

Prevalence and risk factors of depression and anxiety in primary care

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ABSTRACT

Introduction: Anxiety and depressive disorders are highly prevalent mental health conditions worldwide. However, little is known about their specific prevalence in primary care settings. This study aimed to determine the prevalence of depression and anxiety in the primary care population and identify associated patient characteristics.

Method: We conducted a cross-sectional study using stratified sampling by age with a self-administered questionnaire survey in Singapore's National Healthcare Group Polyclinics from December 2021 to April 2022. A total score of Patient Health Questionnaire-9 (PHQ-9) ≥ 10 represents clinical depression, and a total score of Generalised Anxiety Disorder-7 (GAD-7) ≥ 10 indicates clinical anxiety. Multivariable logistic regression was used to identify the factors associated with depression and anxiety.

Results: A total of 5694 patients were approached and 3505 consented to the study (response rate=61.6%). There was a higher prevalence of coexisting clinical depression and anxiety (DA) (prevalence=5.4%) compared to clinical depression only (3.3%) and clinical anxiety only (1.9%). The odds of having DA were higher among those aged 21–39 years (odds ratio [OR] 13.49; 95% confidence interval [CI] 5.41–33.64) and 40–64 years (OR 2.28; 95% CI 1.03–5.03) compared to those ≥ 65 years. Women had higher odds of having DA (OR 2.33; 95% CI 1.54–3.50) compared to men. Respondents with diabetes had higher odds of having DA (OR 1.78; 95% CI 1.07–2.94) compared to those without diabetes.

Conclusion: Coexisting clinical depression and anxiety are significantly present in the primary care setting, especially among younger individuals, patients with diabetes and women. Mental health screening programmes should include screening for both depression and anxiety, and target these at-risk groups.

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CLINICAL IMPACT

What is New

- To our knowledge, this study is the first to examine the prevalence of clinical depression and anxiety in the Singapore primary care setting.
- Findings highlight the burden of mental illness in primary care and its associated factors.

Clinical Implications

- The study supports the screening for coexisting depression and anxiety, rather than either one alone, especially in at-risk groups such as younger individuals, patients with diabetes and women.
- This data can potentially help policymaking and guide efforts to improve community mental wellness in Singapore.

INTRODUCTION

The global prevalence of individuals living with a mental disorder in 2019 was 970 million, with anxiety and depressive disorders being the most common.¹ The Singapore Mental Health Study 2016 showed that the lifetime prevalence of at least one mood, anxiety or alcohol use disorder was 13.9% in the adult Singaporean population. Major depressive disorder (MDD) had the highest lifetime prevalence of 6.3%, and the lifetime prevalence of generalised anxiety disorder (GAD) was 1.2%.² People with chronic diseases, such as diabetes, coronary heart disease and stroke, had a higher prevalence of depression and anxiety.³

The Singapore inter-agency COVID-19 Mental Wellness Taskforce Report found a majority

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preference to seek help from primary care providers for emotional or psychological problems related to COVID-19.⁴ Findings from the Mind Matters study in 2014 similarly indicated that individuals would seek help from general practitioners for various mental health conditions.⁵

With this trend in help-seeking behaviour, coupled with a growing movement towards community prevention and management of mental illness, this study aimed to determine the prevalence of depression and anxiety in the Singapore primary care setting, and identify the associated factors of patients with depression and anxiety. This is particularly relevant given the paucity of relevant literature to guide practice and intervention.

METHOD

Study setting, design, recruitment and data collection

Primary care is provided through an islandwide network of outpatient polyclinics and clinics run by private general practitioners in Singapore. At the time of study in 2021, 23 polyclinics were organised into 3 healthcare clusters, of which the National Healthcare Group (NHG) ran 7 polyclinics located in the north and central regions (at the time of publication, there are 26 polyclinics with 9 run by NHG).⁶ We conducted a cross-sectional study among patients ≥ 21 years old, who visited any of the 7 NHG polyclinics between December 2021 to April 2022, during the COVID-19 pandemic.

To reduce selection bias, patients were approached for recruitment via systematic sampling based on the last digit of their registration queue numbers. These polyclinic-specific queue numbers were generated daily and assigned in ascending order by a central computerised system according to the sequence of patient registration at the polyclinic. On Mondays, Wednesday and Fridays, only patients with an odd number as the last digit of their queue numbers were approached. On Tuesdays, Thursdays and Saturdays, only patients with an even number in the last digit of their queue numbers were approached.

Patients who were incapable of completing the questionnaire due to severe physical or mental conditions or language barriers were excluded. Eligible patients who agreed to participate in the study were asked to sign on the written consent forms that indicated approval for their electronic medical records to be accessed after completing a set of questionnaires. The set of self-administered questionnaires were provided in patients' preferred language (English, Chinese or Malay) for their

completion while they waited to be seen by their healthcare professional at the polyclinic. Patient education materials on mental health were given to every respondent upon questionnaire completion.

Relevant diagnoses of cardiovascular disease, diabetes (including pre-diabetes) and stroke (including transient ischaemic attack) were retrieved from respondents' electronic medical records by the study team.

Study instruments

Socio-demographic questionnaire

Data on sex, age, ethnicity, marital status, highest education level attained, employment status and type of dwelling were collected.

Quality of life and social support questionnaires

The EuroQoL Group 5-Dimension 5-Level Self-Report Questionnaire (EQ-5D-5L) is a 5-level patient-reported tool that measures health-related quality of life. It consists of the 5-dimension descriptive system (EQ-5D) and the visual analogue scale (EQ-VAS). The EQ-5D evaluates 5 items related to health: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. There are 5 possible responses for each item, which is scored 1 to 5 respectively: no problems, slight problems, moderate problems, severe problems and extreme problems. Scores from the 5 items are used to derive a single utility index. The utility index ranges from -1.00 (worst possible health state) to 1.00 (perfect health state). The EQ-VAS is a vertical scale that is scored from 0 (worst imaginable health state) to 100 points (best imaginable health state). A higher score indicates better health status.^{7,8}

The modified Medical Outcomes Study Social Support Survey (mMOS-SS) is an 8-item self-reported measure of individual experience of social support, with 2 subscale measures of emotional support and instrumental support. Respondents rate how often they receive support for physical needs and emotional assistance using these ratings: 1 = "none of the time", 2 = "a little of the time", 3 = "some of the time", 4 = "most of the time" and 5 = "all of the time". The score for mMOS-SS is calculated as the average score of subscale items transformed to a 0 to 100 scale, with higher scores indicating more support.⁹

Mental health questionnaires

The Patient Health Questionnaire-9 (PHQ-9) is a 9-item tool that screens for and measures the severity of self-reported depression. The response options to each item are 0 = "not at all",

1 = “several days”, 2 = “more than half the days” and 3 = “nearly every day”. A 2-week recall period is used. The total score ranges from 0 to 27, with a higher score indicating greater self-reported depression. A total score of ≥ 10 indicates clinical depression, with a sensitivity of 80% and specificity of 92%.^{10–12}

The Generalised Anxiety Disorder-7 (GAD-7) is a 7-item tool that screens for and measures the severity of self-reported anxiety. The response options to each item are 0 = “not at all”, 1 = “several days”, 2 = “more than half the days”, and 3 = “nearly every day”. A 2-week recall period is used. The total score ranges from 0 to 21, with a higher score indicating greater self-reported anxiety. A total score of ≥ 10 indicates clinical anxiety, with a sensitivity of 89% and specificity of 82%.^{12–14}

Sample size estimation

Sample size estimation was based on previously published data, which reported the prevalence of depression in Singapore’s primary care of 10.8%.¹⁵ Considering a 5% margin of error and achieving a comparable representation across 3 age groups, namely 21–39 years, 40–64 years and ≥ 65 years, the approximate sample size of 3299 was obtained.

Statistical analysis

Descriptive statistics were used to describe the socio-demographic profile of respondents. Mean score of EQ-5D utility index, mean score of EQ-VAS, mean score of mMOS-SS, prevalence of clinical depression (PHQ-9 ≥ 10) and clinical anxiety (GAD-7 ≥ 10) were calculated. We further described the prevalence of 3 clinical categories and considered them as outcome variables in the subsequent statistical analysis. The 3 clinical

categories were: (1) respondents with clinical depression only (DO), i.e. PHQ-9 ≥ 10 , GAD-7 < 10 ; (2) respondents with clinical anxiety only (AO), i.e. PHQ-9 < 10 , GAD-7 ≥ 10 ; and (3) respondents with coexisting clinical depression and anxiety (DA), i.e. PHQ-9 ≥ 10 , GAD-7 ≥ 10 . Associations between the socio-demographic variables, EQ-5D, EQ-VAS, mMOS-SS and presence of diabetes/cardiovascular disease/stroke with the 3 clinical outcome categories above were explored using multivariable logistic regression. All statistical analyses were performed using R statistical software version 4.1.2 (R Core Team 2021, Vienna, Austria)¹⁶ with P values < 0.05 indicating statistical significance.

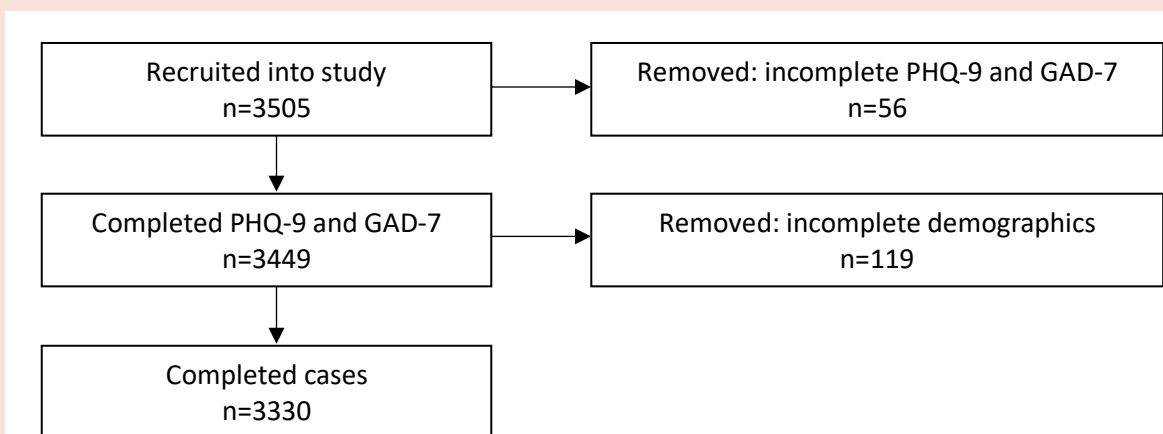
Approval from the NHG Domain Specific Review Board was obtained for the study methods (Reference number: 2021/00741).

RESULTS

A total of 5694 patients were approached across 7 NHG polyclinics and 3505 consented to the study (response rate=61.6%). Respondents with incomplete PHQ-9 and GAD-7 components of the questionnaire (n=56) and those with incomplete demographic information (n=119) were removed from the analysis. The remaining 3330 completed questionnaires were used for the study analysis (see Fig. 1).

The mean age of the respondents was 52.3 years old (SD=17.1). There were 1797 (54.0%) male respondents, 2313 (69.5%) were Chinese, 2105 (63.2%) were married, 1873 (56.2%) were working full time, 805 (24.2%) did not complete secondary education and 201 (6.0%) stayed in a 1-room or 2-room Housing and Development Board apartment (managed by the public housing authority in Singapore).

Fig. 1. Participant inclusion flowchart.



The overall prevalence of clinical depression was 8.7% ($n=289$) and the overall prevalence of clinical anxiety was 7.3% ($n=243$). Of the respondents, 3.3% ($n=110$) had DO, 1.9% ($n=64$) had AO, and 5.4% ($n=179$) had DA. The prevalences of DO, AO and DA were consistently the highest in respondents who were 21–39 years old, followed by respondents who were 40–64 years old.

The mean EQ-5D utility index was 0.85 ($SD=0.20$) and the mean EQ-VAS was 78.1 ($SD=15.9$). Respondents with DA had the lowest EQ-5D utility index (mean=0.53, $SD=0.26$) compared to respondents who had DO (mean=0.66, $SD=0.25$) and AO (mean=0.72, $SD=0.16$). This trend was also observed for the EQ-VAS score.

The mean mMOS-SS score was 60.2 ($SD=30.3$). Respondents with AO had the highest mMOS-SS score (mean=62.6, $SD=19.1$) compared to all other clinical categories, even those without any clinical depression or anxiety. Respondents with DA had the lowest mMOS-SS score (mean=49.7, $SD=26.8$).

Of the 3330 respondents, 38.6% ($n=1,286$) of them had diabetes, 9.3% ($n=310$) had cardiovascular disease and 4.7% ($n=158$) had stroke recorded in their electronic medical records.

Descriptive analysis of the respondents without missing data, stratified according to the 3 clinical categories (DO, AO and DA) are in Table 1.

Associated factors

Multinomial logistic regression was conducted to explore the factors associated with the 3 clinical categories (Table 2).

Younger age groups exhibited a stronger association with both depressive symptoms (DO) and anxiety symptoms (DA) compared with older individuals. Those aged 21–39 years (OR 13.49; 95% CI 5.41–33.64) and 40–64 years (OR 2.28; 95% CI 1.03–5.03) had higher odds of DA than those aged ≥ 65 years. Similarly, for DO, elevated odds were seen in the 21–39 years group (OR 6.34; 95% CI 2.50–16.09) compared to those aged ≥ 65 years. In terms of sex, females had greater odds of DA (OR 2.33; 95% CI 1.54–3.50) than males. Regarding employment, National Service men had significantly higher odds of DO (OR 2.52; 95% CI 1.14–5.57) compared with full-time employees, while homemakers had lower odds of DA (OR 0.23; 95% CI 0.06–0.87). Individuals with diabetes had higher odds of DA (OR 1.78; 95% CI 1.07–2.94) compared with those without diabetes. Respondents with higher EQ-5D-5L utility index scores or EQ-VAS scores were less likely to have DO, AO and DA. Similarly, higher mMOS-SS scores were associated with lower odds

of DO (OR 0.99; 95% CI 0.98–1.00) and DA (OR 0.99; 95% CI 0.98–0.99). No statistically significant associations were found for ethnicity, education level, marital status, and type of dwelling with DO, AO or DA.

DISCUSSION

To our knowledge, this is the first study that examined the prevalence of depression and anxiety in the Singapore primary care setting. Anxiety and depressive disorders are known to coexist with each other. A worldwide survey reported that 45.7% of individuals with lifetime major depressive disorder had a history of one or more anxiety disorders.¹⁷ Our study observed that respondents with DA had the lowest EQ-5D-5L utility index and lowest EQ-VAS, which indicated a poorer health state and poorer quality of life. Studies have found that patients with MDD and comorbid anxiety disorders tend to have more depressive episodes, greater functional impairment, and greater severity of episodes than individuals with MDD alone.^{18,19} Early recognition of comorbid clinical depression or anxiety in anxiety disorders and depression disorders, respectively, affects management and prevents worsening of the conditions. Hence, screening for clinical depression and anxiety should be encouraged in patients presenting with symptoms suggestive of either. Mental health screening programmes should also consider screening for both depression and anxiety rather than either one alone.

There is a higher prevalence of DA in the younger population (90.5%), who also reported more severe symptoms. A study of patients with multiple chronic conditions found that patients <65 years old were more likely to report depression and worse quality of life, compared with those ≥ 65 years old.²⁰ Findings from a study in Singapore noted that young adults between 21–29 years old and adults between 40–49 years old reported declining mental and emotional health due to various family, workplace and societal factors.²¹ Based on the Global Health Estimates 2020, the top 10 causes of disability-adjusted life years (DALY) in Singapore for both sexes between 20–50 years old included depressive disorder and anxiety disorders.²² There is an urgency to reduce DALYs especially among the young, as Singapore's strategic resource is its human capital. However, resource constraints in healthcare limit the help available to them. Moreover, these patients are often not forthcoming with their mood issues. The use of digital mental health tools that provide targeted self-help resources and brief psychotherapy may be an effective intervention as the young are

Table 1. Descriptive analysis of respondents without missing data (n=3330).

Age, years	PHQ-9<10 & GAD-7<10 (n=2977)	PHQ-9≥10 & GAD-7<10 (DO) (n=110)	PHQ-9<10 & GAD-7≥10 (AO) (n=64)	PHQ-9≥10 & GAD-7≥10 (DA) (n=179)	Total (n=3330)	P value
21–39	737 (24.8%)	65 (59.1%)	37 (57.8%)	119 (66.5%)	958 (28.8%)	<0.001
40–64	1185 (39.8%)	29 (26.4%)	20 (31.2%)	43 (24.0%)	1277 (38.3%)	
≥65	1055 (35.4%)	16 (14.5%)	7 (10.9%)	17 (9.5%)	1095 (32.9%)	
Sex						0.061
Male	1629 (54.7%)	56 (50.9%)	31 (48.4%)	81 (45.3%)	1797 (54.0%)	<0.001
Female	1348 (45.3%)	54 (49.1%)	33 (51.6%)	98 (54.7%)	1533 (46.0%)	
Ethnicity						
Chinese	2113 (71.0%)	64 (58.2%)	41 (64.1%)	95 (53.1%)	2313 (69.5%)	<0.001
Malay	457 (15.4%)	25 (22.7%)	11 (17.2%)	54 (30.2%)	547 (16.4%)	
Indian	275 (9.2%)	12 (10.9%)	11 (17.2%)	24 (13.4%)	322 (9.7%)	
Others	132 (4.4%)	9 (8.2%)	1 (1.6%)	6 (3.4%)	148 (4.4%)	<0.001
Marital status						<0.001
Never married/single	691 (23.2%)	50 (45.5%)	34 (53.1%)	93 (52.0%)	868 (26.1%)	<0.001
Married	1963 (65.9%)	49 (44.5%)	26 (40.6%)	67 (37.4%)	2105 (63.2%)	
Separated/divorced/widowed/others	323 (10.8%)	11 (10.0%)	4 (6.2%)	19 (10.6%)	357 (10.7%)	
Highest level of education attained						<0.001
Below secondary	755 (25.4%)	18 (16.4%)	8 (12.5%)	24 (13.4%)	805 (24.2%)	<0.001
Secondary and pre-university	907 (30.5%)	21 (19.1%)	13 (20.3%)	43 (24.0%)	984 (29.5%)	
Diploma and professional qualification	615 (20.7%)	43 (39.1%)	19 (29.7%)	74 (41.3%)	751 (22.6%)	
Degree and above	700 (23.5%)	28 (25.5%)	24 (37.5%)	38 (21.2%)	790 (23.7%)	<0.001

Table 1. Descriptive analysis of respondents without missing data (n=3330). (Cont'd)

	PHQ-9<10 & GAD-7<10 (n=2977)	PHQ-9≥10 & GAD-7<10 (DO) (n=110)	PHQ-9<10 & GAD-7≥10 (AO) (n=64)	PHQ-9≥10 & GAD-7≥10 (DA) (n=179)	Total (n=3330)	P value
Main work status, over the last 12 months						
Working (full-time)	1669 (56.1%)	57 (51.8%)	44 (68.8%)	103 (57.5%)	1873 (56.2%)	<0.001
Working (part-time)	326 (11.0%)	10 (9.1%)	5 (7.8%)	18 (10.1%)	359 (10.8%)	
Student (full-time)	62 (2.1%)	3 (2.7%)	4 (6.2%)	10 (5.6%)	79 (2.4%)	
National Service ^a	66 (2.2%)	15 (13.6%)	2 (3.1%)	18 (10.1%)	101 (3.0%)	
Homemaker/housewife	257 (8.6%)	11 (10.0%)	2 (3.1%)	3 (1.7%)	273 (8.2%)	
Retired	460 (15.5%)	8 (7.3%)	1 (1.6%)	9 (5.0%)	478 (14.4%)	0.043
Unemployed	137 (4.6%)	6 (5.5%)	6 (9.4%)	18 (10.1%)	167 (5.0%)	
Type of dwelling						
HDB 1-room/2-room apartment ^b	172 (5.8%)	5 (4.5%)	4 (6.2%)	20 (11.2%)	.0%	<0.001
Other types of housing	2805 (94.2%)	105 (95.5%)	60 (93.8%)	159 (88.8%)	3129 (94.0%)	
EQ-5D-5L utility index						
Mean (SD)	0.88 (0.17)	0.66 (0.25)	0.72 (0.16)	0.53 (0.26)	0.85 (0.20)	<0.001
Median (Q1, Q3)	0.88 (0.85, 1.00)	0.74 (0.55, 0.88)	0.75 (0.64, 0.86)	0.56 (0.36, 0.73)	0.88 (0.76, 1.00)	
Range	-0.56–1.00	-0.21–1.00	0.29–1.00	-0.26–1.00	-0.56–1.00	
EQ-VAS						
Mean (SD)	79.97 (14.78)	61.86 (15.47)	68.69 (13.86)	59.38 (15.75)	78.05 (15.89)	<0.001
Median (Q1, Q3)	80.00 (70.00, 90.00)	61.00 (50.00, 70.00)	70.00 (60.00, 80.00)	60.00 (50.00, 70.00)	80.00 (70.00, 90.00)	
Range	3.00–100.00	25.00–95.00	35.00–100.00	10.00–100.00	3.00–100.00	

Table 1. Descriptive analysis of respondents without missing data (n=3330). (Cont'd)

	PHQ-9<10 & GAD-7<10 (n=2977)	PHQ-9≥10 & GAD-7<10 (DO) (n=110)	PHQ-9<10 & GAD-7≥10 (AO) (n=64)	PHQ-9≥10 & GAD-7≥10 (DA) (n=179)	Total (n=3330)	P value
mMOS-SS						<0.001
Mean (SD)	61.13 (30.78)	51.48 (23.33)	62.60 (19.13)	49.72 (26.82)	60.22 (30.32)	
Median (Q1, Q3)	68.75 (37.50, 87.50)	50.00 (35.16, 65.62)	62.50 (50.00, 75.00)	50.00 (31.25, 70.31)	65.62 (37.50, 84.38)	
Range	0.00–100.00	0.00–100.00	28.12–100.00	0.00–100.00	0.00–100.00	
Diabetes (including pre-diabetes)						<0.001
No	1772 (59.5%)	86 (78.2%)	48 (75.0%)	138 (77.1%)	2044 (61.4%)	
Yes	1205 (40.5%)	24 (21.8%)	16 (25.0%)	41 (22.9%)	1286 (38.6%)	
Cardiovascular disease (angina, myocardial infarction, atrial fibrillation, poor circulation of lower limbs)						0.041
No	2685 (90.2%)	104 (94.5%)	61 (95.3%)	170 (95.0%)	3020 (90.7%)	
Yes	292 (9.8%)	6 (5.5%)	3 (4.7%)	9 (5.0%)	310 (9.3%)	
Stroke (including transient ischaemic attack)						0.955
No	2833 (95.2%)	105 (95.5%)	62 (96.9%)	172 (96.1%)	3172 (95.3%)	
Yes	144 (4.8%)	5 (4.5%)	2 (3.1%)	7 (3.9%)	158 (4.7%)	

AO: clinical anxiety only; DA: coexisting clinical depression and anxiety; DO: clinical depression only; EQ-5D-5L: EuroQol Group 5-dimension 5-level Self-Report Questionnaire; EQ-VAS: EuroQol Group visual analogue scale; GAD-7: Generalised Anxiety Disorder-7; HBD: Housing and Development Board; mMOS-SS: modified Medical Outcomes Study Social Support Survey; PHQ-9: Patient Health Questionnaire-9; SD: standard deviation

^a National Service: A 2-year mandatory conscription duty that every male citizen and permanent resident in Singapore must undertake upon attaining the age of 18.

^b HDB 1-room/2-room: public housing 1-room and 2-room apartments managed by HDB, the state's public housing authority.

All values in no. (%) unless indicated otherwise.

Table 2. Multinomial logistic regression analysis of respondents without missing data (n=3330).

	PHQ-9 ≥ 10 & GAD-7 < 10 (DO)			PHQ-9 < 10 & GAD-7 ≥ 10 (AO)			PHQ-9 & GAD-7 ≥ 10 (DA)		
	Odds ratio	95% CI	P value	Odds ratio	95% CI	P value	Odds ratio	95% CI	P value
Age, years									
≥65	Ref			Ref			Ref		
21–39	6.34	2.50–16.09	<0.001	3.15	0.98–10.10	0.05	13.49	5.41–33.64	<0.001
40–64	1.85	0.84–4.04	0.12	1.55	0.57–4.23	0.39	2.28	1.03–5.03	0.04
Sex									
Male	Ref			Ref			Ref		
Female	1.36	0.85–2.19	0.20	1.32	0.77–2.28	0.31	2.33	1.54–3.50	<0.001
Ethnicity									
Chinese	Ref			Ref			Ref		
Malay	1.28	0.74–2.18	0.38	1.02	0.50–2.11	0.95	1.49	0.94–2.36	0.09
Indian	1.16	0.58–2.29	0.68	1.92	0.93–3.92	0.08	1.31	0.73–2.34	0.36
Others	1.67	0.73–3.84	0.23	0.33	0.04–2.50	0.28	0.50	0.17–1.44	0.20
Marital status									
Married	Ref			Ref			Ref		
Never married/single	1.01	0.58–1.75	0.97	1.85	0.97–3.54	0.06	0.98	0.61–1.57	0.93
Separated/divorced/widowed/others	1.07	0.51–2.26	0.86	0.85	0.27–2.63	0.77	0.77	0.39–1.51	0.44

Table 2. Multinomial logistic regression analysis of respondents without missing data (n=3330). (Cont'd)

	PHQ-9 ≥ 10 & GAD-7 < 10 (DO)			PHQ-9 < 10 & GAD-7 ≥ 10 (AO)			PHQ-9 & GAD-7 ≥ 10 (DA)		
	Odds ratio	95% CI	P value	Odds ratio	95% CI	P value	Odds ratio	95% CI	P value
Highest level of education attained									
Below secondary	Ref			Ref			Ref		
Secondary and pre-university	0.78	0.39 to 1.59	0.50	1.11	0.43–2.87	0.83	1.26	0.65–2.43	0.49
Diploma and professional qualification	1.14	0.54–2.41	0.73	1.19	0.43–3.27	0.74	1.32	0.65–2.67	0.44
Degree and above	0.95	0.44–2.05	0.90	1.38	0.51–3.74	0.53	0.86	0.41–1.82	0.70
Main work status, over the last 12 months									
Working (full-time)	Ref			Ref			Ref		
Working (part-time)	1.46	0.69–3.09	0.32	0.91	0.34–2.41	0.85	1.50	0.78–2.87	0.22
Student (full-time)	0.65	0.18–2.35	0.51	1.12	0.36–3.47	0.84	1.34	0.57–3.16	0.50
National Service ^a	2.52	1.14–5.57	0.02	0.56	0.12–2.59	0.46	1.87	0.87–4.01	0.11
Homemaker/housewife	2.30	1.00–5.29	0.05	0.50	0.11–2.32	0.38	0.23	0.06–0.87	0.03
Retired	1.62	0.61–4.31	0.33	0.20	0.02–1.69	0.14	1.05	0.38–2.90	0.93
Unemployed	1.38	0.53–3.58	0.51	1.95	0.74–5.14	0.18	1.74	0.83–3.64	0.14
Type of dwelling									
HDB 1-room/2-room apartment ^b	Ref			Ref			Ref		
Other types of housing	1.88	0.70–5.07	0.21	1.09	0.36–3.32	0.88	1.00	0.50–2.01	1.00
EQ-5D-5L utility index	0.05	0.02–0.11	<0.001	0.05	0.02–0.15	<0.001	0.01	0.00–0.01	<0.001
EQ-VAS	0.96	0.94–0.97	<0.001	0.98	0.96–0.99	<0.01	0.96	0.95–0.97	<0.001
mMOS-SS	0.99	0.98–1.00	<0.01	1.00	0.99–1.01	0.38	0.99	0.98–0.99	<0.001

Table 2. Multinomial logistic regression analysis of respondents without missing data (n=3330). (Cont'd)

		PHQ-9 ≥ 10 & GAD-7 < 10 (DO)			PHQ-9 < 10 & GAD-7 ≥ 10 (AO)			PHQ-9 & GAD-7 ≥ 10 (DA)		
		Odds ratio	95% CI	P value	Odds ratio	95% CI	P value	Odds ratio	95% CI	P value
Diabetes (including pre-diabetes)										
No	Ref				Ref			Ref		
Yes	0.99	0.57–1.74	0.98		1.28	0.65–2.52	0.47	1.78	1.07–2.94	0.03
Cardiovascular disease (angina, myocardial infarction, atrial fibrillation, poor circulation of lower limbs)										
No	Ref				Ref			Ref		
Yes	0.93	0.36–2.45	0.89		1.00	0.28–3.56	1.00	1.17	0.48–2.86	0.72
Stroke (including transient ischaemic attack)										
No	Ref				Ref			Ref		
Yes	1.97	0.70–5.60	0.20		1.30	0.29–5.83	0.73	1.44	0.51–4.11	0.49

AO: clinical anxiety only; CI: confidence interval; DA: coexisting clinical depression and anxiety; DO: clinical depression only; EQ-5D-5L: EuroQol Group 5-dimension 5-level Self-Report Questionnaire; EQ-VAS: EuroQol Group visual analogue scale; GAD-7: Generalised Anxiety Disorder-7; HBD: Housing and Development Board; mMOS-SS: modified Medical Outcomes Study Social Support Survey; PHQ-9: Patient Health Questionnaire-9

^a National Service: A 2-year mandatory conscription duty that every male citizen and permanent resident in Singapore must undertake upon attaining the age of 18.

^b HDB 1-room/2-room: public housing 1-room and 2-room apartments managed by HDB, the state's public housing authority.

P values in bold indicate statistical significance.

generally digital natives. It would also allow for reduction in manpower-intensive initiatives while ensuring accessibility of support services. Further studies are needed to understand the help-seeking behaviour of young people with mental health issues to guide the development of effective strategies and interventions to support them.

National Service (NS) in Singapore is a 2-year mandatory conscription duty that every male citizen and permanent resident must undertake at 18 years old. It is a period of many changes as they transit from civilian life into regimentation, resulting in multiple stressors and adjustments, which may present as symptoms of depression and possibly escalate to depressive disorders. Studies show that the prevalence of depression in the military community was higher than that in the general community.²³ While our respondents may not be a representative sample of the NS population, further research to study this observation would be needed to better understand the prevalence of mental illnesses among those in NS. Support for the mental wellness of NS men should be made readily available, together with psychoeducation to enable NS men to develop healthy coping strategies.

Findings from our study reflected a differing relationship between homemaking and mental health compared to the literature. Homemakers have traditionally been at greater risk of adverse mental health compared with those who worked outside of the home^{24,25} via mechanism of increased codependency and negative self-perception.²⁶ This, taken together with findings from the Singapore 2022 Labour Force Survey,²⁷ could suggest that homemakers in our study exercised the choice to leave the workforce to be involved in housework or the caring for their family members, and may have the option, skills and resourcefulness to return to the workforce if they wished to. Thus, they possibly had reduced codependency, a more positive view of their role in the family, and an increased sense of purpose and satisfaction, which buffer against adverse mental health outcomes. Further studies can be done to better understand the challenges and needs of homemakers in Singapore, and to ascertain if such findings are generalisable to the population, so that adequate support may be provided to safeguard their mental wellbeing.

It is well established in literature that females have a higher risk of depression and anxiety compared with males. Our study reported similar findings. Studies during the COVID-19 pandemic also found that females experienced greater

psychological impact compared to males, with a greater propensity to develop symptoms of anxiety and depression.^{28,29} While the exact reasons for this difference are not fully understood, it is important to recognise this complexity in the management of mental health issues and encourage a more inclusive approach to ensure that both men and women who are struggling with depression and anxiety receive targeted support needed for their recovery.

Studies have observed that the presence of social support predicts better mental health function and can be regarded as a protective factor against the onset of mental health difficulties.^{30,31} In managing depression and anxiety in the community, efforts to improve social support should be considered. Further research to understand the specific social support that has the highest influence on depression and anxiety will guide resource planning and improve the availability of this support system.

There is a complex relationship between diabetes, anxiety and depression. People with diabetes have a higher risk of developing anxiety and depression, and those with anxiety and depression are at a higher risk of developing diabetes.^{32,33} In various Asian studies, individuals with diabetes exhibited an elevated likelihood of depression compared with those without diabetes, with a 5-fold higher odds found in a study conducted in Malaysia (OR 5.05; 95% CI 2.08–12.27),³⁴ a 1.3 times higher odds in a study conducted in Hong Kong (OR 1.35; 95% CI 1.25–1.46),³⁵ and a 2.22 times higher odds in a study conducted in Thailand (adjusted OR 2.22; 95% CI 1.28–3.84).³⁶ Studies found that treatment of depression in people with type 2 diabetes were associated with improved glycaemic control and quality of life.³⁷ In addition, the use of metformin in patients with diabetes is associated with a lower risk of depression, although the exact mechanism is still unclear.³⁸ Hence, patients with diabetes should be screened for depression and anxiety, which should be treated when identified for better health outcome.

Our study had various strengths. We had a good response rate of 61.6% and a large sample size of 3505 respondents, which meant that the results of our study are representative of the patient population visiting the NHG polyclinics. In addition, we employed systematic sampling to reduce selection bias during the recruitment and had questionnaires in 3 major local languages to reduce the chances of misinterpretation. Lastly, the study questionnaires were self-administered, which reduces social desirability bias and interviewer bias.

There are several limitations to our study. First, it was conducted during the COVID-19 pandemic, potentially inflating reported depression and anxiety levels. Second, the study was confined to NHG polyclinics, representing about 20% of the central-north population visiting primary care. Furthermore, the study's demographics featured a higher proportion of males, Malays and other ethnicities compared with the national population.³⁹ Hence, our study population may not be an inclusive representation of the nation. Third, the study did not investigate the association of important factors such as body mass index (BMI) on the impact on mental health. These are areas for further research.

CONCLUSION

Our study showed that there was significant presence of coexisting clinical depression and anxiety (5.4%) in the primary care setting, especially among younger individuals, patients with diabetes and females. We propose that mental health screening programmes in the community should include screening for both depression and anxiety, rather than either of these only. Mental health screening should target at-risk groups, such as younger individuals and patients with diabetes. Studies to explore the help-seeking behaviours of younger individuals will help to guide interventional strategies to support them in the community.

Disclosure

The authors have no conflict of interest to declare.

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