# Impact of the COVID-19 Epidemic on Eating Habits and Lifestyle : An East Nusa Tenggara Survey

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***Abstract: The Large Scale Social Restrictions, implementation has been regulated in Government Regulation (PP No. 21 of 2020) signed by the President of the Republic of Indonesia and along with the Minister of Health of Republic of Indonesia's Regulation (Permenkes No. 9 of 2020) concerning Large-Scale Social Limitation Guidelines in the Context of the Handling of COVID-19. This is undoubtedly to overcome the problem of dissemination COVID-19. This research aimed to find out the lifestyle of the people in East Nusa Tenggara, Indonesia, during the emergency response phase of COVID-19. Methods of data collection were executed by filling out the lifestyle questionnaires that were previously prepared and uploaded in the Google Form toward the population aged over 16 years in East Nusa Tenggara, Indonesia. This research was conducted by a cross-sectional study method. According to the results of data analysis, about 191 respondents were involved in this study. Information about COVID-19 was mostly obtained from the internet or social media was 71.20%. Daily consumption of vegetables and fruit was 39.27%. Around 47.64% of respondents experienced a change of habit, such as sometimes do sunbathe, and 30.89% of respondents increased physical activity frequency more than three times a week. The 98.43% of East Nusa Tenggara society tended to wear masks outside of their house, and 85.34% always wash their hands using soap. The prevalence of daily fresh food consumption during this virus pandemic was 77.49%, and instant food products were 2.62% every day. Factors that changed during the Covid-19 virus pandemic were smoking, physical activity, consumption, washing hands, wearing masks, sunbathing, and processed foods consumption.***

***Keywords: COVID-19, eating habits, lifestyle behaviors***

## 1.  INTRODUCTION:

On March 12th, 2020, coronavirus disease 2019 (COVID-19) has been confirmed in 125.048 people worldwide, bringing the mortality rate of around 3-7%, compared with a mortality death of less than 1% in influenza case. There is an urgent need for effective

treatment. The focus now is on the development of new therapies, including antivirals and vaccines (Lancet 2020).

Coronavirus's first case was identified and infected humans in Wuhan province, China. Initially, it was suspected as pneumonia, a disease with similar symptoms to the flu in general. These symptoms, including coughing, fever, fatigue, shortness of breath, and no appetite. But unlike influenza, coronavirus can multiply quickly to cause more severe infections, organ failures, and deaths. This emergency condition primarily occurs in patients with health problems (Mona, 2020)

At the same time, the WHO announced the COVID-19 as pandemic disease. Pandemic is a health term that refers to the disease outbreak, infects the human being, and widely rapid spreading around the world (Porta, 2008). Some prevention of this pandemic is carried out by many countries in a variety of ways, including in Indonesia, by performed the Large Scale Social Restrictions (called  Pembatasan Sosial Berskala Besar (PSBB)).

The Large Scale Social Restrictions, implementation has been regulated in Government Regulation (PP No. 21 of 2020) signed by the President of the Republic of Indonesia and along with the Minister of Health of Republic of Indonesia's Regulation (Permenkes No. 9 of 2020) concerning Large-Scale Social Limitation Guidelines in the Context of the Handling of COVID-19. This is undoubtedly to overcome the problem of dissemination COVID-19. Steps have been taken by the government to resolve this extraordinary case, one of which is to socialize the Social Distancing movement. This concept explains that in order to reduce or even break the COVID-19 infection chain, one must maintain a safe distance from other humans at least 2 meters, and not make direct contact with others, avoiding mass meetings or gathering.

The impact of the pandemic on individuals and society lives in the social and food fields also occurs. The completion of the COVID-19 problem, particularly on social impacts, will involve the smallest element of the community, such as each family should try to overcome related problems, especially lifestyle. Therefore an integrated program in a joint effort of politically, economically, and social mobilization with an awareness of the importance of the availability of accurate information systems in providing appropriate and timely information will help break the problem of lifestyle changes. The purpose of this study was to describe the lifestyle factors that change during the COVID-19 within two weeks of observation.

## 2. MATERIAL AND METHODS:

### Design, Time, and Location

Data collection using an internet platform questionnaires among the East Nusa Tenggara population . The sample represents all districts and cities in East Nusa Tenggara. Data processing and analysis were carried out in May-Agustus 2020. This study uses a cross-sectional design. Data collection using google form questionnaires. The sample represents all districts and cities in East Nusa Tenggara. Data processing and analysis were carried out in May-August 2020.

**Number and  Sampling Method**

About 243 people over 16 years old involved as the subjects of this study. Criteria for variables in this analysis were aged over 16 years, lifestyle data including smoking, food consumption, washing hands and wearing masks, physical activity and sunbathe, and have complete data. 191 subjects had comprehensive data and met the criteria. The required data were variables of education, occupation, family economic status, area of residence, gender, media information about COVID-19.

**Data Processing and Analysis**

Data analysis was done descriptively by considering the percentage/proportion of respondents who answered the online questionnaires. The analysis was executed on univariate data using Microsoft Excel 2013. The univariate analysis applied to explain descriptively each variable used, both the independent and the dependent variables, with their frequency distribution and descriptive statistical form in numbers and percentages. The spearman correlation coefficient was calculated in order to evaluate the correlation between continuous variables. Chi Square test was employed to asses the association between categorical variables during the COVID 19 emergency. Instead, Mann whitney and Kruskal Wallis test were performed to compare continuous variables among two or more groups, respectively.

## 3.  RESULT AND DISCUSSION

**Characteristics of Respondents**

The total respondents obtained in this study were 191 persons. Respondents within 16-19 years old were 40 persons (20.94%), 20-30 years old were 126 persons 960.73%), and the rest 31-58 years old was 35 persons (18.32%). The majority of respondents were female, about 146 persons (76.44%), and men were only 45 persons (23.56%). According to education, about 82 persons (42.93%) were junior/senior high school, diplomas were 67 persons (35.08%), bachelor degrees were 24 persons (12.57%), and master degrees were 18 persons (9.42%). About 46 respondents (24.08%) work as civil servants, 56 respondents (29.32%) were not working, and others were about 69 respondents (36.13%). Information media of COVID-19 was obtained from social media was about 136 persons (71.2%) (see Table 1).

Higher levels of education will be more easily implement their knowledge in daily behavior, especially in terms of health and nutrition. Thus, lower education will be related to attitudes and actions in dealing with health problems (Atmarita and Fallah, 2004). Education is an attempt in order to organize the community to improve health. Those due to the education level may affect the healthy behavior of families with less knowledge and education, which leads to low environmental awareness, the higher education level will support the understanding of environmental health knowledge and awareness of maintaining a healthy lifestyle.

The finding of Kusumawati et al. (2008) supports this finding reveals there was a relationship between education and health behavior. A socioeconomic status, which includes education, correlates with clean and healthy life behavior. This correlation has significance with health levels — higher education, the easier to accept the concept of a healthy life. Following Suryanto in Wantiyah (2004), young people are more receptive to information and

are more dynamic than the older one so they will be more receptive to behavioral changes. The higher socioeconomic status, which includes the type of work, the better of the clean and healthy life behavior in the family, and vice versa.

Table 1. Distribution of respondent characteristics

| Characteristic | Participants, n (%) | Kupang City, n (%) | Other Districts, n (%) | P value |
|---|---|---|---|---|
| **Age (years)** | | | | |
| 16-20 | 68 (35,6) | 37 (31,3) | 31 (42,5) | .03 |
| 21-25 | 59 (30,9) | 39 (33,1) | 20 (27,4) | .02 |
| 26-30 | 28 (14,7) | 19 (16,1) | 9 (12,3) | N/A |
| 31-35 | 17 (8,9) | 9 (7,6) | 8 (12,3) | N/A |
| > 35 | 19 (9,9) | 14 (11,9) | 5 (6,8) | N/A |
| **Gender** | | | | |
| Male | 44 (23,0) | 29 (25,6) | 15 (20,5) | 0.68 |
| Female | 147 (77,0) | 89 (75,4) | 58 (79,5) | N/A |
| **Marital Status** | | | | |
| Married | 46 (24,1) | 30 (25,4) | 16 (21,9) | <.001 |
| Unmarried | 145 (75,9) | 88 (74,6) | 57 (78,1) | N/A |
| **Education** | | | | |
| High School and Below | 82 (43,0) | 46 (39,0) | 36 (49,3) | N/A |
| College or University Degree | 90 (47,1) | 59 (50,0) | 31 (42,5) | .06 |
| Master's Degree and Above | 19 (9,9) | 13 (11,0) | 6 (8,2) | N/A |
| **Employment** | | | | |
| Goverment Employees | 46 (24,1) | 24 (20,3) | 22 (30,1) | <.001 |
| Private Employees | 14 (7,3) | 10 (8,5) | 4 (5,5) | N/A |

| | | | | |
|---|---|---|---|---|
| Housewife and Farmer | 5 (2,6) | 4 (3,4) | 1 (1,4) | N/A |
| Not Working | 57 (29,8) | 29 (24,6) | 28 (38,4) | .068 |
| Others | 69 (36,1) | 51 (43,2) | 18 (24,7) | .03 |
| **Source Of Covid Information** | | | | |
| Social Media | 137 (71,7) | 83 (70,3) | 54 (74,0) | .02 |
| Electronic Media | 40 (20,9) | 28 (23,7) | 12 (16,4) | N/A |
| Newspaper Media | 11 (5,8) | 7 (5,9) | 4 (5,5) | N/A |
| Family and Friend's | 3 (1,6) | 0 (0,0) | 3 (4,1) | N/A |

**The Lifestyle during Pandemic**

According to Kotler, lifestyle is the pattern of individual daily life expressed in the activities, interests, and opinions concerned. This shows the overall appearance of a person's behavior patterns in everyday life.

Lifestyle is an indicator in the form of a composite variable composed/calculated by five variables, namely: 1) handwashing habits, 2) defecation habits, 3) smoking habits in the past month, 4) physical activity, and 5) fruit and vegetable consumption habits. Food consumption behavior as a lifestyle variable generally shows an association with health (Simosick 1991). Another study on civil servants conducted in Japan showed a correlation between health and smoking habits (Hu, 2007). While the association between physical activity as a lifestyle variable has an association with health (Sanchez-Villegas 2008). Good health status is correlated to the high frequency of physical activity, no consumption/ no excessive consumption of alcohol, no smoking, and not 'underweight' or 'overweight' (Velten 2014).

Table 2. Life style of people in East Nusa Tenggara during pandemic

| Lifestyle and Eating Habits | Age Groups (years) | | | | | *P* value |
|---|---|---|---|---|---|---|
| | 16-20 | 21-25 | 26-30 | 31-35 | > 35 | |
| **Smoking during COVID-19** | | | | | | |
| No | 68 | 48 | 24 | 16 | 15 | |
| 1-4 cigarettes/day | 0 | 4 | 1 | 1 | 1 | .36 |
| 5-14 cigarettes/day | 0 | 6 | 3 | 0 | 3 | |

| > 14 cigarettes/day | 0 | 1 | 0 | 0 | 0 | |
|---|---|---|---|---|---|---|
| **Training during COVID-19 Emergency** | | | | | | |
| No Training | 13 | 10 | 2 | 3 | 4 | |
| 1-3 times/week | 35 | 28 | 16 | 9 | 10 | .79 |
| > 3 times/week | 20 | 21 | 10 | 5 | 5 | |
| **Frequency of Vegetable and Fruit Intake** | | | | | | |
| Everyday | 18 | 18 | 18 | 8 | 14 | |
| 3-5 times/week | 43 | 31 | 10 | 7 | 4 | .02 |
| 1-3 times/week | 7 | 10 | 0 | 2 | 1 | |
| **Frequency of Fresh Food Intake** | | | | | | |
| Everyday | 51 | 40 | 26 | 12 | 19 | |
| 3-5 times/week | 13 | 18 | 2 | 3 | 0 | .04 |
| 1-3 times/week | 4 | 1 | 0 | 2 | 0 | |
| **Frequency of Instant Food Intake** | | | | | | |
| No Intake | 6 | 5 | 2 | 3 | 4 | |
| 3-5 times/week | 18 | 27 | 12 | 2 | 4 | .93 |
| 1-3 times/week | 42 | 24 | 14 | 12 | 11 | |
| Everyday | 2 | 3 | 0 | 0 | 0 | |
| **Sugar Intake** | | | | | | |
| 1-4 Tablespoon/day | 45 | 48 | 21 | 12 | 16 | .043 |
| > 4 Tablespoon/day | 23 | 11 | 7 | 5 | 3 | |
| **Salt Intake** | | | | | | |
| 1 Teaspoon/day | 62 | 56 | 27 | 14 | 18 | .032 |
| > 1 Teaspoon/day | 6 | 3 | 1 | 3 | 1 | |
| **Water Intake** | | | | | | |
| 1-8 cup/day | 21 | 22 | 5 | 5 | 2 | .021 |
| > 8 cup/day | 47 | 37 | 23 | 12 | 17 | |
| **Wash Hand with Soap and Running Water** | | | | | | |

| Everyday | 61 | 47 | 22 | 17 | 19 | .013 |
|---|---|---|---|---|---|---|
| Sometimes | 7 | 12 | 6 | 0 | 0 | |
| **Sunbathing Above 9 O'clock** | | | | | | |
| Everyday | 14 | 17 | 6 | 2 | 7 | .045 |
| 1-2 times/week | 16 | 13 | 3 | 4 | 3 | |
| 3-5 times/week | 33 | 24 | 19 | 9 | 7 | |
| No Sunbathing | 5 | 5 | 0 | 2 | 2 | |

This finding is consistent with the theory states that smoking can reduce appetite, constrict blood vessels of the heart and digestive tract, so it interferes with the absorption process (Arisman, 2009). From Table 2 above, it was revealed that most of the population in the East Nusa Tenggara had used or complied with using masks were about 188 persons (98.43%). A non-smoking habit of 172 people (90.05%), In particular, smoking habits have been reduced during the lockdown. Do the physical activity was 99 persons (51.83%) with a frequency of fewer than three times a week. Those who did not use to play sports before the COVID-19 lockdown did not use this as an opportunity to start. However, the most interesting fact is that among those who already took part in sports, training frequency has increased. Those who previously managed to exercise only occasionally, now have more time to do it at home.

On the variable of fruit and vegetable consumption, the majority of people (50.26%) in East Nusa Tenggara consume it sometimes, and the other was 39.27% do the daily consumption of it. Consumption of fresh food that is always processed just before consumption was 148 respondents (77.49%), while those who consume instant food every day were only 2.62%. During the lockdown, Publics have more desire to cook, and above all to knead. Accordingly, the consumption of homemade has increased. On the other hand, the consumption of savory snacks, snacks, processed meat, carbonated and sugary drinks has decreased. During the COVID-19 lockdown, the sense of hunger and satiety changed for more than half of the population: 17.8% of responders had less appetite, while 34.4% of responders increased appetite. The increased sense of hunger and the consequent change in eating habits could justify the perception of weight gain observed in 48.6% of the population. It was expected that during the quarantine there would have been a reduction of the consumption of fresh food, accompanied by vitamins and minerals deficiency, including vitamin C and vitamin E and beta-carotene with antioxidants and anti-inflammatory properties. The deficiency of these micronutrients is associated with both obesity and impaired immune responses, thus making more susceptible to viral infections

In fact, 40.3% thinks they have slightly increased their weight, while 8.3% of the studied population thinks they have highly increased their weight. On the other hand, 3.3% of smokers in this period have quit smoking. It is interesting to notice that the number of those who smoked more than 10 cigarettes per day has decreased by 0.5%. This phenomenon could be explained by the fear induced in smokers of the increased risk of respiratory distress and

mortality from COVID-19. The habit of washing hands using soap for the people of East Nusa Tenggara during the pandemic had reached 85.34%. The respondent that always do sunbathe was 23.56% and some time of 47.64%, to activate or increase the immunity.

Compliance is a term used to describe people's behavior in using masks. Compliance is a positive behavior displayed by the community when people use masks. Some factors are influencing, including knowledge, motivation, perceptions, and beliefs in disease control and prevention efforts, environmental variables, health instructional quality, and ability to access available resources (Sinuraya et al., 2018). Meanwhile, non-compliance is a condition when individuals or groups wish to obey, but several factors hinder adherence to health advice given by health workers (Prihantana et al., 2016). Non-compliance is the extent to which a person's behavior and/or caregiver is in line or not in line with the health promotion plan or therapeutic plan agreed between the person (or caregiver) and health care professionals (Wulandari, 2015).

The study carried out by Alsyary in 2020 identified that the higher duration of sun exposure was associated with more cases of recovery from COVID-19 among patients. This correlation is in line with previous evidence that sunlight will not stop the coronavirus, so it cannot prevent the infection. Conversely, sunlight can maintain the health condition of COVIDd-19 patients, so they have a chance to recover from this disease. Sun exposures enhance the immune system, which slows the development of influenza and SARS agents in the human body (Cannell et al., 2006; Miller, 2018).

Sun exposure triggers the production of vitamin D, which functions as an immune booster (Slusky and Zeckhauser, 2018). Poor sun exposure leads to influenza activation (Sagripanti and Lytle, 2007). Previous studies have shown that sunlight significantly contributes to the healing of most respiratory conditions, including tuberculosis and lung disease (Aloia and Li-Ng, 2007; Asyary et al., 2017).

The main limitation of the present study is represented by a self-reported questionnaire, which may lead to the actual misreporting of data. However, our web-survey was similar to others that have been frequently employed. A strength of our study was represented by the fact that the survey was conducted quickly in the most critical period of the epidemic, less than three weeks after the lockdown.

## 4. CONCLUSION

Currently, there are many Indonesian people do not obey the government's call to overcome this coronavirus pandemic. In East Nusa Tenggara, basic behavior in social distancing has been implemented very well, along with the changes of a better lifestyle. The new habit, such as wearing masks, washing hands, and doing sunbathe in the morning, has been very well implemented by society there.

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