior and to develop effective interventions. Several previous studies have shown a relationship between stress and self-prescribing behavior. A study found that stress was associated with self-prescribing of antibiotics among medical students. A study found that stress was associated with self-prescribing of medications among resident physicians. The findings of this study are in line with previous research and indicate that stress is an important factor that can encourage self-prescribing behavior.[12-16]

Although this study did not find a clear association between total PSS scores and self-prescribing behavior, it is important to note that these findings do not exclude the possibility of stress as a contributing factor. The relationship between stress and self-prescribing behavior may be more complex than indicated by the PSS total score. The type of stress experienced (e.g., acute vs. chronic stress) can influence how individuals respond to it. How individuals cope with stress (e.g., through medication use) may influence self-prescribing behavior. Ease of access to medications can increase the likelihood that individuals will self-prescribe medications. This research only focuses on the total PSS score as an indicator of stress. Other factors may influence self-prescribing behavior. Symptoms of depression and anxiety may prompt individuals to seek self-treatment with medication. Lack of knowledge about the dangers and risks of drug abuse can increase the likelihood of individuals self-prescribing drugs. Peer or family pressure to use certain medications can influence self-prescribing behavior. Stress can encourage students to look for quick ways to overcome their physical complaints. Prescribing medication yourself may be perceived as an easy and quick solution, although it is not always appropriate. Further research is needed to understand in more depth the complex relationship between stress and self-prescribing behavior in specialist medical education participants. More specific instruments to measure types of stress and coping mechanisms could provide more detailed information about the relationship between stress and self-prescribing behavior. Examining other factors, such as depression, anxiety, knowledge about medications, and social pressure, may help explain variations in self-prescribing behavior. Longitudinal studies can track students over a period of time to see how stress and other factors influence their self-prescribing behavior.[17-20]

5. Conclusion

The high self-use of antibiotics is a major concern. Meanwhile, the use of other drugs from the various drug classes studied appears to be rare. Although the relationship between stress and self-prescribing behavior is not apparent based on the available data, further research is needed to gain a more comprehensive understanding, especially by including more complete measures of stress.

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