

# ANXIETY DISORDERS IN MALAYSIA FROM 2005 TO 2015: A SCOPING REVIEW OF THEIR PREVALENCE RATES, ASSOCIATED FACTORS, AND PREDICTORS

**Abdul Khaiyom JH<sup>1</sup>, Mukhtar F<sup>2</sup>, and Oei TPS<sup>3,4</sup>.**

<sup>1</sup>Department of Psychology, Kulliyah of Islamic Revealed Knowledge and Human Science, International Islamic University Malaysia, Jalan Gombak, 53100 Kuala Lumpur, Selangor, Malaysia

<sup>2</sup>Department of Psychiatry, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

<sup>3</sup>School of Psychology, University of Queensland, Brisbane, QLD 4072 Australia

<sup>4</sup>James Cook University, 149 Sims Drive, 387380 Singapore

## Correspondence:

Jamilah Hanum Abdul Khaiyom,  
Department of Psychology,  
Kulliyah of Islamic Revealed Knowledge and Human Science,  
International Islamic University Malaysia,  
Jalan Gombak,  
53100 Kuala Lumpur, Selangor, Malaysia  
Phone number: +603 64215151  
Email: hanum@iium.edu.my

## Abstract

**Introduction:** The current study aims to investigate the prevalence rates, associated factors, and predictors of anxiety disorders in Malaysia through a scoping review.

**Methods:** PsycINFO and MEDLINE databases and a total of 28 local journals were used to search for published papers in this particular area. In this case, 37 out of 105 articles managed to meet the inclusion criteria and were subjected to review. A total of 17,673 respondents, which comprised university students, the general community, and numerous types of clinical patients, were included in the review.

**Results:** The results showed that the prevalence rate of anxiety disorders was in the range between 1% and 67.6% for the mentioned populations. Moreover, various types of associated factors were found to be related to anxiety such as being divorced, widowed, or single; having a lower than tertiary level of education; being unemployed or retired; and having a low socioeconomic status. Meanwhile, there were also several predictors of anxiety such as having to deal with negative life events; domestic violence; family history of mental illness; severe psychological problems; and chronic physical illness.

**Conclusion** Generally, the prevalence of anxiety disorders is noticeable, and anxiety disorders may contribute to a decrease in the quality of life, an increase in social burden, reduced productivity, and increased utilization of health services. Therefore, awareness among community and health service providers regarding the prevalence rate of anxiety is believed to help in developing access to evidence-based psychological and pharmacological interventions.

**Keywords:** Prevalence, Associated Factors, Predictors, Anxiety, Malaysia

## Introduction

Anxiety disorders (AD) are among the most common mental illnesses around the world (1). This became very clear when the World Health Organization (WHO) considered AD a core disorder that should be assessed in World Mental Health (WMH) surveys, along with mood disorders and substance use disorders (2). The meta-analytic review of 202 studies conducted in 94 countries globally managed to discover that the lifetime prevalence of AD was in the range between 12.9% and 16.6% (i.e., between one out

of eight individuals to one out of six individuals tend to experience AD in their lifetime) (1, 3). In the United States of America (USA), AD represents the single largest mental health problem with an 18.1% prevalence rate (4), whereby more than 19 million American adults are diagnosed with AD in any given year (5).

Apart from the high prevalence rate, AD is also characterized by an early age of onset (4), associated with the development of other psychiatric comorbidities, particularly among ADs and depressive disorders (6), and

is believed to have a prolonged chronic course with a high relapse rate (7). Moreover, AD with other psychiatric comorbidities is associated with a high risk of suicidal ideation, suicide attempts, and completed suicide (8, 9).

Due to its chronic nature, most patients with AD tend to experience a poor quality of life (10) and significant impairments in role function, such as in their social, family, and work roles (11, 12). AD has been found to be the sixth leading cause of disability, both in high-income and low- and middle-income countries (13). The burden of AD includes the excess use of health care services, while the economic cost for AD has increased since 2005 (13). In 2010, the economic cost for AD was reported to be 74.4 billion Euros per year in Europe and was considered the second-highest disorder after mood disorder (14).

### **Epidemiology of anxiety disorders in Malaysia**

AD has emerged as one of the most commonly reported and fastest growing mental health problems in Malaysia. This became evident when the Fourth National Health Morbidity Survey (NHMS-IV) started to utilize diagnostic assessment in assessing the prevalence rate of AD among Malaysians (15). The validated MINI International Neuropsychiatric Interview (MINI) (16) was utilized by NHMS-IV specifically to assess generalized anxiety disorder (GAD) (15) instead of using screening tools as applied in the three previous versions of NHMS for psychiatric morbidity to assess distress such as depression, anxiety, social impairment, and hypochondriasis (17). In relation to this, the prevalence rate of GAD was 1.7% (95% CI: 1.5 - 2.0) and was comparable to international figures (1.9%-2.5%) (15).

GAD has been extensively studied, thus revealing several sociodemographic characteristics of GAD. The most obvious finding from the analysis was that the prevalence of GAD was higher in the 16-24 years age group, accounting for 2.1% compared to the other age groups (15). Similar to the results found globally, (18, 19) it was highlighted that the prevalence of GAD in Malaysia was almost double in females compared to males, represented by 2.2% and 1.3%, respectively. In terms of ethnicity, GAD prevalence was the highest amongst Indians (4.5%), followed by other Bumiputeras such as indigenous people and natives of Sarawak and Sabah (2.0%), Malays (1.7%), and Chinese (1.0%). In contrast to McEvoy and colleagues (2), the prevalence rate of GAD in Malaysia was higher amongst individuals with tertiary education (2.1%) compared to those with primary education (1.8%) (20). Moreover, GAD was higher in homemakers or unpaid workers, recorded at 1.7%, compared to retirees (1.6 %) (21). The prevalence of GAD in Malaysia was high among individuals with low socioeconomic status including those with a household income of less than RM 3,000, which is parallel to the reports of global studies related to the epidemiology of AD (22).

However, other types of AD such as panic disorder, agoraphobia, social anxiety disorder, and specific phobia remain under-detected among Malaysians despite the

available information on GAD. This may be explained by the fact that the issue of AD in Malaysia has not received the attention it deserves, thus resulting in information on AD in Malaysia remaining fragmented and unclear. With this in mind, the current study aims to further investigate AD in Malaysia by conducting a scoping review on the prevalence rates of AD (indicated by moderate to severe/extremely severe levels of anxiety or confirmed diagnosis) in Malaysia. Secondly, this paper will review the associated factors and predictors of AD reported in the selected literature.

## **Materials and Methods**

### **Literature search**

In June 2016, both the PsycINFO and MEDLINE databases were explored using specific search terms such as *anxiety, panic, phobia, and distress* that were combined with the terms *prevalence* and *Malaysia* as identifiers. Besides, 28 local journals were manually searched and scrutinized between June to December 2016 for additional published papers in this area. These journals included the International Journal of Public Health Research, *Jurnal Psikologi Malaysia*, Malaysian Journal of Psychiatry, Malaysian Journal of Medical Sciences, and Journal of Health and Translational Medicine. The search was limited only to the title of scientific articles published in English or Malay from 2005 to 2015, without any restriction on the subject area.

### **Inclusion criteria**

Previous studies that were included were chosen based on the following criteria: (a) contained information on prevalence rate, (b) participants were assessed for anxiety, panic, or phobia, (c) conducted among Malaysian adults, and (d) published in a peer-reviewed journal.

### **Data extraction**

The characteristics of the study were extracted independently by one reviewer and entered into data extraction forms specifically designed for the review. Next, a second review author was consulted to detect any discrepancies, which were then resolved through discussion.

### **Encoding results**

The information from each of the studies was arranged based on the order of publication and three categories of population (i.e., student, general community, and clinical). The details of the studies were divided into 11 features listed as follows: (a) population, (b) author/s and year of publication, (c) study design, (d) study settings, (e) target group, (f) mean age of participants, (g) gender, (h) ethnicities, (i) measures used, (j) prevalence rate, and (k) other relevant findings such as associated factors and predictors of AD.

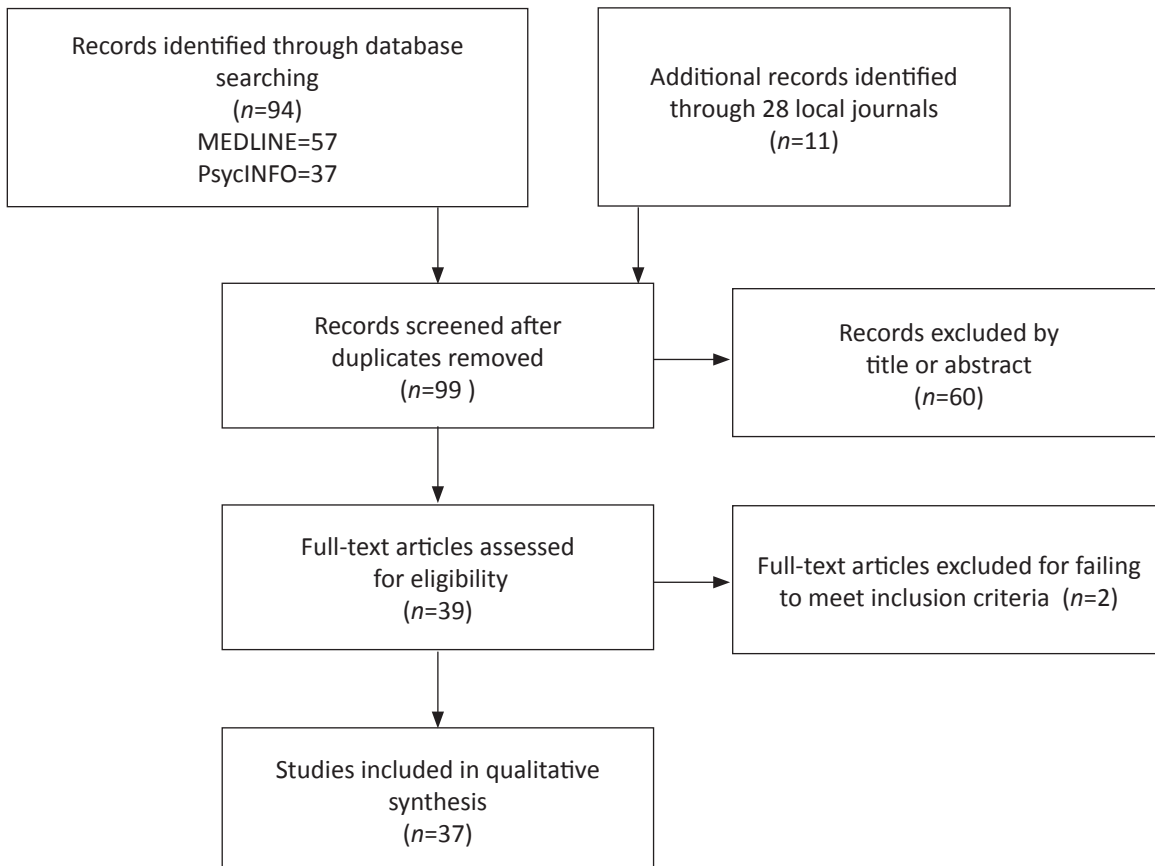
The population, setting, and target group were included in the discussion to investigate whether the assessment for AD focused on clinical or non-clinical samples. In

addition, the study design was described to enable further understanding of the research design developed to examine the prevalence rate in Malaysia. Moreover, several factors such as age, gender, and ethnicity were considered important for future research recommendations, especially for prevention or early intervention programs. Finally, information regarding the measures used was vital in order to conclude which types of psychological tests used to study AD in Malaysia would also be used as the basis for future research improvements.

**Results**

**Results of the search**

A total of 104 articles were found; however, 67 articles were excluded due to failure to meet the inclusion criteria. Therefore, only a total of 37 articles were subjected to review (see Figure 1 for article selection using the PRISMA flowchart).



**Figure 1:** Study selection flowchart

**Characteristics of included studies**

The characteristics of the included studies are provided in Table 1. More than 80% of the studies had been published from 2010 onwards and around 75% of the studies utilized the cross-sectional research design. Moreover, the majority of the studies, which accounted for 62% of the total number of studies, were conducted in the central region of Malaysia.

A total of 17,673 respondents participated in the studies, which involved university students, the general community, and numerous types of clinical patients. The sample size was in the range of 47 to 2508, while the mean age of participants ranged from 18 to 70 years old. In terms of gender, it was found that female subjects tended

to dominate participation in the prevalence studies (n=10,296), except for a few studies which only involved males as participants.

Meanwhile, in terms of ethnicity, the participants were primarily Malays (n=7,371), followed by Chinese (n=2,695), Indians (n=2,429), and others (n=221). Nevertheless, the above information cannot be considered absolute because 11 studies failed to report information on ethnicity.

**Prevalence of anxiety disorders in Malaysia**

**Student population**

Twelve studies reported the prevalence rates of anxiety among university students in Malaysia. The mean age of

**Table 1:** Characteristics of included studies

Population	Study	Design	Setting	Target group	Age M	Gender F	Ethnicity	Measure/s	Prevalence Rate %	Associated Factors/ Predictors
Student	Study 1 (23)	C-S	private medical uni, Cyberjaya	ug, medicine, n=762	22	77%	M: 66.9% C: 4.2% I: 25.5% O: 3.4%	P: DASS-21 S: MSSQ-40	76.2% (NR on anxiety levels)	AF P
	Study 2 (24)	Q-E	private uni, KL	ug, 1st yr pharmacy, n=225	19	31%	NR	P: WTAS S: PDS, AMS	Test anxiety: 9.1% (mod-ext high)	NA
	Study 3 (25)	C-S	private uni, KL	ug, medicine & students who have completed ≥6 mth of a medical degree, n=358	NR	51%	NR	P: DASS-21 S: SSI	44% (mild-ext severe)	AF P
	Study 4 (26)	C-S	public uni (medical school), Klang Valley	ug, medicine & dentistry n=1126	NR	NR	NR	DFS	Dental anxiety: Medical: 90% (low-high) Dental: 96% (low - high)	NA
	Study 5 (27)	C-S	uni hospital, KL	ug, medicine, clinical yr, n=350	23	58.2%	M: 63.2% C: 34.7% I: 1.3% O: 0.8%	DASS-21 (BM valid)	2.4% (mild-severe)	AF
	Study 6 (28)	C-S	4 public uni, Klang Valley	ug, various disciplines n=506	21	55%	M: 77.1% C: 18.6% I: 2% O: 2.3%	DASS-21	63% (mod-ext severe)	AF
	Study 7 (29)	1-yr prospective cohort	public uni (medical school), Kelantan	successful medical degree applicants, n=174	NR	67.2%	M: 46.6% C: 39.7% I: 10.9% O: 2.9%	DASS-21	Before medical training: 55.6% (mod-ext severe)  During medical training (2- mth to 1st yr exam): Range between: 41.1%-56.7% (mod-ext severe)	NA
	Study 8 (30)	C-S on 2 cohorts	public uni (medical school), Kelantan	ug, 2 cohorts, medicine, n=743	19	60.8%	M: 47.9% C: 38.9% I: 9.6% O: 3.6%	DASS-21	54.5% (mod-ext severe)	AF

Population	Study	Design	Setting	Target group	Age M	Gender F	Ethnicity	Measure/s	Prevalence Rate %	Associated Factors/ Predictors
	Study 9 (31)	C-S	private uni, Selangor	ug, various disciplines n=468	18 (<20) 22 (>20)	69.6	M: 77.8% NM: 22.2%	LSAS	Social phobia: 53.9% Other phobias: Animal=37.6% Speaking in front of a crowd=11.5% Situations=7.7%	AF P
	Study 10 (32)	NR	19 public & private uni, KL & Selangor	ug, various disciplines n=584	21	59.4%	M: 44.7% C: 44.5% I: 9.9% O: 0.9%	P: DASS-21 S: EAT-26	55% (mod-severe)	AF
	Study 11 (33)	C-S	uni hospital KL	ug, medicine, final yr, n=101	NR	73%	NR	SPIN	Social phobia: 56% (cut-off point SPIN≥19)	NA
	Study 12 (34)	C-S	public uni (medical school), Selangor	ug, medicine, n=396	22	61.6%	M: 53% C: 36.2% I: 6.8% O: 4.1%	P: BAI S: BDI	38.4% (mod-severe)	AF
General community	Study 13 (35)	C-S	living quarters in 3 districts, Selangor	adult aged ≥18 yrs n=1556	35	62.7%	M: 64.6% C: 7.9% I: 18.8% O: 2.1%	P: GAD-7 (BM valid) S: PHQ-9 (BM valid), SLE, PSS- 10, HARK, RSES, DUREL	8.2% (cut-off point GAD-7≥8)	AF P
	Study 14 (36)	C-S	palm oil plantation Johor	farmers, n=47	30	100% male	NR	DASS-21 (BM valid)	27.7% (mild-mod)	NA
	Study 15 (37)	C-S	rural areas, Terengganu, Pahang, Kelantan	rural residents, n=520	42	56.2%	M: 88.5% C: 9.8% I: 0.2% O: 1.5%	HADS (BM valid)	16.9% (mild-severe)	AF
	Study 16 (38)	C-S	2 major automotive assembly plant, Selangor & Pahang	automotive assembly works, n=728	27	100% male	NR	P: DASS-14 S: JCQ	(cut-off point HADS≥8) 47.2% (mild-severe) (cut-off ≥78 percentile scores)	AF P
Clinical	Study 17 (39)	C-S	2 primary care-based hypertensive clinic, West Coast	elderly hypertensive, n=398	69	50.5%	M: 76.1% C: 14.3% I: 9.5%	HADS (BM valid)	13.3% (mild-severe) (cut-off point HADS≥8)	AF P

Population	Study	Design	Setting	Target group	Age M	Gender F	Ethnicity	Measure/s	Prevalence Rate %	Associated Factors/ Predictors
	Study 18 (40)	C-S	inpatient medical ward at a uni hospital, Kuala Lumpur	IHD patients, n=100	age range 31-70	66%	M: 60% C: 33% I: 7%	P: HADS (BM valid) S: PSS*	15% (mild-severe)	AF
	Study 19 (41)	longitudinal cohort study with case- control	university hospital	women with HG, a control group matched for gestational age≥28 wk, n=234	HG: 29 Control: 31	100%	M: 73.9% C: 10.7% I: 12% O: 3.4%	DASS-21 (BM valid)	HG at hospitalization: 68.6% HG at 3rd trimester: 19% Control at 3rd trimester: 61.1% (mild-severe)	AF
	Study 20 (42)	C-S	antenatal clinic at a uni hospital, Klang Valley	out-patient antenatal mothers n=320	range 19-34	100%	M: 78.4% C: 8.4% I: 11.9% O:1.2%	P: HADS (BM valid) S: RSES, OSS	35.5%	AF
	Study 21 (43)	NR	oncology clinic at an academic medical center, location NR	adult cancer patients attending oncology follow- up n=467	56	75.3%	M: 24.6% C: 57% I: 15.2% O: 3.2%	HADS SCID	Baseline: 44.3% At 4-6mth f-u: 54.6% (mild-severe) (cut-off point HADS≥8) Specific diagnosis: GAD 6mth f-u 18.8% 12-18mth f-u 17.7%	NA
	Study 22 (44)	C-S	12 randomly selected primary care clinics, Klang Valley	type II diabetes, n=2508	57	61.1%	M: 51.2% C: 17.5% I: 31.3%	P: DASS-21 (BM valid) S: anthropo. & blood assay measurements	30.5%	AF P
	Study 23 (45)	C-S	antenatal clinic at tertiary gov. hospital, Perak	antenatal women, n=175	31 gestational age (M=27 weeks)	100%	M: 78.9% NMI: 21.9%	P: HADS (BM valid), MINI S: obstetric info.	9.1% (mild-severe) (cut-off point HADS≥8)	AF P
	Study 24 (46)	C-S	Center for Addiction Science, uni hospital, Klang Valley	adult drug- dependent patients (including MMT) & normal people, n=150	MMT: 38 normal: 36	100% male	M: 92.9% C: 4.1% I: 3.0%	SCL-90-R GHQ-28	Specific diagnosis: PD=5.7% Agora x PA=2.9% Anxiety: MMT: 34.7% Normal: 10.2% Phobic anxiety: MMT: 6.1%	AF

Population	Study	Design	Setting	Target group	Age M	Gender F	Ethnicity	Measure/s	Prevalence Rate %	Associated Factors/ Predictors
	Study 25 (47)	C-S	gov-funded drug rehab center, Kuala Lumpur	adult drug- dependent patients, n=201	Involved ≥ 18	NR	NR	P: MINI S: AUDIT, ASSIST	27.9%	AF
	Study 26 (48)	NR	uni hospital, Klang Valley	functional gastrointestinal disorders n=248	FD: 51 NERD: 50 IBS: 50 Control: 51	≈62.1%	M: 45.6% C: 25.4% I: 29%	HADS (BM & Eng valid)	FD=43.5% NERD=42.5% IBS=67.7% Control=14.5% (mild - severe) (cut-off point HADS≥8)	NA
	Study 27 (49)	C-S	primary care clinic, location NR	adult women, n=845	31	100%	NR	P: GAD-7 (BM valid), CIDI S: GHQ-12	7.8% (cut-off point GAD-7≥8) Specific diagnosis: GAD=26%	NA
	Study 28 (50)	C-S	urban district primary care clinic, location NR	adult female patients, n=845	31	100%	NR	P: GAD-7 (BM valid) S: SLE, HARK	7.8% (cut-off point GAD-7≥8)	AF
	Study 29 (51)	C-S	surgical ward & palliative care at the public hospital, Kuala Terengganu	adult cancer out- & in-patients n=150	50	60%	M: 92% C: 8%	P: HADS (BM valid) S: MMQoL (BM valid)	44.7% (mild & mod)	AF P
	Study 30 (52)	C-S	public hospital, Kuala Lumpur	hematological cancer patients, n=105	40	52.4	M: 60% C: 24.8% I: 13.3% O: 1.9%	P: MINI S: EORTC QLC-C30	Range from 1%-24.8% Specific diagnosis: PD x Agora: 1.0% OCD: 1.9% PD w Agora: 2.9% PTSD: 2.9% SAD: 7.6% GAD: 10.5% Agora x PD: 24.8%	NA
	Study 31 (53)	Prospective C-S	NR	functional and organic dyspepsia, n=839	50	55.7%	M: 30.5% C: 38.4% I: 29.4%	P: HADS (BM valid) S: HRQOL LDQ	51.6% (mod-severe)	AF

Population	Study	Design	Setting	Target group	Age M	Gender F	Ethnicity	Measure/s	Prevalence Rate %	Associated Factors/ Predictors
	Study 32 (54)	Prospective C-S	university hospital, Klang Valley	in-patient women with HG, n=209	28	100%	M: 72.7% C: 6.2% I: 16.3% O: 4.8%	HADS	46.9% (mild-severe) (cut-off point HADS≥8)	AF
	Study 33 (55)	C-S	outpatient oncology unit at a uni hospital, Kuala Lumpur	breast cancer patient, n=141	50	100	NR	HADS (BM valid)	24.1 (mild-severe)	AF
	Study 34 (56)	NR	the drug rehabilitation center, Selangor	drug offenders, n=142	37	NR	M: 83.8% C: 8% I: 7% O: 1%	SCID-CV Axis I DSM-IV	63.4% (CP) 67.6% (LP)	NA
	Study 35 (57)	NR	urban areas, locatton NR	man with ED/ no ED, man with/ without PE n=430	EDwPE 50 EDxPE 53 xEDwPE 35 xEDxPE 39	100% male	M: 41.9% C: 37.7% I: 27.4%	HADS	8.1% (cut-off point HADS≥11=moderate anxiety)	AF
	Study 36 (58)	C-S	various locations* Kelantan	naturally menopausal healthy women n=326	57.01 49 & 50*	100%	NR	BM valid. semi-structured questionnaire on menopausal symptoms	39.8%	NA



Population	Study	Design	Setting	Target group	Age M	Gender F	Ethnicity	Measure/s	Prevalence Rate %	Associated Factors/ Predictors
	Study 37 (59)	C-S	3 primary care clinics, Sarawak	patients age ≥ 15 yrs, n=196	37	50.5%	M: 36.9% C: 38.4% O: 23.7%	10 screen questions for mental illness & structured clinical interview for psychiatric diagnosis (BM & Chinese valid)	GAD: 5.6% PD : 0.5%	NA

**Notes:**

NR=not reported, NA=not available

**Design:** Q=E=quasi-experimental, C=S=cross-sectional, yr=year, wk=week

**Setting:** uni=university; KL=Kuala Lumpur; various locations\*=public services departments village committee, nursing staff from university and public hospital, non-governmental organization, menopause clinic, gynecology clinic from university hospital; gov.=government

**Target group:** ug=undergraduate university students, yr=year, M=mean, mth=month/s, ED=erectile dysfunction, PE=premature ejaculation, MMT=heroin dependents patients receiving Methadone Maintenance Therapy, IHD=ischemic heart disease

**Age:** M=mean age, w=with, x=no, 49 & 50\*=the mean and median age at menopause respectively, FD=functional dyspepsia, NERD=nonerosive reflux disease, IBS=irritable bowel syndrome, HG=hyperemesis gravidarum

**Gender:** F=female

**Ethnicity:** M=Malay, C=Chinese, I=Indian, O=Others, NM=Non-Malay

**Measure/s:** P=primary scale measuring the prevalence of anxiety, S=secondary measures used for other findings, WTAS=Westside Test Anxiety Scale, PDS=Kessler Perceived Distress Scale, AMS=Academic Motivation Scale, DASS-21=Depression, Anxiety, and Stress Scale-21 item, SSI=Students Life Stress Inventory, DFS=Kleinkecht's Dental Fear Survey, DSM-IV=Diagnostic and Statistical Manual of Mental Disorders 4<sup>th</sup> ed., AD=Anxiety Disorders, LSAS=Liebowitz Social Anxiety Scale, EAT-26=Eating Attitude Test-26 item, BM=Bahasa Malaysia, valid=validated version, SPIN=Social Phobia Inventory, MSSQ=Medical Student Stressor Questionnaire-40 item, DASS-14=DASS-14 item, JCQ=Job Content Questionnaire, HADS=Hospital Anxiety and Depression Scale, GAD-7=Generalized Anxiety Disorder-7 item, PHQ-9=Patient Health Questionnaire-9 item, SLE=Kendler et al. stressful life events, PSS-10=Perceived Stress Scale, HARK=humiliation, afraid, rape, and kick - domestic violence questionnaire, RSES=Rosenberg self-esteem scale, DUREL=Duke University Religion Index, Eng=English language, CIDI=Composite International Diagnostic Interview, GHQ-12=General Health Questionnaire-12 item, OSS=Oslo Social Support Scale, SCID=Structured Clinical Interview for DSM-IV-TR, SCL-90-R=Symptom Checklist-90-Revised, MMQoL=Malay McGill Quality of Life

Questionnaire, PSS\*=Perceived Social Support, anthroppo.=anthropometric, MINI=MINI International Neuropsychiatric Interview, AUDIT=Alcohol Use Disorders Identification Test, ASSIST=Alcohol, smoking, and substance involvement screening; EORTC QLQ-C30=European Organization for Research and Treatment of Cancer Quality of Life, SCID-CV=SCID-Clinical Version, HRQL=Health-Related Quality of Life, LDQ=Leeds Dyspepsia Questionnaire

**Prevalence Rate %:** mod=moderate, ext=extreme, CP=current prevalence, LP=lifetime prevalence, PD=Panic Disorder, Agora=Agoraphobia, w=with, x=without, PA=panic attack, GAD=Generalized Anxiety Disorder, f-u=follow-up, OCD=Obsessive Compulsive Disorder, PTSD=Post Traumatic Stress Disorder, SAD=Social Anxiety Disorder

**Associated Factors/Predictors:** AF=associated factors of anxiety reported, P=predictors of anxiety reported

student participants was in the range of 18 to 23 years old. In addition, all of the participants were undergraduate students, from both public and private universities, and most of them were majoring in medicine. The majority of the studies utilized the screening measures of the Depression Anxiety Stress Scale-21 (DASS-21). However, only Study 5 reported the use of a validated Malay version of the scale. Apart from DASS-21, some studies applied more accurate symptom measures of AD such as the Beck Anxiety Inventory (BAI), Liebowitz Social Anxiety Scale (LSAS), and Social Phobia Inventory (SPIN). However, none of the reports noted whether the studies used Malay validated measures or the original English version of the measures.

As can be seen in Table 1, the reported prevalence of anxiety among university students was in the range of 2.4% to 96%. This prevalence rate was unreliable as an indicator of AD due to the mixed cut-off point used for reporting anxiety despite the same measures being used. For example, both Study 3 and Study 6 used DASS-21; however, the prevalence rate of anxiety reported by Study 3 was based on mild to extremely severe scores, whereas Study 6 used moderately to extremely severe cut-off points. Thus, to avoid the over-reporting of prevalence rates of AD among university students in Malaysia, only the studies which presented moderate to severe/extremely severe levels of anxiety were reported. From the results shown in Table 1, the reported prevalence rates ranged between 9.1% and 63%.

### **General community population**

Only four studies were found on prevalence in the general community, and all of them are reviewed in the second section of Table 1. Various types of samples were reported which included general adults in one of the states in central Malaysia, farmers, rural residents residing on the east coast of Malaysia, and automotive workers. The mean age of general community participants ranged from 27 to 42 years old. Similar to the studies conducted on the student population, the majority of the studies used DASS to screen for anxiety symptoms. However, one study adopted the screening measure of the Hospital Anxiety and Depression Scale (HADS), while the other study applied the specific symptom measures of Generalized Anxiety Disorder-7 (GAD-7). Three of these studies reported using Malay validated measures.

According to the results shown in Table 1, the prevalence of anxiety was reported to be in the range between 8.2% and 47.2%. However, only the prevalence rate of Study 13 (i.e., 8.2%) can be used as an indicator of AD (i.e., cut-off point  $GAD-7 \geq 8$ ).

### **Clinical population**

The final section of Table 1 presents 21 studies that were carried out amongst clinical populations who were diagnosed with different conditions such as hypertension,

diabetes, pregnancy, heart disease, cancer, drug-dependence, gastrointestinal disorders, dyspepsia, erectile dysfunction, hyperemesis gravidarum, and menopause. The mean age of the clinical populations involved in the studies was in the range of 18 to 70. The studies were conducted in various settings involving patients from primary care, public hospitals, university hospitals, and various clinics.

Similar to the student and general community populations, more than half of the prevalence studies conducted among clinical populations used screening measures such as DASS-21, HADS, and the General Health Questionnaire-28 (GHQ-28) to measure anxiety. Ten of these studies were reported to use validated measures. However, six of the studies (Study 21, 23, 25, 28, 30, and 34) used more accurate symptom measures such as GAD-7. Furthermore, six studies (Study 21, 23, 25, 27, 30, and 34) used gold-standard diagnostic measures of anxiety such as the Structured Clinical Interview for DSM Axis-I disorders (SCID), MINI International Neuropsychiatric Interview (MINI), and Composite International Diagnostic Interview (CIDI). However, only Study 30 and 34 reported the prevalence rate of specific AD but with no information provided to confirm whether the tools had been validated for Malaysian populations. Moreover, only two out of 21 studies (Study 21 and 23) conducted two stages of screening and diagnosis to establish whether the anxiety symptoms were a disorder or otherwise.

The prevalence of anxiety ranged between 0.5% and 68.6%. This information is vital because clinical patients may also suffer from anxiety before, after, or during dealing and coping with a physical illness. Hence, this would significantly assist physicians and clinicians to direct their attention to the psychological aspects instead of only focusing on the physical state of their patients. However, similar to the student and general community populations, this prevalence rate was still unreliable due to different cut-off points for reporting anxiety despite the same measures being used. Therefore, only studies that adopted gold-standard diagnostic measures were used to describe the prevalence rates of anxiety among clinical populations in Malaysia to avoid their over-reporting. Hence, as shown in Table 1, the reported prevalence rates of AD were in the range between 1% and 67.6%. Furthermore, only one study (Study 34) on the clinical populations reported current and lifetime prevalence using SCID, which makes it unique from the prevalence studies conducted among the student and general community populations.

### **Associated factors and predictors of anxiety disorders in Malaysia**

The secondary objective of the present study was to review the associated factors and predictors of AD in Malaysia obtained from the reviewed literature. The total number of studies that were reviewed was 37, of which 25 studies discussed the associated factors and nine the predictors of anxiety in Malaysia, respectively.

The socio-demographic factors which were significantly associated with AD in Malaysia included being female (Study 3, 12, 15, and 22); being Malay (Study 8 and 12) or Indian (Study 1 and 22); being divorced, separated, widowed, or unmarried (Study 13, 22, and 23); possessing a lower than tertiary level of education (Study 15 and 22); being unemployed, retired, or being a housewife (Study 22 and 24); and having a low socioeconomic status (Study 15, 20, and 22).

There were also several other unique associated factors related to AD depending on the nature of the study. For example, Study 3 found a significant association between being born in a rural area and AD among students. The additional unique associated factors related to AD were as follows: (i) academic-related stress (Study 1), (ii) extra-curricular inactivity (Study 8), (iii) being a preclinical medical student (Study 12), (iv) low self-esteem, perceived stress, and depression (Study 13), (v) limited support from co-worker and supervisor (Study 16), (vi) history of obstetric complications (Study 20), (vii) having diabetes for more than two years and physical inactivity (Study 22), (viii) unplanned pregnancy (Study 23), and (ix) being afraid of and humiliated by partner (Study 28).

Apart from the above-mentioned associated factors, a few studies managed to reveal several types of predictors of AD such as a history of childhood abuse (Study 3); interpersonal problems such as unhappy relationships with family and domestic violence (Study 13); family history of mental illness (Study 15 and 22); severe psychological problems such as stress and depression (Study 3, 13, 17, and 23); a chronic physical illness such as cancer (Study 13), stroke (Study 17); gestational age below 20 weeks (Study 23); being physically inactive (Study 22); serious problems at work (Study 13) such as high psychological job demands, job insecurity, and working in hazardous conditions (Study 16); and finally, non-organizational religious activity and intrinsic religiosity (Study 13).

## Discussion

The present study aimed to review the prevalence rates of AD in Malaysia and its associated factors and predictors. A total of 37 studies were reviewed and the results are summarized and presented in Table 1. It is important to note that the majority of the studies were published from 2010 onwards, thus reflecting a growing and strong interest in this particular research area in Malaysia. This growing interest may be the result of the Mental Health Gap Action Programme (mhGAP) launched by WHO in 2008 to advocate for a much greater focus on mental health in global health policies (60). The program is grounded on the best available scientific and epidemiological evidence on mental health conditions, which have been identified as priorities, especially in low- and middle-income countries. Hence, Malaysia addressed the call made by WHO by conducting an assessment of the pattern of mental health conditions among Malaysians, starting from the Third

NHMS in 2006 until the most recent Fifth NMHS in 2015 (17, 61).

The majority of the studies utilized a cross-sectional research design, and this is in tandem with the common research designs used in epidemiological studies (62). The review of the studies was conducted on various sample types, settings, age ranges, gender, and ethnicities, and mainly classified into student populations, the general community, and clinical patients.

Overall, the prevalence rates of AD in Malaysia were in the range between 1% and 67.6%. However, careful interpretation of these results is critical for each study for two main reasons: (a) the cut-off scores used from one study to another were different, which makes it difficult to draw conclusions about the exact prevalence rate, and (b) certain studies tended to describe anxiety symptoms, or current and lifetime anxiety disorders. Therefore, comparison between the prevalence rates of AD in Malaysia and other countries globally is difficult to make.

Various associated factors and predictors of AD were found among Malaysians. Moreover, the majority of the associated factors and predictors related to socio-demographic factors were similar to those in other contexts. For example, women were reported to have higher prevalence rates and were almost twice as likely to have AD compared to men based on the WHO WMH Survey Initiative (18, 19). Furthermore, a 65% recurrence rate of AD was reported among women in a 3-year follow-up study (63). In terms of marital status, the results of the current study are in agreement with the two systematic reviews of 52 studies and three national-scale epidemiologic surveys of mental health which highlight that being widowed/divorced/separated or never married is significantly associated with a higher prevalence rate of AD compared to being married (20, 64). People with AD have difficulties starting and/or maintaining romantic relationships; hence, they are most likely to fail in their relationships (22).

In terms of educational status, the results of the current study are consistent with those described in the literature. There is also evidence to indicate that a low level of education is a significant risk factor for AD (20, 65, 66). McEvoy and colleagues further assert that postgraduate qualifications can help people avoid AD (20). In addition, concerning employment status, being unemployed (66) or not in the labor force (20) and being a housewife (21) or househusband (22) are also risk factors of AD. Jacobi and colleagues found that being retired was significantly correlated with a higher prevalence rate of AD (Odd Ratio 2.1), which is similar to the results found in the current study (67). However, in contrast to the above findings, Tanios and colleagues in their systematic review of the epidemiology of AD in the Arab world found that being employed and being engaged in modern occupations tended to increase psychiatric morbidity compared to engaging in traditional, agricultural, and manual work (66). Another socio-demographic risk factor of AD which

is comparable to the results of the current study is low socioeconomic status (20, 65, 66).

Apart from socio-demographic factors, the associated factors and predictors of AD found in this study are consistent with the findings of the previous literature, which include academic stress (68, 69), low self-esteem (70), depression (71); a history of obstetric complications (72); unplanned pregnancy (73, 74), negative life events, domestic violence, and family history of mental illness (75); a chronic physical illness such as cancer (76-80), stroke (81, 82), and diabetes (83, 84).

The results of this review provide some evidence for the diathesis-stress model that explains individual diathesis, also known as dispositions or vulnerabilities (in the form of genetic, biological, psychological, or situational factors), particularly in the Malaysian context, and which allows for interaction with environmental influences (i.e., stressors) to produce disorders such as anxiety (85). However, no studies regarding cognitive-based risk factors and vulnerabilities were identified in this scoping review. According to the literature, the cognitive vulnerabilities of AD can be divided into broader and specific cognitive constructs, which include anxiety sensitivity, diminished personal control that leads to intolerance of uncertainty, and fear of negative evaluations, as confirmed by a meta-analytic review of 73 studies conducted by Hong and Cheung (86). Meanwhile, specific cognitive vulnerability constructs, as discussed by Beck and colleagues in their highly influential work on AD and cognitive perspectives, are prepotent threat schemas and a heightened sense of personal vulnerability (87, 88). Therefore, it is highly recommended and encouraged that future studies explore the associations between cognitive variables and AD in the Malaysian context.

Another interesting aspect of the findings in the scoping review refers to religiosity, which is believed to be one of the significant predictors of AD in the Malaysian context. In this case, religiosity refers to intrinsic religiosity, which is described as the degree of personal religious commitment or motivation whereby individuals view their religion as the framework for their lives, and they try to live their religion consistently. In contrast, a non-organizational religious activity can be explained based on religious activities performed in private, such as prayer, Scripture study, watching religious TV, or listening to religious radio (89). It is undeniable that many studies have found religiosity to be a protective factor against mental disorders such as AD (90-92); however, one of the studies reviewed in this study proved otherwise. In the context of Malaysia, where the majority of the population is Malay Muslim, the finding strongly contradicts the general concept that mental disorders are the outcome of abandoning or neglecting Islamic values (93).

Nevertheless, there are mixed and contradictory findings on the association between religiosity and anxiety. Koenig, in his review of religion, spirituality, and health asserted that some individuals might use religion to warrant their aggressive behaviors, hatred, obsession to gain power,

escape from dealing with family problems, and the presence of stress due to their inability to reach high religious standards (94). Hence, this particular misuse of religion can lead to AD. In another study performed among Turkish students, extrinsic religiosity emerged as a significant predictor for anxiety, depression, and hostility, but only 2% of the variance was explained (95). Furthermore, the results from a longitudinal cohort study conducted among adults in Baltimore showed the absence of an association between religious worship attendance and spirituality and anxiety (96). Whereas, Ellison and colleagues found an inverse relationship between the frequency of religious attendance and belief in an afterlife and anxiety (97). Various factors could be possible reasons for these mixed findings. Therefore, future studies are strongly encouraged to explore the relationship between religiosity and AD using the standardized method.

### **Limitations**

The scoping review involved a few limitations; hence, it is hoped that future studies will be able to bridge the gaps found in the literature.

Prevalence studies among university students were observed to put a lot of focus on undergraduate levels only and seemed to limit the research to medical students. Some researchers managed to show that postgraduate students, especially Ph.D. students, tended to experience psychological distress and that one in three were at risk of a common psychiatric disorder such as AD (98). Hence, future studies are urged to conduct prevalence studies among postgraduate students from various academic disciplines.

Research studies varied in methodology, especially in terms of the instruments used which led to diverse findings on the prevalence rates of AD among Malaysian populations.

There were minimal reports (or minimal use) of the validated Malay version being used as one of the instruments in the study of AD. Most of the instruments originated from the West, and it is known that the representation of anxiety may be different in the Asian setting (99). Therefore, extra caution is critical in interpreting the prevalence rates of anxiety since the cut-off scores and norms used are not Malaysian-based.

There were minimal applications of the gold-standard diagnostic measure in assessing AD. This is believed to have resulted in inaccurate reports of anxiety disorders and a misunderstanding between anxiety symptoms and anxiety disorder among the community. Moreover, it would be alarming if society perceived having anxiety symptoms to be equal to having an anxiety disorder.

Many studies underrepresented ethnicities in their samples; for example, choosing to focus more on the Malays. This could lead to bias in concluding the prevalence rate of anxiety in the Malaysian population.

Studies on children were not included in this review paper even though it is known that AD is also found to



have an early age of onset (AOO). Particularly in the USA, the median AOO for AD is 11 years old (4). However, it is still undetermined in Malaysia because the studies varied in terms of reported recruitment age. Hence, future systematic or scoping reviews are encouraged to focus on this area.

A review of the associated factors and predictors of AD was carried out as the secondary objective of this study. Hence, the information was primarily obtained from the prevalence studies, thus producing an incomprehensive conclusion. Therefore, a meta-analysis should be conducted on the associated factors and predictors of AD among Malaysians.

### Conclusion

This scoping review has provided the first step towards acknowledging AD as one of the most common mental illnesses in Malaysia despite all the limitations. This is also the first scoping review conducted on the prevalence rates, associated factors, and predictors of AD in Malaysia. Overall, the prevalence rates of AD (indicated by moderate to severe/extremely severe level of anxiety symptoms or confirmed diagnosis) range between 1% and 67.6% among students, the general community, and clinical populations. Moreover, AD may contribute to a decrease in the quality of life, increased social burden, reduced productivity, and increased health service utilization. In addition, the comparable rates of AD in Malaysia and other countries, as discussed at the beginning of the article, seem to suggest that early detection and early intervention are essential. Nevertheless, awareness among community and health service providers regarding the prevalence rate of AD will help to develop access to evidence-based interventions, be it psychiatric services which are primarily medication oriented, or psychological interventions such as stress management, problem-solving skills, relaxation training, Cognitive Behaviour Therapy and the currently growing mindfulness-based interventions (e.g., Dialectical Behaviour Therapy, Mindfulness-Based Stress Reductions, Mindfulness-Based Cognitive Therapy, Mindfulness Self-Compassion, or Acceptance Commitment Therapy).

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### Competing interests

The authors have no conflict of interest to declare.

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