



Association between Lifestyle Habits and Major Depression in Patients Attending Psychiatric Clinics in Sana'a City, Yemen: A Case-Control Study

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ABSTRACT

Background: Depression is a serious mental disorder and is ranked as the fourth leading cause of disease burden worldwide, which can be multifactorial with unclear etiology. Therefore, this study assessed the association between certain lifestyle habits and depression among psychiatric patients in Sana'a city, Yemen.

Methods: An unmatched case-control study was conducted in October and November 2019 at Al-Amal Hospital for Psychiatric Diseases and outpatient clinics of the University of Science and Technology Hospital (USTH) in Sana'a. Thirty patients aged 18–65 years, with a mean age of 31.1 ± 10.4 years, who were diagnosed with major or unipolar depression for the first time in the past three months were conveniently selected as cases, while 90 adult subjects, with a mean age of 30.9 ± 10.5 years, were conveniently selected as non-depressed controls from various USTH clinics other than the psychiatric clinic during the study period. Data on sociodemographic characteristics and lifestyle habits were collected using a structured questionnaire. Univariate analysis using the chi-square or Fisher's exact test was used to test the association between lifestyle habits and depression, with a confidence level of less than 0.05.

Results: There was no statistically significant association between depression among patients attending psychiatric clinics and current smoking status (OR = 0.9, 95% CI: 0.29–2.57; $P = 0.785$), khat chewing (OR = 1.0, 95% CI: 0.41–2.25; $P = 0.913$), or the frequency of khat chewing (OR = 0.8, 95% CI: 0.21–3.26; $P = 0.932$). Coffee drinking was not significantly associated with depression (OR = 1.1, 95% CI: 0.50–2.62; $P = 0.750$), while infrequent drinking of red tea was significantly associated with depression among patients compared to controls (OR = 16.8, 95% CI: 6.14–45.73; $P < 0.001$). On the other hand, no significant association was found between hours of sleep per day and depression (OR = 1.7, 95% CI: 0.71–3.87; $P = 0.245$). However, sedentary lifestyle was significantly associated with depression among psychiatric patients compared to controls (OR = 5.2, 95% CI: 2.15–12.7; $P < 0.001$).



Conclusion: Drinking red tea and regular exercise may help reduce depression in psychiatric patients with depression. By encouraging the integration of red tea consumption and regular exercise into the daily routine of Yemeni patients with depression, healthcare providers can support the mental health and well-being of this population.

Keywords: Depression ■ Lifestyle ■ Smoking ■ Khat chewing ■ Psychiatric patients ■ Yemen

1. Introduction

Depression is a common and debilitating mental disorder that represents a major public health issue.⁽¹⁾ According to the World Health Organization (WHO),⁽²⁾ it is the leading cause of years lived with disability and is associated with most annual suicides worldwide. WHO estimates that 5% of the world's adult population suffers from depression,⁽¹⁾ with approximately 280 million people worldwide suffering from this condition.⁽³⁾

Depression is a multifactorial disorder involving environmental, genetic and psychological factors, making its etiology difficult to identify.^(4,5) Although the effects of lifestyle habits, such as diet and exercise, have been extensively studied in numerous diseases like cancer and cardiovascular diseases, the association between these habits and depression is still relatively unexplored. Moreover, prevention strategies for depression have not received as much attention as therapeutic options.

There is limited research on the association between lifestyle habits and depression, and there is a lack of studies about the relationship between lifestyle habits and depression in Yemen. Therefore, this study aimed to assess the association between lifestyle habits and depression among patients attending psychiatric clinics in two hospitals in Sana'a City, Yemen.

2. Methods

2.1. Study design, population and setting

An unmatched case-control study was conducted in October and November 2019 at Al-Amal Hospital for Psychiatric Diseases and outpatient clinics of the

University of Science and Technology Hospital (USTH) in Sana'a.

Thirty patients aged 18–65 years, with a mean age of 31.1 ± 10.4 years, who were diagnosed with major or unipolar depression for the first time during the past three months at the psychiatric clinic of Al-Amal Hospital for Psychiatric Diseases were conveniently selected as cases. A case of depression was confirmed by a psychiatrist and classified as mild, moderate, or severe based on the criteria of the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV).⁽¹⁶⁾ Patients were excluded if they had other psychotic illnesses, were severely depressed, were unable to cooperate and answer the questions, or had hormonal disorders diagnosed by a psychiatrist or took medications for Cushing disease, hyperthyroidism, hypothyroidism, hyperparathyroidism, or Addison's disease. Patients with chronic diseases (such as cancer, heart disease, diabetes, stroke, renal failure, liver failure, multiple sclerosis, or Parkinson's disease), infectious diseases (such as tuberculosis, hepatitis, or pneumonia), or a history of accidental injuries resulting in unconsciousness and hospitalization in the past three months were also excluded. In addition, obese patients with body mass index (BMI greater than 40 kg/m^2 , and pregnant or lactating women at the time of the study or in the past year were excluded.

Ninety individuals with a mean age of 30.9 ± 10.5 years were conveniently selected as non-depressed controls from various USTH clinics other than the psychiatric clinic during the study period. They had no major depression based on individual reports and interviews and had no history of depression in the year preceding the study.



2.2. Data collection

Data were collected using a structured questionnaire consisting of three sections. The first section covered participants' sociodemographic characteristics, including gender, age, marital status, level of education, place of residence, employment status, smoking status, and khat chewing. The second section included questions about lifestyle habits, including smoking, khat chewing, coffee and tea consumption, average hours of sleep per day, and physical activity.

2.3. Data analysis

Data were analyzed using IBM SPSS Statistics, version 21.0 (IBM Corp., Armonk, New York, USA). The association between the dependent variable (depression) and independent variables (lifestyle habits) was assessed using the chi-square test or Fisher's exact test, as appropriate. The odds ratio (OR) and 95% confidence interval (CI) of the association were also reported. Statistical significance was set at a *P* value of <0.05.

3. Results

3.1. Characteristics of study participants

The majority were aged more than 30 years among both groups. Females constituted the majority in both cases (73.3%) and controls (70%) were, with half of the cases being married compared to 41.1% of the controls. In terms of education, most participants in both groups had secondary education and above, accounting for 63% of cases and 75% of controls. Residents of Sana'a city (86.7% and 90%, respectively) and the unemployed (80% and 72.2%, respectively) made up the majority of cases and controls. The majority of participants in both groups (86.7% of cases and 67.8% of controls) had a normal BMI (Table 1).

Table 1: Characteristics of cases and controls included in the study

Characteristics	Cases (N=30)	Controls (N=90)
	n (%)	n (%)
Gender		
Male	8 (26.7)	27 (30.0)
Female	22 (73.3)	63 (70.0)
Age (years)		
<30	13 (43.0)	44 (49.0)
≥30	17 (57.0)	46 (51.0)
Marital status		
Unmarried	15 (50.0)	53 (58.9)
Married	15 (50.0)	37 (41.1)
Level of education		
Primary or less	11 (36.7)	22 (24.4)
Secondary and above	19 (63.3)	68 (75.6)
Place of residence		
Sana'a city	26 (86.7)	81 (90.0)
Other cities	4 (13.3)	9 (10.0)
Employment status		
Unemployed	24 (80.0)	65 (72.2)
Employed	6 (20.0)	25 (27.8)
BMI (kg/m²)		
≥25	4 (13.3)	29 (32.2)
<25	26 (86.7)	61 (67.8)

BMI, body mass index.

3.2. Association of smoking, khat chewing, drinking coffee and drinking red tea with depression

There was no statistically significant association between depression among patients attending psychiatric clinics and current smoking status (OR = 0.9, 95% CI: 0.29–2.57; *P* = 0.785), khat chewing (OR = 1.0, 95% CI: 0.41–2.25; *P* = 0.913), or frequency of khat chewing (OR = 0.8, 95% CI: 0.21–3.26; *P* = 0.932). Coffee drinking was not significantly associated with depression (OR = 1.1, 95% CI: 0.50–2.62; *P* = 0.750), while infrequent drinking of red tea was significantly associated with depression among patients compared to controls (OR = 16.8, 95% CI: 6.14–45.73; *P* <0.001) (Table 2).

Table 2: Association of smoking, khat chewing, coffee drinking and red tea drinking with depression



Habits	Cases (N=30)	Controls (N=90)	OR (95% CI)	P-value
	n (%)	n (%)		
Current smoking status				
Smoker	5 (16.7)	17 (18.9)	0.9 (0.29–2.57)	0.785
Non-smoker	25 (83.3)	73 (81.1)	Reference	
Khat chewing				
Yes	11 (36.7)	34 (37.8)	1.0 (0.41–2.25)	0.913
No	19 (63.3)	56 (62.2)	Reference	
Frequency of khat chewing (times per week)*				
<3	6 (54.5)	17 (50.0)	Reference	0.932
≥3	5 (45.5)	17 (50.0)	0.8 (0.21–3.26)	
Coffee drinking				
Infrequent	14 (46.7)	39 (43.3)	1.1 (0.50–2.62)	0.750
Frequent	16 (53.3)	51 (56.7)	Reference	
Red tea drinking				
Infrequent	21 (70.0)	11 (12.2)	16.8 (6.14–45.73)	<0.001
Frequent	9 (30.0)	79 (87.8)	Reference	

*Calculated for khat chewers; OR, odds ratio; CI, confidence interval.

3.3. Association of lifestyle routine with depression

Table 3 shows no significant association between hours of sleep per day and depression (OR = 1.7, 95% CI: 0.71–3.87; P = 0.245). However, sedentary lifestyle was significantly associated with depression among psychiatric patients compared to controls (OR = 5.2, 95% CI: 2.15–12.7; P < 0.001).

Table 3: Association of lifestyle routine with depression among patients included in the study

Lifestyle routine	Cases (N=30)	Controls (N=90)	OR (95% CI)	P-value
	n (%)	n (%)		
Hours of sleep per day				
<8	19 (63.3)	46 (51.1)	1.7 (0.71–3.87)	0.245
≥8	11 (36.7)	44 (48.9)	Reference	
Physical activity				
Sedentary	17 (56.6)	18 (20.0)	5.2 (2.15–12.7)	<0.001
Active	13 (43.4)	72 (80.0)	Reference	

OR, odds ratio; CI, confidence interval.

4. Discussion

To the best of our knowledge, this case-control study was the first to assess the association between lifestyle habits and depression in psychiatric patients in Yemen. Conventional treatments of depression often involve medications and psychotherapy, which can be effective but are not universally accessible or

suitable for all patients.^(7–9) Therefore, it is crucial to explore the lifestyle habits that may influence the outcomes of depression treatment.

This study found that infrequent drinking of red tea was significantly associated with depression among psychiatric patients. However, no significant association was found with smoking, khat chewing, or coffee drinking. This finding aligns with several studies that have identified tea consumption as having a protective effect against depression.^(10–13) Likewise, a recent meta-analysis has provided evidence on the positive impact of tea consumption against depression.⁽¹⁴⁾ Researchers have recently become interested in exploring the potential benefits of tea consumption for mental well-being and proposed their biochemical mechanisms.⁽¹²⁾ Tea catechins, particularly epigallocatechin gallate, have been suggested to have antidepressant-like properties and the ability to prevent a decrease in dopamine levels in the brain.^(15,16) Caffeine in tea is known to improve alertness and mood.⁽¹³⁾ Additionally, theaflavins, the primary polyphenolic compounds in black tea, may protect against oxidative stress.⁽¹⁷⁾

The significant association between sedentary lifestyle and depression among psychiatric patients compared to controls in the present study is con-



sistent with previous studies suggesting that exercise can alleviate depressive symptoms and improve overall physical and mental well-being.⁽¹⁸⁻²²⁾ Studies have shown that regular exercise not only reduces the likelihood of developing depression and anxiety disorders^(17,23-26) but also increases the production of certain mood-regulating neurotransmitters, lowers cortisol levels, stimulates neurogenesis and improves the secretion of neurotrophic factors.⁽²⁷⁻³⁰⁾ Several studies suggest that exercise may influence various neurobiological pathways linked to depression,⁽³¹⁻³³⁾ including muscle-brain and gut-brain communication, as well as skeletal-brain signaling pathways.^(34,35)

The present study provides insights into the influence of certain lifestyle habits on depression among psychiatric patients in Yemen. However, recall bias might be introduced due to the case-control design of the study, potentially affecting its generalizability to the broader population of psychiatric patients in the population. Therefore, there is a need for longitudinal studies to establish a cause-and-effect relationship between lifestyle habits and depression.

5. Conclusion

Drinking red tea and engaging in regular physical exercise can help reduce depression among psychiatric patients with depression. By encouraging the incorporation of red tea consumption and regular physical exercise into the daily routines of Yemeni patients with depression, healthcare providers may support mental health and well-being in this population.

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Ethical approval and consent

Approval to conduct this study was obtained from the University Research Ethics Committee of the University of

Science and Technology in Sana'a. Permission was also obtained from the administration of Al-Amal Hospital for Psychiatric Diseases and the USTH in Sana'a before data collection. Informed consent was obtained from participants to ensure the privacy of participants and the confidentiality of their information.

Conflict of Interest

The authors declare no conflict of interest associated with this article.

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