ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 8, Dec 2022

Impact Of Covid 19 Lockdown On The Lifestyle Of Kerala Population-A South Indian Study

Dr Reshmi R*,
Assistant Professor (Community Science), Krishi Vigyan Kendra, Palakkad, Kerala Agricultural University, Kerala, India.
reshmi.r@kau.in
Dr Anu Joseph,
Associate Professor, Dept of Home Science, St.Teresa's College, Ernakulam, Kerala, India
anujosephstc@gmail.com
Dr Mini Joseph,
Head of Department & Assistant Professor (Food & Nutrition), Department of Home Science, Government College for Women, Thiruvananthapuram, Kerala, India
minijoseph66@yahoo.in

ABSTRACT

This study was conducted across all the 14 districts of the Southern State of Kerala, during the Covid 19 pandemic. Google forms were used to collect demographic details, changes in food budget and lifestyle changes. The respondents aged between 18-45 years (N=1504), included students, working and non-working people and cut across all socio-economic groups. They hailed from various geographic locations since the State of Kerala includes regions of high altitudes, coastal regions, and plains. The Covid 19 brought about phases of lockdown and releases which affected the economy of the population. The adult workforce went through job losses, irregular and reduced income, all of which had an impact on the food budget of the families. This was felt most amongst those residing in high altitudes. Healthy practices like inclusion of Vitamin C rich foods, herbs and spices inculcating healthy cooking methods were adopted in more than half the population. Chi square test showed a statistical difference amongst the population, and it was found that those residing in rural areas, women folk, those with least education and the daily workers were more amenable to these new practices. Nearly 60% of the population initiated Kitchen Gardens. Weight gain was self-reported in nearly half the population (45%) and one-fourth (26%) of them reported a weight loss. The time spent on physical activity increased in 48% while one-third made no changes to their active time during the pandemic period. Social media emerged as the main source for disseminating information and the population relied on it for gaining health related information. Ethical clearance was obtained for this study.

Keywords: COVID-19; food budget; healthy practices; lifestyle changes; Kerala

INTRODUCTION

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. Studies have highlighted the importance of healthy lifestyles as they are crucial in maintaining and improving physical and mental health and improving the quality of life. Earlier research linking COVID-19 and lifestyle patterns illustrated that an individual's lifestyle is a crucial factor for preventing infectious diseases (Hamer et al., 2019).

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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 (Mattioli et al., 2020). These factors compound over time to radically change lifestyle-related behaviours, especially daily eating, activity and sleep behaviours that are known to be independent risk factors for metabolic complications such as obesity, diabetes and cardiovascular disorders (Górnicka et al., 2020 and Hallal et al., 2012).

Few preliminary studies from the west have highlighted a negative impact on various lifestyle-related behaviours as a potential implication 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 lifestyle-related behaviours might vary from country to country.

This pandemic not only adversely affected the physical health of individuals, but also brought forth significant changes in their lifestyle. Unhealthy lifestyle habits such as poor diet, lack of physical activity, smoking, and alcohol use are not only major contributors to the global burden of disease(GBD 2017 Risk Factor Collaborators, 2018), but are also positively associated with worse mental health outcomes (Rao et al., 2015). Recently, lifestyle guidelines have emphasized maintaining a healthy nutritional status and engaging in physical exercise at home during the COVID-19 outbreak (Chen et al., 2020).

There is a lack of evidence that evaluates the effect of COVID-19 on lifestyle-related behaviours in Kerala. It is important to determine which lifestyle behaviours are most affected, the reasons for these changes and which demographic section is the most impacted. Hence the present study was conducted to evaluate the overall impact of COVID-19 on lifestyle changes experienced by the population in all 14 districts of Kerala State during the pandemic.

The specific objectives of the study were:

- to study the demographic details of the selected population study group from the North, South, and Central districts of Kerala State
- to determine the changes in food budget of the families due to COVID-19 lockdown period in the various districts
- to assess the healthy dietary practices adopted across the State during the pandemic
- to ascertain the changes in the physical activity of the population
- to compare the region and district wise changes in lifestyle during the COVID lockdown period

MATERIALS AND METHODS

Study Design

This cross-sectional study was conducted in all the 14 districts of Kerala State. The 14 Districts were further classified into North, Central and South districts for study analysis. The North districts includes Kozhikode, Wayanad, Kannur, Kasargod, and Malappuram; the Central districts include- Palakkad, Thrissur, Idukki and Ernakulam; and the South districts include- Thiruvananthapuram, Kollam, Pathanamthitta, Kottayam and Allepey. A total of

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1504 respondents were selected from all these districts by convenience sampling. The age group of the respondents was between the age group of 18-45 years and consisted of both male and female, with almost equal number from each district. The respondents were from across all sections of the society and included mainly students, working and non-working people from all socio-economic groups and hailed from various geographic locations.

Data Collection

The data for the study was collected using a questionnaire. Considering the present pandemic situation, the questionnaire was circulated as a Google form for the collection of data. Google forms is a web-based app developed by Google which is used to create forms for data collection purposes. Data gathered using the form is stored in a spreadsheet. The google form was forwarded to selected respondents, who were in the age group of 18-45 years. The questionnaire was used to collect information's on the demographic details, food budget changes, healthy practices adopted, and lifestyle changes of the subjects during the COVID lockdown period.

Statistical Analysis

The data was tabulated, and it was analysed using appropriate statistical software tools (Statistical Package for the Social Sciences). The results of the study were interpreted using frequency, percentage, and Chi-square test.

Ethical Consideration

The Ethical approval for the study was obtained from the Institutional Ethical Committee of St.Teresa's College, Ernakulam (STCAU /2021/dated 30/6/2021). A consent was obtained from each of the respondents by informing them about the purpose of the research.

RESULTS AND DISCUSSIONS

Demographic profile:

This study included 1504 respondents from the 14 districts of Kerala. Females constituted 62% of the study population and the remaining were males. Majority of them had degree level education (50%) and 1/4th was postgraduates. The remaining had school level education. The occupational status showed that 44% were students, 19% were professionals, 10% were self-employed, 8% were homemakers, 6% were government employees, 5% were daily wage workers and 7% were unemployed. Nearly half of them hailed from rural areas (55%), 42% from urban areas and a small proportion were from remote regions (3%). Their economic standing in society was estimated from the possession of their ration card. White coloured card (indicating highest income group) was owned by 38% of the population, blue card by 33%, pink card by 23%, yellow card by 3% (lowest strata of the society). There was a small proportion (3%) who did not own any ration card. The Table below shows the demographic profile of the population hailing from the North, South, and Central districts of Kerala.

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Table 1: District wise distribution of the population demography from North, South and Central Districts of Kerala

Demographic variables	**North District**	**Central district**	**South District**	**Total**
Gender				
Male	241(42.7%)	177 (33%)	156 (38.8%)	574 (38.2%)
Female	322(57%)	360 (67%)	246(61.2%)	929 (61.7%)
Transgender	1(0.3%)	0	0	1 (0.3%)
Educational status				
Below 10^{th} class	8 (1.4%)	37 (6.9%)	7 (1.7%)	52 (3.5%)
10^{th} class	13 (2.3%)	38 (7.1)	4 (1%)	55 (3.7%)
High school	98 (17.3%)	78 (14.5%)	26 (6.5%)	202 (13.4%)
Degree	306 (54.2%)	247 (46%)	205 (51%)	758 (50.4)
Post-graduation	126 (22.3%)	120 (22.3%)	145 (36.1%)	391 (26%)
>Post-graduation	14 (2.5%)	17 (3.2%)	15 (3.7%)	46 (3.1%)
Occupational status				
Student	290 (51.3%)	241 (44.8%)	132 (32.8%)	663 (44.1%)
Home maker	38 (6.7%)	46 (8.6%)	34 (8.5%)	118 (7.8%)
Professional	102 (18.1%)	81 (15.1%)	116 (28.8%)	229 (19.9%)
Govt Job	29 (5.1%)	37 (6.9%)	30 (7.5%)	96 (6.4%)
Self- employed	50 (8.8%)	52 (9.7%)	45 (11.2%)	147 (9.8%)
Unemployed	41 (7.3%)	32 (6.0%)	30 (7.5%)	103 (6.8%)
Daily worker	15 (2.7%)	48 (8.9%)	15 (3.7%)	78 (5.2%)
Location of residence				
Urban	229 (40.5%)	214 (39.9%)	184 (45.8%)	627 (41.7%0
Rural	318 (56.3%)	302 (56.2%)	204 (50.7%)	824 (54.8%)
Remote	18 (3.2%)	21 (3.9%)	14 (3.5%)	53 (3.5%)
Ration Card				
White	263 (46.5%)	157 (29.2%)	155 (38.6%)	575 (38.2%)
Blue	203 (35.9%0	142 (26.4%)	147 (36.6%)	492 (32.7%)
Pink	73 (12.9%)	196 (36.5%)	71 (17.7%)	340 (22.6%)
Yellow	11 (1.9%)	25 (4.7%)	8 (2%)	44 (2.9%)
No card	15 (2.7%)	17 (3.2%)	21 (5.2%)	53 (3.5%)

Impact on the Food Budget of the families:

Food Expenditure showed that Covid 19 had an impact on the food budget of the households. One-third of the households increased their food budget, $1/3^{rd}$ decreased and the remaining

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1/3rd made no changes to their food budget. Chi-square analysis showed there was a significant difference between the different districts with respect to change in food budget (p=0.001). The Central districts of Kerala increased their food budget (p=0.001). Amongst all the districts it was found that the Central district of Idukki showed a significant increase in the food budget. A decrease in food budget was more apparent in the Northern districts of Kasargod, Kannur and Kozhikode. The change in food budget also varied with the educational status of the population (p=0.043). The degree holders showed an increase in their food budget.

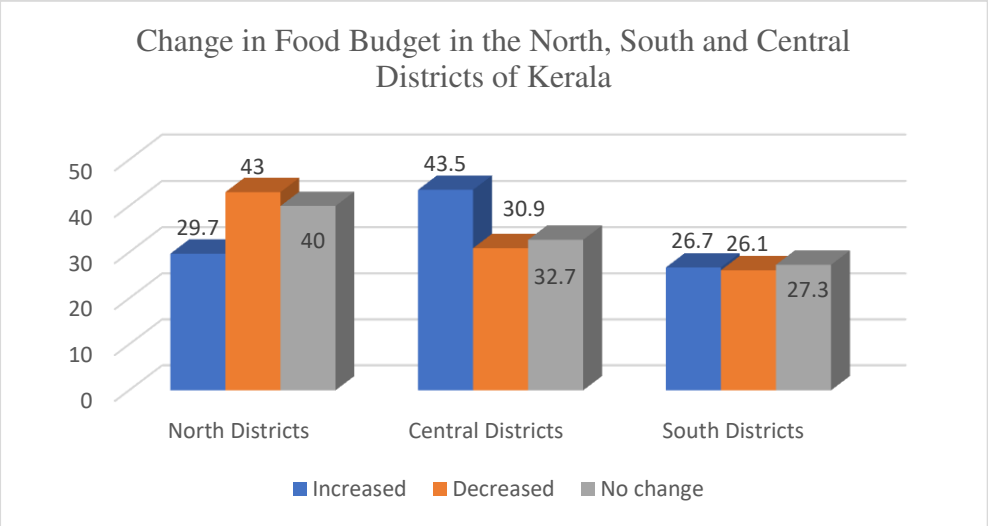

Figure 1: Changes made to Food budget in the North, Central and South Districts of Kerala during Covid 19 lockdown (N=1504)

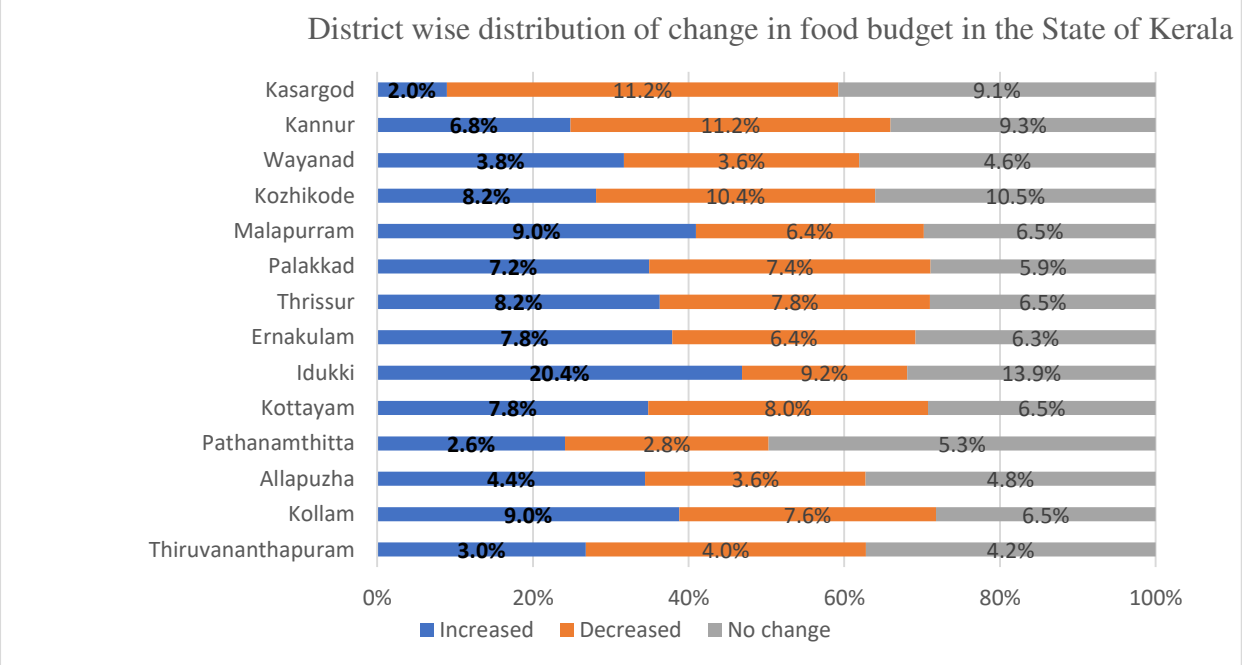

Figure 2: District wise distribution of the population of Kerala and change made to Food budget during the Covid 19 lockdown (N=1504)

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Healthy practices followed during the Covid 19 lockdown period:

Various healthy practices like inclusion of spices, Vitamin C rich foods, herbs, sprouted pulses, practice of healthy cooking methods were elicited form the sample and is tabulated below.

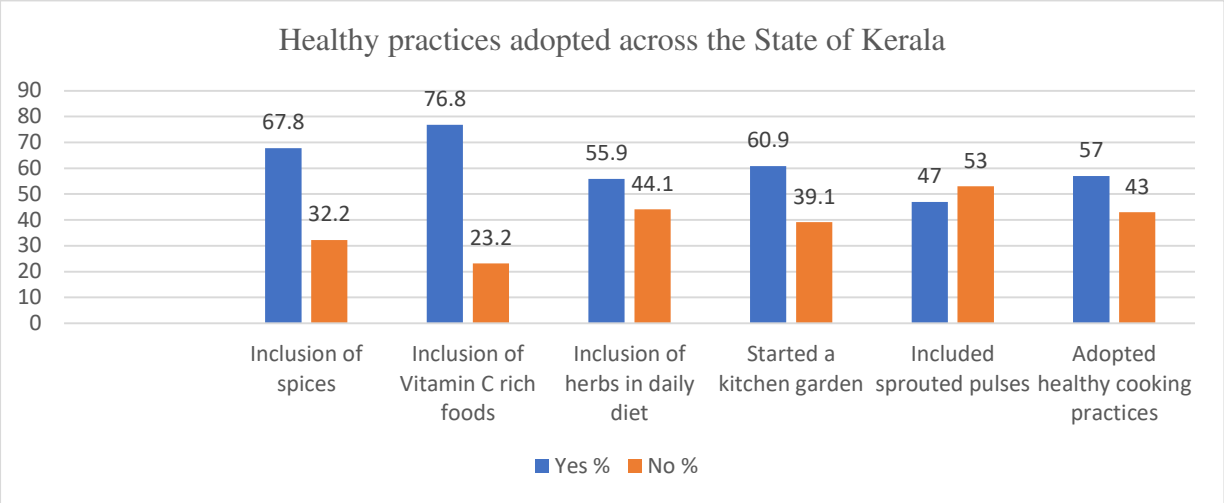

Figure 3: Healthy practices followed by the study sample (N=1504) during Covid 19 lockdown in Kerala population

The results showed that majority of the population adopted healthy practices during the lockdown period. Spices like turmeric, ginger, garlic, cloves cardamon were used in increased quantities during this period. Vitamin C rich foods like limes, fresh foods, gooseberry and herbs like coriander leaves, curry leaves, neem leaves were also included in their daily diet. Sprouting of pulses and initiation/promotion of kitchen garden was seen in nearly half of the population. Grilling, steaming was adopted in 57% households. Chi square analysis was done to find out the association between the healthy practices followed and various population parameters.

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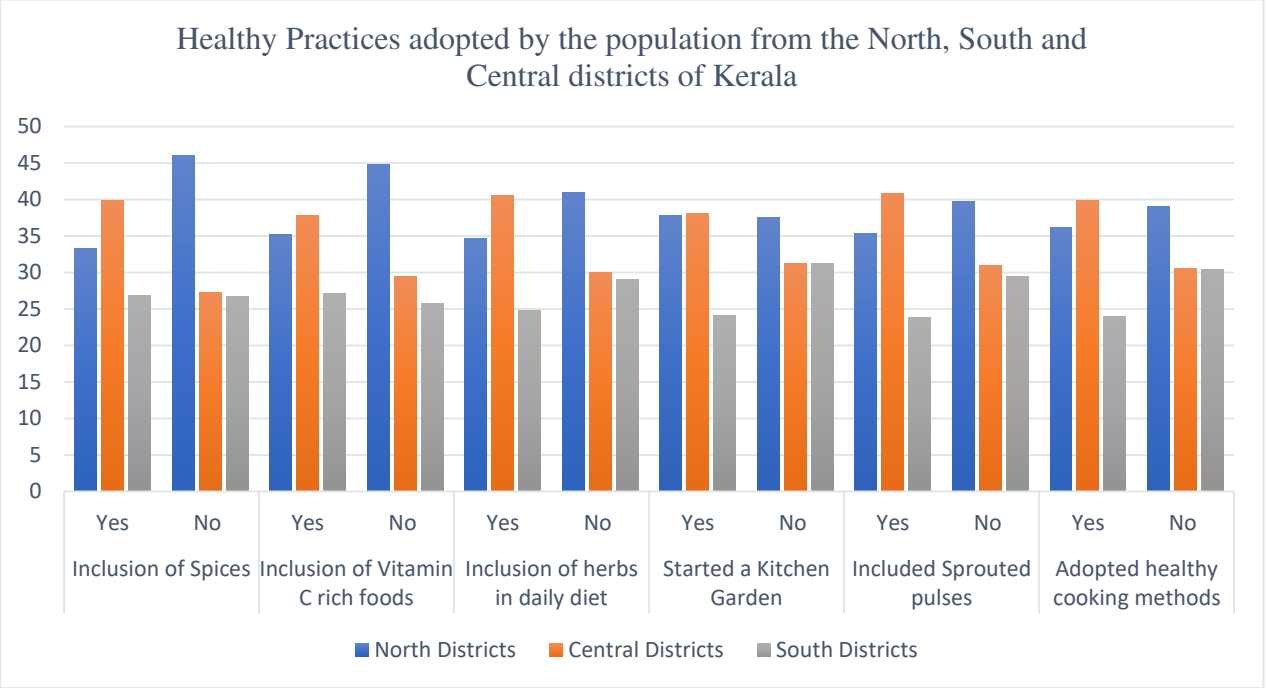

Figure 4: Healthy practices followed by the study sample in the North, South and Central Districts of Kerala (N=1504) during Covid 19 lockdown

There was a significant difference in the adoption of healthy practices amongst the different districts. Overall, it was found that the population in the Central district adopted the healthiest practices. Amongst the Central districts, it was found that Idukki followed the healthiest practices as compared to the populations in the other districts of Kerala (p=0.001).

The female respondents adopted an overall healthy practice as compared to their male counterpart (p=0.001). There was a statistical association between the occupation of the sample and the healthy practices adopted (p=<0.05). Kitchen garden was initiated more in the daily wage worker category. This group of workers also used more herbs and sprouted pulses in their daily menu. The use of spices was seen mostly amongst the home makers. The professional group of individuals followed the least number of healthy practices in their daily living.

The educational status of the population was studied with the healthy practices and was found to be statistically significant (p=<0.05). It was interesting to note that those with the least school education (below 10^{th} standard education) adopted the healthiest practice like inclusion of spices, herbs, sprouted pulses, initiating kitchen garden, and adopting steaming and grilling of foods. In contrast, those with a degree level of education adopted the least number of healthy practices.

Chi square test showed an association between the area of residence, (urban and rural) and adoption of healthy practices in daily life. It was seen that those residing in rural areas adopted more healthy practices like inclusion of spices, vitamin C rich foods, herbs, sprouted pulses; they also initiated kitchen gardens as compared to their counterparts in urban areas.

The types of ration card were found to have an association with the healthy practices followed in the family. It was interested to note that majority of those who owned the yellow-

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coloured ration cards (most economically backward section of the society) had adopted the healthier practices in daily life. This contrasts with those with white cards (non-priority); they adopted least healthy practices.

Lifestyle practices:

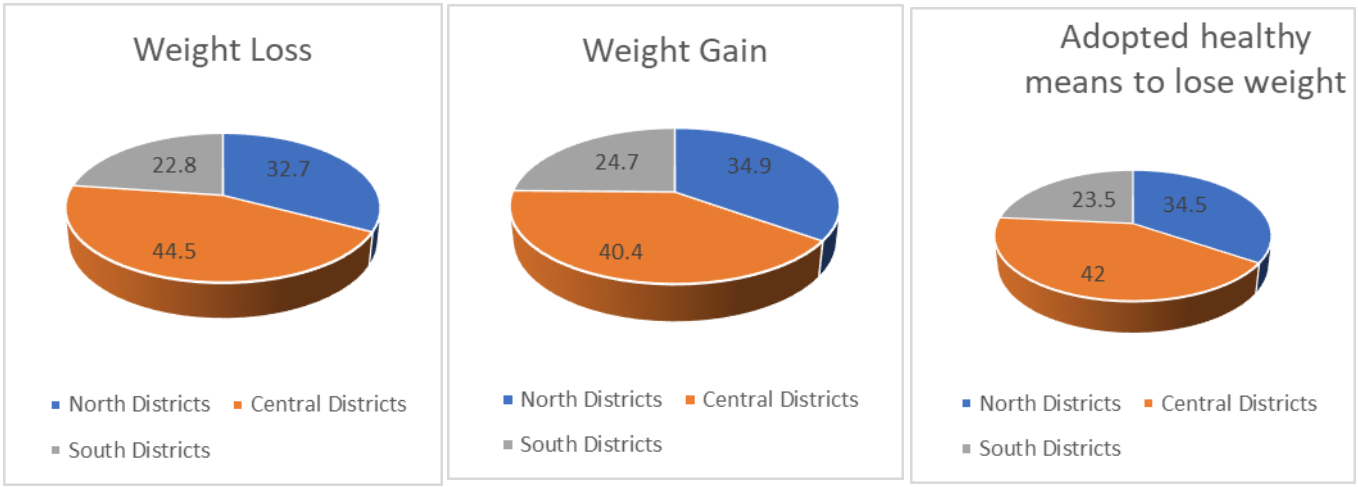

Figure 5: Changes in Body Weight (self-reported) of the population of Kerala during the Covid 19 pandemic (N=1504)

The self-reported weight gain/loss during the lockdown period was elicited. Overall, there was a weight gain reported by half the Kerala population (55.1%) and a weight loss in one-fourth of the population (26.4%). Statistical tests showed a significant difference between the three main divisions of Kerala. The maximum weight loss was reported in the population residing in the Central Districts of Kerala (44.5%). Interestingly, the highest percentage of

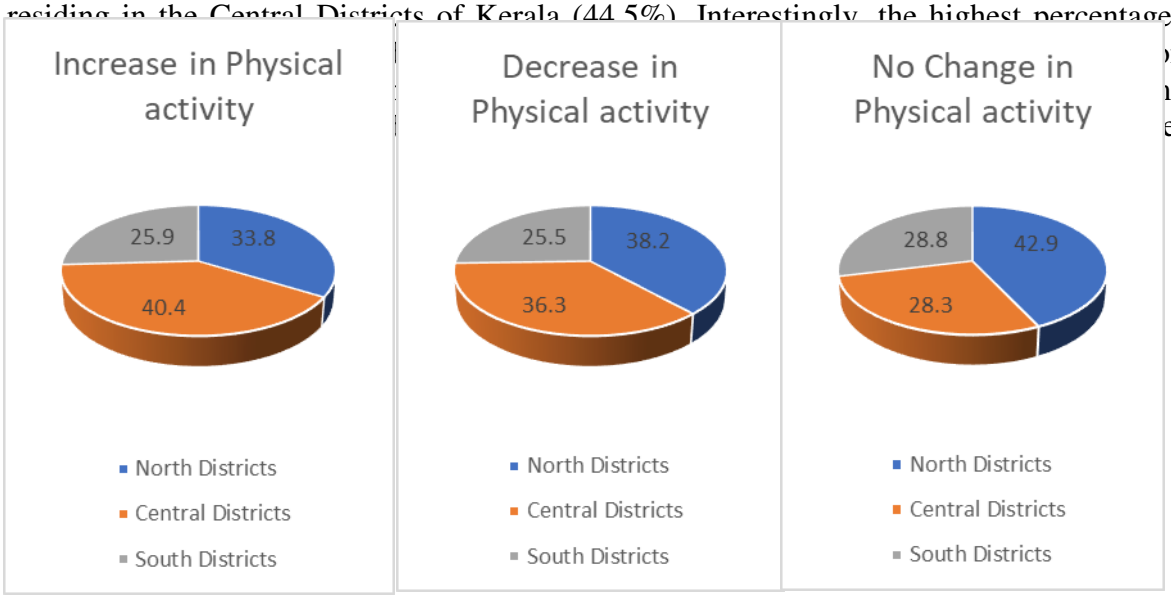

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Figure 6: Details of Physical activity in the population of Kerala during the Covid 19 lockdown

Overall, there was an increase in physical activity in 48.4% of the

population while 22.1% of the population reported a decrease in physical activity and one-third reported no change to their physical activity. There was a statistical difference in physical activity across the three major divisions of Kerala. Increase in physical activity was most reported amongst those residing in the Central districts of Kerala, while those residing in the Northern districts reported a decrease in activity.

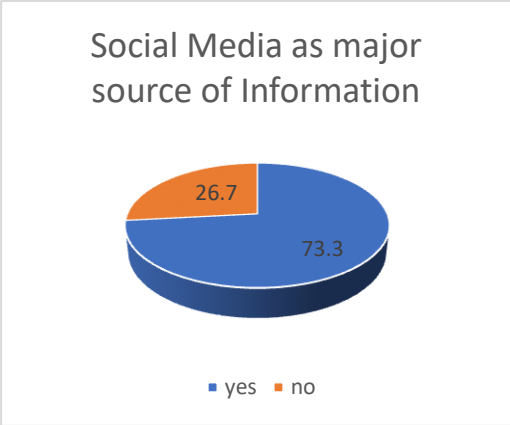

Figure 7: Source of information in the Kerala population during the Covid 19 lockdown (N=1504)

The main source of information related to health information was social media (73%). Newspaper was the major informant in 27% of the population.

Discussion

This study threw light on the changes in food budget and lifestyle practices that occurred in the Kerala adult population during the Covid 19 pandemic (March 2020- August 2020). The Government of Kerala roped in all the stakeholders to combat this biological warfare.

The economy was gravely affected, and its impact was felt more amongst the working class of the society. The dip in economy resulted in loss of jobs, reduced work, and the total family income fell resulting in a consequent rise in food expenditure of the families. Those living in the Central district of Idukki which is a high-altitude area indicated an increase in their expenditure on food. The Northern districts of Kerala (Kasargod, Kannur and Kozhikode) recorded households which made least changes to their food budget. Interestingly it was those with degree level of education that made an increase in the food budget compared to the others. Since many of them were employed in private sectors their pay would have been affected and the decreased pay exaggerated their food expenditure. Moreover, due to the lockdown situation expenses on entertainment, clothes, miscellaneous items were curtailed which led to a greater slice being spent on food. Similar findings were reported in a Mumbai based study during the same period (Mehta, 2020). However a UK based study reported that the participants made no changes to their diet and this was associated with a change in their work-status (Ingram et al., 2020).

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The data on the healthy practices followed in the population showed that more than half the population resorted to including spices like turmeric, ginger, garlic, cloves cardamom, Vitamin C rich foods like limes, fresh fruits and vegetables, gooseberry, herbs like coriander leaves, curry leaves, sprouted pulses in their diet. Initiation/promotion of kitchen garden was also popular. The social media, which was overwhelmed with information regarding the significance of including of spices and condiments in daily diet played a pivotal role in taking these healthy practices to the masses.

Healthy cooking methods also became popular, and it was the female population who were receptive to these practices compared to the male counterparts. It was interesting to note that those living in high ranges of Idukki district, those hailing from rural areas, subjects with the lowest level of education, daily wage workers, and those who owned yellow coloured ration cards were more agreeable to following healthy practices as compared to the rest of the population. The professional group of individuals and those with degree level of education followed the least number of healthy practices in their daily living. This evidently points outs that a high position in society or a high level of education does not always translate to good nutrition practices. It was those from the lower strata of society who were more amenable to inculcating newer and healthier practices. A French study indicated that the lockdown period adversely affected the quality of diet of the French people and the food intake was dependant on their mood (Marty et al., 2021).

The Indian society witnessed the “work from home” norm to ensure social distancing; this resulted in a large segment of the working class working from home. The home isolation rules enforced to prevent spread of the virus resulted in decreased physical activity; which led to a positive energy balance, ensuing a weight gain in nearly half of the studied population. However, one-fourth of the population reported weight loss. Similar findings were elicited in an Italian study; there was weight gain in 48% of the population and a slight increase in physical activity (Di Renzo et al., 2020). The China-US cross-sectional study revealed a weight gain in 25% of the Chinese and 13% of the US population (Dou et al., 2020).The French study indicated that 35% gained weight while 23% lost weight during the lockdown period (Deschasaux-Tanguy et al., 2021).

Nearly half the studied Kerala population were able to increase physical activity levels while one- fifth reported a decrease in physical activity. No change was reported in one-third of the population. An increase in physical activity was found in the 35% of the respondents of a UK-Scottish study (Ingram et al., 2020). In contrast, 53% in a French population study reported a decrease in physical activity (Deschasaux-Tanguy et al., 2021). An Australian study in the city of Adelaide showed that the lifestyle of these citizens were not affected (Curtis et al., 2021) by the pandemic.

The pandemic also made people more tech savvy. Results of the survey show that social media was the main source of information for the studied population. This clearly illustrates that this pandemic has brought about a paradigm shift in the manner in the which the people access knowledge. If social media is tapped correctly, it can be used to transform the communication industry.

Conclusion

This study highlights the changes on the food budget, the healthy practices adopted and changes in the lifestyle of the Kerala population during the Covid 19 lockdown period (March 2020-August 2020). The negative effect it had on the economy affected the food

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expenditure of the families. Healthy practices were adopted by more than half the population. The gain in weight in nearly half the study population and decreased physical activity in one-fifth of them points towards an unhealthy trend. Social media has emerged as the main source for disseminating information. It can be used by government for the promotion of healthy practice. Understanding the food expenditure of families, adoption of healthy habits and lifestyle changes that evolved during this pandemic period can help the government to conceptualise and formulate appropriate policy interventions for the population. Further studies are required to comprehend the impact Covid 19 had on the long-term health status of the population

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