PAPER NAME

Dietary diversity on complementary feeding by maternal employment status during COVID-19 Pandemic.pd

AUTHOR

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WORD COUNT

5298 Words

CHARACTER COUNT

27709 Characters

PAGE COUNT

11 Pages

FILE SIZE

786.1KB

SUBMISSION DATE

Apr 22, 2025 8:57 PM GMT+7

REPORT DATE

Apr 22, 2025 8:58 PM GMT+7

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Jurnal Gizi dan Dietetik Indonesia
(Indonesian Journal of Nutrition and Dietetics)
Vol 12, Issue 2, 2024:104-114

Available online at: https://ejournal.almaata.ac.id/index.php/IJND
p-ISSN 2303-3045 e-ISSN 2503-183X
DOI: https://dx.doi.org/10.21927/ijnd.2024.12(2).93-114

Dietary diversity on complementary feeding by maternal employment status during COVID-19 Pandemic

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ABSTRAK

Latar Belakang: *Praktik pemberian Makanan pendamping ASI (MPASI) yang tepat selama pandemi COVID-19 menjadi tantangan tersendiri karena kebijakan pemerintah untuk mengurangi penularan virus di tempat kerja seperti perubahan status pekerjaan termasuk bekerja dari rumah. Perubahan status pekerjaan, khususnya bagi ibu bekerja, berkaitan dengan keragaman pola makan dalam praktik pemberian MPASI.*
Tujuan: *Penelitian ini bertujuan untuk menganalisis dampak status pekerjaan ibu terhadap Keanekaragaman Gizi Minimum (MDD) selama pandemi COVID-19.*
Metode: *Penelitian cross-sectional dilakukan dan online self-administered questionnaires digunakan untuk mengumpulkan data dari 403 ibu yang memiliki anak usia 6-23 bulan yang tinggal di Jawa, Indonesia.*
Hasil: *Secara keseluruhan, 91,1% anak memenuhi kriteria MDD. Dalam model yang disesuaikan, anak-anak dengan ibu yang bekerja di luar rumah dikaitkan dengan penurunan peluang mengalami MDD (AOR: 0.85, 95%CI: 0.42-0.98). Faktor yang berhubungan dengan MDD pada praktik pemberian MPASI adalah daerah tempat tinggal (AOR: 0.12; 95%CI: 0.03-0.54), usia anak (AOR: 2.93; 95%CI: 1.12-7.67), dan usia ibu (AOR: 1.39 ; 95%CI: 1,16-3,93).*
Kesimpulan: *Praktik pemberian makanan pendamping ASI dipengaruhi oleh status pekerjaan ibu selama pandemi. Namun demikian, strategi lain untuk meningkatkan keragaman pangan MPASI diperlukan untuk mencegah malnutrisi pada anak dengan meningkatkan pengetahuan ibu terkait gizi anak, khususnya pada ibu bekerja.*

KATA KUNCI: *COVID-19;keanekaragaman pangan minimum; pemberian makanan pendamping ASI; status pekerjaan ibu*

ABSTRACT

Background: *Appropriate complementary feeding practices during the COVID-19 pandemic are challenging due to government policies to reduce the virus transmission in workplace such as changes of employment status including working from home . The changes of employment status, especially for working mothers was related to the dietary diversity of complementary feeding practice.*
Objectives: *This study aimed to analyze the impact of maternal employment status on Minimum Dietary Diversity (MDD) during the COVID-19 pandemic.*
Methods: *A cross-sectional study was conducted, and online self-administered questionnaires were used to collect data from 403 mothers of children ages 6-23 months who live in Java, Indonesia.*

Results: *Overall, 91.1% of the children met the criteria for MDD. In the adjusted model, children with mothers who work outside of home were associated with a reduced odds of meeting MDD (AOR: 0.85, 95%CI: 0.42-0.98). The factors related to MDD on complementary feeding practices were area of residence (AOR: 0.12; 95%CI: 0.03-0.54), child's age (AOR: 2.93; 95%CI: 1.12-7.67), and maternal ages (AOR: 1.39; 95%CI: 1.16-3.93).*
Conclusions: *Complementary feeding practices were impacted by maternal employment status during pandemic. However, other strategies to increase dietary diversity of complementary feeding are needed to prevent child malnutrition by increasing maternal knowledge related to child nutrition, especially for working mothers.*

KEYWORDS*:* *Complementary feeding; COVID-19, Minimum dietary diversity, Maternal employment status*

Article info:
Article submitted on December 23, 2023
Articles revised on December 39, 2023
Articles received on January 28, 2024

INTRODUCTION

The COVID-19 pandemic was first identified in Wuhan, China in 2019. The virus spread throughout the world, reaching Indonesia in 2020. Due to the highly contagious airborne transmission, several policies were applied related to physical restriction (1,2). In working environments, the government implemented work from home policies for non-essential businesses and work from office for essential businesses. Work from home policies were known to have positive impacts on employees such as shorter work duration that increases leisure time and family care responsibilities. However, work from home also could increase stress and depression (3). The changes of employment status, especially for working mothers, were related to the quality of infant feeding practice (4,5).

Infant feeding practices are an important aspect to improving child survival and promoting child growth and development. The first two years of a child's life are a crucial window of opportunity to assure growth and development (6). Appropriate infant feeding practices can prevent nearly 19% deaths of all under-five aged children (7). The World Health Organization (WHO) recommends children age 6-24 months should be given complementary food with continuing breastfeeding up to two years (8). Appropriate complementary feeding practices are required to support growth and development and to prevent growth faltering and malnutrition including stunting, wasting, and underweight (9–11). Complementary feeding practices incorporate several components including adequate nutrition, proper meal frequency based on the age of infants, and minimum required food groups or Minimum Dietary Diversity (MDD). Consumption of five or more food groups out of the eight food groups provided higher dietary quality and ability to meet daily energy and nutrient requirements (12).

A previous study in Daerah Istimewa Yogyakarta showed that 44% of infants had inappropriate complementary feeding during the COVID-19 pandemic (13). The research by Pradeilles et al from Peru found that the minimum dietary diversity score on complementary feeding was higher during COVID-19 than pre-COVID-19 pandemic (14). A study done in North West Amhara, Ethiopia showed that housewives or mothers who worked from home had twice the chance of meeting MDD (13,15).

Java is the center of the Indonesian economy, which has been affected by changes of employment status during COVID-19 pandemic. A national survey of appropriate complementary feeding practices during the COVID-19 pandemic was unavailable in Indonesia, especially in all

areas of Java Island. This study aimed to analyze the impact of maternal employment status on complementary feeding practices, especially MDD, during the COVID-19 pandemic, and factors associated with MDD of complementary feeding practice in Java, Indonesia.

MATERIALS AND METHODS

Study design

A cross-sectional study design was used with convenience sampling on 403 mothers with children aged 6-23 months during the COVID-19 pandemic who lived in Java, Indonesia. An online self-administered questionnaire from April 2022 to May 2022 was distributed through social media, including Instagram, WhatsApp, Line, Facebook, and Twitter. Data was collected from local community organizations, such as the Association of Indonesian Breastfeeding Mothers in the Java region as an efficient method to reach respondents. The study was approved by the Research Ethics Committee of Faculty of Health Sciences, Universitas Alma Ata (KE/AA/ VI/ 10832/ EC/ 2022). All protocols concerning the study participants were kept private and used exclusively for the purpose of the study. This protocol was carried out in compliance with the Declaration of Helsinki's principles. An informed consent form was signed digitally by the respondent before initiating the survey. The self-administered structured online questionnaire consisted of two parts (1) Sociodemographic characteristics (2) Food group consumption on complementary feeding.

Outcome variables

The outcome variables were complementary feeding practices including food group consumption and MDD. Food group consumption on complementary feeding was defined as children 6-23 months who consumed each food group on the previous day. The eight food groups recommendations based on Infant and Young Child Feeding (IYCF) from UNICEF and WHO 2021 (12) guidelines included (1) Breastmilk; (2) Grains, root, and tubers such as rice, noodle, cassava, potato, etc.; (3) Legumes, nuts, and seeds such as tempeh, tofu, beans, etc.; (4) Dairy products such as milk, cheese, yoghurt, etc. (5) Eggs; (6) Flesh food such as meat, poultry, fish, seafood, organ meats, etc.; (7) Vitamin A rich fruits and vegetables such as pumpkin, carrot, papaya, dark leafy vegetable, etc.; (8) Other fruits and vegetables such as apple, banana, cauliflower, etc. Appropriate MDD was defined as children who consumed foods and beverages from at least five out of eight defined food groups during the previous day.

Explanatory variables

The explanatory variables included sociodemographic characteristics, such as the area of residence of five provinces in Eastern Java, Central Java, Western Java, DI Yogyakarta, and DKI Jakarta, child's age (6-11, 12-17, and 18-23 months), child's gender (male and female), maternal educational level (low if junior high school and below, middle if senior high school, and high if the college or above), maternal ages (18-25, 26-35, and >36 years), maternal employment type (housewife/ unemployed, government employees, and private employees), maternal employment status (housewife/ unemployed, work from home, and work away from home), father's occupation (unemployed, government employees, and private employees), and household income level was defined based on median income quintiles (low if IDR <= 3.000.000, middle if IDR > 3.000.000 - 3.500.000, and high if IDR > 3.500.000). Maternal employment status was based on the mother's work location, work from home if the mother fulfilled their role from home instead of in an office environment, and work away from home if the mother fulfilled their role from an office or outside home environment, and housewife/ unemployed.

Data analysis

Food group consumption and sociodemographic data were analyzed using a descriptive analysis for frequency distribution. A Pearson's Chi-Square test ($p<0.05$) was used to conduct a bivariate analysis of food group consumption and maternal employment status. For adjusted analyses, multinominal logistic regression analysis was used to estimate the adjusted odds ratios and 95% confidence intervals

for the association between MDD and variables related to sociodemographic characteristics. Statistical analyses were computed using Statistical Package for Social Sciences (SPSS) 26 Software (IBM Corp, Armonk, NY).

RESULTS AND DISCUSSION

The number of total respondents **(Table 1)** were 403 mothers of children aged 6-23 months who lived in Java, Indonesia. Majority of respondents were from Western Java (32.5%) and were from low-income level households (55.3%). Most mothers were housewives/ unemployed (61.8%) and in the middle level of education status (64.3%). Among the working mothers, the majority were private employees (26.1%). Most mothers worked away from home (25%).

Table 1. Respondent Characteristic (N=403)

Characteristic	Frequency (n)	Percentage (%)
Area of residence		
Eastern Java	65	16.1
Central Java	109	27.0
Western Java	131	32.5
DI Yogyakarta	72	17.9
DKI Jakarta	26	6.5
Child's age		
6-11 months	166	41.2
12-17 months	155	38.5
18-23 months	82	20.3
Child's gender		
Male	212	52.6
Female	191	47.4
Maternal educational level		
High	3	0.7
Middle	259	64.3
Low	141	35.0
Maternal ages		
18-25 years	111	27.5
26-35 years	264	65.5
>36 years	28	8
Maternal employment type		
Housewife/ Unemployed	249	61.8
Government employees	49	12.2
Private employees	105	26.1
Maternal employment status		
Housewife/ Unemployed	249	61.8
Work from home	53	13.2
Work away from home	101	25.0
Father's occupation		
Unemployed	2	0.5
Government employees	115	28.5
Private employees	286	71.0

Household income level		
High	159	39.5
Middle	21	5.2
Low	223	55.3
Minimum Dietary Diversity (MDD)		
Yes	367	91.1
No	36	8.9

Table 2 shows that mothers who work away from home during the COVID-19 pandemic were statistically significant and have decreased odds of food group consumption, such as breast milk (OR: 0.42; 95%CI: 0.23-077), eggs (OR: 0.57; 95%CI: 0.35-0.93), and flesh food (OR: 0.53; 95%CI: 0.29-0.94). Plant based foods have no significant association with maternal employment status, including grains, root, and tubers; legumes, nuts, and seeds; vitamin A rich fruits and vegetables; and other fruits and vegetables. Minimum dietary diversity (OR: 0.46; 95%CI: 0.22-0.96) also decreased among mothers who work away from home than housewives/unemployed during the COVID-19 pandemic.

Table 2. Consumption of each food group on complementary feeding during COVID-19 pandemic by maternal employment status

Maternal employment status	Food group consumption				OR	95% CI	p-value
	Yes		No				
	n	%	n	%			
Breast milk							
Work away from home	77	76.2	24	23.8	0.42	0.23-0.77	0.005*
Work from home	45	84.9	8	15.1	0.74	0.32-1.73	0.488
Housewife/ unemployed	220	88.4	29	11.6	Ref		
Grains, root, and tubers							
Work away from home	94	93.1	7	6.9	0.34	0.23-1.65	0.339
Work from home	50	94.3	3	5.7	0.69	0.21-2.86	0.697
Housewife/ unemployed	238	95.6	11	4.4	Ref		
Legumes, nuts, and seeds							
Work away from home	76	75.2	25	24.8	0.78	0.45-1.35	0.381
Work from home	44	83	9	17	1.26	0.58-2.75	0.563
Housewife/ unemployed	198	79.5	51	20.5	Ref		
Dairy product							
Work away from home	83	82.2	18	17.8	1.49	0.83-2.69	0.178
Work from home	38	71.7	15	28.3	0.82	0.42-1.59	0.563
Housewife/ unemployed	188	75.5	61	24.5	Ref		
Eggs							

Maternal employment status	Food group consumption				OR	95% CI	p-value
	Yes		No				
	n	%	n	%			
Work away from home	61	60.4	40	39.6	0.57	0.35-0.93	0.025*
Work from home	44	83	9	17	1.84	0.85-3.96	0.121
Housewife/ unemployed	181	72.7	68	27.3	Ref		
Flesh food							
Work away from home	77	76.2	24	23.8	0.53	0.29-0.94	0.030*
Work from home	48	90.6	5	9.4	1.57	0.59-4.22	0.371
Housewife/ unemployed	214	85.9	35	14.1	Ref		
Vitamin A rich fruits and vegetables							
Work away from home	90	89.1	11	10.9	0.64	0.39-1.78	0.636
Work from home	49	92.5	4	7.5	0.69	0.41-3.77	0.696
Housewife/ unemployed	226	90.8	23	9.2	Ref		
Other fruits and vegetables							
Work away from home	73	72.3	28	27.7	0.77	0.46-1.31	0.340
Work from home	44	83	9	17	1.45	0.67-3.15	0.347
Housewife/ unemployed	192	77.1	57	22.9	Ref		
Minimum Dietary Diversity							
Work away from home	87	86.1	14	13.9	0.46	0.22-0.96	0.040*
Work from home	48	90.6	5	9.4	0.70	0.25-1.99	0.509
Housewife/ unemployed	232	93.2	17	6.8	Ref		

OR= Odd Ratio; CI = Confidence Interval; * Statistically significant at p-value <0.05

Based on multivariate analysis (**Table 3**), MDD was lower in children who lived in Eastern Java (AOR: 0.12; 95%CI: 0.03-0.54), Western Java (AOR: 0.24; 95%CI: 0.11-0.55), DI Yogyakarta (AOR: 0.37; 95%CI: 0.16-0.87) and had a working mother who worked away from home (AOR: 0.85; 95%CI: 0.42-0.98). The odds of MDD were increased among younger aged children (AOR: 2.93, 95%CI: 1.12-7.67) and children who had a mother who was 26-35-years-old (AOR: 1.39, 95%CI: 1.16-3.93).

Table 3. Multivariable logistic regression of factors associated with minimum dietary diversity on complementary feeding during COVID-19 pandemic

Characteristic	Minimum Dietary Diversity	
	COR (95% CI)	AOR (95% CI)
Maternal employment status		
Work away from home	0.46 (0.22-0.96)*	0.85 (0.42-0.98)*
Work from home	0.70 (0.25-1.99)	0.88 (0.33-2.49)
Housewife/ unemployed	Ref	Ref

Characteristic	Minimum Dietary Diversity	
	COR (95% CI)	AOR (95% CI)
Area of residence		
Eastern Java	9.94 (2.33-9.39)*	0.12 (0.03-0.54)*
Central Java	2.14 (1.10-4.15)	0.56 (0.28-1.13)
Western Java	4.85 (2.19-9.76)*	0.24 (0.11-0.55)*
DI Yogyakarta	2.52 (1.12-5.69)*	0.37 (0.16-0.87)*
DKI Jakarta	Ref	Ref
Child's age		
6-11 months	3.02 (1.23-7.40)*	2.93 (1.12-7.67)*
12-17 months	1.11 (0.67-1.84)	1.01 (0.92-6.23)
18-23 months	Ref	Ref
Child's gender		
Female	0.97 (0.60-1.57)	
Male	Ref	
Maternal educational level		
Low	0.16 (0.05-0.52)	0.43 (0.18-1.02)
Middle	1.12 (0.67-1.12)	4.49 (0.31-6.02)
High	Ref	Ref
Maternal ages		
18-25 years	1.40 (0.63-3.14)	1.22 (0.24-1.49)
26-35 years	2.57 (1.17-5.64)*	1.39 (1.16-3.93)*
>36 years	Ref	Ref
Maternal employment type		
Private employees	1.05 (0.47-2.34)	
Government employees	0.59 (0.35-1.00)	
Housewife/ unemployed	Ref	
Father's occupation		
Unemployed	1.46 (0.16-13.30)	
Informal worker	2.11 (0.22-19.82)	
Formal worker	Ref	
Household income level		
Low	0.70 (0.27-1.84)	
Middle	0.99 (0.59-1.64)	
High	Ref	

COR= Crude Odd Ratio; AOR= Adjusted Odd Ratio; CI = Confidence Interval; *Statistically significant at p-value <0.05

This study set out to analyze the impact of maternal employment status on complementary feeding practices during COVID-19 pandemic in Java, Indonesia using observational data from April – May 2022. The proportion of maternal employment with work from home or work away

from home status during COVID-19 were 13.2% and 25%, respectively. Maternal employment status had a role in providing appropriate complementary feeding, particularly with meeting the MDD indicator.

This research showed that 45% of working mothers tend to not meet the MDD indicator. Working mothers typically don't have enough time to prepare a variety of food for their children. Mothers who work from home could provide appropriate complementary feeding practice while they are working (16). Working mothers also might have increased workloads that might lead to psychological problems, especially during the COVID-19 pandemic with risk of virus exposure in their environment (17). Mental conditions of working mothers during COVID-19 pandemic could also limit a mother's ability to provide nutritious food (18). Working mothers who are stressed tend to prepare simple meals, which often incorporate low dietary diversity, low animal source food intake, and high cereal intake (19). Mothers' positive emotions were related to greater probability of providing healthy foods, healthy home food environments, and parental role modeling of healthy eating behavior (20). Maternal support systems, such as husbands who had understanding and cooperating attitudes were related to decreased maternal stress and fewer maternal mood disorders (21).

The present findings show significant associations between maternal employment status and breastfeeding practices. Mothers who worked away from home had 42% lower odds of breastfeeding their child compared to housewives/unemployed mothers. This result was similar to the previous study in Taiwan that found how breastfeeding practices decreased when mothers returned to work (22). Basrowi et al stated that 45% of working mothers in Indonesia had stopped breastfeeding because of returning to work (23). Maternal employment can be a barrier to breastfeeding practices when there is no adequate support from family and the workplace (24). Lactation counselors at work, lactation facilities, and support by colleagues at the workplace are critical to help working mothers continue breastfeeding practices (25–27).

Maternal employment status also significantly lowered the odd consumption of eggs and flesh food in complementary feeding, particularly with mothers who worked away from home. This result may be because of the higher workload of working mothers so they didn't have enough time to prepare complementary feeding for their children. Mothers did not have time to provide complementary feeding that required a long duration of processing, such as eggs and flesh food groups compared to other food groups. Eggs and flesh food groups tend to be consumed during weekends or other special occasions days when mothers have more free time to cook rather than on weekdays (28). Consumption of animal source protein foods, including eggs and flesh food will increase dietary diversity (29).

There were several factors influencing MDD compliance, such as area of residence, child's age, and maternal age. The Eastern Java, Western Java, and DI Yogyakarta residents tend to have lower odds of meeting the MDD standard rather than DKI Jakarta, Indonesia's capital city. This condition may be related to economic factors (30,31). Jakarta's minimum salaries are twice as high than other area. Furthermore, reduction of working hours and lay-offs during the COVID-19 pandemic resulted in a decrease of household income (32). A previous study that conducted in Ethiopia showed that a higher household monthly income and being in a higher wealth quintile were positively associated to providing food in adequate minimum dietary diversity for children. Households with high income or wealth provide the opportunity and ability to purchase diverse foods compared to households with low income (33).

Younger children (6-11) had increased odds of meeting the MDD indicator by 2.9 times. This result contrasts from a previous study in Nepal which stated that children 6–11 months and 12–17 months had higher odds of not meeting the MDD (34). This different result may be due to how the previous study used an old version of IYCF with 7 food groups of diverse diets, whereas this study used the new version of IYCF with 8 food groups, which includes breastmilk as one of the food groups. Breastmilk consumption of children 6-11 months was higher than in older children, which resulted in higher MDD compliance in younger children.

Children with a 26-35-year-old mother had

higher odds of meeting the MDD indicator (AOR=1.38, 95%CI: 1.16-3.93). The result is similar to the previous study by Costa et al which stated that children with young mothers tend to have lower dietary diversity score. Lower dietary diversity scores were caused by younger mothers feeding foods with more sugars, oils, as well as salty foods, and less meats, eggs, beans, fruits, and vegetables (35). MDD and maternal ages were correlated with education status and nutrition knowledge. Higher maternal education status correlated to having more knowledge of nutrition and a higher diverse meal preparation practice score (36). During COVID-19 social media was utilized to increase health and nutrition knowledge because of the decrease in accessibility to health services (37,38).

Limitations of this study included barriers to methods, such as only using an online questionnaire due to social distancing protocols. Our sample may be less representative in regard to the diversity of the Indonesian region. This study only represents mothers who can access the internet and fill out the online questionnaire.

CONCLUSIONS AND RECOMMENDATIONS

Most children in this study met the criteria for MDD (91.1%). Meeting the MDD requirements and providing appropriate complementary feeding practices can prevent child malnutrition. One of the factors that significantly decreased the odds of meeting the MDD criteria was employment status, especially with mothers who worked outside of the home. Nutrition interventions are needed to increase maternal nutrition knowledge and skills regarding the importance of providing complementary feeding with diverse food ingredients, especially to working mothers. Health promotion activities can be carried out during the pandemic by health workers utilizing social media to share nutrition education resources. Understanding the present complementary feeding practices during the COVID-19 lockdown will help public health authorities reshape future policies on child feeding recommendations when new pandemics and lockdowns occur.

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