WORKING STATUS, SOCIAL EATING AND DIET QUALITY AMONG THE INDONESIAN PRODUCTIVE-AGE POPULATION: A STUDY OF THE INDONESIAN FOOD BAROMETER

Alkanisa Rahma[1], Helda Khusun[1,2*], Indah Tasya Kamila[1], Judhiastuty Februhartanty[2,3]

[1]Universitas Muhammadiyah Prof. DR. HAMKA (UHAMKA), Jakarta, Indonesia

[2]Southeast Asian Ministers of Education Organization Regional Centre for Food and Nutrition (SEAMEO RECFON) – Pusat Kajian Gizi Regional, Universitas Indonesia, Jakarta, Indonesia

[3]Department of Nutrition, Faculty of Medicine, Universitas Indonesia – Dr. Cipto Mangunkusomo General Hospital, Jakarta, Indonesia

Email: hkhusun@gmail.com

ABSTRACT

The 2014 Total Diet Study reported that the dietary patterns among Indonesians remain inconsistent with the 2014 Balanced Nutrition Guidelines leading to low diet quality. Social eating has been shown to influence diet quality and may be influenced by working status. This study aims to determine the relationship between working status and social eating with diet quality among the productive-age population in Indonesia. This study employed a cross-sectional approach using secondary data from the 2018 Indonesian Food Barometer, with a sample of 271 respondents (135 men and 136 women) aged >18 years. Only subjects who completed 2x24 hr-recall were included in the study, while pregnant/breastfeeding women were excluded. Working status (defined as any income generating activities) and social eating (indicated by eating location, meal preparation, eating activities, and eating companions), as well as sociodemographic information were collected by interview. Diet quality (indicated by Balanced Nutrition Index or Indeks Gizi Seimbang) was calculated from 2x24 hr recall. Chi-square test revealed that working status and social eating had no significant relationship with diet quality. However, socioeconomic status had a relationship with diet quality (p = 0.026). Multivariate analysis further revealed that socioeconomic status was a dominant factor in diet quality among the productive-age population in Indonesia. Individuals with low socioeconomic status faced a 2.5-times higher risk of poor diet quality compared to those with high socioeconomic status.

Keywords: *adults, diet quality, social eating, working status*

INTRODUCTION

Because of its proven connection to health outcomes and the prevention of NCDs—the main causes of death on a global scale—such as diabetes, obesity, and cardiovascular disease—diet quality has shifted the spotlight in public health (Aigner et al., 2018; Fleet et al., 2023; Molendijk et al., 2018; Morze et al., 2020). For adults in their productive years, who contribute actively to economic productivity, maintaining an adequate diet is essential not only for individual health but also for broader social and economic stability. Diet quality, defined by the extent to which an individual's food intake aligns with dietary recommendations, is central to assessing nutritional adequacy and health risks (Alkerwi, 2014). However, a substantial proportion of the global adult population does not meet these dietary standards, with many consuming diets high in energy-dense, nutrient-poor foods, ultimately leading to adverse health outcomes (Swinburn et al., 2019; B. Zhang et al., 2023), which not only impair individual productivity but also place a considerable economic burden on healthcare systems (Rozjabek et al., 2020).

In Indonesia, national data from the 2014 Total Diet Study revealed a concerning dietary trends among adults, characterized by high reliance on cereals and vegetable proteins and low adherence to recommended vegetable and fruit intake (Siswanto et al., 2014). Excessive intake of sugar, salt, and fat has become prevalent, with levels nearing maximum recommended thresholds (Atmarita et al., 2016; Yunita et al., 2024). Multiple studies indicate that diet quality

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among Indonesians is generally low (Christy et al., 2021; Fariski et al., 2020; Khusun et al., 2023; Palupi et al., 2024; Sekarini et al., 2022; Stefani et al., 2018; Triatmoko et al., 2024. This pattern is evident among both men and women, though gender differences exist (Abassi et al., 2019)

Diet quality is shaped by a range of interrelated factors, including socioeconomic status and urbanization (Darmon & Drewnowski, 2008; McCullough et al., 2020), food availability (Ranjit et al., 2020), and consumption behavior (Thorpe et al., 2014). Urban populations, particularly those engaged in full-time employment, generally report lower diet quality compared to their rural counterparts (McCullough et al., 2020). The transition toward convenience-driven and social eating practices has further complicated dietary patterns, particularly in metropolitan areas (Febriana et al., 2024; Rodhiah et al., 2023) . With increasing work demands, many individuals rely on meals consumed outside the home due to time constraints and limited access to home-cooked food (Y. Zhang et al., 2023). Eating out has been consistently linked to higher intake of calorie-dense and nutrient-poor foods, which negatively affects diet quality. Additionally, social eating influences food choices and portion sizes, as individuals tend to mimic the eating behaviors of their companions, often leading to overconsumption of unhealthy foods (Chae et al., 2018; Higgs & Thomas, 2016; Poulain et al., 2020; Sobal & Nelson, 2003). Furthermore, employment status introduces a paradoxical influence ; while financial resources may enhance access to a variety of food options, (Martin et al., 2017; Paludi & Juwita, 2021).). workplace routines, and long commuting hours often increase reliance on external food sources, which may not adhere to dietary recommendations (Febriani et al., 2023). This dynamic underscores the complexity of maintaining a high-quality diet amidst evolving social and occupational environments.

This study focuses on the relationship between social eating, employment status, and diet quality, with particular attention to lunch consumption. Lunch is a critical meal, contributing significantly to daily nutrient intake, yet it poses specific challenges for employed individuals (Al-Faida, 2021). The social aspect of lunch, where meals are often consumed with colleagues, friends, or clients, further complicates dietary choices. Given that working individuals are more likely to dine out due to professional commitments, understanding the impact of workplace-based social eating on diet quality is essential for developing effective nutritional interventions. The study utilizes the Balanced Nutrition Index or *Index Gizi Seimbang* (IGS) to assess how closely individuals' dietary intake aligns with national dietary recommendations (Rahmawati et al., 2015).. By examining the intersection of employment status and social eating, this research aims to provide insights into the broader determinants of diet quality among Indonesian adults, ultimately informing policies that promote healthier food environments in both professional and social settings.

METHODS

The researchers in this study used secondary data collected from the 2018 Indonesian Food Barometer in a cross-sectional fashion. This study used all data from participants who met the inclusion criteria, namely individuals aged between 19 and 64 years with two 24-hour dietary recalls conducted on weekdays and weekend. Pregnant and/or breastfeeding women were excluded from this study. Of the 271 individuals who completed two 24-hour recalls, 212 reported having lunch during the survey and were included in the analysis.

The data collected included subject characteristics (age, education, employment status, socioeconomic status, residency) and social eating during lunchtime (location, preparation, activities, and companions), two non-consecutive 24 dietary recall and lunch habits obtained from the respondents' meal times. The 24-hour recall data were converted into nutrients using NutriSurvey software using the Indonesia's Food Composition Table. Balanced Nutrition Index (Index Gizi Seimbang/IGS) were then calculated using the methodology reported by Rahmawaty et al. (2015) to derive the IGS3-60. IGS3-60 assessed six nutrients and food groups, namely carbohydrates, animal protein, nuts, vegetables, fruits, and milk, without considering total fat,

saturated fat, cholesterol, added sugars, and sodium (Rahmazahra Danty et al., 2019). Possible total score of IGS3-60 was 60 (sixty). The IGS3-60 categorizes diet quality into five: poor (<24), lacking (24-32), moderate (33-41), good/sufficient (42-50), and very good (≥51) (Amrin et al., 2013).

A Chi-square test was employed to examine the relationship between the independent and dependent variables, and multiple logistic regression was employed to determine the most important elements linked to the quality of the food. "The Faculty of Health Sciences at Syarif Hidayatullah State Islamic University in Jakarta's Health Research Ethics Committee gave its stamp of approval to this study (Un.01/F.10/KP.01.1/KE.SP/08.08.007/2024)".

RESULTS AND DISCUSSION

Table 1 displays the characteristics of the study's respondents. The findings revealed that the vast majority of participants (78.2%) were within the age bracket of 19–44. Most respondents had attained at least high school level, accounting for 64.6%, while those with education level of junior high school level were fewer. Employment was more common among respondents, with 58.3% being employed. Additionally, a higher proportion of respondents (36.5), fell into the low socioeconomic status. Urban residency was also more common, with 62.4% residing in urban areas as opposed to rural areas.

Table 1. Characteristics of Respondents

Variable	n	(%)
Gender		
Male	135	49.8
Female	136	50.2
Total	271	100
Age		
19-44 years	212	78.2
45-60 years	35	19.6
61-64 years	6	2.2
Total	271	100
Education Level		
(≤JHS	96	35.4
≥SHS	175	64.6
Total	271	100
Employment Status		
Unemployed	113	41.7
Employed	158	58.3
Total	271	100
Socioeconomic Status		
T1 (Low)	99	36.5
T2 (Medium)	77	28.4
T3 (High)	95	35.1
Total	271	100
Residency		
Urban	169	62.4
Rural	102	37.6
Total	271	100

Social Eating

Table 2 shows that 76.3% men and 80.1% women reported eating lunch. Among men, a higher proportion ate lunch outside the home (84.5%) compared to women (68.8%). A higher proportion of men (83%) are working than women (37,4%).

Cooking was the most common method of lunch preparation for both men (68.9%) and women (77.1%), rather than ordering meals. Among men, 50.5% reported only eating during lunch without additional activities, whereas 59.6% ate lunch while doing other activities. Additionally, 59.2% and 63.3% ate lunch alone.

Diet Quality

Table 3 shows overall diet quality score was very low for both men and women, scoring only 20 for men and 15 for women out of a possible total score of 40. There was only minor differences in the average intake of food components between men and women. Men tended to have a higher median intake across most food components compared to women, except for fruits. Nonetheless, the median IGS3-60 scores for each component are different only in the nuts for men and women, with men scoring higher than women. In addition, the median of total IGS3-60 score is higher in men than in women. Figure 1 shows that poor diet quality was predominant among both men (79.6%) and women (87.2%). This low diet quality can be attributed to limited food diversity, due to monotonous food choices, personal food preferences, and socioeconomic status (Rahmasari et al., 2022). Low food diversity may be influenced by a lack of awareness of food quality, purchasing power, and food availability (Stefani et al., 2018).

Table 2. Lunchtime Habits and Social Eating by Gender

Variable	Category	Gender			
		Male		Female	
		n	%	n	%
Lunch Habits	Not having lunch	32	23.7	27	19.9
	Having lunch	103	76.3	109	80.1
	Total	135	100	136	100
Lunch Location*	Eating at home	16	15.5	75	68.8
	Eating out	87	84.5	34	31.2
	Total	103	100	109	100
Lunch Preparation*	Cooking	71	68.9	84	77.1
	Ordering	32	31.1	25	22.9
	Total	103	100	109	100
Lunchtime Activities*	Only eating	52	50.5	44	40.4
	Eating while doing activities	51	49.5	65	59.6
	Total	103	100	109	100
Lunch Companion*	Eating alone	61	59.2	69	63.3
	Eating with others	42	40.8	40	36.7
	Total	103	100	109	100

*Only for respondents who had lunch

Table 3. Average Intake, IGS3-60 Score, and Total IGS3-60 Score of Food Components

Food Components	Average Intake (g)	IGS3-60 Score	Total IGS3-60 Score
	Median (Min-Max)	Median (Min-Max)	Median (Min-Max)
Male			
Carbohydrates	366 (0-902)	5 (5-10)	20 (5-40)
Vegetables	82 (0-331)	0 (0-10)	
Fruits	7 (0-425)	0 (0-10)	
Animal Protein	124 (0-835)	5 (0-10)	
Legumes	59 (0-536)	5 (0-5)	
Milk	0 (0-220)	0 (0-10)	
Female			
Carbohydrates	306 (60-677)	5 (5-10)	15 (5-40)
Vegetables	65 (0-332)	0 (0-10)	
Fruits	21 (0-319)	0 (0-10)	
Animal Protein	123 (0-416)	5 (0-10)	
Legumes	38 (0-183)	0 (0-5)	
Milk	0 (0-225)	0 (0-10)	

Relationship between Employment Status and Diet Quality

Table 4 indicates no significant relationship between employment status and diet quality (p=0.374). This finding is consistent with the study by Assumpção et al. (2018) which, when comparing women in the labor force with those without jobs on the Brazilian Healthy Eating Index-Revised (BHEI-R), discovered no significant difference in the quality of their diets. This result, however, contradicts the work by other researchers, which found employed individuals demonstrating better diet quality compared to those unemployed (Martin et al., 2017; Nurpratama et al., 2022). The lack of a significant relationship between employment status and diet quality may be due to time constraints, workplace food environments, and

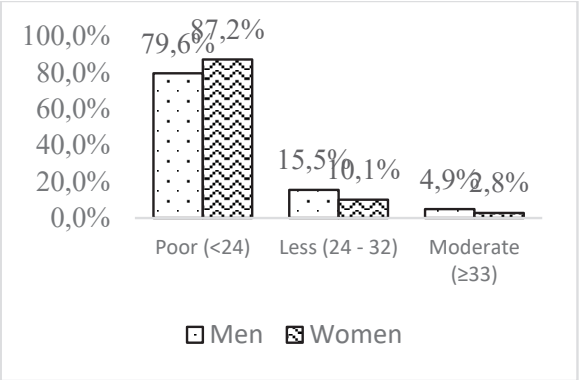

Figure 1. Diet Quality by Gender

Table 4. Relationship between Employment Status and Social Eating with Diet Quality

Variable	Diet Quality Based on IGS3-60				p-value
	Poor		Less		
	n	(%)	n	(%)	
Employment Status					
Unemployed	75	86.2	12	13.8	0.374
Employed	102	81.6	23	18.4	
Lunch Location					
Eating at home	80	87.9	11	12.1	0.133
Eating out	97	80.2	24	19.8	
Lunch Preparation					
Cooking	129	83.2	26	16.8	0.864
Ordering	48	84.2	9	15.8	
Lunchtime Activities					
Only eating	82	85.4	14	14.6	0.492
Eating while doing activities	95	81.9	21	18.1	
Lunch Companion					
Eating alone	110	84.6	20	15.4	0.579
Eating with others	67	81.7	15	18.3	

cultural factors influencing dietary habits. While employment provides financial resources for healthier food choices, it also increases reliance on external meals, which may not always align with dietary recommendations (Fernandez et al., 2019). Other factors, such as education level, nutritional awareness, and food access, likely have a stronger impact on diet quality than employment alone. This aligns with studies suggesting that knowledge and accessibility play a greater role in shaping dietary patterns than income or job status, explaining the inconsistent findings (Ranjit et al., 2020; Thorpe et al., 2014).

Relationship between Lunch Location and Diet Quality

Table 4 indicates no significant relationship between lunch location and diet quality (p=0.133), contrasting with studies that found associations between dining location and diet quality. For instance, Pimenta et al. (2022) reported that individuals who ate out tended to have lower diet quality compared to those who ate at home. Similarly, Gorgulho et al. (2013) found a significant relationship (p=0.008) between lunch location and diet quality, with lunches consumed outside the home having a lower Meal Quality Index (MQI) score than those consumed at home. Additionally, Todd et al. (2010) observed that eating out, referred to as Food Away From Home (FAFH), can increase daily calorie intake and reduce diet quality.

The lack of a significant association in this study may be attributed to the widely varied nutritional quality of meals consumed outside. Some dining venues offer healthier options that align with dietary guidelines, potentially mitigating negative impacts on diet quality. Moreover, health consciousness and nutritional knowledge of individual may influence food selections when eating out, leading to healthier choices irrespective of the dining location. Furthermore, variations in study methodologies, such as differences in dietary assessment tools, definitions of eating locations, and sample characteristics, could contribute to inconsistent findings across studies. Therefore, while previous research has often linked eating out with poorer diet quality, this study's findings suggest that the relationship between lunch location and diet quality is complex and may be influenced by various contextual and individual factors.

Relationship between Lunch Preparation and Diet Quality

Table 4 indicates no significant relationship between lunch preparation and diet quality with a p-value of 0.864. This finding is in contrast with the study by Thorpe et al. (2014) which found a significant relationship ($p < 0.001$) between ordering meals and diet quality among adults, as measured by the DGI, with an average DGI score

of 102.2. Additionally, this finding is in contrast with the study by Tiwari et al. (2017) which found a significant relationship between home-cooked meals and good diet quality. Similarly, Mancino et al. (2009) suggested that ordering meals is associated with high calorie intake and low diet quality, as measured using the HEI-2005.

The absence of a significant association in this study may be attributed the fact that nutritional quality of meals is not solely determined by the location or method of preparation but also by the specific food choices. Individuals who prepare meals at home may still opt for less nutritious ingredients or cooking methods high in fats and sugars, while those purchasing meals might select healthier options, thereby diminishing differences in diet quality based on preparation location alone. Moreover, nutritional knowledge, cooking skills, and health consciousness may play pivotal roles in dietary choices. Individuals with higher nutritional awareness and cooking proficiency are more likely to prepare balanced meals, irrespective of whether the food is home-cooked or purchased. Conversely, those with limited nutritional understanding may not achieve better diet quality even when cooking at home.

Relationship between Lunchtime Activities and Diet Quality

Table 4 shows that there was no statistically significant correlation (p = 0.492) between lunchtime activities and dietary quality. This result agrees with the research by Shams-White et al. (2021) according to which there was no discernible change in the aggregate HEI-2015 ratings among those who ate while engaging in other activities, such as watching television or using a computer, and those who did not. Holm et al. (2015) found a relationship between watching television while eating and diet quality in Denmark and Sweden. However, the study found no such relationship in Finland and Norway.

The lack of a significant relationship between lunchtime activities and diet quality may be due to individual behavioral variations and cultural differences in eating habits. While some studies indicate that distractions during meals, such as watching television, are linked to poorer diet quality, others suggest that the impact varies by population and context (Avery et al., 2017). Factors like personal dietary awareness, meal planning habits, and food choices may outweigh the effects of eating while multitasking.

Relationship between Lunch Companion and Diet Quality

Table 4 shows that there was no statistically significant correlation (p = 0.579) between the quality of a person's diet and the company they kept while eating lunch. This result agrees with the research by Pachucki et al. (2018) which failed to detect a correlation between eating with others at lunch and nutritional status, as measured using the HEI-2010 and the Dietary Approaches to Stop Hypertension (DASH). In contrast, Chae et al. (2018) discovered a strong correlation between people' quality of nutrition and the frequency with which they eat alone in Korea, suggesting that individuals who ate alone tended to have low diet quality.

The absence of a significant correlation between lunchtime companionship and diet quality may result from cultural differences influencing social eating norms and dietary habits. Additionally, individual factors such as personal dietary preferences, time constraints, and socioeconomic status can impact diet quality, potentially dominating the influence of social dining contexts.

Sociodemographic factors associated with Diet Quality

Table 5 shows the association between sociodemographic factors and diet Quality. The table indicates no significant difference between gender and diet quality (p=0.139). However, the proportion of men having poor diet quality (79.6%) was less than women (87.2%). This finding is consistent with research conducted by Abassi et al. (2019) among productive-age adults, showing that diet quality in women is slightly lower than that of men, as women tend to consume less red meat and consume more sweet foods than men. Specifically in Indonesia, recent research shows that adult women have poor diet quality (Stefani et al., 2018).

Table 5 further shows that age was not associated with diet quality (p=0.359), but

Table 5. Factors Associated with Diet Quality

Variable	Diet Quality Based on IGS3-60				p-value
	Poor		Less		
	n	(%)	n	(%)	
Gender					
Male	82	79.6	21	20.4	0.139
Female	95	87.2	14	12.8	
Age					
Young adults (19-44 years)	139	84.8	25	15.2	0.359
Middle adulthood (45-64 years)	38	79.2	10	20.8	
Education Level					
Low education	67	85.9	11	14.1	0.471
Higher education	110	82.1	24	17.9	
Socioeconomic Status					
Low	76	90.5	8	9.5	0.026
High	101	78.9	27	21.1	
Residency					
Urban	106	82.8	22	17.2	0.743
Rural	71	84.5	13	15.5	

young adults had slightly poorer diet quality than middle age adults. This finding is consistent with research conducted by Panizza et al. (2020), which indicated that middle-aged adults tend to have slightly better diet quality compared to young adults. Similarly, Sakai et al. (2017) studied a female population in Japan and found that young adults had slightly lower diet quality compared to middle-aged adults. This may be attributed to younger individuals consuming higher amounts of sodium and added sugars while eating fewer vegetables and fruits than older adults (Grech et al., 2017).

Furthermore, Table 5 also shows no significant difference between education level and diet quality (p=0.471). This finding is consistent with research conducted by Gardiarini et al. (2024). In contrast, Kang et al. (2019), Pestoni et al. (2019), and Thorpe et al. (2019) found that education level had a significant relationship with diet quality, with higher education levels being associated with good diet quality.

A significant association was found between socioeconomic status and diet quality (Table 5). Low socioeconomic status individuals are associated with poorer diet quality. This finding is consistent with research conducted by Livingstone et al. (2017). Low-income households have lower diet quality as they tend to buy less "healthy" foods compared to high-income households (French et al., 2019a). Similarly, Hiza et al. (2013) suggested that higher diet quality, as indicated by adherence to dietary guidelines, is associated with higher socioeconomic status.

Table 5 further shows that there was no significant relationship (p=0.743) between residency and diet quality. This finding is in contrast with research conducted by Sartika (2018) in Indonesia, suggesting that adults living in rural areas have better diet quality compared to those living in urban areas. On the contrary, other research showed that the diet quality of people living in urban areas is higher than that of those living in suburban and rural areas, that could be attributed to the fact that people living in suburban and rural areas tend to consume more grains and less vegetables and meats (Gao et al., 2022). This is also influenced by local food availability, as urban shopping centers typically offer a wider range of food options compared to those in rural areas.

Table 6 presents the final results of the multivariate analysis, indicating that only socioeconomic status had a significant relationship with diet quality among productive-age adults in Indonesia, with a p-value of 0.030. The odds ratio (OR) for socioeconomic status variable is 2.540, suggesting that respondents with low socioeconomic status are 2.540-times more likely to have poor diet quality compared to those with high socioeconomic status. This shows that socioeconomic status plays an important role in determining a person's access to nutritious and healthy food. Individuals with low socioeconomic status often face limitations in terms of income, education, and access to markets that provide nutritious foods, such as fruits, vegetables, and other fresh produce. They are more likely to rely on cheaper and more accessible foods, which are often high in calories but low in nutrition. In contrast, individuals with high socioeconomic status usually have more resources to purchase healthy and nutritious food, and have more knowledge about healthy eating patterns. These

Table 6. Most Dominant Factors Associated with Diet Quality among Productive-Age Population in Indonesia

Variable	p-value	OR	CI 95%
Lunch location	0.401	1.482	0.591-3.712
Gender	0.125	0.557	0.264-1.176
Socioeconomic status	0.030	2.540	1.093-5.902

findings are in line with previous studies showing that socioeconomic status can influence eating patterns, which in turn affect overall health. Additionally, education about the importance of nutrition and healthy eating patterns is also more accessible to those with higher socioeconomic status, which may strengthen their ability to make better food choices (French et al., 2019; Kang et al., 2019; Livingstone et al., 2017; Pestoni et al., 2019; Thorpe et al., 2019).

CONCLUSION

The results of the study showed no significant relationship between employment status and social eating with diet quality among Indonesia's productive-age population. This may be attributed to the generally poor diet quality observed among most respondents, both men and women. However, a significant relationship was found between socioeconomic status and diet quality. The multivariate analysis revealed that socioeconomic status significantly influenced diet quality (p=0.030), with individuals of low socioeconomic status being 2.5 times more likely to have poor diet quality.

The Balanced Nutrition Index used in this study as an instrument to assess diet quality only looks at dietary adequacy without considering other components such as moderation and variety, thus providing a limited perspective on overall diet quality. Therefore, future research should investigate factors that may influence diet quality in Indonesia's adult population, such as nutritional status, health status, nutrition-related knowledge, and stress levels using the Balanced Nutrition Index by adding elements of moderation.

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