

Determinants of Food Safety Practices among Mothers of Toddlers in Gedongkiwo Village, Mantrijeron, Yogyakarta

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Received: October 4, 2023

Revised: November 25, 2023

Accepted: December 25, 2023

Published: December 31, 2023

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DOI: [10.29303/jppipa.v9iSpecialIssue.6161](https://doi.org/10.29303/jppipa.v9iSpecialIssue.6161)

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Abstract: Food safety is very important, and the implementation of effective food safety practices among mothers is very important in mitigating the incidence of foodborne diseases in the vulnerable age group of toddlers. This research aims to determine the factors that influence food safety practices among mothers of toddlers in Gedongkiwo Village, Mantrijeron, Yogyakarta. This research uses a quantitative approach with analytical observational methods and a cross-sectional research design. The research population consisted of all mothers of toddlers in Gedongkiwo Village, totaling 462 mothers and a sample of 215 mothers. The sampling method used was proportional stratified random sampling. For data collection, a questionnaire was used as a research instrument. Data analysis included descriptive statistics, chi-square analysis, and binary logistic regression. The results showed that education level and employment status were associated with a 0.373 and 0.415 higher likelihood, respectively, for mothers of toddlers to adopt food safety practices. Based on the results, it was concluded that employment status was the factor most related to food safety practices.

Keywords: Food Safety Practice; Mother of Toddler; Working Status

Introduction

Food safety holds paramount significance due to the essential nature of food in daily human life. Food insecurity can lead to health complications, notably foodborne illnesses, particularly affecting vulnerable demographics like toddlers. In the year 2022, the World Health Organization (WHO) is expected to document an alarming annual incidence of 600 million cases of foodborne diseases, with children under the age of five accounting for 30% of the associated fatalities (World Health Organization, 2022). In the year 2020, Badan Pengawas Obat dan Makanan (BPOM) documented a total of 45 instances of exceptional events attributed to food poisoning. Among these cases, 49% were linked to food preparation within households, leading to illnesses and fatalities (Badan Pengawas Obat dan Makanan RI, 2020).

Food safety is a responsibility primarily shouldered by individuals who handle food, and in household settings, this responsibility typically falls on mothers in accordance with prevailing gender roles in Southeast Asia, including Indonesia (Miranti, Sulistyaningrum, and Mulyaningsih, 2022). Maintaining proficient food safety practices is of paramount importance for mothers, particularly in households with toddlers. Mothers are expected to exert extra effort in handling food conscientiously to ensure the well-being of their families (Ogotu et al., 2022). Prior research has identified that the presence of toddlers within a family can elevate stress levels and heighten the family's susceptibility to encountering food-related issues (Herrera-fontana et al., 2020). There is a correlation between food handling practices by mothers and the occurrence of diarrhea in toddlers, primarily due to the fact that toddlers' bodies are still in the

How to Cite:

Jannah, A.A., Suryani, D., & Sukesi, T.W. (2023). Determinants of Food Safety Practices among Mothers of Toddlers in Gedongkiwo Village, Mantrijeron, Yogyakarta. *Jurnal Penelitian Pendidikan IPA*, 9(SpecialIssue), 324-331. <https://doi.org/10.29303/jppipa.v9iSpecialIssue.6161>

developmental stage (Ashraf T Soliman, Nada M Alaaraj, and Alan D Rogol, 2022). Therefore, mothers must implement good safety practices to it is imperative for mothers to adhere to sound safety practices to safeguard their families from food-related hazards.

Numerous factors exert influence on food safety practices among mothers of toddlers. These factors encompass knowledge, attitudes, and individual characteristics such as education, age, the number of children, and employment status. Multiple studies have demonstrated that insufficient levels of knowledge can elevate the susceptibility to foodborne illnesses. Additionally, a lack of knowledge pertaining to food handling serves as a hindrance to the adoption of food safety practices (Dagne, Raju, Andualem, Hagos, and Addis, 2019; Soon, Wahab, Hamdan, and Jamaludin, 2020). Attitudes also play a pivotal role in shaping food safety practices, with a direct correlation observed between the adoption of sound food hygiene practices and positive attitudes towards food safety (Chekol, Melak, Belew, and Zeleke, 2019; Hossen et al., 2021; Soon et al., 2020). Educational level and maternal age also influence food handling and storage practices (Dagne et al., 2019; Odonkor, Kurantin, and Sallar, 2020). The number of children and employment status consistently exhibit associations with food safety practices (Odonkor et al., 2020; Zyoud et al., 2019).

Yogyakarta experiences a notably high population density, particularly among children under the age of five. According to data from the Yogyakarta City Health Service for the year 2022, there were 25,019 toddlers among a total population of 365,385 residents, and this population saw 4,219 cases of diarrhea in toddlers (Dinas Kesehatan Kota Yogyakarta, 2022). Mantrijeron, which is located in the city center, is listed as an area where cases of toddler diarrhea are often found. In the last three months, starting in August 2023, a total of 23 cases were found (Puskesmas Mantrijeron, 2023). Given this situation, it is imperative that food safety practices among mothers of toddlers be rigorously standardized to mitigate the health risks associated with unsafe food handling.

Numerous prior studies have emphasized the significance of implementing sound food safety practices among mothers of toddlers as a crucial measure in reducing the incidence of diarrhea cases in this age group (Chidziwisano, Slekiene, Kumwenda, Mosler, and Morse, 2019; Gautam and Curtis, 2021; Joshi, Kumar, and Masih, 2020; Manaseki-Holland et al., 2021; Natnael, Lingerew, and Adane, 2021). Therefore, enhancing food hygiene practices takes precedence in disease control efforts. Nevertheless, before undertaking interventions at the necessary scale, it is imperative to gain a more comprehensive understanding of the determinants involved. By understanding the factors

associated with food safety practices, education and training programs can be developed appropriately (Amosu, Adewoye, and Mustapha, 2020). This can not only improve the well-being of mothers and children but also encourage better food safety practices at the household level as a whole (Ayad, Abdulsalam, Khateeb, Hijazi, and Williams, 2022).

Research focused on food safety at the household level remains insufficient, particularly among mothers of toddlers in Yogyakarta. Gedongkiwo Village, situated within the Mantrijeron District of Yogyakarta, is recognized for its population of 462 toddlers. In the last three months since August 2023, it was recorded as the area with the highest number of diarrhea cases compared to other areas in Mantrijeron Village, namely 10 cases (Puskesmas Mantrijeron, 2023). Given this context, the implementation of robust food safety practices is deemed highly imperative. Moreover, the primary objective of this research is to identify the factors influencing food safety practices among mothers of toddlers residing in Gedongkiwo Village, Mantrijeron, Yogyakarta.

Method

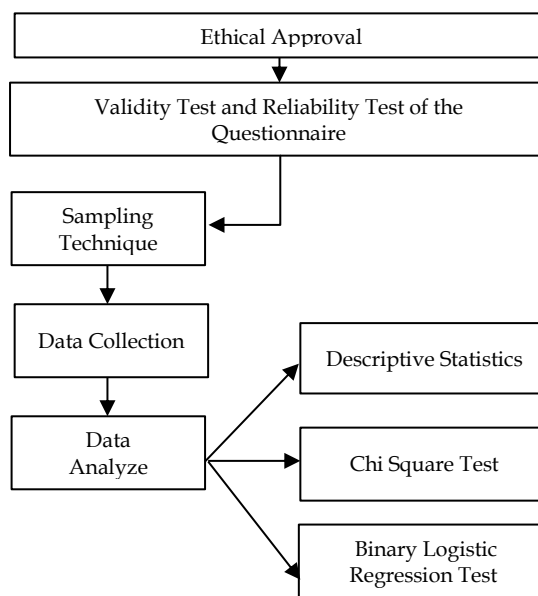


Figure 1. Research Flow

This research adopts a quantitative approach, employing analytical observational methods within a cross-sectional research design. The primary objective of this research is to ascertain the factors influencing food safety practices among mothers of toddlers. The research took place in Gedongkiwo Village, situated within the Mantrijeron District of Yogyakarta, during the period from August to October 2023. Ethical approval for this research has been obtained from the Ahmad Dahlan University Research Ethics Committee (KEP UAD)

under the reference number 012307131, which pertains to research involving human subjects.

The population under investigation for this research comprised 462 mothers of toddlers residing in the Gedongkiwo Village region. The research sample size was determined using the Slovin formula, leading to a sample of 215 individuals. This sample was selected through the application of the Proportional Stratified Random Sampling method among mothers of toddlers distributed across the jurisdiction of 18 Posyandu (Integrated Health Post) in Gedongkiwo Village. The respondents were chosen randomly utilizing a spinner tool. The selected respondents were subsequently visited at their homes to gather the necessary data. Researchers received assistance from health cadres within each Posyandu working area, along with one enumerator whose perspectives had been previously calibrated

Data collection was conducted using a questionnaire as the research instrument, which was created by the researcher and based on PERMENKES RI No. 1096/Menkes/Per/VI/2011, some of which are also modifications of the research questionnaire of da Vitória et al. (2021) and Odeyemi et al. (2019). Prior to its implementation, the questionnaire underwent validation and reliability testing. A total of 30 mothers of toddlers from one of the Posyandu in Mantrijeron Village, specifically in RW 01, were involved in this process. The results revealed that the knowledge questionnaire, comprising 22 statement items, exhibited validity with a Cronbach's alpha value of 0.948. Likewise, the attitude questionnaire, encompassing 21 statement items, demonstrated validity with a Cronbach's alpha value of 0.906, while the practice questionnaire, consisting of 20 statement items, displayed validity with a Cronbach's alpha value of 0.912.

The independent variables are education level, level of knowledge, attitudes, age, number of children, employment status of the mother of the toddler, the economic status of the family. The dependent variable tested was the food safety practices of mothers of toddlers. The collected data was analyzed using descriptive statistics, bivariate analysis with the Chi-square statistical test, and multivariate analysis with multiple logistic regression tests using SPSS version 25.

Result and Discussion

Tabel 1 explains the characteristics of research respondents. Of the 215 respondents, more than half each had a high level of education (66%), a good level of knowledge (60.5%), a good attitude (52.1%), and was an adult (79.1%). %, having ≥2 children (68.8%), not working (62.8%), family economic status at low level (77.7%), and good food safety practices (54%).

Table 1. Respondent Characteristics

Variable (n=215)	Frequency (n)	Percentage (%)
Level of education		
Low	73	34
High	142	66
Level of knowledge		
Poor	85	39.5
Good	130	60.5
Level of attitude		
Poor	103	47.9
Good	112	52.1
Age		
Adolescent	45	20.9
Adult	170	79.1
Number of children		
1 child	67	31.2
≥2 child	148	68.8
Working status		
Working	80	37.2
Not working	135	62.8
Economic status		
Low	124	77.7
High	91	42.3
Food safety practice		
Poor	99	46
Good	116	54

Based on the results of bivariate analysis with the Chi Square test presented in Table 2, it was found that the variables that had a significant relationship with food safety practices among mothers of toddlers were education level, knowledge level, attitude level and employment status. However, other variables such as age, number of children, and economic status were not found to be related to food safety practices among mothers of toddlers.

Table 2. The Result of Chi Square Test

Independent Variable	N	Food Safety Practices				COR (CI 95%)	P value
		Poor		Good			
		n	%	n	%		
Level of education							
Low	73	49	67.10	24	32.90	0.266 (0.146-0.484)	0.000
High	142	50	35.20	92	64.80		
Level of knowledge							

Independent Variable	N	Food Safety Practices				COR (CI 95%)	P value
		Poor		Good			
		n	%	n	%		
Poor	85	48	56.50	37	43.50	2.010 (1.154-3.500)	0.014
Good	130	51	39.20	79	60.80		
Level of attitude						2.828 (1.625-4.924)	0.000
Poor	103	61	59.20	42	40.80		
Good	112	38	33.90	74	66.10		
Age						1.818 (0.935-3.536)	0.078
Adolescent	45	26	57.80	19	42.20		
Adult	170	73	42.90	97	57.10		
Number of children						1.206 (0.676-2.150)	0.526
1 child	67	33	49.30	34	50.70		
≥2 child	148	66	44.60	82	55.40		
Working status						2.687 (1.520-4.749)	0.001
Working	80	49	61.30	31	38.80		
Not working	135	50	37.00	85	63		
Economic status						1.578 (0.912-2.730)	0.103
Low	124	63	50.80	61	49.20		
High	91	36	39.60	55	60.40		

This research reveals that mothers with higher levels of education tend to exhibit superior food safety practices. In theory, formal education is able to encourage someone to better understand various information or at least provide encouragement for awareness of something (Conner, 2020). These outcomes align with prior research indicating that higher levels of education are frequently associated with greater adherence to food safety guidelines (Ma, Chen, Yan, Wu, and Zhang, 2019; Madaki and Bavorova, 2019; Negassa, Ashuro, and Soboksa, 2022; Zenbaba et al., 2022). Higher education has the potential to positively influence food handlers, fostering a favorable attitude towards food safety practices and promoting their implementation (Dagne, Azanaw, Hagos, and Addis, 2021; Tuglo et al., 2021). These practices may encompass correct procedures for food handling, storage, and preparation, in addition to a heightened comprehension of hygiene (Auad et al., 2019; Kamboj, Gupta, Bandral, Gandotra, and Anjum, 2020).

Education empowers individuals with critical thinking skills, facilitating a deeper comprehension of health-related guidelines and enhancing the probability of their effective implementation (Pulimeno, Piscitelli, Colazzo, Colao, and Miani, 2020). Higher education typically offers increased access to information. Individuals with higher education levels may be more inclined to engage in activities such as reading educational materials, accessing online resources, or attending classes that offer insights into best practices for ensuring food safety for their toddlers (Yemane and Tamene, 2022).

The results from this research emphasize that a mother's level of knowledge regarding food safety practices has a substantial impact on her capability to

effectively implement these practices. As in the theory of Planned Behavior, knowledge can direct someone to understand or use it as a basis for taking action according to the information (Glanz, Rimer, and Viswanath, 2008). This observation aligns with earlier research, which similarly asserted that a higher level of knowledge correlates with improved food safety practices (Islam et al., 2022; Negash, Shaleka, and Ashenafi, 2022). Kamboj et al., (2020) additionally elucidated that knowledge empowers individuals to make informed decisions and embrace healthier behaviors. As mothers acquire knowledge regarding the hazards associated with improper food handling, they become more inclined to modify their behavior and proactively implement enhanced food safety measures, particularly when caring for their toddlers (Almanasrah et al., 2022; Hoffmann, Moser, and Saak, 2019).

Conversely, this research also uncovered that a mother's attitude towards food safety practices plays a significant role in determining her dedication to implementing these practices. As the Theory of Reasoned Action states, attitude is a strong factor determining intentions that lead to action (Conner, 2020). The association between maternal attitudes and the execution of food safety measures in the context of toddlers is a pivotal factor in establishing a secure and healthful environment for children (Yemane and Tamene, 2022). A positive attitude frequently translates into a readiness to acquire knowledge, adapt to new practices, and consistently implement food safety measures (Teshome, Yallew, Mulualem, Engdaw, and Zeleke, 2022).

The correlation between a mother's employment status has a significant impact on the adoption of food safety practices. This outcome aligns with prior research

that has indicated that employed mothers are more susceptible to exhibiting subpar food safety practices (Zyoud et al., 2019). Employed mothers frequently contend with time constraints that can impede their capacity to concentrate on household chores (Steiner, Krings, and Wiese, 2019). Juggling work and domestic

responsibilities can elevate levels of stress and fatigue (Chung, Chan, Lanier, and Wong, 2023). This situation can have an impact on a mother's energy and focus, affecting her ability to consistently maintain proper food safety practices and potentially resulting in lapses (Arfaoui, Mortada, Ghandourah, and Alghafari, 2021).

Table 3. The Result of a Binary Logistic Regression Test on Poor Food Safety Practices among Mothers of Toddlers

Independent Variable	Adj. OR	95% Confidence Interval		P value
		Lower	Upper	
Level of education (ref. High)				
Low	0.373	0.186	0.748	0.005
Level of knowledge (ref. Good)				
Poor	0.724	0.385	1.359	0.315
Level of attitude (ref. Good)				
Poor	0.551	0.296	1.025	0.060
Age (ref. Adult)				
Adolescent	0.705	0.340	1.463	0.348
Number of children (ref. ≥2 child)				
1 child	0.925	0.483	1.773	0.814
Working status (ref. Not working)				
Working	0.415	0.224	0.769	0.005
Economic status (ref. High)				
Low	0.925	0.481	1.780	0.816

Based on the results of the Binary Logistic Regression test presented in Table 3, correlations were identified for each variable after adjusting for other predictors. The outcomes indicate that both education level and employment status exhibit a significant relationship with food safety practices among mothers of toddlers. Specifically, when considering the adjustment for other independent variables, education level displayed a statistically significant correlation with food safety practices among mothers of toddlers. Mothers of toddlers with lower levels of education were found to be 0.373 times more inclined to engage in subpar food safety practices. Subsequently, it was observed that mothers of toddlers who were employed were 0.415 times more prone to engaging in suboptimal food safety practices, even after accounting for other independent variables. However, it's worth noting that other variables, such as knowledge level, attitude level, age, number of children, and economic status, did not show a statistically significant relationship with food safety practices among mothers of toddlers.

Based on the findings of this research, the most significant factor influencing food safety practices among mothers of toddlers is their employment status. The research was conducted in the city center area, where, on average, mothers are employed. The majority of employed respondents acknowledged that the care of their toddlers was entrusted to their parents or in-laws while they were at work. Consequently, mothers of toddlers find themselves unable to dedicate their full attention to food safety practices. Their limited

availability of time for household responsibilities, including the preparation of food with ample time to adhere to stringent food safety measures, is a contributing factor (Hunt et al., 2019; Kabir and Maitrot, 2017).

This is a shared concern among numerous parents, as the care of toddlers can be demanding and time-intensive. In theory, working too long hours means mothers don't fully devote time to housework and childcare (Mori, Asakura, Sasaki, and Nishiwaki, 2021). Striking a balance between childcare responsibilities and other household duties, including cooking, can indeed pose significant challenges (Del Boca, Oggero, Profeta, and Rossi, 2020). Furthermore, increasing awareness regarding the significance of food safety and offering educational initiatives on efficient and expedient food safety practices could prove to be advantageous (Ayaz, Priyadarshini, and Jaiswal, 2018; Dagne et al., 2021; Esfarjani et al., 2019).

This research has the potential to contribute valuable data that can enhance food safety practices among mothers of toddlers, thereby reducing the risk of food-related health issues in toddlers. It's important to acknowledge, however, that this research has its limitations, including the inability to generalize the results to other geographical areas. Within a localized context, this research has the potential to offer a comprehensive comprehension of food safety among mothers of toddlers. On a global scale, this research can furnish a broad overview of food safety practices among mothers of toddlers, thereby facilitating the

enhancement of these practices through the implementation of suitable interventions tailored to the influencing factors.

Conclusion

The determining factors for food safety practices found include level of education, level of knowledge, level of attitude, and employment status. The strongest factor is working status, which states that working mothers of toddlers tend to have poor food safety practices. The level of education, level of knowledge, and level of attitude are also significantly related to food safety practices among mothers of toddlers, so there is a need to increase awareness through health promotion or food safety training. Furthermore, additional research endeavors can explore various factors linked to food safety practices among mothers of toddlers by employing mixed-methods research methodologies.

Acknowledgments

We appreciate all parties who have helped and fully participated in this research, especially the Mantrijeron Community Health Center which has helped in providing work areas that can be researched and Ahmad Dahlan University Yogyakarta for all its support during this research.

Author Contributions

Conceptualization, A.A.J.; methodology, A.A.J., D.S., and T.W.S.; validation, A.A.J.; data analysis, A.A.J.; writing—preparation of original draft, A.A.J., D.S., and T.W.S.; writing—review and editing, A.A.J., D.S., and T.W.S. All authors have read and agreed to the published version of the manuscript.

Funding

This research was independently funded and did not receive external funding.

Conflicts of Interest

There is no conflict of interest with any party or anyone in this research.

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