Original Article

Relation between socio-demographic data and lifestyle changes during COVID 19 pandemic social confinement in a group of Egyptian elderly

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Abstract

Background: COVID 19 lockdown is known to have effects on different aspects of life especially dietary habits and lifestyle in elderly.
Aim of the work: To detect changes in lifestyle among a sample of Egyptian elderly during COVID 19 confinement.
Methodology: Three hundred and thirty-four **(**334) of community dwelling Egyptian elderly were invited to complete an online survey which was sent using social media platforms; What's App ®, Facebook®, E-mail, and Geriatrics Telemedicine clinics of Ain Shams University Virtual Hospital. Survey approached 500, answered by 400, and fulfilled by 334 of community dwelling Egyptian elderly in the duration from 23/8/2021 to 8/6/2022.
Results: In terms of gender and lifestyle changes, women experienced a considerable decrease in outdoor time, a rise in housework, and an increase in computer use. Participants over the age of 70 experienced significant weight change in the form of weight loss, dietary changes, and an increase in housework, whereas participants under the age of 70 experienced significant negative changes in outdoor time, indoor socializing with friends, physical activity, weekly shopping, and sleeping hours. Highly educated persons' lifestyle modifications included a large reduction in outdoor time, a rise in housework, and a drop in physical exercise. Residency and lifestyle changes in senior people living in cities include a considerable reduction in outdoor time and time spent with families.
Conclusion: COVID 19 social confinement had an effect on dietary habits and life style of Egyptian elderly.
Keywords: lifestyle changes, social confinement, elderly, COVID 19.

Introduction

In late 2019, COVID 19 infection began in Wuhan, Hubei, China. This epidemic began with animal-to-human infection, and the direct cause of death is generally due to severe atypical pneumonia **(**1**).** The pandemic has been declared by the WHO as a global public health emergency **(**2**).** Old age is also associated with increased mortality. According to the China Center for Disease Control and Prevention, it has been reported that the mortality rate of all cases is 2.3%, while the mortality rate between the ages of 70 and 79 is 8%, and those aged 80 and over are 15% **(**3).

In an analysis conducted in the United Kingdom, the risk of death of individuals aged 80 and over was found to be 20 times higher than the death risk of individuals aged 50 to 59 **(**4**).**The risk of COVID19 infection in elderly patients generally increases in other crowded areas for socialization such as social settings, day care centers and elderly nursing homes **(**5**) (6).**

Different methods have been tried to combat pandemic diseases. In the manners of fighting pandemic diseases, increasing awareness, protective clothing, treatment, and the most effective of these methods are quarantine application and vaccination **(7).**

It has been documented that the older adults of the population are at the greatest risk of mortality due to coronavirus disease; consequently, social isolation seems the best option to protect them. Unfortunately, due to many physiological changes and comorbidities they are also the most negatively affected population by social isolation. This is due to socioeconomic insecurity, which could affect food acquisition and the need for support in daily tasks and meals. The institutionalized older adults often depend on food donations, which may have reduced due to the economic crisis caused by the pandemic **(**8**) (9).**

COVID-19 pandemic has also brought a new set of challenges for the individual to maintain a healthy diet. The lockdown status announced in many countries of the world had serious effects on both access to food and use. The confinement to one's home has direct effects on one's lifestyle, including dietary habits, eating, and physical activity patterns **(2)(10).**

The data collected from many studies all over the world suggest that the lockdown has affected lifestyle and dietary habits of elderly as the new situation limits access of individuals to their families and the rest of their social network. This has a psychological impact and affects daily shopping **(9)**.

Loneliness feelings due to COVID-19 pandemic are indirectly associated

with depressive symptoms which led to malnutrition; older adults feeling lonely reported higher levels of malnutrition, which is associated with increased depressive symptoms **(11).** Gender difference has been reported in food craving, with a higher prevalence in women than in men. Carbohydrate craving encourages serotonin production that in turn has a positive effect on mood **(12).** Males and females crave different kinds of foods as males reported more craving for savory foods (e.g., meat, fish, eggs), while females reported more craving for sweet foods (e.g., chocolate, pastries, ice cream. Males may crave different types of sweets than females do (e.g., sugar-sweetened beverages, but not chocolate) **(13)**.

Diet and lifestyle may influence inflammation and subsequently alter functions of the immune system. A balanced nutritional status and healthy eating choices are important to manage viral infections, such as COVID 19. It must be made to decrease inflammation and strengthen the immune system and suppress the cytokine storm. In addition to the conventional COVID-19 control measures such as social distancing, wearing a mask and sanitizing, it is proposed that fermented vegetables and foods with antioxidant properties may help limit infection severity **(14)**.

Poor nutritional status and malnutrition in the elderly population are important areas of concern especially those who have multiple comorbidities or cognitive impairment and those who depend on another person for feeding or shopping **(15).** Research focusing on elderly is limited especially during COVID, which limits our understanding the consequences of pandemics on this vulnerable group and hence our mitigating plans to protect them.

Aim of the Work

The aim is to detect changes in lifestyle among a sample of Egyptian elderly during COVID-19 confinement.

Methodology

A cross-sectional study targeting elderly (60years and above).

A self-administrated online survey was designed in Arabic using Google document forms. This survey has been developed and validated by Dr/Leila Cheikh Ismail et al ***(16).*** This survey contained questions on dietary and lifestyle habits prior to and during the COVID-19 confinement. A researcher from the College of Health Sciences at the University of Sharjah and a researcher from the College of Food and Agriculture at United Arab Emirates University (UAE) developed the draft of the survey in English.

Questions were developed based on the International Physical Activity Questionnaire Short Form (IPAQ-SF) and the Copenhagen Psychosocial Questionnaire (COPSOQ-II). It was then translated from English to Arabic and culturally adapted in UAE by Leila Cheikh Ismail and her team following an internationally accepted methodology.

After obtaining permission from Leila Cheikh Ismail and her team to translate and culturally adapt the survey to the Egyptian population, we examined which of the items had to be adapted to the Egyptian culture. Forward translation into Egyptian dialect was done. Then translated and adapted version was then back translated into English.

An expert group from community medicine department Ain Shams University then rated the degree of agreement between the back-translated version and the original version. As a final step to ensure the equivalence of the translated survey and modified by the study team. Slight modifications were made to the survey by our team under supervision of a panel of experts from the Community Medicine department at the Faculty of Medicine Ain Shams University to accommodate our study and Egyptian community. And small sample was taken as pilot sample for any further modifications which were done.

The online survey contains questions about 1-socio-demographic background: gender, age, marital status, number of children the participant has, education level, employment status, weight change, perceived health status, and residence. 2- Shopping habits: frequency of grocery shopping. 3- Physical activity: exercising frequency, household chores frequency, computer time for work or study, and screen time for entertainment. 4- sleep: sleep duration, and used questionnaire is provided in supplementary material.

Questions on dietary habits, physical activity, and sleep were asked twice, first time regarding the period before the pandemic (pre-COVID-19) and then regarding the period during lockdown (during COVID-19).

The survey was posted on social media (WhatsApp, Facebook), sent via emails, and administered during telemedicine consultations (Geriatrics telemedicine clinics of Ain Shams University Virtual Hospital).

Exclusion criteria

People who are unwilling to participate in the study.

Statistical analysis:

Data were analyzed using the Statistical Package for Social Sciences (SPSS version 25).

Descriptive analyses were performed as numbers and percentages for all qualitative data . Also, different types of graphs were used as bar, pie charts. Bivariate analyses were performed using the chi-square test for categorical variables. For comparison of habits and lifestyle changes before and during the COVID-19 pandemic McNamar test was used for qualitative binary variables ,While, Marginal Homogeneity test was used for nominal variables. P value < 0.05 was considered significant.

RESULTS

The survey approached 500, answered by 400 and fulfilled by 334 of community dwelling Egyptian elderly both males and females were invited to complete an online survey which was sent using social media platforms; What's App ®, Facebook®, E-mail, and Geriatrics Telemedicine clinics of Ain Shams University Virtual Hospital.
Results of our study shows that 51.7% of the participants were females, 53.5% aged 60-69 years old, 49.8% were married, the sample distribution from different governorates of Egypt with the highest number of participants residing in Cairo (61.6%) and 57.4% live in rural areas, 57.1% have 1-3 siblings, 71.8% live with their families, 31.2% were educated up to university level and 14.7% were illiterate, 57.1% were retired and 45.9% were nonsmokers (table1).
The prevalence of chronic disease among the study population the most prevalent was HTN (50%), followed by DM (30%), CVD (25%), CNS diseases (15%), endocrinal diseases 10%, and prostatic problems (10%) (Figure1).
As regard gender and lifestyle before COVID 19 there was significant difference between males and females before COVID19 in physical activity, house chores, computer use and sleeping hours (p value 0.007, < 0.001, 0.014 and 0.015 respectively) (table 2).

As regards gender and life style changes during COVID 19, in females there was significant decrease in outdoor times, decrease physical activity, increase house chores and increase computer use (p value=0.03, 0.024,<0.001&<0.001) (table 3).
As regard age and lifestyle before COVID 19 there was significant change between the 2 age groups before COVID 19 in water intake, physical activity, weekly shopping, house chores, computer use, and sleeping hours (p value < 0.001, <0.001, 0.0341, <0.001, 0.05, and <0.001 respectively) (table 4)
As regard age and lifestyle changes, in elderly older than 70 years old there was significant weight change in form of weight loss, dietary changes and increase house chores, while in elderly less than 70 years old there

was significant decrease in outdoor times, spending time with friends at home, decrease physical activity, decrease weekly shopping, and increase sleeping hours in both age groups (p value= <0.001, 0.004, 0.01, <0.001, <0.001, <0.001, 0.003) (table 5).

As regard educational level and lifestyle before COVID19 there was significant changes between different educational levels in physical activity, house chores, computer use, and sleeping hours (p value <0.001, 0.003, 0.002, <0.001 respectively) (table 6).

As regard educational level and lifestyle changes, in highly educated adults there was significant decrease in outdoor times, decrease physical activity and increase house chores (p value = <0.001, 0.001, 0.03) (table7).

As regard residency and lifestyle before COVID19 there was significant changes between rural and urban areas residents in physical activity, house chores, and sleeping hours (p value =0.009, 0.01, and 0.003 respectively) (table 8).

As regard residency and lifestyle changes, in elderly living in urban areas there was significant decrease in outdoor times, spending time with friends at home, increase home chores, increase computer use, while in rural areas there was significant decrease physical activity, and decrease weekly shopping. (p value= 0.01,0.002, 0.002, <0.001, <0.001,0.01,) (table 9).

During COVID 19 lockdown 53.8% of participants skip one of their meals, 45.9% eat 1-2 meals, 49.2% skip meals due to reduced amount of consumed food. There was no significant changes as regard type of food consumed before and after COVID 19 lockdown but we noticed that there was slight increase in consumption of carbohydrates and caffeine.

Table 1: Socio- demographic data of the study population.

		N*	%
Gender	Female	172	51.7%
	Male	161	48.3%
Age	60-69 years	178	53.5%
	70-79 years	105	31.5%
	80-89 years	37	11.1%
	More than 90 years	13	3.9%
Marital status	Married	166	49.8%
	Single	86	25.8%
	Widow	40	12.0%
	Divorced	41	12.3%
Residency	Cairo	205	61.6%
	Others	128	38.4%
Urban/rural	Rural	191	57.4%
	Urban	142	42.6%
Number of siblings	No	40	12.0%
	1-3	197	59.2%
	4-6	63	18.9%
	more than 6	33	9.9%
Living with family	No	94	28.2%
	Yes	239	71.8%
Educational level	Illiterate	49	14.7%
	Less than secondary level	80	24.0%
	Secondary level	100	30.0%
	University level	104	31.2%
Working status	Retired	190	57.1%
	Working	143	42.9%
Smoking	Non-smoker	53	45.9%
	Ex-smoker	139	41.7%
	current smoker	41	12.3%

*N:Number

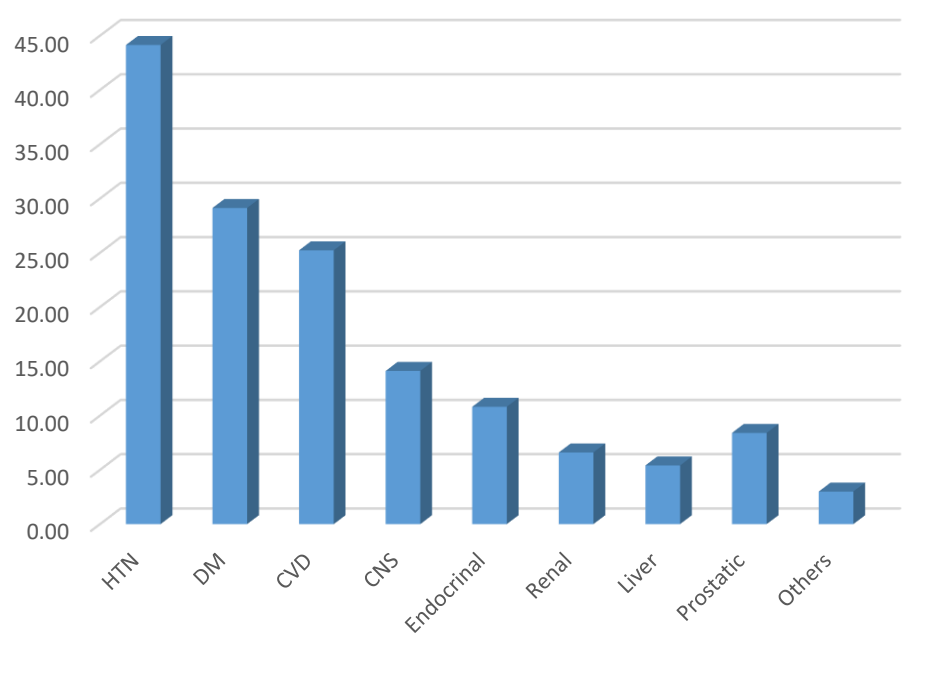

Figure 1: Frequency of chronic diseases among the studied group

Table2: Gender and lifestyle pre COVID-19 pandemic.

		Gender				Test Value *	P value#
		Female		Male			
		N	%	N	%		
Water intake	1-4 glasses	64	37.2%	45	28.0%	3.23	0.198
	5-7 glasses	72	41.9%	77	47.8%		
	More than 8 glasses	36	20.9%	39	24.2%		
Physical activity	No	82	47.7%	50	31.1%	9.934	0.007#
	1-3 times /week	64	37.2%	83	51.6%		
	More than 3 times/week	26	15.1%	28	17.4%		
Weekly shopping	No	69	40.1%	78	48.4%	2.34	0.126
	Yes	103	59.9%	83	51.6%		
House chores	Never	29	16.9%	49	30.4%	26.71	<0.001#
	1-3 times/week	76	44.2%	74	46.0%		
	4-5 times /week	23	13.4%	28	17.4%		
	Everyday	44	25.6%	10	6.2%		
Computer use	Less than 30 Minutes	46	26.7%	48	29.8%	10.54	0.014#
	1-2 hours	51	29.7%	69	42.9%		
	4 -5 hours	44	25.6%	27	16.8%		
	More than 5 hours	31	18.0%	17	10.6%		
Sleeping hours	Less than 5 hours	59	34.3%	63	39.1%	3.69	0.015#
	5-7 hours	81	47.1%	80	49.7%		
	More than 7 hours	32	18.6%	18	11.2%		

** Chi-square test; #significant results*

Table 3: Gender and lifestyle during COVID19:

		Gender					
		Female		Male		Test	P
		N	%	N	%	Value*	value#
Weight change	not known	32	18.6%	20	12.4%	2.85	0.414
	Loss of weight	53	30.8%	58	36.0%		
	Constant	49	28.5%	49	30.4%		
	Gain weight	38	22.1%	34	21.1%		
Lifestyle changes	No	45	26.2%	39	24.2%	0.166	0.689
	Yes	127	73.8%	122	75.8%		
Dietary change during COVID	No	74	43.0%	57	35.4%	2.023	0.155
	Yes	98	57.0%	104	64.6%		
Decrease in outdoor times.	No	57	33.1%	72	44.7%	4.71	0.03#
	Yes	115	66.9%	89	55.3%		
Spending time with friends at home.	No	50	29.1%	61	37.9%	2.91	0.08
	Yes	122	70.9%	100	62.1%		
Water intake	1-4 glasses	62	36.0%	53	32.9%	0.623	0.728
	5-7 glasses	78	45.3%	80	49.7%		
	More than 8 glasses	32	18.6%	28	17.4%		
Physical activity	No	80	46.5%	60	37.3%	7.48	0.024#
	1-3 times /week	54	31.4%	74	46.0%		
	More than 3 times/week	38	22.1%	27	16.8%		
Weekly shopping	No	89	51.7%	92	57.1%	0.97	0.323
	Yes	83	48.3%	69	42.9%		
House chores	Never	26	15.1%	56	34.8%	31.91	<0.001#
	1-3 times/week	82	47.7%	73	45.3%		
	4-5 times /week	19	11.0%	21	13.0%		
	Everyday	45	26.2%	11	6.8%		
Computer use	Less than 30 Minutes	24	14.0%	17	10.6%	21.28	<0.001#
	1-2 hours	40	23.3%	75	46.6%		
	4 -5 hours	64	37.2%	35	21.7%		
	More than 5 hours	44	25.6%	34	21.1%		
Sleeping hours	Less than 5 hours	42	24.4%	45	28.0%	0.668	0.716
	5-7 hours	68	39.5%	58	36.0%		
	More than 7 hours	62	36.0%	58	36.0%		

* Chi-square test, #significant results

Table 4: Age and lifestyle before COVID-19.

		Age				Test Value*	P value#
		Less than 70 years		more than 70 years			
		N	%	N	%		
Water intake	1-4 glasses	76	42.7%	33	21.3%	17.30	<0.001#
	5-7 glasses	67	37.6%	82	52.9%		
	More than 8 glasses	35	19.7%	40	25.8%		
Physical activity	No	91	51.1%	41	26.5%	21.27	<0.001#
	1-3 times /week	65	36.5%	82	52.9%		
	More than 3 times/week	22	12.4%	32	20.6%		
Weekly shopping	No	69	38.8%	78	50.3%	4.48	0.0341#
	Yes	109	61.2%	77	49.7%		
House chores	Never	35	19.7%	43	27.7%	24.02	<0.001#
	1-3 times/week	82	46.1%	68	43.9%		
	4-5 times /week	18	10.1%	33	21.3%		
	Everyday	43	24.2%	11	7.1%		
Computer use hours	Less than 30 Minutes	48	27.0%	46	29.7%	7.81	0.05#
	1-2 hours	57	32.0%	63	40.6%		
	4 -5 hours	39	21.9%	32	20.6%		
	More than 5 hours	34	19.1%	14	9.0%		
Sleeping hours	Less than 5 hours	49	27.5%	73	47.1%	19.485	<0.001#
	5-7 hours	91	51.1%	70	45.2%		
	More than 7 hours	38	21.3%	12	7.7%		

* Chi-square test; #significant results

Table 5: Age and lifestyle during COVID-19

		Age					
		Less than 70 years		More than 70 years		Test Value*	P value #
		N	%	N	%		
Weight change	Not known	25	14.0%	27	17.4%	28.88	<0.001
	Loss of weight	42	23.6%	69	44.5%		
	Constant	55	30.9%	43	27.7%		
	Gain weight	56	31.5%	16	10.3%		
Lifestyle change	No	40	22.5%	44	28.4%	1.57	0.215
	Yes	138	77.5%	111	71.6%		
Dietary change	No	79	44.4%	52	33.5%	4.07	0.044#
	yes	99	55.6%	103	66.5%		
Decrease of outdoor time	No	52	29.2%	77	49.7%	14.62	<0.001#
	yes	126	70.8%	78	50.3%		
Spending time with friends at home	No	42	23.6%	69	44.5%	16.31	<0.001#
	yes	136	76.4%	86	55.5%		
Water intake	1-4 glasses	66	37.1%	49	31.6%	1.223	0.581
	5-7 glasses	80	44.9%	78	50.3%		
	More than 8 glasses	32	18.0%	28	18.1%		
Physical activity	No	94	52.8%	46	29.7%	19.23	<0.001#
	1-3 times /week	59	33.1%	69	44.5%		
	More than 3 times/week	25	14.0%	40	25.8%		
Weekly shopping	No	86	48.3%	95	61.3%	5.62	0.01#
	yes	92	51.7%	60	38.7%		
House chores	Never	41	23.0%	41	26.5%	12.88	0.005#
	1-3 times/week	74	41.6%	81	52.3%		
	4-5 times /week	21	11.8%	19	12.3%		
	Everyday	42	23.6%	14	9.0%		
Computer use	Less than 30 Minutes	20	11.2%	21	13.5%	0.447	0.932
	1-2 hours	63	35.4%	52	33.5%		
	4 -5 hours	53	29.8%	46	29.7%		
	More than 5 hours	42	23.6%	36	23.2%		
Sleeping hours	Less than 5 hours	33	18.5%	54	34.8%	11.40	0.003#
	5-7 hours	74	41.6%	52	33.5%		
	More than 7 hours	71	39.9%	49	31.6%		

* Chi-square test; #significant results

Table 6: Educational level and the lifestyle before the COVID-19 pandemic.

		Education					
		less than high school		high and university level		Test value*	P value #
		N	%	N	%		
Water intake	1-4 glasses	33	25.6%	76	37.3%	5.001	0.082
	5-7 glasses	65	50.4%	84	41.2%		
	More than 8 glasses	31	24.0%	44	21.6%		
Physical activity	No	31	24.0%	101	49.5%	21.63	<0.001 #
	1-3 times /week	73	56.6%	74	36.3%		
	More than 3 times/week	25	19.4%	29	14.2%		
Weekly shopping	No	62	48.1%	85	41.7%	1.31	0.252
	Yes	67	51.9%	119	58.3%		
House chores	Never	26	20.2%	52	25.5%	13.608	0.003#
	1-3 times/week	66	51.2%	84	41.2%		
	4-5 times /week	26	20.2%	25	12.3%		
	Everyday	11	8.5%	43	21.1%		
Computer use	Less than 30 Minutes	40	31.0%	54	26.5%	14.37	0.002#
	1-2 hours	54	41.9%	66	32.4%		
	4 -5 hours	28	21.7%	43	21.1%		
	More than 5 hours	7	5.4%	41	20.1%		
Sleeping hours	Less than 5 hours	68	52.7%	54	26.5%	25.63	<0.001 #
	5-7 hours	51	39.5%	110	53.9%		
	More than 7 hours	10	7.8%	40	19.6%		

* Chi-square test; #significant results

Table 7: Education and lifestyle during COVID-19

		Education				Test Value*	P value #
		Less than high school		High and university level			
		N	%	N	%		
Weight change	Not known	19	14.7%	33	16.2%	5.37	0.149
	Loss of weight	52	40.3%	59	28.9%		
	Constant	36	27.9%	62	30.4%		
	Gain weight	22	17.1%	50	24.5%		
Lifestyle change	No	35	27.1%	49	24.0%	0.406	0.524
	Yes	94	72.9%	155	76.0%		
Dietary change	No	52	40.3%	79	38.7%	0.08	0.773
	Yes	77	59.7%	125	61.3%		
Decrease in outdoor times	No	70	54.3%	59	28.9%	21.38	<0.001#
	Yes	59	45.7%	145	71.1%		
Spending time with friends at home	No	51	39.5%	60	29.4%	3.64	0.06
	Yes	78	60.5%	144	70.6%		
Water intake	1-4 glasses	38	29.5%	77	37.7%	2.499	0.288
	5-7 glasses	65	50.4%	93	45.6%		
	More than 8 glasses	26	20.2%	34	16.7%		
Physical activity	No	38	29.5%	102	50.0%	13.95	0.001#
	1-3 times /week	62	48.1%	66	32.4%		
	More than 3 times/week	29	22.5%	36	17.6%		
Weekly shopping	No	72	55.8%	109	53.4%	0.181	0.671
	Yes	57	44.2%	95	46.6%		
House chores	Never	37	28.7%	45	22.1%	8.945	0.03#
	1-3 times/week	63	48.8%	92	45.1%		
	4-5 times /week	17	13.2%	23	11.3%		
	Everyday	12	9.3%	44	21.6%		
Computer use	Less than 30 Minutes	16	12.4%	25	12.3%	2.82	0.42
	1-2 hours	48	37.2%	67	32.8%		
	4 -5 hours	41	31.8%	58	28.4%		
	More than 5 hours	24	18.6%	54	26.5%		
Sleeping hours	Less than 5 hours	40	31.0%	47	23.0%	3.392	0.183
	5-7 hours	49	38.0%	77	37.7%		
	More than 7 hours	40	31.0%	80	39.2%		

* Chi-square test; #significant results

Table 8: Residency and lifestyle before COVID 19 lockdown.

		Residency				Test Value*	P value#
		Rural		Urban			
		N	%	N	%		
Water intake	1-4 glasses	45	35.2%	64	31.2%	3.39	0.183
	5-7 glasses	61	47.7%	88	42.9%		
	More than 8 glasses	22	17.2%	53	25.9%		
Physical activity	No	64	50.0%	68	33.2%	9.48	0.009*
	1-3 times /week	48	37.5%	99	48.3%		
	More than 3 times/week	16	12.5%	38	18.5%		
Weekly shopping	No	63	49.2%	84	41.0%	2.17	0.14
	Yes	65	50.8%	121	59.0%		
House chores	Never	36	28.1%	42	20.5%	10.14	0.01*
	1-3 times/week	53	41.4%	97	47.3%		
	2	12	9.4%	39	19.0%		
	Everyday	27	21.1%	27	13.2%		
	4-5 times /week	0	0.0%	0	0.0%		
Computer use	Less than 30 Minutes	38	29.7%	56	27.3%	1.01	0.79
	1-2 hours	46	35.9%	74	36.1%		
	4 -5 hours	24	18.8%	47	22.9%		
	More than 5 hours	20	15.6%	28	13.7%		
Sleeping hours	Less than 5 hours	33	25.8%	89	43.4%	11.09	0.003*
	5-7 hours	69	53.9%	92	44.9%		
	More than 7 hours	26	20.3%	24	11.7%		

** Chi-square test;* *#significant results*

Table 9: Residency and lifestyle changes during COVID 19:

		Residency					
		Rural		Urban		Test Value*	P value #
		N	%	N	%		
Lifestyle change	No	38	29.7%	46	22.4%	2.19	0.138
	yes	90	70.3%	159	77.6%		
Dietary change e	No	50	39.1%	81	39.5%	0.007	0.93
	yes	78	60.9%	124	60.5%		
Decrease of outdoor time	No	39	30.5%	90	43.9%	5.99	0.01#
	yes	89	69.5%	115	56.1%		
Spending time with friends at home	No	30	23.4%	81	39.5%	9.15	0.002#
	yes	98	76.6%	124	60.5%		
Water intake	1-4 glasses	46	35.9%	69	33.7%	0.14	0.82
	5-7 glasses	61	47.7%	97	47.3%		
	More than 8 glasses	21	16.4%	39	19.0%		
Physical activity	No	70	54.7%	70	34.1%	14.14	<0.001#
	1-3 times /week	36	28.1%	92	44.9%		
	More than 3 times/week	22	17.2%	43	21.0%		
Weekly shopping	No	80	62.5%	101	49.3%	5.99	0.01#
	yes	48	37.5%	104	50.7%		
House chores	Never	34	26.6%	48	23.4%	10.6	0.002#
	1-3 times/week	55	43.0%	100	48.8%		
	2	9	7.0%	31	15.1%		
	Everyday	30	23.4%	26	12.7%		
	4-5 times /week	0	0.0%	0	0.0%		
Computer use	Less than 30 Minutes	22	17.2%	19	9.3%	16.5	<0.001#
	1-2 hours	34	26.6%	81	39.5%		
	4 -5 hours	31	24.2%	68	33.2%		
	More than 5 hours	41	32.0%	37	18.0%		
Sleeping hours	Less than 5 hours	32	25.0%	55	26.8%	0.88	0.66
	5-7 hours	46	35.9%	80	39.0%		
	More than 7 hours	50	39.1%	70	34.1%		

* Chi-square test, #significant results

Discussion

COVID-19 pandemic disproportionally impacted older adults and they were the most at-risk for severe COVID-19 clinical forms, complications and death, showing the highest mortality rates worldwide **(17)**.

Globally, more than 157 million confirmed cases of COVID-19, including more than 3 million deaths, were reported to the World Health Organization (WHO). In Egypt, from January 3, 2020, to May 16, 2021, a total of 244,520 confirmed cases and 14,269 deaths were reported **(18).** Older patients have more chronic diseases, such as hypertension, making them more susceptible to severe forms of COVID-19 based on

some earlier reports. Therefore, older people have higher mortality rates compared to younger patients (the mortality of people over 60 years old is 4.5% in comparison to 1.4% in people under 60 (19).

Obligatory mass quarantine was useful in controlling the spread of infectious diseases in many countries and in Egypt. All schools and universities, restaurants, and religious places were closed and restriction between 8 pm and 6am local time had been introduced but that caused unpleasant experiences including loss of freedom, and boredom which affected dietary habits, accessibility to food and lifestyle **(20)**.

The purpose of the current study was to detect changes in lifestyle among a sample of Egyptian elderly during COVID 19 confinement.

During the study period, 334 of community dwelling Egyptian elderly both males and females completed an online survey designed in Arabic using Google forms.

As regards socio demographic data and lifestyle changes during COVID 19 confinement the current study showed that in females (51.7% (172)) there was significant decrease in outdoor times, decrease physical activity compared to males and there was an increased computer use in both males and females but more significant in females. There was no significant difference as regard dietary habits. That may be due to decrease in outdoor times and physical activity in Egyptian females even before the lockdown and that was consistent with another Egyptian cross-sectional study done by **Ali et al., 2021**about "Dietary practices of adult Egyptians before and during COVID-19 lockdown" using an online survey from 430 Egyptian adults. The age of the participants ranged from 18 to 72 years nearly half of the participants were aged from 30 to 40 years, more than two-thirds of the participants were females. Results showed that there were significant changes as regard gender and lifestyle changes during COVID 19 confinement in form of decrease physical activity and increase sedentary lifestyle more in females **(20).**

This was in contrast with the cross sectional study done by **Husain et al., 2020** in Kuwait was designed to detect the changes in dietary and lifestyle behaviors that are major determinants of health during the COVID-19 outbreak through an online questionnaire using a convenience sample of 415 adults living in Kuwait (age range 18-73 years) which showed that there was no significant changes as regard gender and lifestyle changes during COVID 19 confinement **(21)**.

The results of the current study was in contrast with the study done by **Ben Hassen et al., 2022** in Egypt, Morocco and Tunisia about

"Gendered Impacts of the COVID-19 Pandemic on Food Behaviors in North Africa" based on online survey the total number of valid collected responses was 995: 343 in Egypt, 340 in Morocco, and 312 in Tunisia, aged 18 years old and more, 58% were between 25 and 45. The results showed that women ate more food due to fear, anxiety, or boredom than men (30.97% compared to 12.97%), women ate more comfort food (e.g., candy, cookies, cakes, and pastries) than men, 43.91% compared to 36.34%, men stocked more food than women, 41.21% compared to 33.33% (22**).**

The difference in results may be due to cultural differences and inclusion of different age groups.

As regard the age groups (53% aged 60-69 years old) the results of current study showed that in elderly older than 70 years old there was significant weight change in the form of weight loss, dietary changes and increase house chores, while in elderly less than 70 years old there was significant decrease in outdoor times, spending time with friends at home, decrease physical activity, decrease weekly shopping, and increase sleeping hours in both age groups, and that may be due to the decreased ability of above 70 elderly to prepare their own meals and their dependence on others with difficult accessibility to food, decrease outdoor times and decrease physical activity in comparison to younger than 70 years even before COVID19.

This was consistent with a study done by **Kasuga et al., 2022** in Japan about "Older Adults' Resilience Against Impact of Lifestyle Changes During the COVID-19 Pandemic" that included older adults from 70 years old and above, showing that the frequency of going out decreased during the pandemic (in 2020) and that agreed with results of the current study, however, there was no significant change in physical activities. The frequency of exercise and social interaction increased irrespective of the living arrangement. The frequency of exercise increased more in those living alone (23**),** probably by increasing indoor exercises.

Many studies showed no significant changes as regard age and life style changes and that was in contrast with results of the current study as the cross-sectional study by **AlMughamis et al., 2020** in Kuwait about "poor eating habits and predictors of weight gain during the COVID-19 quarantine measures in Kuwait" there was a total of 522 valid respondents, with a mean age of 41.78 years **(24),** the study by **Ali et al., 2021** showed the same results in all participants as mean age was from 30 to 40 (20**).** The differences may be due to inclusion of different age groups not only older adults, cultural differences and

lifestyle differences even before COVID 19.

As regard the educational level and lifestyle changes (31.2% were educated up to university level) the results of the present study showed that there was a significant decrease in outdoor times in high school and university level graduates and that may be due to increase level of awareness about the importance of being confined to home to decrease possibilities of being infected.

The results of the current study agreed with results of the study by **Ali et al., 2021 (20),** the study by **AlMughamis et al., 2020 (24),** and the global online survey by **Ammar et al., 2020** including participants from Asian (36%, mostly from Western Asia), African (40%, mostly from North Africa), European (21%) and other (3%) countries about "effects of COVID-19 home Confinement on eating behavior and physical Activity" **(25)** that the higher the educational level the less out door times.

As regard residency and lifestyle changes (57% live in rural areas) the present study showed that there was significant decrease in outdoor time and an increase in spending time at home with friends in rural areas. This may be due to the nature of lifestyle in rural areas even before COVID which was a more active lifestyle comparable to urban lifestyle.

The results of present study agreed with results of the study by **Ali et al., 2021(20),** the study by **AlMughamis et al., 2020 (24),** and the global online survey by **Ammar et al., 2020 (25),** as socialization and strong social network is more common in rural areas.

The results of current study showed that there was a decrease in the numbers of meals consumed daily during lockdown. Twenty seven percent of the participants skipped meals before lockdown due to reduced appetite, while 49.2% (154) of the participants skipped meals during lockdown to reduce the amount of the food consumed daily and this was statistically significant. These results are in accordance with several studies as a study done in Australia by **Phillipou et al., 2020** about "Eating and exercise behaviors in eating disorders and the general population during the COVID-19 pandemic" included participants aged 18 years old and above with a mean age of 40.62 reported that there was a decrease in the number of meals consumed during lockdown but differ in that anxiety and psychological effect of lockdown where the main causes of reducing the number of daily meals **(26).**

The study by **Husain et al., 2020** revealed that there was a drop in the reported number of times the majority of participants ate per day, from 4 times before the pandemic to 3 times

during, however, there was increase in snack time **(21).**

On the other hand, the results of the current study are not in accordance with the study done in China by **Yang et al., 2022** about "The Impact of the COVID-19 Pandemic on Food Consumption Behavior". Based on the Perspective of Accounting Data of Chinese Food Enterprises and Economic Theory showed an increase in the number and frequency of meals people ate during lockdown **(27).** And that may be due to inclusion of different age groups as data of Yang et al study based on data of Chinese food enterprises provided by the China Stock Market and Accounting Research (CSMAR) database and may be also due to cultural difference and different response to stress.

Overall, there was significant decrease in physical activity and increase sedentary lifestyle and that agreed with results of almost all revised studies (**20), (24), (25) &** (**23)**.

The strength of this study lies in the fact that it is the only study dedicated to investigating the effect of COVID 19 confinement on elderly in Egypt, and to our knowledge in the region.

The availability of a culturally adjusted online survey allows replication of the results in any other similar situations.

Being online allows wider access for better representation of the Egyptian elderly, it may even be used for a broader cross – border Arabic speaking population.

The weakness points of the present study are that our survey was online so, verification of the answers was not possible.

We believe a short telephone interview following the survey could help in eliminating any vagueness in the future studies.

It also made it difficult to recruit lower levels of education, this could be remedied by engaging care givers and adjusting the survey for their input.

One of the major deficits was that the survey depended on recall which may be affected in the elderly due to cognitive impairment so, we suggest a quick online cognitive assessment prior to completing the survey.

Conclusion

COVID 19 lockdown has an effect on nutritional habits and life style of Egyptian elderly in the form of decreased meals and decreased frequency of physical activity.

Recommendations

Future national programs will be needed to educate the population about how to deal with lockdown to avoid their bad effect on lifestyle.

Online physical programs will be needed to help elderly to practice at home physical activity.

Online food services to help those who didn't have easy accessibility to food.
Online nutritional and all specialties clinics to maintain population health during lockdowns.
Programs to educate the population on how to deal with stressful conditions as pandemics.

The following is the supplementary data related to this article: https://docs.google.com/forms/d/19XbQZKZ9L8vrkvVqpSLDs3nEXDm11RLNPOiZTd1CXT0/edit

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