

# Prevalence of Erectile Dysfunction and its Associated Factors among Men in Government Health Clinics in Kuantan, Pahang

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## ABSTRACT

**INTRODUCTION:** Erectile dysfunction (ED) is a significant issue that should not be ignored in the clinical setting and can negatively affect the quality of life of patients and their partners. This study aims to determine the prevalence of ED and its associated factors among men who visited 12 government health clinics in Kuantan, Pahang, Malaysia. **MATERIALS AND METHODS:** Between July and October 2021, 300 males aged 18 to 60 participated in this cross-sectional study at 12 government health clinics in Kuantan. Information on demographic data, medical history, and lifestyle of the participants was obtained through a self-administered questionnaire that included a validated Malay version of the 21 item Depression Anxiety Stress Scale (DASS 21) and the International Index of Erectile Function (IIEF-5). **RESULTS:** The overall prevalence of self-reported ED was 69.3%. In terms of severity, 45.7% had mild, 20.7% mild-to-moderate, 2.3% moderate, and 1% severe ED. Multivariate analysis showed that ED associated with diabetes (OR 2.97, 95% CI 1.13–7.79); anxiety (OR 2.85, 95% CI 1.06 – 7.67) and household income (OR 0.41, 95% CI 0.18–0.95). **CONCLUSION:** ED was high in our study population. Diabetes mellitus, anxiety and household income were significantly associated with ED.

## Keywords

Erectile dysfunction, sexual dysfunction, prevalence.

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## INTRODUCTION

Men's health issues include erectile dysfunction (ED). It is defined as the inability to provide and sustain an erection that is enough for experiencing satisfying sexual activity.<sup>1</sup> Erectile dysfunction is a cause for alarm since it may lead to sexual dissatisfaction, a partner's relationship being affected much of stress, crisis of confidence, and increased anxiety and depression.<sup>2-3</sup> There are numerous factors that contribute to the development of ED. The disease arises due to either local or central causes such as neurological, psychological, vascular diseases, endocrine related diseases, lifestyle, being on drugs, and some substances.<sup>4</sup>

In Malaysia, the National Health Morbidity Survey on ED in 2019 found that the total prevalence of probable ED was 78.7 %, among sexually active Malaysian men between the ages 18 and above, with 47.1% having mild ED and 31.6% moderate to severe ED.<sup>5</sup> Various studies comparing ED prevalence across Malaysia have been conducted at various sites and populations.<sup>6-8</sup> However, there is no baseline data regarding ED in Pahang. According a report has the highest diabetes prevalence (25.7%)<sup>5</sup>, which is connected to the incidence of ED. Consequently, the purpose of this research is to determine how common ED is among males who visit 12 government health clinics in Kuantan, Pahang, Malaysia, and its associated factors.

## MATERIALS AND METHODS

### Study design and population

This cross-sectional research was placed at 12 government health clinics in the Kuantan District, from July to October 2021. Kuantan, the capital city of Pahang has 0.5 million people served by government health facilities. Male outpatients aged 18 years until sixty attendees who consented to participate in this study and were able to read Malay language questionnaire were included. Those diagnosed with sexual dysfunction, known cases of psychiatry disorder, and on psychotropic drugs were not excluded. The sample size was calculated using a single proportionate calculation based on the prevalence of ED in Johor<sup>8</sup> and with a 20% non-response rate-making sample size for this study of 300. A purposive sampling method was applied to recruit subjects in each health clinic until the total number of samples needed was achieved.

### Data collection

A self-administered questionnaire form subdivided into three sections. The sociodemographic section was to obtain data on the ethnicities, ages, education status, employment, sector occupation, income, and body mass index of the participants. Secondly, general health section to assess the subjects' previous medical and lifestyle habits, like smoking, consumption of caffeine, alcohol, and frequency of physical exercise. The third section was evaluated their sexual and psychological health using the validated Malay version International Index of Erectile Function (IIEF-5) and validated Malay version 21-item Depression Anxiety Stress.

### Malay version International Index of Erectile Function (IIEF-5)

The IIEF-5 is self-administered, cross-culturally valid, with a 0.86 area under the ROC curve and excellent sensitivity and specificity. It consists of five items used to measure five distinct domains. It is suitable for screening purposes. The score range from 5-25 are classified; severe (5-7), moderate (8-11), mild to moderate (12-16), mild (17-21), and no ED (22-25).<sup>9</sup>

### Malay version 21-item Depression Anxiety Stress (DASS-21)

DASS-21 consists of seven self-reported items in each of the three subscales of depression, anxiety, and stress with a good Cronbach's alpha score of 0.84, 0.74, 0.79 for depression, anxiety, and stress. The score was further classified into groups: normal, mild, moderate, severe, or extremely severe for the respective component.<sup>10</sup>

### Data analysis

SPSS software was used to examine the data. Since it was normally distributed, the continuous factors will be written as mean and standard deviation. On the other hand, categorical variables will be described in terms of frequencies and percentages. Then, the prevalence of self-reported ED was computed in frequency, percentage, and 95 percent confidence intervals (CI). The Pearson chi-square test and Fisher's exact test were used to examining the relationship between ED and sociodemographic and comorbid variables. The value for statistical significance will be set at  $p < 0.05$ . To find significant predictors of ED, researchers used univariate analysis; all significant predictors are included in multivariate logistic regression. The final model includes significant ( $p < 0.05$ ) and conclude as substantial predictors of ED.

### Ethical considerations

The Medical Research Ethics Committee (MREC) approved this study and registered it to National Medical Research Register (NMRR) with ID: NMRR-21-1125-59766.

## RESULTS

### Sociodemographic data

A total of 300 patients participated in this research. Table I shows the sociodemographic data of the subjects. The participants were within 18- 60 years of age, with a mean age of 46.06 ( $\pm 9.96$ ) years. More than half (57.9%,  $n=174$ ) were aged  $< 50$  years. Malay was the dominant ethnic identity (80%), whereas Chinese and Indian consisted of 12% and 8% respectively. The majority (57.3%) had received education up to secondary school level while 43% had higher education. About 54% of subjects were

working in the service sector of occupation. Their household income ranged below RM 3900, known as the B40 group-participants were 68.7%. About 51.3% of participants were obese as measured by body mass index (BMI). Most participants were only involved low physical activity (68%). Half of the participants (59.3%) were smokers; however, the majority never drank alcohol (89.3%). In all 56.7% consumed caffeine in daily life.

### Prevalence of erectile dysfunction and severity

The overall prevalence of ED was 69.3%. Among those with ED, the highest proportion (45.7%) reported mild ED, followed by mild to moderate ED (20.7%) and 1% severe respectively (Table II).

### Associated factors

As shown in Table III, being elderly (odds ratio [OR] = 21.86, 95% CI 6.28–76.11), obese (OR=2.13, 95%

CI 1.01- 4.5), had unhealthy clinical profile (OR=15.13, 95% CI 8.27-27.67), diabetes mellitus (DM) (OR=9.96, 95% CI 4.75–20.87), hypertension (OR=8.38, 95% CI 4.51–15.58), dyslipidemia (OR=6.48, 95% CI 3.54–11.86), stress (OR=8.10, 95% CI 1.06–61.81), anxiety (OR = 2.99, 95% CI 1.49-5.99) and depression (OR=4.52, 95% CI 1.03–19.84) at higher risk to experience ED compared to their counterpart.

However, being Malay ethnicity (OR = 0.28, 95% CI 0.08 – 0.95), working in the service (OR = 0.05, 95% CI 0.06 – 0.35) and the industry sectors (OR = 0.05, 95% CI 0.06 – 0.41), being in the M40 household income group (OR = 0.55, 95% CI 0.32–0.95), and being a smoker (OR = 0.53, 95% CI 0.32–0.89) were protective factors for ED. Other variables such as education level, physical activity, alcohol consumption, caffeine consumption, and heart disease did not show significant associations (Table III).

Multiple logistic regression analysis assessed the relationship between background characteristics and comorbid predictors with the ED (Table IV). The model consists of thirteen independent factors: age, ethnicity, sector occupations, household income, body mass index, smoking, clinical profile, DM, hypertension, dyslipidemia, stress, anxiety, and depression. Using Enter method, the full model containing the three remaining variables (i.e., household income, DM, and anxiety) are statistically significant, showing that the model could discriminate between patients who reported and those who did not report the ED. The model computed between 40.5% (Cox and Snell R2) and 57.1 % (Nagelkerke R2) of the variation in ED and properly identified 85.3 percent of cases.

As shown in Table IV, it showed that being a diabetic patient was two times more likely to report ED (OR=2.97, 95% CI 1.13 – 7.79) than those respondents without DM. Besides that, those respondents who experienced anxiety were more likely to develop ED (OR 2.85, 95% CI 1.06 – 7.67). However, those with the

**Table I.** Sociodemographic characteristic of respondents (n=300)

Characteristics	n (%)	
Age (mean ± SD)	(46.06 ± 9.96) <sup>a</sup>	
<b>Age (year)</b>		
18-29	16	5.3
30-39	76	25.3
40-49	82	27.3
50-60	126	42.0
<b>Ethnicity</b>		
Indian	24	8.0
Chinese	36	12.0
Malay	240	80.0
<b>Education level</b>		
No formal education	7	2.3
Primary school	30	10.0
Secondary school	134	44.7
Institute vocational	33	11.0
College/ University	96	32.0
<b>Sector occupation</b>		
Retired / Unemployed	36	12.0
Agriculture	31	10.3
Service	162	54.0
Industry	71	23.7
<b>Household income</b>		
<RM3900 (B40)	206	68.7
RM3900- 7599 (M40)	78	26
>RM7600 (T20)	16	5.3
<b>Body mass index</b>		
Normal	36	12
Overweight	110	34.7
Obese	154	51.3
<b>Exercise status</b>		
High	29	9.7
Moderate	67	22.3
Low	204	68.0
<b>Smoking status</b>		
Yes	178	59.3
No	122	40.7
<b>Alcohol consumption</b>		
Yes	32	10.7
No	268	89.3
<b>Caffeine consumption</b>		
Yes	170	56.7
No	130	43.3

<sup>a</sup> mean ± SD

**Table II.** Severity of erectile dysfunction

ED severity	No (%)
Normal	91 (30.7)
Mild	137 (45.7)
Mild-Mod	62 (20.7)
Moderate	7 (2.3)
Severe	3 (1.0)

household income in the M40 group were less likely (OR 0.41, 95% CI 0.18 – 0.95) to experience ED compared to the B40 group. Other variables were associated with an increased risk of ED, but they were not statistically significant.

**Table III.** Univariate binary logistic regression predicting the likelihood of ED

Predictor	B	SE	Wald	p-value	Crude OR (95%CI)
<b>Age group</b>					
18-29 (ref.)	-0.176	0.556	0.1		0.84 (0.28 – 2.49)
30-39	0.801	0.554	2.095	0.751	2.23 (0.75 – 6.59)
40-49	3.085	0.637	23.479	0.148	21.86 (6.28 – 76.11)
50-60				<0.001*	
<b>Ethnicity</b>					
Indian (ref.)					
Chinese	-0.525	0.747	0.493	0.483	0.59 (0.14 – 2.56)
Malay	-1.29	0.632	4.166	0.041*	0.28 (0.08 – 0.95)
<b>Education level</b>					
No formal education (ref.)					
Primary school	1.91	0.977	3.823	0.051	6.75 (0.99 – 45.77)
Secondary school	0.956	0.791	1.458	0.227	2.6 (0.55 – 12.26)
Institute vocational	-0.227	0.839	0.073	0.787	0.79 (0.15 – 4.13)
College/ University	0.049	0.791	0.004	0.951	1.05 (0.22 – 4.95)
<b>Sector occupations</b>					
Retired/ Unemployed (ref.)					
Agriculture	-1.646	1.147	2.059	0.151	0.19 (0.02 – 1.83)
Service	-3.051	1.027	8.825	0.003*	0.05 (0.06 – 0.35)
Industry	-3.007	1.044	8.3	0.004*	0.05 (0.06 – 0.41)
<b>Household income</b>					
<RM3900 (B40) (ref.)					
RM3900 - 7599 (M40)	-0.598	0.278	4.629	0.031*	0.55 (0.32 – 0.95)
>RM7600 (T20)	0.505	0.659	0.588	0.443	1.66 (0.46 – 6.03)
<b>Body mass index</b>					
Normal (ref.)					
Overweight	0.581	0.394	2.179	0.14	1.79 (0.83 – 3.87)
Obese	0.758	0.381	3.953	0.047*	2.13 (1.01 – 4.5)
<b>Physical Activity</b>					
High (ref.)					
Moderate	-0.186	0.464	0.161	0.688	0.83 (0.33 – 2.06)
Low	0.33	0.421	0.614	0.433	1.39 (0.61 – 3.18)
<b>Smoking</b>					
No (ref.)					
Yes	-0.634	0.266	5.677	0.017*	0.53 (0.32 – 0.89)
<b>Alcohol consumption</b>					
No (ref.)					
Yes	0.137	0.415	0.109	0.742	1.15 (0.51 – 2.59)
<b>Caffeine consumption</b>					
No (ref.)					
Yes	-0.249	0.255	0.953	0.329	0.78 (0.47 – 1.29)
<b>Clinical profile</b>					
Healthy (ref.)					
Unhealthy	2.717	0.308	77.74	<0.001*	15.13 (8.27 – 27.67)
<b>Diabetes mellitus</b>					
No (ref.)					
Yes	2.299	0.377	37.098	<0.001*	9.96 (4.75 – 20.87)
<b>Hypertension</b>					
No (ref.)					
Yes	2.126	0.316	45.175	<0.001*	8.38 (4.51 – 15.58)
<b>Dyslipidaemia</b>					
No (ref.)					
Yes	1.868	0.309	36.606	<0.001*	6.48 (3.54 – 11.86)
<b>Heart disease</b>					
No (ref.)					
Yes	1.718	1.049	2.684	0.101	5.57 (0.71 – 43.49)
<b>Stress</b>					
No (ref.)					
Yes	2.092	1.037	4.07	0.044*	8.10 (1.06 – 61.81)
<b>Anxiety</b>					
No (ref.)					
Yes	1.094	0.356	9.442	0.002*	2.99 (1.49 – 5.99)
<b>Depression</b>					
No (ref.)					
Yes	1.509	0.754	4.004	0.045*	4.52 (1.03 – 19.84)

Ref.: reference group; CI: confidence interval; OR: odd ratio; SE: standard error \*significant at p< 0.05

**Table IV** Multiple logistic regression predicting the likelihood of ED

Predictor	B	SE	Wald	p-value	Adjusted OR (95% CI)
Age group					
18-29 (ref.)					
30-39	-0.637	0.677	0.884	0.347	0.53 (0.14 – 1.99)
40-49	-0.097	0.696	0.019	0.89	0.91 (0.23 – 3.55)
50-60	1.272	0.812	2.452	0.117	3.56 (0.73 – 17.52)
Ethnicity					
Indian (ref.)					
Chinese	0.053	0.97	0.003	0.956	1.05 (0.15 – 7.05)
Malay	0.45	0.827	0.296	0.587	1.57 (0.31 – 7.93)
Sector occupation					
Retired/ Unemployed (ref.)					
Agriculture	-1.24	1.326	0.874	0.35	0.29 (0.02 – 3.89)
Service	-1.918	1.156	2.751	0.097	0.15 (0.02 – 1.42)
Industry	-2.063	1.183	3.044	0.081	0.13 (0.01 – 1.29)
Household income					
<RM3900 (B40) (ref.)					
RM3900 - 7599 (M40)	-0.884	0.423	4.371	0.037*	0.41 (0.18 – 0.95)
>RM7600 (T20)	1.006	0.923	1.189	0.275	2.73 (0.45 – 16.68)
Body mass index					
Normal (ref.)					
Overweight	-0.057	0.589	0.009	0.923	0.95 (0.29- 2.99)
Obese	0.047	0.583	0.006	0.936	1.05 (0.33 – 3.28)
Smoking					
No (ref.)					
Yes	-0.769	0.407	3.565	0.059	0.46 (0.21 – 1.03)
Clinical profile					
Healthy (ref.)					
Unhealthy	1.022	0.567	3.249	0.071	2.78 (0.92 – 8.45)
Diabetes mellitus					
No (ref.)					
Yes	1.090	0.492	4.915	0.027*	2.97 (1.13 – 7.79)
Hypertension					
No (ref.)					
Yes	0.365	0.491	0.555	0.456	1.44 (0.55 – 3.77)
Dyslipidaemia					
No (ref.)					
Yes	0.763	0.476	2.562	0.109	2.14 (0.84 – 5.45)
Stress					
No (ref.)					
Yes	2.201	1.274	2.987	0.084	9.04 (0.74 – 109.66)
Anxiety					
No (ref.)					
Yes	1.050	0.504	4.35	0.037*	2.85 (1.06 – 7.67)
Depression					
No (ref.)					
Yes	0.604	1.033	0.342	0.559	1.83 (0.24 – 13.85)

Ref.: reference group; CI: confidence interval; OR: odd ratio; \*significant at  $p < 0.05$

## DISCUSSION

### Prevalence of erectile dysfunction and severity

The result showed that 69.3% of respondents self-reported to having ED, lower than the nationwide population study 2019.<sup>5</sup> The finding was significantly higher than other studies conducted in primary care settings with a similar age groups (18 years and above). As an example, 55.1% of respondents reported ED in Nigeria.<sup>2</sup> Among Malaysia's neighboring countries showed lower respectively, Indonesia (11%), Singapore (2-53%), Thailand (29-65%) and the Philippines (33-65%).<sup>11,12</sup>

In terms of ED severity, the finding was consistent with the national prevalence of ED, which showed mild ED at (47.1 %) versus moderate to severe ED(31.6%).<sup>5</sup> Aside from that, other studies reported comparable results in terms of the severity of ED.<sup>2,7</sup> The findings comparable

to research in Johor (1% vs 29.5%) for severe ED, as it widened the age range to above 60.<sup>8</sup> ED might potentially be linked to metabolic syndrome, which is more prevalent among men<sup>13</sup> and is associated with getting older.<sup>14</sup> It also high? in the United Kingdom, where metabolic syndrome and hypogonadism are implicated in ED.<sup>15</sup>

### Associated factors

Numerous risk variables were shown to be involved with the occurrence of ED. There are four factors closely associated with ED in the present study: DM, anxiety, and household income.

Our study suggests that DM was significant risk factor of ED; those with DM were two times more prone to have ED. Our data are compatible with that of Yap et al.<sup>16</sup> but differ from Hassan et al., who found no significant association between ED and DM.<sup>7</sup> In Malaysia, about 1 in 5 adult population have DM.<sup>5</sup> Diabetes, cardiovascular disease, hyperlipidemia, and smoking are all involved in the pathogenesis of ED.<sup>17</sup> Only diabetes has a positive finding, while other diseases show the opposite results due to our population's overwhelming number of diabetes. Diabetes patients with high HbA1C levels are more susceptible to have moderate to severe ED.<sup>18</sup> ED is a frequent condition among male diabetic patients. Additionally, it is more prevalent in the elderly, including those with long-standing or severe diabetes, reflecting poor blood sugar control and cardiovascular health.<sup>19</sup>

Our study has demonstrated that anxiety was an important risk factor for ED, which is consistent with Vo et al. which state that ED was associated to anxiety.<sup>20</sup> Our findings contrary to others which state that stress associated with erectile dysfunction<sup>3,8,21</sup>. On the other hand, Tripathi et al. were conclude that depression was clearly related to mild ED.<sup>22</sup>

Surprisingly household income was a significant predictor associated with ED. Our finding comparing three group of household income. M40 group with income in range of RM 3900-7599 less likely having ED compared to B40 group. A cross sectional study showed those patients with low yearly income were significantly related with erectile

dysfunction.<sup>23</sup> However, other Malaysian studies stated that no significant association regarding household income with erectile dysfunction.<sup>6,7,24</sup>

The limitation for this study was that the data was obtained by self-reporting, which might have led to recall bias. Also, there might be reporting bias from responders about ED, where gender issues are not openly acknowledged. Additionally, since the questionnaire is a screening tool for ED, this study seems unable to distinguish between organic and psychogenic ED.

## CONCLUSION

Erectile dysfunction was found to be high among men attending government health clinics in Kuantan. Diabetes mellitus, anxiety and household income were significantly associated factors of ED. Hence, awareness and optimization of underlying comorbidities should be emphasized among those who are at risk.

## CONFLICT OF INTEREST

The authors disclose that they have no conflicting interests.

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