

# Impact of Online Teaching on Dietary Pattern and Quality of Life of Science Teachers During Covid 19 Pandemic

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**ABSTRACT** **Objectives:** The COVID-19 pandemic has led teachers to an unpredictable scenario with accelerated shift from traditional to online educational methods, and relationships have been altered by the avoidance of direct contact with the others, with implications in mental health. The objectives of the study include effect of COVID 19 on working pattern, sleeping pattern, dietary intake, physiological (musculoskeletal) and psychological changes in teachers and comparison of work load and stress among teachers from different colleges and the methods adopted to overcome the psychological changes. **Study Design:** Descriptive cross-sectional study. **Methods:** 100 science teachers from aided and self-financing colleges in Alappuzha, Kerala were selected by random sampling. Google forms were administered for qualitative and quantitative data collection. The google forms containing questions related to online teaching, FFQ, PSQI, Perceived stress scale and PROQOL were enquired. **Results:** It was found that a positive correlation ( $r = 0.194$ ) exists between weight gain and dietary pattern ( $p$ -value 0.173). Majority (90%) of teachers were found to have poor sleep quality influencing the QoL negatively. There was a significant association of degree of stress to the overall sleep qualities indicated by as the stress reduced sleep quality improved. Nutritional status of teachers in terms of body weight was found to be poor. From the study it was evident that work load and stress of online teaching very much affected teachers both physically and psychologically irrespective of self-financing and private administration. **Conclusion:** To prevent health problems and promote good quality of living among teachers in future it would be important to facilitate proper planning, management and balance in academic, diet pattern, physical activity, recreation and social interaction beneficial in improving the QOL of teachers. Furthermore, teacher training in blended or online educational methods would be crucial for their conducive work development.

**Keywords:** COVID 19; Online teaching; Dietary Pattern; Quality of Life; Sleep Quality; Perceived Stress Scale

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## INTRODUCTION

Coronavirus pandemic has significantly changed the lifestyle of the world and the education sector remains one of the hardest affected by the Coronavirus outbreak.<sup>[1]</sup> It is very difficult to plan and offer quality lectures to the students during this pandemic and the situation gets worse when the teaching is online as most teachers have not been equipped to use web teaching tools and techniques effectively.<sup>[2]</sup> High levels of problems in technology management may have a

detrimental effect on teacher's mental health, leading to issues such as stress and/or anxiety.<sup>[3]</sup>

Restricted access to fresh food may also have a detrimental effect on both physical and mental health. Anxiety and boredom evoked by quarantine are considered risk factors relative to normal living conditions for eating more food and

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of lower quality.<sup>[4]</sup> The negative changes in most eating habits can be traced to eating out of fear or boredom, a reduction in desire to share.<sup>[5]</sup>

During Covid 19 an individual does not need to wake up for work at the same time as before when working in the home office, and therefore increases latter to get the same amount of sleep. The everyday routine changes and, in turn, the timing of sleep changes.<sup>[6]</sup>

The evidence available indicates that screen time is linked to obesity, type 2 hypertension, type 2 Diabetes, myopia, depression, and many other noncommunicable conditions, including sleep disorders.<sup>[7]</sup> Digital eye strain, an emerging public health concern, is a condition characterized by visual interference and/or eye pain associated with digital device use and arising from a variety of eye environment stresses.<sup>[8]</sup>

In this case, teachers are forced to deal not only with educational problems, but also with those related to economics and politics. Compliance with this rationale implies increased scientific output, workload, number of students and relationships with jobs. Furthermore, the time for qualification is gradually decreased, thus undermining one's own growth and professional achievement. Obviously, these problems affect the physical and psychological well-being of the worker, interfering with their quality of life.<sup>[9]</sup>

The change in the teaching environment due to COVID-19 has led to shift from traditional teaching method to online teaching. In this study we have discussed on the impact of online teaching and the factors which affect the QOL of teachers.

## METHOD

A descriptive cross-sectional study was conducted among college teachers in Alappuzha district of Kerala. College teachers of science stream were selected under the study by random sampling technique. A total of 100 science teachers each were selected from aided and self-financing colleges respectively. Teachers of age group 24-55 years willing to participate were selected for the study. Google forms were used for the data collection. Google Form is a web-based tool with several innovative features to carry out surveys, administer tests or gather data from respondents. The collected data is populated by the software and the output can be viewed as spreadsheets and in the form of graphical representation.<sup>[10]</sup>

Sociodemographic questionnaire which covers personal details like name, age, gender, marital status, college details and subject of teaching and also, general questions about online teaching and the health-related questions were also included.

The next component asks about diet related questions which contains Food Frequency Questionnaire (FFQ). "FFQs assess the frequency with which foods and/or food groups are eaten over a certain time period. The questionnaire includes a food list (usually close-ended) and a frequency category section, and can be self- or interviewer administered".<sup>[11]</sup> In the present study the "FFQ made participants to recall the number of times each food item was consumed per day, per 1-2 times per week, 3-4 times per week, 1-3 times per month or never during the pandemic".

The respondents current state of stress, was assessed using perceived stress scale. "The Perceived Stress Scale (PSS) was the most widely used psychological instrument for measuring the perception of stress. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress".<sup>[12]</sup>

Sleep quality and quality of life assessment were also added in the questionnaire which was assessed using Pittsburgh sleep quality index and professional quality life scale. "The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and pattern of sleep in the older adult. It differentiates sleep from "poor" to "good" by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the last month. The client self-rates each of these seven areas of sleep. Scoring of answers was based on a 0 to 3 scale, where 3 reflects the negative extreme on the Likert scale".<sup>[13]</sup> The Professional Quality of Life Scale, known as the PROQOL, is the most commonly used measure of the positive and negative effects of working with people who have experienced extremely stressful events. The professional quality of life scale incorporates two aspects, the positive (Compassion Satisfaction) and the negative (Compassion Fatigue). Compassion fatigue breaks into two parts. The first part consists of things such as exhaustion, frustration, anger and depression typical of burnout. Secondary Traumatic Stress is a negative feeling derived from fear and work related trauma. It is important to remember that some trauma at work can be direct (primary) trauma and work related trauma can be a combination of both primary and secondary trauma.<sup>[14]</sup>

After collecting the data, it was analysed and subjected to statistical analysis using SPSS 26.0 (Statistical Package for Social Sciences).<sup>[15]</sup> Spearman's Rho test was used to measure the strength of association between dietary pattern and weight changes. Independent sample t-test was used to compare changes in dietary pattern of male and female teachers from different colleges. ANOVA was used to compare the influence of stress level to type of college, stress between gender and

age group, dietary changes in different age group, stress and sleeping quality and stress and quality of life.

## RESULTS

The study was conducted among 100 teachers, 75% teachers were from aided institution, 25% from self-financing college. The results shows that 78% of the respondents were females and 22% of the respondents were males. Majority of the samples were in the age group of 31-40 years. It was found that majority (58%) of the teachers took online class for 3-5 hours a day. About 78% of the respondents have chosen smart phone or tablet as a device for online teaching based on convenience. 84% of the teachers were only fairly satisfied with the technology and software used for online teaching. From the data it was evident that 82% of teachers felt a heavy workload when compared to the normal face-to-face teaching method. 36% teachers felt tiredness after online teaching because of the long hours spent in front of screen. 28% not at all felt tired after online teaching because they were taking online classes only for 1-2 hours a day and were aware of online teaching and pedagogical techniques and some of the teachers do not had daily classes that might be the reason and 36% teachers felt tired only sometimes after online teaching. It was found that majority (36%) of the teachers who took >5 hours of online class were not getting time for doing extra-curricular activities. The busy schedule might have affected their involvement in extra-curricular activities (Table 1).

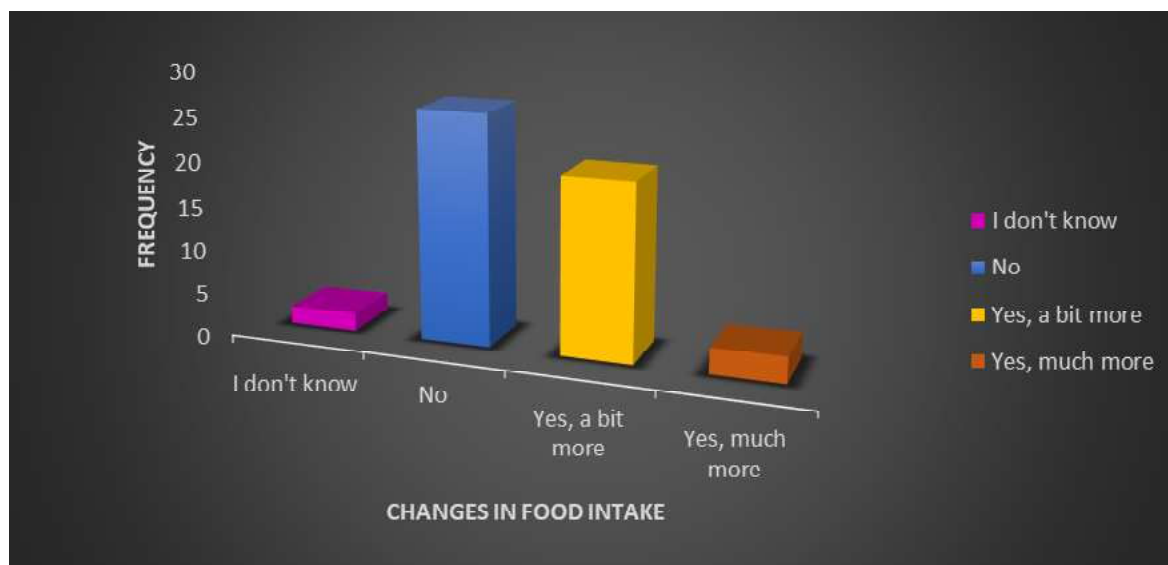
It was clear that the change in the food consumption during pandemic is due to the boredom and stress affected during online teaching practices. 24% teachers showed slight decrease in meal pattern (Quantity) and 16% teachers showed slight increase in meal pattern (Figure 1).

During pandemic the online teaching and preparation took more time and the lack of time management led to improper timing in the food consumption among teachers. Majority (62%) teachers had increased intake of immunity boosting foods during pandemic to fight against corona virus. The news regarding immune foods against corona virus in social media and television led to increased consumption. It was found that the milk and dairy products consumption (78) and vegetable consumption (other vegetables category) (90) was high on a daily basis. It was found that because of the lack of availability of the fish and peoples feeling of fear going to market for purchasing things on a daily basis led to low consumption of fish during pandemic. It was clear that junk food consumption was less because of less access of going outside and having junk foods and due to insufficient time for going outside for gatherings. The intake of protective foods was found to be low when compared to body building foods. Among 46.2% teachers there was slight increase in their body weight and in 1.9% the body weight was very much increased. A positive correlation ( $r = 0.194$ ) was found between weight gain and dietary pattern. Spearman's Rho is a non-parametric test used to measure the strength of association between weight gain and dietary

**Table 1: Teacher Profile Related to Online Teaching**

Engagement of Online Teaching			Work Load of Online Classes Compared to Conventional Classes			Types of Gadgets Used	
Time	Frequency	Percent	Variable	Frequency	Percent	Variable	Percent
1-2 hrs	20	20	Feeling heavy work load	82	82	Smart Phone or Tablet	78
3-5 hrs	58	58	Sometimes feeling heavy workload	8	8	Laptop or Desktop	16
>5 hrs	22	22	Work load same as normal teaching	10	10	Both	6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>Total</b>	<b>100</b>	<b>100</b>	<b>Total</b>	<b>100</b>
Satisfaction Scale of Technology Used			Engagement of College Teachers in Extra-Curricular Activities			Gender Distribution	
Scale	Frequency	Percent	Variable	Frequency	Percent	Variable	Percent
Extreme Satisfaction	14	14	Yes	22	22	Male	22
Fair	84	84	No	36	36	Female	78
Poor	2	2	Some Times	42	42		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>Total</b>	<b>100</b>	<b>100</b>	<b>Total</b>	<b>100</b>

**Figure 1: Alterations in Food Consumption**



pattern. The correlation coefficient was 0.19 with p-value 0.17.

Eye strain, head ache and neck pain were the common physical problems faced by college teachers. Majority (36%) of the respondents did not exercise throughout the life time. The physical activity were significantly decreased among 14% and in 4% involvement in aerobic exercise was slightly decreased. It was found that only 2% of teachers were found to be affected by lifestyle disease during this pandemic. It was clear that majority (68%) of the teachers had moderate stress score (14-26) due to online teaching based on perceived stress scale (Table 2).

Independent sample t test was used to compare stress between male and female with calculated t-value -1.3 with p-value > 0.05 which indicates no significant difference in stress between males and females. One way ANOVA was used to test any difference in stress levels in teachers based on type of college.

**Table 2: Perceived Stress Scale**

Scale	Stress Score	Frequency	Mean & S.D
0-13	Low stress	31	3.2±0.3
14-26	Moderate stress	68	3.1±0.4
27-40	High perceived stress	1	3.3±0.3

**Table 3: Relation of Stress to Type of College, Over All Sleep Quality and Gender**

Characteristics	Stress			
	Characteristics	F-value	P-value	
Type of college	Aided	2	0.1	
	Self-financing			
Over all Sleep quality	Fairly bad	3.5	0.04	
	Fairly good			
	Very good			
One-Way ANOVA, Significant at 0.05 Level				
Gender	Gender	t-value	Degrees of Freedom	Sig (2 tailed)
	Male	-1.3	49	0.2
	Female			
Independent Samples Test, Significant at 0.05 Level				

Compassion Satisfaction Scale					
Score	Scale			Frequency	Percentage
6 or less	Low			2	2
Between 7 and 12	Average			94	94
13 or more	High			4	4
Burnout Scale					
8 or less	Low			4	4
Between 9 and 16	Average			94	94
17 or more	High			2	2
Secondary Traumatic Stress Scale				F-value	p-value
6 or less	Low	20	20		
Between 7 and 12	Average	80	80	1.7	0.2
13 or more	High	0	0		

The calculated F-value was 1.2 with p-value > 0.05. There was no significant difference in stress level with respect to type of college (Table 3).

Majority (94%) had an average satisfaction scale (7-12) which points out they may had some problems with their job. They were not completely satisfied with their work. Helplessness in supporting students or may be other personal reasons which might led to decreased satisfaction score. 2% of the respondents have a high degree of burnout (Table 4). The workload and online teaching efficacy may be the reason for burnout during online teaching. None of the respondents suffered from high traumatic stress. It was found that there was a significant association between quality of life and the stress levels. It was found that respondents (31%) were in low stress (0-13) and having better quality of life.

Majority (90%) of the teachers were having poor sleep quality (Table 5). It was found that among 66% the sleep duration was found to be poor. About 2% of the college teachers were taking sleeping pills which may be because of the stress during online teaching and the long time spent in front of the desktop and personal problems. It was found that there was a significant difference in stress between the overall sleep qualities; as the stress reduces sleep quality will improve. One way ANOVA was used to test association between stress levels to sleep quality. The calculated F value was 3.5 with p-value < 0.05. There was a significant association of degree of stress to the overall sleep qualities at 5% level which indicated as the stress reduced sleep quality improved.

Score	Sleep Quality	Percentage	F-value	P-value
0-5	Healthier sleep quality	10		
>5	Poor sleep quality	90	3.5	0.03
<b>Total</b>		<b>100</b>		

## DISCUSSION

When compared with offline classes, online teaching needs extra effort from teachers for making the students understand the concept well and two-way communication was also difficult due to network and connectivity issues, hence long hours of online class were a need to satisfy both the teacher and the student. Moreover, teachers who took more than 5 hours were trying to carry out the online classes same as that of conventional classes. The study conducted by Van De Vord & Pogue<sup>[6]</sup> found that the academic community believes that teaching on online mode takes longer time than teaching a face-to-face class. Due to the specific group of students, a course that seems relatively simple to teach one semester can be much more time consuming the following semester. Comparing face-to-face, online courses is more difficult due to the significant variations in the environments.

Due to the continuous online teaching, teachers were facing so many physical problems. The study points out that the physiological problems, stress, changes in sleeping pattern during online teaching very much affected the quality of life

of teachers. The changes in dietary pattern and meal consumption due to the busy schedule of online teaching affected their health status. The change in the food consumption is due to the boredom and stress affected during online teaching practices. Psychological influences are known to have a significant influence on dietary preferences, during lockdown with a noticeable effect. Belén Ruiz-Roso *et al.*<sup>[17]</sup> found that food cravings can be triggered by a variety of mental health factors such as stress, social isolation, or a lack of physical activity, leading people to eat more often during the day.

The change in meal timing might be due to the long hours of online class and busy and frequently changing schedule. Before pandemic teachers used to consume meals at correct timing, because of the proper timing to have meal. But during pandemic the online teaching and preparation took more time and the lack of time management led to improper timing in the food consumption. Moreover, the online class schedule was planned taking into consideration of student's needs. The study conducted by Cheikh Ismail *et al.*<sup>[18]</sup> shows that prior to the pandemic, the main explanation for missing meals was a lack of time; however, during the pandemic, participants missed meals mostly due to lack of appetite, which is normal among people who are depressed. During the Covid 19 Pandemic, there was an increase in the percentage of participants experiencing physical and emotional fatigue, irritability, and tension all of the time.

From the study it was clear that the stress factors include poor social gathering, long hours of online teaching, no face-to-face communication with students and peer groups, internet connectivity issues and efficacy of online teaching. The physiological issues during online teaching and maintenance of personal and professional life also led to stress. Many of the teachers were not satisfied with remote teaching practices which may be the reason for building stress during this pandemic.

According to Panisoara *et al.*<sup>[19]</sup> teachers with more personal resources and expertise are less likely to burnout, while those with high levels of neuroticism, perfectionism, and a willingness to support others are more vulnerable to burnout. Because of the growing popularity of online learning, digital platforms were increasingly being used as additional teaching and learning tools. The intrinsic motivation of wanting to use technology, and the difficulty of learning new and fascinating things is negatively associated with the extrinsic motivation of teach only online due to the COVID-19 pandemic background. As a result, many teachers were afraid of making mistakes while using online tools, or they lack the necessary skills and competencies to rethink virtual learning space design. The pandemic exacerbates problems for teachers

who lack knowledge of emerging information and communication technologies (ICT). As a result, adopting online instruction resulted in increased workload, conflicts, and negative affective responses to technology use among teachers.

It was found that their overall sleep quality was fairly bad and were facing sleep problems during that time. The corresponding study conducted by Alomari *et al.*<sup>[20]</sup> the COVID19 pandemic had an effect on people's everyday lives, lifestyles, and well-being. Many physical and psychological factors, such as quality of life, psychological well-being, and physical activity levels, have been shown to influence sleep.

It is commonly accepted that work-life balance is beneficial to an individual's psychological well-being, as well as their self-esteem, job satisfaction, and overall sense of harmony in life, all of which can be seen as indicators of a good work-family role balance.<sup>[21]</sup>

## CONCLUSION

The study points out that the physiological problems, stress, changes in sleeping pattern during online teaching very much affected the quality of life of teachers. The changes in dietary pattern and meal consumption due to the busy schedule of online teaching affected their health status. It was clear that the change in the food consumption during pandemic is due to the boredom and stress affected during online teaching practices. There was no significant difference in stress level with respect to type of college, gender and age. It was found that there was a significant difference in stress between the overall sleep qualities; as the stress reduces sleep quality will improve and also there was a significant association between quality of life and the stress levels. Proper planning, management and balance in academic, diet pattern, recreation and social interaction was found to be beneficial in improving the QOL of teachers.

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