

Post-COVID-19 Cognitive Dysfunction: Analyzing the Role of Age, Lifestyle, and Neurological Impairments: A Multi-Centric Case-Control Study



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Table A. The consumption of brain food diet (Healthy and unhealthy).

	Case (Post-COVID-19) T= 176 F (%)	Control T= 92 F (%)	Test (p)
Omega 3 (nuts, fish, and tuna....)	99 (56.3)	14 (15.2)	6.7 (0.00*)
Never	15 (8.5)	14 (15.2)	
Rare	33 (18.8)	27 (29.3)	
sometimes	22 (12.5)	22 (23.9)	
Often	7 (4.0)	15 (16.3)	
Always			

(Table A.) contd.....

	Case (Post-COVID-19) T= 176 F (%)	Control T= 92 F (%)	Test (p)
Vitamin D (Sun exposure of more than 1h)	36 (20.5)	6 (6.5)	2.23
Never	22 (12.5)	9 (9.8)	(0.39)
Rare	46 (26.1)	35 (38.0)	
sometimes	29 (16.5)	16 (17.4)	
Often	43 (24.4)	26 (28.3)	
Always			
More than two letters of water	38 (21.6)	5 (5.4)	
Never	22 (12.5)	17 (18.5)	
Rare	15 (8.5)	18 (19.6)	
sometimes	23 (13.1)	23 (25.0)	
Often	78 (44.3)	29 (31.5)	
Always			
Strawberry or grab	8 (4.5)	6 (6.5)	0.82
Never	33 (18.8)	18 (19.6)	(0.41)
Rare	70 (39.8)	28 (30.4)	
sometimes	30 (17.0)	34-(37.0)	
Often	35-(19.9)	6-(6.5)	
Always			
Leafy Green vegetables	5-(2.8)	3 (3.3)	0.24 (0.81)
Never	20 (11.4)	9 (9.8)	
Rare	35 (19.9)	15 (16.3)	
sometimes	55 (31.3)	35 (38.0)	
Often	61 (34.7)	30 (32.6)	
Always			
Caffeine (cup of coffee or more than 2 cup of tea)	64 (36.4)	7 (7.6)	4.98 (0.00*)
Never	7 (4.0)	4 (4.3)	
Rare	16 (9.1)	9 (9.8)	
sometimes	11 (6.3)	12 (13.0)	
Often	78 (44.3)	60 (65.0)	
Always			
Vegetable oil (Oliver oil,)	67 (38.1)	23 (25.0)	3.33 (0.01*)
Never	43 (24.4)	11 (12.0)	
Rare	31 (17.6)	24 (26.1)	
sometimes	13 (7.4)	19 (20.7)	
Often	22 (12.5)	15 (16.3)	
Always			
Total score	12.0 ± 4.1	14.1 ± 3.7	0.00*

The English Version of the Questionnaire

1- Informed consent

2- Demographic

- Sex (male, female)
- Residence (urban, rural)
- Educational level
- Nationality (Saudi, non-Saudi)
- Occupation
- Age, in years
- Body mass index (BMI); body weight (kg)/ (height in meter)²

- Marital status (single, widow, married, divorced)

- Comorbidities (non, mental and psychological, neurological disorder, autoimmune diseases, Diabetes mellitus, cardiovascular diseases, others)

3- History of COVID-19 infection

- Since (duration in months)
- Before the vaccination, after the 1st dose, after the 2nd dose, after the 3rd dose
- Management plan: (Asymptomatic, at home, required hospital admission, required ICU admission, required mechanical ventilation)

- Resolved symptoms (yes, no)

4- COVID-19 vaccination history (Event data) per each dose; (1st, 2nd, and the 3rd dose)

- Types (AstraZeneca, Johnson and Johnson (J&J), Sputnik light, Sepotoc -7, Sinopharm, Sinovac, Moderna, Pfizer, mixed) vaccines
- Adverse Effects;

- i. No side effects (SE)
- ii. Local (injection site) SE e.g., pain, heaviness, redness and swelling.
- iii. General SE
- iv. Systemic SE
- v. Serious SE

5- Nutritional, and supplement history

Item	Not at all	Less than three times a month	Once or twice a week	3-5 times a week	more than 5 times a week
Omega-3, Tuna fish, Nuts	-	-	-	-	-
Vit D, Sun e	-	-	-	-	-
Vitamin D or prolonged exposure of long bones (more than an hour) to direct sunlight	-	-	-	-	-
Processed meats such as hamburgers and hot dogs	-	-	-	-	-
Fried foods	-	-	-	-	-
Sugar in excess of three teaspoons	-	-	-	-	-
Drinking more than two liters of water per day	-	-	-	-	-
Berries or grapes	-	-	-	-	-

6- Exercise level

Level	Description
Sedentary lifestyle	Less than 5,000 steps per day and less than 2.5 hours of physical activity per week.
Low activity level	5,000 to less than 7,500 steps per day or 2.5 to less than 5 hours of physical activity per week.
Moderate activity level	7,500 to 10,000 steps per day or 2.5 to less than 5 hours of physical activity per week.
High activity level	More than 10,000 steps per day or more than 5 hours of physical activity per week.

7- Sleep

- Average duration in hours
- Continuity (continuous, interrupted)
- Quality of sleep (very bad, poor, accepted, good, very good)

8- Screen use

- Average duration in hours

9- Supplement Intake

- No at all
- Zinc
- Iron

- Vitamin A
- Selenium
- Vitamin D
- Vitamin E
- Vitamin C
- Multi vitamin
- Collagen
- Vitamin B12
- Others (Mention)

10. Montreal Cognitive Assessment Test (MOCA test)

MONTREAL COGNITIVE ASSESSMENT (MOCA)
Version 7.1 Original Version

NAME : _____
Education : _____
Sex : _____
Date of birth : _____
DATE : _____

VISUOSPATIAL / EXECUTIVE		POINTS	
		Copy cube []	Draw CLOCK (Ten past eleven) (3 points) [] [] [] Contour Numbers Hands ___/5
NAMING		___/3	
		[] [] []	
MEMORY		No points	
Read list of words, subject must repeat them. Do 2 trials, even if 1st trial is successful. Do a recall after 5 minutes.		FACE VELVET CHURCH DAISY RED 1st trial [] [] [] [] [] 2nd trial [] [] [] [] []	
ATTENTION		___/2	
Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order. [] 2 1 8 5 4 Subject has to repeat them in the backward order. [] 7 4 2		___/1	
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors. [] FBACMNAAJKLBAFAKDEAAAJAMOFAB		___/3	
Serial 7 subtraction starting at 100 [] 93 [] 86 [] 79 [] 72 [] 65 4 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt		___/2	
LANGUAGE		___/1	
Repeat: I only know that John is the one to help today. [] The cat always hid under the couch when dogs were in the room. []		___/2	
Fluency / Name maximum number of words in one minute that begin with the letter F [] _____ (N ≥ 11 words)		___/1	
ABSTRACTION		___/2	
Similarity between e.g. banana - orange = fruit [] train - bicycle [] watch - ruler		___/5	
DELAYED RECALL		___/6	
Has to recall words WITH NO CUE [] [] [] [] [] Category cue [] [] [] [] [] Multiple choice cue [] [] [] [] []		Points for UNCUED recall only	
Optional		___/6	
ORIENTATION		___/6	
[] Date [] Month [] Year [] Day [] Place [] City		___/6	
© Z.Nasreddine MD www.mocatest.org Normal ≥ 26 / 30		TOTAL ___/30 Add 1 point if ≤ 12 y edu	

Administered by: _____

11. Chronic Fatigue Symptoms (CFS) Questionnaire

CFS Questionnaire Instructions								
Score each symptom in 2 steps. First, has the symptom caused you problems on more than half of the days in the past 6 months? Second, what was the overall severity of the symptom for the past 6 months?								
Symptom	Is this a problem more than half the time?		Severity in the past 6 months					Score
	Yes	No	None	Trivial	Mild	Moderate	Severe	
Fatigue	Yes	No	0	1	2	3	4	Sum8
Short term problems with memory or concentrating	Yes	No	0	1	2	3	4	
Sore throat	Yes	No	0	1	2	3	4	
Sore lymph nodes (neck, armpits, groin)	Yes	No	0	1	2	3	4	
Muscle pain	Yes	No	0	1	2	3	4	
Joint pain	Yes	No	0	1	2	3	4	
Headaches	Yes	No	0	1	2	3	4	
Difficulty sleeping or unrefreshing sleep	Yes	No	0	1	2	3	4	
Extreme fatigue after exercise or mild exertion	Yes	No	0	1	2	3	4	

		Fatigue	
		None, Trivial, Mild	Moderate, Severe
Sum of ancillary criteria (Sum8)	0–13	☐ Normal	☐ Chronic idiopathic fatigue (CIF)
	14–32	☐ CFS-like with insufficient fatigue syndrome (CFSIWIFS)	☐ Chronic fatigue syndrome (CFS)

What would you do if you were better tomorrow?	☐ 1. I have a list of things to do ☐ 2. I would stop being sad ☐ 3. Not sure
What happens if you walk a long distance?	☐ 1. My symptoms get worse ☐ 2. No change to my symptoms ☐ 3. My symptoms are better
Do you tolerate alcohol?	☐ 1. I can drink and get drunk ☐ 2. Drinking alcohol helps me feel better ☐ 3. I may have a drink socially ☐ 4. I rarely drink alcohol ☐ 5. I avoid alcohol because it makes my symptoms worse

The Arabic Version of the Questionnaire

- 1- الموافقة المستنيرة
- 2- البيانات الديموغرافية
 - (الجنس) ذكر / انثي
 - مكان الإقامة
 - المستوى التعليمي
 - (الجنسية) سعودي / غير سعودي
 - الوظيفة
 - العمر بالسنوات
 - وزن الجسم (كجم) / الطول بالمتر
 - (الحالة الزوجية) اعزب / ارملة / متزوج / مطلق
 - (لا شيء، اضطرابات نفسية ونفسولوجية، أمراض القلب اضطرابات عصبية، أمراض مناعية ذاتية، مرض السكري، أمراض القلب (والشرابين، غيرها
- 3- تاريخ الإصابة بفيروس كورونا
- قبل التطعيم، بعد الجرعة الأولى، بعد الجرعة الثانية، بعد الجرعة الثالثة

- خطة الإدارة: (بدون أعراض، في المنزل، تطلب الدخول إلى المستشفى، تطلب الدخول إلى وحدة العناية المركزة، تطلب التهوية الميكانيكية
- خطة الإدارة: (بدون أعراض، في المنزل، تطلب الدخول إلى المستشفى، تطلب الدخول إلى وحدة العناية المركزة، تطلب التهوية الميكانيكية
- (تم حل الأعراض) نعم / لا
- 4- تاريخ التطعيم ضد فيروس كورونا
- (بيانات الأحداث لكل جرعة (الأولى، الثانية، الثالثة
- سبوتنيك لايت، سبوتنيك-7، سينوفارم، سينوفاك، موديرنا، فايزر، أسترازينيكا، جونسون اند جونسون، مختلطة
- خطة الإدارة: (بدون أعراض، في المنزل، تطلب الدخول إلى المستشفى، تطلب الدخول إلى وحدة العناية المركزة، تطلب التهوية الميكانيكية
- (الآثار الجانبية في موضع الحقن) الألم والتهور والاحمرار والتورم
- الآثار العامة
- آثار جانبية خطيرة
- 5- التغذية والمكملات

أكثر من خمس مرات أسبوعياً	أسبوعياً 3-5	مرة - مرتين أسبوعياً	أقل من ثلاث مرات في الشهر	أطلقاً
				الأوميغا 3 أو الأسماك التونة المكسرات
				فيتامين دال أو التعرض للعظام الطويلة (أكثر من ساعة) لأشعة الشمس المباشرة
				اللحوم المصنعة كالهامبرجر و الهوت دوج
				المقليات
				السكريات أكثر من ثلاث ملاعق شاي صغيرة
				تشرب أكثر من لترين ماء يومياً
				التوت أو العنب

6- التدريب واللياقة البدنية

المستوى	الوصف
حياة خاملة	لا امارس أي نشاط بدني عدا الأنشطة اليومية العادية
منخفض	حياة خاملة أقل من 5000 خطوة يوميية
متوسط	أقل من ساعتين ونصف في الاسبوع او (من 5000 الي أقل من 7500 خطوه يوميا
عالي	من ساعتين ونصف الي أقل من خمس ساعات اسبوعياً او من 7500 الي عشرة الاف خطوه يوميا
	أكثر من خمس ساعات اسبوعياً او أكثر من 10 الف خطوه يوميا

7- معدل النوم

- متوسط ساعات النوم
- (معدل استمرارية النوم) متقطع؛ مستمر
- (جودة النوم) سيئة جداً - سيئة - مقبولة - جيدة - جيدة جداً
- 8- معدل وقت تشغيل الشاشة بالساعات

9- تناول الفيتامينات

- الحديد
- الزنك

فيتامين أ

- فيتامين ب
- فيتامين د
- فيتامين س
- فيتامينات متعددة
- السليينيوم
- الكولاجين
- (اخرى) انكر

10- استبيان مونتريال التعرفي للنشاط الذهني

11- استبيان أعراض الإجهاد المزمن (English version only available)

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