



Food and cigarettes expenses during COVID-19 pandemic on diet quality in Jakarta and surroundings

Pengeluaran untuk rokok dan makanan dengan kualitas diet selama pandemik COVID-19 di Jakarta dan sekitarnya

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Abstract

It is clearly understood that the economic disruption during the COVID-19 outbreak is causing people to lose their income and access to healthy food. Our study aims to investigate people's spending on food and how their daily expenses on cigarettes impact diet quality. We conducted a cross-sectional online survey in April, 2020 and interviews through social media. There were 180 subjects followed in this study. Analysis was conducted using chi-square. It is found that even though our subjects able to access food but their diet quality to have whole food of four food group daily is not adequate. There is significant association between food expenses on whole food and processed food to diet quality ($p < 0,001$). While there is no significant association between smoking behaviours to diet quality ($p = 0,684$) but the percentage of those who smoke 1 to 3 cigarettes and more than 3 cigarettes daily is larger to have poor diet quality rather than people who do not smoke at all. This study concluded household's expenses for cigarettes and food during the COVID-19 pandemic were able to explain whether diet quality is poor or good. The study suggests the government needs to impose smoking restrictions as part of COVID-19 prevention and reassure people's accessibility to nutritious food during this pandemic.

Keywords: Diet quality, pandemic, processed food, smoking, whole food

Abstrak

Dampak ekonomi yang disebabkan dari wabah COVID-19 menyebabkan kehilangan pendapatan dan akses makanan sehat. Studi ini bertujuan untuk mengkaji dampak pengeluaran masyarakat pada pangan dan pengeluaran rokok harian terhadap kualitas diet. Pengumpulan data dilakukan dengan potong lintang survey online selama April tahun 2020 dengan 180 subjek. Analisis data menggunakan uji Chi-square. Hasil studi ini menunjukkan subjek mampu membeli makanan namun kualitas dietnya tidak cukup untuk memenuhi empat kelompok pangan yang utuh. Terdapat hubungan signifikan ($p < 0,001$) antara pengeluaran pangan dengan kemampuan mengkonsumsi makanan utuh dibandingkan makanan olahan. Meskipun tidak ada hubungan signifikan ($p = 0,684$) antara merokok dengan kualitas diet namun persentase merokok 1 hingga 3 batang dan lebih dari 3 batang rokok sehari lebih banyak yang mengkonsumsi pangan dengan kualitas diet buruk daripada subjek yang tidak merokok sama sekali. Kesimpulan, pengeluaran rumah tangga terhadap pangan dan rokok selama pandemik COVID-19 dapat menentukan kualitas diet. Saran, untuk memasukkan larangan merokok sebagai bagian pencegahan COVID-19 dan memastikan akses pangan bergizi selama pandemik.

Kata Kunci: Kualitas diet, makanan olahan, pandemik, rokok

Introduction

Numerous studies have demonstrated that smokers have a higher risk of being infected with the coronavirus (Alqahtani et al., 2020; Berlin et al., 2020; Forster, 2020; Kabbani & Olds, 2020), including e-cigarette consumption (e-cigarettes or vaping) (Lewis, 2020). Cigarette substances, such as carbon monoxide and ash particles, have the same destructive effects as air pollution, increasing the risk of respiratory infections, especially in toddlers (Sinharoy et al., 2020).

During lockdown restrictions, nicotine use increased in five countries: Italy, India, South Africa, the United States, and the United Kingdom, including Indonesia (Ruhayat, 2021; Yach, 2020). Indonesia remains the first country for male smokers globally (Holipah et al., 2020). Unfortunately, since the smoking prevalence in Indonesia shows no sign of decrease, there is likely a high number of COVID-19-related deaths among smokers (Karnadi & Kusumahadi, 2021).

The exponential rise in infection and mortality due to the spread of coronavirus has led the government to impose large-scale social distancing measures. However, many regions still neglect the possibility of infection, resulting in a high risk of COVID-19 spread across provinces. Senior doctors have warned that more than 100 children may have died from the coronavirus (Walden & Souisa, 2020).

Therefore, stunting and secondhand smoke (SHS) may cause more children to die in Indonesia during the pandemic. These numbers paralleled more stunting children in Indonesia than in Malaysia, Vietnam, or Singapore. According to UNICEF data, more than 2 million Indonesian children suffer from severe wasting, while more than 7 million others under five years of age experience stunting (Fachriansyah, 2020).

A study examining the relationship between children's dietary quality and parental smoking status found that children of smokers had a significantly higher intake of monounsaturated fatty acids and starch. In contrast, they have a lower intake of non-starch polysaccharides (NSP). In addition, they are more likely to drink sugar-sweetened soft drinks and less likely to eat poultry, buns, cakes, puddings, wholemeal bread, and fruit. In comparison, non-smokers consumed a diet that conformed more closely to the current guidelines on healthy eating: whole-meal bread, fruit, and fruit juice. These dietary differences may contribute to the

excess ill-health observed in the children of smokers and less-educated mothers compared with non-smokers (Alkerwi et al., 2017).

Similar results have been reported in studies on the influence of parental smoking on children's nutritional status in Indonesia (Aginta, 2012; Nia, 2017; Syahrir et al., 2021; Wijaya-Erhardt, 2019). In addition, smoking is prevalent in rural Indonesia, and underweight children are common (Kurniawan et al., 2021; Sandjaja et al., 2013).

Recent studies in Indonesia have reported similar results. Wijaya et al., found that the degree of height growth faltering was higher in children whose fathers did not smoke than in those whose fathers smoked. Households with fathers who smoked spent 16,6% of their income on cigarette smoking. Children whose fathers did not smoke had higher height-for-age and greater weight-for-age, but were not statistically significantly different from those whose fathers smoked (Wijaya-Erhardt, 2019).

Beal et al. (2018) argued that spending more on non-food items, such as cigarettes, may lead to other health problems, such as stunting children. That the prevalence of stunted growth was higher in children with a father who smoked than in those with a father who did not smoke (62,2 vs. 49,6%, $p = 0,070$, respectively). There were 28,3% of underweight children in homes where fathers did not smoke and 35,6% in households where fathers smoked ($p = 0,110$) (Wijaya-Erhardt, 2019).

Several studies have shown changes in Indonesian people's smoking behavior and alcohol consumption during the COVID-19 outbreak, and there has been a tendency to increase smoking prevalence during the pandemic (Astuti & Mahardhika, 2020; Hanafi et al., 2021; Ramalho et al., 2021). These studies show that parents who smoke are more likely to spend time on non-food, such as cigarettes, rather than highly nutritious food for family members. However, no study has been conducted on households' expenditure on food and non-food (i.e., cigarettes) and how their consumption impacts diet quality, especially during the COVID-19 pandemic.

The economy has been impacted by the pandemic and hence affected the prices of food and non-food, including cigarettes (Galiani, 2022; Sparrow et al., 2020; Susilawati et al., 2020; Zahraturrehmi et al., 2021). This study

investigates people's spending on food and non-food during the pandemic, and how their daily expenses impact diet quality. We conducted an online survey and social media interviews to answer our research questions. The findings of this study are expected to provide initial information on household expenses for cigarettes and food during the COVID-19 pandemic.

Methods

This cross-sectional study used an online platform to collect data on food and cigarette expenses during the pandemic period. Ethical clearance was obtained from the Nursing Faculty Health Research Ethics Committee at Universitas Sumatera Utara (no. 204/1/V/SP/2020).

The online questionnaire consisted of 12 closed and semi-open questions from April 20 to April 30, 2020, and was distributed through the researchers' network WhatsApp group. Respondents provided informed consent to participate in the survey. The survey collected information on people's occupations and incomes. We also asked what food and non-food items were usually purchased during the pandemic. Appreciation of participation in the survey—IDR 50.000 phone vouchers were given to the first 50 respondents who filled in and returned the questionnaire.

Statistical analyses were conducted using descriptive statistics (frequency and distribution) for demographic data including age, sex, occupation, income, and number of family members. COVID-19 related issues and smoking behavior during the pandemic. Diet quality was measured by calculating the subjects' daily food consumption, which consisted of four food groups (cereals, animal/plant protein, vegetables, and fruits). Whole food was defined as all foods consumed, excluding snacks and instant noodles. Food expenses were measured based on food availability. Diet quality was categorized as poor or good. Poor was defined as the consumption of whole food less than processed food. Food expenses were categorized into two groups: availability of whole food less than processed food and otherwise around.

Smoking behavior was measured by frequency, family members who smoked, and cost of cigarettes. This study analyzed the association between cigarette consumption, food

expenses, and diet quality using bivariate chi-square tests.

Result and Discussion

In total, 180 respondents participated in the online survey. Among the respondents, 90% lived in Jakarta between 20 and 50 years old. They are active workers, with 48% of them considered financially secure by means of those working as permanent employers, able to work from home, and do not have any financial issues due to COVID-19.

However, Indonesia's Statistic Service Bureau (BPS) has recorded a decreasing workforce participation rate of 0,15%, increasing unemployment by 60,000 people and poverty by 1,1 million people due to this health pandemic.

Table 1. Sociodemographic respondents

Sociodemographic	n	%
Age (years)		
15-19	3	1,81
20-35	74	44,58
36-40	46	27,71
41-45	20	12,05
45-50	11	6,63
>50	12	7,23
Gender		
Male	48	28,92
Female	118	71,08
Occupation		
Daily worker*	12	7,23
Contract-based**	38	22,89
Civil servant officer	71	42,77
Entrepreneur	9	5,42
Other type of job	36	21,69
Income per month (MRW)#		
< IDR 3.940.973	48	28,92
≥ IDR 3.940.973	118	71,08
Number of family member		
2 people	15	9,04
3 to 4 people	73	43,98
> 4 people	78	46,99

* As a public transport driver, online/station-based motorcycle driver, building labor, commute seller.

** As a temporary civil servant/non formal education staff.

Based on Jakarta minimum regional wage

Table 1 describes the respondents' demographic information, revealing that most of our respondents were aged 20–35 years (44,58%) and females (71,08%). Most

of the respondents worked as permanent work officers or civil servant officers (42,77%) with an income per month of more than IDR 3.940.973 (71,08%) and lived in a household with more than four members of a family (46,99%). Among the respondents, 90% lived in Jakarta between 20 and 50 years old. They are active workers, with 48% of them considered financially secured by means of those working as permanent employers, able to work from home, and do not have any financial issues due to COVID-19. However, Indonesia's Statistics Service Bureau recorded a decreasing workforce participation rate of 0,15%, increasing unemployment by 60.000 people and poverty by 1,1 million people due to this health pandemic (Gold et al., 2023).

Detailed result of COVID-19 related issue for our respondents are listed in Table 2. The financial impact of the pandemic on the respondents significantly decreased their income by 40,96%. However, this percentage did not differ considerably from that of those who did not have a financial impact (39,16%). The pattern of economic impact may be due to occupation; in this case, more respondents were permanent work officers or civil servants.

Table 2. COVID-19 related issues

COVID-19 related issues	n	%
Financial Impact	2	1,20
Permanent layoff	31	18,67
Temporary layoff	68	40,96
Lower income	65	39,16
No financial impact		
Increasing expenses during pandemic		69,88
Electricity bill	116	61,45
Phone top-up	102	39,76
Gas bill	66	34,34
Water bill	57	10,84
Transportation	18	3,01
Cigarette	5	27,11
Food	45	
Expenses for food during pandemic		1,20
< IDR 20.000	2	36,75
IDR 20.000 to 50.000	61	62,05
> IDR 50.000	103	
Increasing expenses per food group		67,47

COVID-19 related issues	n	%
Cereals/tubers/bread	112	22,89
Instant noodle	38	50,00
Meat (red/poultry)/fish	83	63,25
Egg	105	30,72
Tempe/tofu	51	51,81
Vegetables	86	62,05
Fruits	103	38,55
Seasonings including herbs	64	46,39
Snacks including fried snacks	77	91,57
Type of Food Group provide in family daily		
Cereals/tubers/bread	152	46,39
Instant noodle	77	45,78
Meat (red/poultry)/fish	76	82,53
Egg	137	42,77
Tempe/tofu	71	62,65
Vegetables	104	54,22
Fruits	90	41,57
Seasonings including herbs	69	37,35
Snacks including fried snacks	62	1,20

Table 3 shows that 23% of the 166 respondents had one or more smokers in their families, with 15% of them smoking every day. Smokers mostly consumed more than three cigarettes per day (14,5%), and nearly most (n=25) reported buying single-stick cigarettes instead of packs during COVID-19. Purchasing single-stick cigarettes is less expensive than buying cigarettes in packs.

Table 3. Smoking behaviour during pandemic

Smoking behaviour	n	%
Smoking in Family Member		
Yes	33	19,88
No	133	80,12
Number of smoking persons in family		
1 person	32	19,28
> 1 persons	4	2,41
No smoker in family	130	78,31
Frequency of smoking		
Daily	25	15,06
Occasionally	9	5,42
Not smoking	132	79,52
Cost of smoking per daily		
IDR 1.700 - IDR 5.100 (1 - 3 cigarettes)	12	7,23
> IDR 5,100 (> 3 cigarettes)	24	14,46
No smoker in family	130	78,31

The exponential rise in infection and mortality due to the spread of coronavirus has led the government to impose large-scale social distancing measures. As a result, by April 15, 2020, 10 regions had implemented interventions that required people to comply with the COVID-19 protocols recommended by the World Health Organization (WHO) (Hoang et al., 2020). However, most neglect the possibility of infection, resulting in a high COVID-19 risk spread across provinces (Adjie, 2020), including Jakarta. In November 2020, Jakarta ranked first for a high number of confirmed COVID-19 cases, placing the city in the red zone, highly affected area with confirmed COVID-19 had reached 478.700 cases with 87% containment rate and 15.500 mortality cases.

Although staggering COVID-19 cases are found across the country, particularly in Jakarta, the national or provincial government has not implemented any significant interventions since the pandemic was officially announced in mid-March (Syakriah, 2020). Middle-low-income families are the most affected by health and socioeconomic pandemics. Based on the interviews, daily expenses, including cigarette use, have increased during the pandemic. Cigarette consumption ranks at 9% and 3% after electricity and phone credits, respectively. These data indicate that respondents have less diversified foods and may experience micronutrient deficiencies that lead to diet quality (Ilman & Wibisono, 2019). In addition, our survey found that expenses for tobacco or cigarettes are as high as other non-food expenditures such as electricity bills, communication top-up, gas, water, and gasoline.

Twenty-three percent of the 166 respondents had one or more smokers in their families, and 15% smoked every day. Smokers mostly consumed more than three cigarettes per day (14,5%), with nearly most of them (n=25) said to buy single-stick cigarettes instead of packs during the COVID-19 pandemic. Purchasing single-stick cigarettes is less expensive than buying cigarettes in packs (Rosemary, 2020). The COVID-19 pandemic has had an unprecedented adverse effect on people's socioeconomic conditions. Family members who smoke are at a high risk of

coronavirus infection and are detrimental to food insecurity.

This condition explains the finding that respondents experience an increased price for some food items, such as rice, meat/poultry, fish, eggs, vegetables, and fruits. However, most respondents were still able to buy and provide daily food at the expense of more than 50 thousand rupiahs (62,05%). Unlike rice, eggs, and instant noodles, which remained available for respondents' daily consumption, the relatively expensive food items during the pandemic caused half of the respondents not to provide meats/poultry and fish for their daily family meals. Meats, poultry, and fish are animal source proteins that provide various nutrients and other source proteins. Interestingly, most respondents agreed that they could obtain vegetables and fruits daily, which suits a nutritionally balanced food.

Job loss has increased during the pandemic (Ryansyah & Tambunan, 2021), impacting daily expenses for primary needs, such as food and exceptionally healthy food, which helps strengthen the body's immune system from being infected by the coronavirus. Economic issues, particularly depression, have an impact on the rise in mental health cases. Social distancing restrictions and other social problems reinforce depression in communities (Kaligis et al., 2020).

Our study also found that people are likely to spend less on food diversity, which affects their nutritious food intake, even among financially secure households. Our survey findings revealed that the prices of some food items, such as rice, meat/poultry, fish, eggs, vegetables, and fruits, have increased. Unlike rice, eggs, and instant noodles that remained available for respondents' daily consumption, the relatively expensive food items during the pandemic caused half of the respondents not to provide meat/poultry, fish, vegetables, and fruits for their daily family meals.

Table 4 shows the association between the subjects' expenses on cigarettes and food expenses of whole food compared to processed food and diet quality.

Our study (Table 4) showed a significant relationship ($p < 0,001$) between whole and processed food expenses and diet quality. This means that people who eat more whole food have better diet quality. The economically

impacted people’s food expenses, which means that cheaper food such as processed food is most likely to be available and ready-to-eat (Chianardi & Permatasari, 2020; Paganini et al., 2020; Pingali & Abraham, 2022; Zahraturrehmi et al., 2021). People with degenerative diseases, such as diabetes and

coronary heart disease, are more prone to COVID-19 than those without degenerative diseases. Degenerative diseases are the result of a continuously poor diet quality that contains less fiber, mostly from vegetables and fruits, but is high in fat, sugar, and salt (Abdi et al., 2020; Chen et al., 2020).

Table 4. Association between cigarette, food expenses and diet quality

Independent Variables	Diet Quality		p-value
	Poor (%)	Good (%)	
Cigarette			
IDR 1.700 - IDR 5.100 (1 - 3 cigarettes)	22(16,7%)	7 (14,6%)	0,684
> IDR 5,100 (> 3 cigarettes)	13(9,8%)	3 (6,3%)	
No smoker in family	97(73,5%)	38 (79,2%)	
Food expenses			
Whole food<processed foodgroups	127 (88,2%)	17 (11,8%)	<0,001
Whole food>processed food	5 (13,6%)	31 (86,1%)	

During the pandemic, the Ministry of Social Welfare provided food package assistance to poor communities (Figure 1), consisting of three pouches of rice (each weighing 5 kg), 2 liters of cooking oil, 2 tins of sardines, and 10 packages of instant noodles. However, the distribution of instant noodles is an unwise food aid because they do not provide sufficient micronutrients for immune support developed through the intake of nutritious food.

such as low sanitation, low education, and limited access to health facilities. Low consumption of nutritious foods and repeated infectious diseases are specific interventions for tackling direct stunting determinants. A stunting intervention was conducted to tackle indirect and direct determinants, as revealed in the WHO conceptual framework (WHO, 2018)

A study by Torlesse et al. (2016) found a combination of unrepaired latrines and untreated drinking water and an increased chance of stunting in Indonesia (TNP2K, 2017), the decline in the prevalence of stunting reached 7% based on the National Health Basic Research (Indonesian called RISKESDAS) 2018 compared to 2013. We observed that stunting intervention should address another determinant (Kemenkes RI, 2018; Tsai et al., 2016) Studies from growing evidence, such as a systematic review, show an interrelation between Second-hand smokers (note: the people exposed to smoke or ash as smoking residues) exposure during pregnancy and after childbirth with growing children, including stunting (Nadhiroh et al., 2020). The Global Adult Tobacco Survey (GATS) in 2009–2013 estimated that as many as 79% of children in Indonesia aged ≥ 15 years were exposed to cigarette smoke at home (Mbulo et al., 2016).

These data indicate that respondents have less diversified foods and may experience micronutrient deficiencies that affect diet quality (Ilman & Wibisono, 2019). In addition, our survey found that expenses for tobacco or cigarettes are

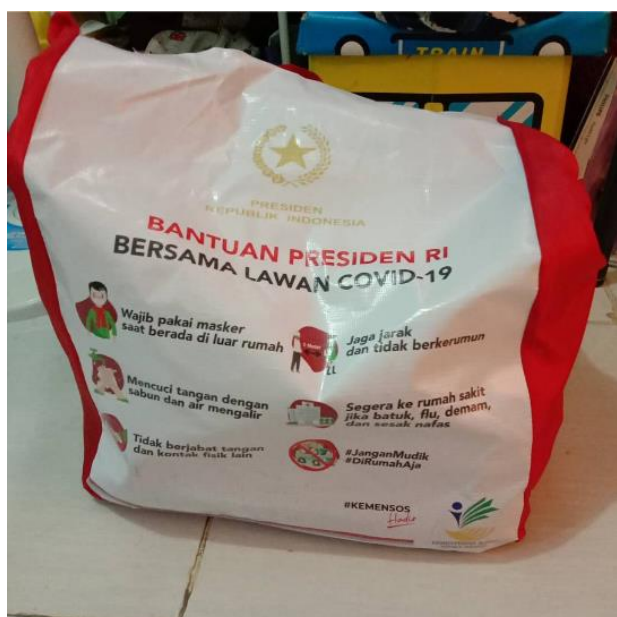


Figure 1. Food packages from the Ministry of Social to Poor Communities.

The determinants of stunting are so complex that they include sensitive interventions to address the indirect determinants of stunting,

as high as other non-food expenditures such as electricity bills, communication top-up, gas, water, and gasoline.

The results (Table 4) showed no relationship between cigarette spending and diet quality at the start of the pandemic in Indonesia ($p > 0,05$). These findings show that at the beginning of the pandemic, people still prioritized buying cigarettes over food or drinks with high nutritional value to maintain their body's immunity from being infected with the coronavirus. Although bivariate statistical tests showed no relationship between smoking expenditure and diet quality, the results of the crosstab description for the number of cigarettes consumed showed a poor-quality diet (26,5%) compared to a good-quality diet (20,9%).

These findings support previous research on smoking expenditures in households with stunted and normal infants. Research conducted in Gorontalo Regency, showed significant differences in daily cigarette expenditure between families with normal toddlers and those with stunted toddlers (Ahmad & Nurdin, 2019). The average expenditure on cigarettes per day in families of stunted toddlers was higher than that of normal toddlers, which was approximately IDR 2.366.600. This study was not conducted during the pandemic period. Meanwhile, a survey by the Center for Indonesia's Strategic Development Initiative (CISDI) on smoking status and behavioral changes in the first 10 months of the COVID-19 pandemic shows that job loss and financial limitations influence changes in people's smoking patterns. People tend to reduce their smoking intensity or change their choice of cigarettes to cheaper types or brands of cigarettes.

Existing nutrition guidelines and tools for continuing essential nutrition service-specific targets. For example, adolescents, women of reproductive age, pregnant and lactating mothers, and children under five. For instance, growth monitoring and promotion, micronutrient supplementation, maternal dietary counseling, infant and young child feeding counseling, distribution of high-energy biscuits, and screening and treatment for stunting should not be stopped during the pandemic by implementing standardized health protocols for both health professionals and communities (UNICEF, 2020).

From this study, we learned that local potential food sources that are cheaper, easier to

access, and more sustainable should be encouraged for mass production. One of the International NGOs initiated a Business and Innovation challenge that became a way for making an example that Pangaisus aquaculture, a medium-sized catfish with high levels of protein, iron, zinc, and calcium snacks (Kasri, 2020).

Conclusion

Efforts to de-normalize internalized values, beliefs, attitudes, and behaviors related to tobacco use are challenging. The survey showed a higher prevalence of Secondhand smoke (SHS) exposure in countries with smoking ratios for adults, and SHS prevalence patterns were higher in rural areas than in urban areas.

The number of people with economic problems leads to low food use, which affects food insecurity. Likewise, the increasing use of cigarettes in the community has impacted food insecurity during the COVID-19 pandemic. Therefore, considering the severe impact of smoking on increasing the risk of Covid-19 and the fact that households have less nutritious food expenses due to more spending on cigarettes and the effect of second-hand smokers, smoking restrictions should be encouraged.

There is a need for the government to include smoking restrictions as part of COVID-19 prevention and health promotion interventions to protect Indonesian people's health and well-being, including reassuring access to nutritious food during this uncertain epidemic.

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