IMPACT OF COVID-19 ON LIFESTYLE RELATED BEHAVIORS OF NIGERIANS

A CROSS SECTIONAL SURVEY

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Abstract

Introduction: A great threat of a novel virus – coronavirus otherwise known as COVID-19 pandemic rocked the entire world in the wake of the year 2020. The threat is so strenuous that the entire world was placed on lockdown in the matter of social restriction such as on international and national transport links, market or business transactions, school and organizational activities, and all related social and religious gatherings. This restriction might change people's lifestyle. This study was aimed at assessing the lifestyle changes caused by the pandemic among Nigerians.

Methodology: A web based cross sectional survey was conducted using an e-questionnaire. A paired t-test, independent t-test were used to test hypothesis while mean, frequency, and percentage were used to summarize the data.

Results: Majority of the participants were male (72.1%), single (83.2%), and middle class (79.5%) of social status. There was a decrease in the habit of consuming meals routinely at regular intervals during COVID-19 (19.4% vs 25.7%). There were significant differences in eating patterns before and during COVID-19 ($P < 0.05$). Likewise, significant differences in physical activity before and during COVID-19 were observed.

Conclusion: Some of the protocol put in place in curtailing the virus has been proven to have a positive impact on the lifestyle of Nigerians. Such health benefits include but not limited to an increase in moderate exercise, increase in the consumption of healthy and reduction in the consumption of unhealthy food.

Keywords: COVID-19, sleep pattern, unhealthy eating behaviors, sedentary life, alcohol

INTRODUCTION

A great threat of a novel virus – coronavirus otherwise known as COVID-19 pandemic rocked the entire world in the wake of the year 2020. COVID-19 which was first reported in December 2019 in Wuhan China, declared as Public Health Emergency of International Concern in January 2020 and later a pandemic in March 2020 [1]. Nigeria recorded its first case of COVID-19 on the 27th February, 2020. This index case was an imported case by an Italian on a business trip to Ogun state, Nigeria [2]. The threat is so strenuous that the entire world was placed on lockdown in the matter of social restriction such as international and national transport links, market or business transactions, school and organizational activities, and all related social and religious gatherings. This restriction might change people's lifestyle [3]. Being a novel disease that is highly contagious, spreading fast across the world, and the fact that there is yet to be an established cure for it, the COVID-19 pandemic has created a lot of panic in every part of the world [4].

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COVID-19 is a global burden which continues to redefine daily lifestyle-related habits in a significant manner as the pandemic progresses through its different phases. Public health recommendations and government measures taken to abate infection have indirectly impacted food availability, dietary quality, normal daily activities, access to recreational public settings, social activities, work and financial security [5]. These compound over time to radically change lifestyle-related behaviors, especially daily eating, activity and sleep behaviors that are known to be independent risk factors for metabolic complications such as obesity, diabetes, and cardiovascular disorders [6-7]. Though the finding of Chopra et al. [8] revealed that people improve slightly in terms of consuming meals at regular intervals routinely basis during COVID-19. Regular pattern as a construct is often described as an individual eating pattern at the level of meal such as a main meal (example breakfast, lunch, snack) or a smaller-sized meal (example super or snack) [9]. Certain experts believe that a proportion of individuals may have marginally improved metabolism and other health outcomes during the COVID-19 pandemic by adhering to the following dietary behaviors: (i) reducing meal frequency, (ii) consuming regular (i.e., breakfast (about 40% of daily total energy)), lunch (30% of daily total energy), and dinner (30% of daily total energy) and having good quality meals (e.g., more fresh vegetables, good quality protein source, avoiding refined and high glycemic foods) [10]. A reduction in engagement in a physical activity at all levels coupled with increase in daily sitting and screen time due to confinement was prominently found across all the literature [11].

Few studies from the West have highlighted a negative impact on various lifestyles related behaviors as a potential implications of COVID-19. However, the interplay of the severity of COVID-19 infection with different social, economic, and cultural constructs in determining the extent of changes in lifestyles related behaviors might vary from country to country. Though there's previous study on psychological distress experiences of Nigerians during COVID-19 pandemic. In Nigeria there is no empirical finding (to the best knowledge of the investigators) establishing the impact of COVID-19 pandemic on lifestyle related behaviors of the general population. Hence we focused to find the impact of COVID-19 on lifestyle related behaviors of Nigerians.

METHODS

Research Design and Population of the Study.

The population of this study were Nigerians on social media and the study was a cross-sectional e- survey.

Sample Size Calculation

The required sample size for this cross-sectional study was estimated using the formula below $n = Z^2 P (1 - P) / e^2$ [12].

Where $Z = 1.96$; $P = 90\%$ (0.9) as the response rate of the online survey [13], and $e = 5\%$. Therefore, the minimum number of participants required for this study was 139.

Inclusion and Exclusion criteria

Any Nigerian with an access to the Internet was eligible to participate. However, individuals below the age of 18 were excluded.

Sampling Technique

A purposive sampling technique was used to recruit the participants for this study.

Data Collection Instrument

The instrument used was adopted from Chopra et al [8]. This questionnaire contains two sections A and B; section A obtains information on socio-demographic characteristics of the participants such as gender, age, ethnicity, marital status, occupation. Section B assess changes in different lifestyle-related behaviors such as eating habits, physical activity, sleep, and other health related behaviors during the COVID-19 outbreak. Part A (A1 to A24) of section B evaluates the lifestyle related behaviors before COVID-19 and Part B (B1 to B24) assess-

ses changes in the lifestyle related behaviors during COVID-19. The questionnaire was scored using a five point Likert responses, namely 'not routinely', 'one to two times a week', 'three to four times a week', 'five to six times a week', and 'almost daily'. The magnitude of the responses ranges from 5 (most acceptable behavior) to 1 (least acceptable behavior). The questionnaire is an extension of already developed questionnaire with chronbachs alpha of 0.72 [14].

Ethical Consideration

Ethical clearance was granted by the research ethics committee of the Kano State Ministry of Health with a reference number MOH/Off/797/T.I/2106 before the commencement of the study.

Method of Data Collection

The purpose of the study, informed consent form along with the questionnaire were sent to the participants using Google form. The participants were asked to share the link to others and paste it on their social media pages.

Data Analysis Procedure

SPSS version 20 was used to analyse the data at an alpha level of 0.05. Frequency, percentage, mean, and standard deviation were used to summarize the data. Paired t-test was used to assess the differences in lifestyle behaviour before and during COVID-19 lockdown while ANOVA and independent t-test were used as appropriate to check the differences in lifestyle behaviours during COVID-19 and socio-demographic variables of the respondents.

RESULTS

Sample Description

The demographic details of the included participants (n= 190) is shown in **Table 1**. The sample has a higher male participation (72.1%) with the mean age of 26.89±5.95 (ranges, 17–58) years. There were more single participants (83.2%), Hausa (56.8%) by tribe, with tertiary education (93.7%) and middle class (79.5%) of social status.

Table 1 Characteristics of the participants

Variables	Frequency	Percentage
Age	26.89±5.95	(17-58)
Gender		
Male	137	72.1
Female	53	27.9
Marital status		
Single	158	83.2
Married	32	16.8
Tribe		
Hausa	108	56.8
Igbo	12	6.3
Yoruba	49	25.8
Other	21	11.1
Level of education		
Non-formal	2	1.1
Secondary	10	5.3
Tertiary	178	93.7
Socio-economic status		
Low	28	14.7
Middle	151	79.5
High	11	5.8

Responses from the Survey

The responses for differential items assessing the changes in lifestyle-related practice before and during COVID-19 are given in **Table 2**. There was a decrease in the habit of consuming meals routinely at regular intervals during COVID-19 (19.4% vs 25.7%). There was a decrease in unhealthy eating behaviors such as consumption of fried food (5.3% vs 4.6%), junk food (4.5% vs 4%), consumption of foods with high sugar (9.3% vs 46.7%), and emotional eating (4% vs 37.4%). However, an improvement was seen in the frequency of consumption of pulses, meats, and eggs (6.7% vs 7.4%) during COVID-19 but a decrease in fruits and vegetables (9.7% vs 5.9%) intake.

In the physical activity domain, an increase in participants exercising for 30 min was observed (4.3 vs 24.5%). An increase in participation in household chores was seen (15.1% vs 32.4%), participation in leisure related activities (9.2% vs 24.7%). However, daily screen time of has reduced during COVID-19. Participants reporting more than 8 hours of sleep increased (15.8% vs 18.9%) but the overall quality of sleep marginally declined (16.8% vs 15.8%) and overall stress amongst the participants slightly increased (2.1% vs 2.6%). There was a decrease in the rate of smoking (3.7% vs 1.1%), alcohol consumption (1.1% vs 0), and social support (9.5% vs 4.7%).

Table 2 Frequency of the participant's responses

Variables	Before COVID-19	During COVID-19
EATING BEHAVIOR		
1. Consumption of regular meal pattern		
Not routinely	38 (20.8)	37 (25.7)
One to two times a week	54 (29.5)	40 (27.8)
Three to four times a week	19 (10.5)	20 (13.9)
Five to six times a week	25 (13.7)	19 (13.2)
Almost Daily	47 (25.7)	28 (19.4)
2. Consumption of fast food		
Not routinely	71 (40.8)	55 (41.0)
One to two times a week	64 (36.8)	51 (38.1)
Three to four times a week	28 (16.1)	17 (12.7)
Five to six times a week	7 (4.0)	7 (4.0)
Almost Daily	4 (2.3)	4 (2.3)
3. Consumption of fried food		
Not routinely	42 (24.6)	39(30.0)
One to two times a week	78 (45.6)	56 (43.1)
Three to four times a week	26 (15.2)	18 (13.8)
Five to six times a week	16 (9.4)	11 (8.5)
Almost Daily	9 (5.3)	6 (4.6)
4. Consumption of junk foods as snacks		
Not routinely	74 (42.3)	51 (38.6)
One to two times a week	63 (36.0)	51 (38.6)
Three to four times a week	16 (9.1)	51 (38.6)
Five to six times a week	15 (8.6)	8 (6.1)
Almost Daily	7 (4.5)	6 (4.0)
5 Frequency of your fruits and vegetables intake		
Not routinely	42 (23.9)	32 (23.7)
One to two times a week	68 (38.6)	53 (38.5)
Three to four times a week	30 (17.0)	23 (17.0)
Five to six times a week	19 (10.8)	20 (14.8)
Almost Daily	17 (9.7)	8 (5.9)

Continuation of table table 2 Frequency of the participant's responses

Variables	Before COVID-19	During COVID-19
6. Consumption of balanced diet including healthy ingredients (whole wheat, pulses, legumes, eggs, nuts, fruits and vegetables)		
Not routinely	42 (23.5)	32 (23.5)
One to two times a week	60 (33.5)	51 (37.5)
Three to four times a week	34 (19.0)	15 (11.0)
Five to six times a week	27 (15.1)	27 (19.9)
Almost Daily	16 (8.9)	11 (8.1)
7. Consumption of milk or its products (curd, chhachh, lassi, cheese, paneer, etc.)		
Not routinely	53 (29.4)	38 (28.6)
One to two times a week	54 (30.0)	48 (36.1)
Three to four times a week	36 (20.0)	25 (18.8)
Five to six times a week	27 (15.0)	12 (9.0)
Almost Daily	10 (5.6)	10 (7.5)
8. Consumption of one or more servings of pulses, eggs, or meat in a day		
Not routinely	46 (25.8)	34 (25.0)
One to two times a week	58 (32.6)	56 (41.2)
Three to four times a week	37 (20.8)	22 (16.2)
Five to six times a week	25 (14.0)	14 (10.3)
Almost Daily	12 (6.7)	10 (7.4)
9. Daily consumption of sugar/honey/jaggery		
Zero teaspoons per day, I don't add sugar in my meals/beverages	144 (14.5)	49 (36.0)
One to two teaspoons per day	56 (32.0)	46 (33.8)
Three to four teaspoons per day	22 (12.6)	19 (14.0)
Five to six times teaspoons per day	16 (9.1)	12 (8.8)
More than 6 teaspoons per day	20 (11.4)	10 (7.4)
10. Consumption of sugar sweetened beverages		
Not routinely	56 (31.6)	43 (31.9)
One to two times a week	51(28.8)	56 (41.1)
Three to four times a week	36(20.3)	14 (10.4)
Five to six times a week	20 (11.3)	8 (5.9)
Almost Daily	14 (7.9)	53 (40.2)
11 Consumption of foods with high sugar		
Not routinely	65 (37.8)	39 (29.5)
One to two times a week	53 (30.8)	17 (12.9)
Three to four times a week	26 (15.1)	12 (9.1)
Five to six times a week	12 (7.0)	11 (8.3)
Almost Daily	16 (9.3)	63 (46.7)
12. Emotional eating (boredom/distress/disappointment)		
Not routinely	88 (50.6)	45 (33.3)
One to two times a week	47(27.0)	13 (9.6)
Three to four times a week	23(13.2)	10 (7.4)
Five to six times a week	9 (5.2)	4 (3.0)
Almost Daily	7 (4.0)	52 (37.4)

Continuation of table table 2 Frequency of the participant's responses

Variables	Before COVID-19	During COVID-19
Physical activity		
13 Participation in 30 min of moderate intensity aerobic exercises/sports		
Not routinely	69 (37.3)	47 (33.8)
One to two times a week	62(33.5)	26 (18.7)
Three to four times a week	31(16.8)	6 (4.3)
Five to six times a week	15 (8.1)	8 (5.8)
Almost Daily	8 (4.3)	34 (24.5)
14 Participation in household chores (cooking, laundry, cleaning)		
Not routinely	42 (22.6)	42 (30.2)
One to two times a week	53(28.5)	25 (18.0)
Three to four times a week	41(22.0)	15 (10.8)
Five to six times a week	22 (11.8)	23 (16.5)
Almost Daily	28 (15.1)	46 (32.4)
15 Participation in leisure related activities (grocery shopping, walking in park, gardening)		
Not routinely	44 (23.9)	42 (29.6)
One to two times a week	47(25.5)	27 (19.0)
Three to four times a week	52(28.3)	18 (12.7)
Five to six times a week	24 (13.0)	9 (24.7)
Almost Daily	17 (9.2)	47 (24.7)
16 Daily sitting time at work		
Less than 2 h	28 (14.7)	23 (12.1)
2-4 h	34(17.9)	38 (20.0)
4-6 h	64 (33.7)	39 (20.5)
6-8 h	34(17.9)	30 (15.8)
More than 8 h	20(10.5)	13 (6.8)
17 Breaks from sitting (such as standing up, stretching, or taking a short walk)		
0 breaks	9 (4.7)	11 (5.8)
1-2 breaks	97 (51.1)	74 (38.9)
3-4 breaks	63 (33.2)	35 (18.4)
5-6 breaks	23 (12.1)	9 (4.7)
More than 6 breaks	11 (5.8)	12 (6.3)
18 Daily screen time		
0-1 h	18 (9.5)	16 (8.4)
1-2 h	56 (29.5)	37 (19.5)
3-4 h	54(28.4)	35 (18.4)
4-5 h	23 (12.1)	23 (12.1)
>5 h	33(17.4) 28 (14.7)	
Sleep pattern		
19 Daily hours of sleep		
<6 h	52 (27.4)	37 (19.5)
6-8 h	107 (56.3)	69 (36.3)
>8 h	30 (15.8)	36 (18.9)

Continuation of table table 2 Frequency of the participant's responses

Variables	Before COVID-19	During COVID-19
20 Quality of sleep		
Excellent	32 (16.8)	30 (15.8)
Very good	75 (39.5)	52 (27.4)
Good	74 (38.9)	52 (27.4)
Bad	6 (3.2)	9 (4.7)
Very bad	1 (0.5)	0
21 Level of stress or anxiety		
Not at all	22 (11.6)	16 (8.4)
A little	111 (58.4)	82 (42.3)
Much	39 (20.5)	28 (14.7)
Very much	13 (6.8)	11 (5.8)
Extremely	4 (2.1)	5 (2.6)
Other behaviors		
22 Smoking		
No	170 (89.5)	130 (68.4)
Yes, 1-3 cigarettes per day	10 (5.3)	9 (4.7)
Yes, 4-6 cigarettes per day	7 (3.7)	2 (1.1)
23 Alcohol consumption		
No	161 (84.7)	119 (62.6)
Yes, on special occasions	24 (12.6)	21 (11.1)
Yes, on weekends	1 (0.5)	1 (0.5)
Yes, almost daily	2 (1.1)	0 (0)
24 Social support		
Always (more than 90% times)	44 (23.2)	33 (17.4)
Most of the times (approx. 75% times)	41(21.6)	39 (20.5)
Sometimes (approx. 50% times)	71 (37.4)	46 (24.2)
Occasionally (approx. 25% times)	13 (6.8)	12 (6.3)
Rarely (approx. 10% times)	18 (9.5)	9 (4.7)

Impact of COVID-19 on Lifestyle-related behavior: Before and during COVID-19 Comparison

The comparison of mean scores of lifestyle related behaviors before and during COVID-19 is shown in **Table 3**. There were significant differences in eating patterns before and during COVID-19 which were observed in regular meal patterns, consumption of fried foods and sugar sweetened beverages ($P < 0.05$).

There were significant differences in physical activity before and during COVID-19 which were observed in leisure related activities and daily sitting time ($P < 0.05$). There were no significant differences in sleeping pattern, smoking and alcohol consumption before and during COVID-19 ($P > 0.05$) however, a difference was seen in daily hours of sleeping ($P < 0.05$).

Table 3 Comparison of mean scores of lifestyle related behavior before and during COVID-19

Variables	Before COVID-19	During COVID-19	p-value
EATING BEHAVIOR	29.34	28.74	0.00*
Consumption of:			
1 Regular meal pattern	2.94	2.75	0.04*
2. Fast food	1.90	1.91	0.87
3. Fried food	2.29	2.12	0.05*
4. Junk foods as snacks	1.98	2.02	0.73
5 Frequency of fruits and vegetables intake	2.48	2.41	0.50
6. Balanced diet including healthy ingredients	2.47	2.50	0.67
7. Milk or its products	2.38	2.33	0.53
8. One/more servings of pulses, eggs/meat in a day	2.50	2.36	0.15
9. Daily consumption of sugar/honey/jiggery	2.27	2.19	0.36
10. Consumption of sugar sweetened beverages	2.39	2.19	0.02*
11 Consumption of foods with high sugar	2.16	2.16	0.93
12. Emotional eating	1.81	1.87	0.59
Physical activity	7.47	7.12	0.02*
13 30 min of moderate intensity aerobic exercises	2.13	2.09	0.68
14 Household chores (cooking, laundry, cleaning)	2.64	2.64	1.00
15 Leisure related activities (grocery, shopping)	2.63	2.33	0.03*
16 Daily sitting time at work	2.79	2.50	0.04*
17 Breaks from sitting (such as standing up)	2.99	3.09	0.20
18 Daily screen time	2.59	2.44	0.04*
Sleep pattern	9.39	9.51	0.20
19 Daily hours of sleep	1.84	1.99	0.00*
20 Quality of sleep	3.74	3.71	0.60
21 Level of stress or anxiety	3.74	3.75	0.89
Other behaviors			
22 Smoking	2.86	2.91	0.13
23 Alcohol consumption	4.85	4.85	1.00
24 Social support	3.54	3.53	0.93

Association of Lifestyle-related behavior with demographics

There were significant differences between gender and level of physical activity during COVID-19. Likewise, a significant differences were seen between social classes and sleep pattern (P<0.05).

Table 4 Association of demographic variables with mean difference of During COVID-19 Lifestyle-related scores

Variables	Eating behaviors	PA	Sleep pattern	Test
Gender	0.38	0.03*	0.14	t-test
Marital status	0.27	0.40	0.25	t-test
Residence area	0.07	0.11	0.70	t-test
Level of education	0.09	0.29	0.08	ANOVA
Social class	0.17	0.51	0.01*	ANOVA
PA= Physical activity				

DISCUSSION

The outcome of this study revealed that there was a decrease in the daily consumption of regular meal pattern during COVID-19 as compared to before COVID-19. This might be due to a high impact of the COVID pandemic on the country's economy or the effect of the lock-down measures on their sources of income. Also, we found a significant decrease in the consumption of unhealthy foods such as fried foods and junk foods before and during COVID-19. This might be due to lack of access to restaurants or other recreational places where these unhealthy foods are being sold due to the impact of the lockdown imposed by the government. However, there was a significant increase in the consumption of healthy foods such as one or more servings of pulses, eggs, or meat in a day, and consumption of milk or its products during COVID-19 as compared to before COVID-19. This result could be a reflection of the awareness provided by the professional health bodies through mass and social media about healthy eating in order to boost immunity. Notable is that the level of emotional eating increased significantly during COVID-19 as compared to before COVID-19 which was hypothesized to be due to the fact that people were bored and had restricted physical participation in social activities.

On the impact of COVID-19 on physical activity level, the outcome of this study revealed that majority of the participants had increased participation level by 30 minutes of moderate intensity aerobic exercises during COVID-19 as compared to before COVID-19 which was associated with the health awareness and sensitization about the benefits of exercise and physical activities on mass media during the COVID-19 lockdown. Concurrently with moderate exercise, the level of participation in household chores such as cooking, laundry, cleaning, and leisure related activities such as grocery shopping, walking in park, gardening was also found to have increased significantly during the COVID-19 as compared to before the COVID-19 outbreak. However, the result of this study was contrary to the findings of Stephanie et al [15], which revealed a decrease in the level of physical activities during COVID-19 compared to before COVID-19.

Majority of the participants in this study had increased the level of daily hours of sleep during COVID-19 as compared to before COVID-19. This could be because people had to stay indoors, had lesser outdoors activities to participate in, and had lesser tasks to perform. However, the result of this study revealed no significant differences in the quality of sleep during COVID-19 compared to before COVID-19 outbreak. This is contrary to the result of a

study carried out by Martínez-de-Quel et al [16], which reported a significant decline in the quality of sleep during the COVID-19 lockdown among a Spanish sample.

Majority of the participants had reduced stress level during the COVID-19 outbreak as compared to the level of stress before COVID-19 due to the fact that people had more time to rest at home or had to work from home as it may be. There was no significant difference in the rate of smoking and alcohol intake during COVID-19 outbreak as compared to before COVID-19 outbreak. This is consistent with the earlier findings by Guignard et al. [17] who reported no significant difference in the level of smoking and alcohol intake during the COVID-19 outbreak as compared to before the COVID-19 outbreak in France.

The existing study shows that there were significant differences between gender and physical activity, there was a significant decline in physical activity level among the studied population which was seen to be higher in men, this was concurrently similar in another study which showed that physical inactivity was higher in men and reduction in moderate intensity aerobic exercises as well as leisure related activities coupled with an increase in daily screen and sitting time due to confinement [8].

It was evident in this study that there was a significant difference between social class and sleep pattern among the participants, the time spent daily on screen time increased in which the sleeping quality of most of the participants belonging to upper socio-economic groups declined, this was equally shown in a study by Chopra et al. [8] that their studied participants reported more than 8 hours of sleeping but the overall quality of sleep marginally declined in which most of the participants belonging to upper socio-economic groups.

CONCLUSION

Even though, COVID-19 is a dreadful virus which has caused a lot of setback in both national and international economies as well as reduction in people's standard of living, some of the protocol put in place in curtailing the virus has been proven to have positive impact on the lifestyle of Nigerians. Such health benefits include but not limited to an increase in moderate exercise, increase in the consumption of healthy and reduction the consumption of unhealthy food. These above mentioned good health practice will go a long way preventing individuals from being overweight or obese which is a very important risk factor for many diseases.

Limitation

The study does not involve larger numbers of Nigerians to ascertain the generalizability of the current findings. It is also possible that the outcomes would vary if measured over a thousand or more participants. Also, the issue of response bias, which is prevalent in self-report surveys, could have influenced the results and considered a limitation to this study.

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