Original Research

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The relationship between sociodemographic factors and awareness of a balanced diet among adults in Kediri, East Java

Hubungan antara faktor sosiodemografi dan kesadaran pola makan seimbang pada orang dewasa di Kota Kediri, Jawa Timur

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Abstract

Background: Awareness refers to a person 'scomprehension of a certain topic and realization that the topic is important for them. Lack of awareness of a balanced diet can lead to nutrient-related diseases, such as obesity, heart disease, diabetes, or iron deficiency, resulting in excess or deficient diet intake. Data from 2022 states that more than 1 billion people worldwide suffer from obesity, including 650 million adults, 340 million adolescents, and 39 million children.
Objectives: This study aimed to identify demographic factors (sex, age, education level, and income level) associated with nutritional awareness. Research.
Methods: A cross-sectional online survey using accidental sampling of 581 respondents aged 15–70 years was conducted in Kediri between March 4 and 14, 2025. The survey collected respondents' sociodemographic attributes and nutritional awareness. Spearman and Chi Square test were performed to asses correlation between variables using SPSS version 26 for MacOS.
Results: Some sociodemographic attributes were significantly correlated with dietary awareness (age, $p < 0.000$, $r = 0.207$; income, $p = 0.000$, $r = 0.162$; and sex, $p = 0.000$, $r = 0.252$) but not with nutritional awareness (p values = 0.000, p-values = 0.000, p-values = 0.000); in contrast, the level of education was not correlated with nutritional awareness ($p = 0.512$).
Conclusion: Some sociodemographic attributes (age, income, gender) correlate with nutritional awareness while education level has no relationship.

Keywords:
Nutrition, Awareness, Sociodemographic Factors.

Abstrak

Latar belakang: Kesadaran (*awareness*) adalah konsep yang menjelaskan seseorang memiliki pengetahuan/pemahaman dalam hal tertentu sekaligus merasa bahwa hal yang dipahami adalah hal yang penting dalam hidupnya. Kurangnya kesadaran akan diet seimbang dapat mengakibatkan penyakit terkait gizi yang meliputi kelebihan dan kekurangan pola makan, seperti obesitas, penyakit jantung, diabetes atau kekurangan zat besi. Data tahun 2022 menyebutkan bahwa lebih dari 1 miliar orang di seluruh dunia menderita obesitas, 650 juta diantaranya adalah orang dewasa, 340 juta remaja, dan 39 juta adalah anak-anak.
Tujuan: Penelitian ini bertujuan untuk mengidentifikasi faktor demografi (jenis kelamin, usia, tingkat pendidikan, dan tingkat pendapatan) terhadap tingkat kesadaran gizi.
Metode Penelitian: Survei cross sectional secara daring menggunakan teknik accidental sampling terhadap 581 responden berusia 15-70 tahun dilakukan di Kediri antara tanggal 4-14 Maret 2025. Survei ini mengumpulkan data

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sosiodemografi dan kesadaran gizi responden. Uji Spearman dan Chi Square dilakukan untuk menentukan korelasi antar variabel menggunakan SPSS versi 26 untuk MacOS.
Hasil: Beberapa aspek sosial demografi memiliki hubungan dengan kesadaran gizi (Usia p:0,000 r: 0,207; pendapatan p:0.000 r: 0,162 ; jenis kelamin p: 0.000 r:0,252). Meskipun berkorelasi, tingkat korelasinya lemah. Sedangkan tingkat pendidikan tidak memiliki korelasi dengan kesadaran gizi (nilai-p 0,512).
Kesimpulan: Beberapa atribut sosiodemografi (usia, pendapatan, jenis kelamin) berkorelasi dengan kesadaran gizi, sedangkan tingkat pendidikan tidak memiliki hubungan.

Kata Kunci:
Gizi, Kesadaran, Faktor Sosiodemografi

Introduction

Fpidemiological trends in most countries show that non-communicable diseases (NCDs) are the primary causes of death. NCDs, including cardiovascular disease, stroke, cancer, diabetes, and chronic lung disease, are collectively responsible for 74% of deaths worldwide. More than three-quarters (86%) of deaths due to NCDs, or approximately 17 million people, die before life expectancy, especially in low- and middle-income countries (WHO, 2023). The Indonesian Ministry of Health reports that in the last two decades, NCDs have become the main cause of increasing health costs paid by the government. Approximately 23.9%–25% of health costs are spent on NCDs, with the highest costs incurred for four catastrophic diseases: heart disease, kidney failure, cancer, and stroke (Kurniawan & Aristianti, 2021). These diseases are mainly caused by an unbalanced diet, including excessive consumption of sugar, fat, and sodium, and a lack of physical activity.

Currently, people consume more ultra-processed foods that contain high amounts of sugar, salt, and saturated fats along with processed carbohydrates. In other words, the current dietary trend does not follow health guidelines and lacks healthy foods rich in macronutrients and micronutrients, such as vegetables, fruits, and grains (Riyanto et al., 2023; Russell et al., 2023). This unbalanced diet and lack of exercise can lead to obesity and NCDs. According to data from 2022, more than 1 billion people worldwide suffer from obesity, of whom 650 million are adults, 340 million are adolescents, and 39 million are children. Obesity in the adult population has significantly increased from 13% in 2018 to 23% in 2023 globally (Volpi, 2022). The rise in obesity prevalence should be a wake-up call for governments and communities to take action before the problem worsens.

There are several factors that shape balanced dietary behavior. These factors can be internal to individuals, such as gender, age, education, income, and knowledge, and external, such as peer pressure and government policies. Both internal and external factors should be comprehensively understood to create effective policies. Without a clear understanding of the underlying causes of dietary behavior, policies will be ineffective, inefficient, and will waste government budgets (Al-Jawaldeh & Abbass, 2022; Herdiani et al., 2021; Vilar-Compte et al., 2021).

Most research addresses how personal knowledge and attitudes shape dietary practices. However, little research has addressed awareness and its correlation with dietary behavior in Indonesia. This lack of research on dietary awareness can limit interventions that focus solely on increasing public knowledge without fostering awareness and encouraging balanced dietary practices.

Most dietary programs in Indonesia aim to increase knowledge. However, these programs have not yet supported awareness and balanced dietary habits. The government is striving to increase knowledge through education and healthier choice labels for packaged foods. However, labeling interventions have lacked effectiveness compared to the traffic light rating label system in France or negative messaging on foods high in sugar, salt, and fat implemented in Mexico (Santos et al., 2020; Vargas-Meza et al., 2019). Furthermore, there is a lack of provisions for over-claiming health products, such as claiming to contain fiber and reduce the risk of health diseases (Shendy & Mamonto, 2023).

Therefore, this study aimed to identify sociodemographic factors (sex, age, education level, and income level) and their correlations with balanced dietary awareness. The results of

this study can serve as a data basis for the development of public health policies on dietary programs and NCD prevention by the government.

Metode

This research is a cross-sectional study using an online survey as a data collection method. The survey was conducted in Kediri (both the city and region) from May 4 to May 14, 2025. The population was all people aged 15-70 years. The sampling technique was accidental sampling, and the number of samples was 581 respondents. The inclusion criteria were those aged 15 and above who agreed to be respondents. Information about the research was disseminated through social media (WhatsApp and Instagram).

An online, self-administered questionnaire was provided to the respondents. Informed consent, which consisted of the research purposes, benefits for respondents, and data confidentiality procedures, was on the first page. Only those who agreed to be respondents could continue to answer the questions. The data collected included the respondents' sociodemographic attributes (age, gender, education, and income) and their awareness of a balanced diet. The questionnaire for the dependent variable was derived from the 10 principles of a balanced diet issued by the Indonesian Ministry of Health. The questionnaire consisted of ten questions using a Likert scale and was tested for validity and reliability.

The statistical tests used were Spearman ’s correlation and chi-square tests to identify correlations between sociodemographic attributes and balanced dietary awareness. Spearman’s correlation test was used for variables related to age, education, and income because the data scale is ordinal. In contrast, the chi-square test was used for sex because the variable is nominal. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 26 for MacOS. Previously, the nutrient awareness questionnaire was tested for validity and reliability, and the results showed that the questionnaire is valid and reliable. The research procedure was approved by the STRADA Health Research Ethics Committee with approval number 0723744/EC/KEPK/I/05/2025.

Result

Respondent Demographic Characteristics

The demographic attributes collected in this study are sex, age, income level, and education. In more detail, the demographic characteristics of respondents can be seen in the following table:

Table 1. Demographic characteristics of respondents (n = 581)

Variables	n	%
Sex		
Male	122	21
Female	459	79
Age (years)		
<20	42	7.2
20–29	281	48.4
30–39	220	37.9
40–49	33	5.7
>49	5	0.9
Education		
Elementary	4	0.7
Junior High School	23	4
Senior High School	279	48
Degree	275	47.3
Income (IDR)		
0–1 Million	199	34.3
1.1–2.5 Million	147	25.3
2.6–5 Million	180	31
5.1–10 Million	47	8.1
>10 Million	8	1.4
Awareness		
Poor	191	32.9
Partial	201	34.6
Good	189	32.5

The demographic proportions of the respondents are further explained in Table 1. Table 1 presents the uneven demographic distribution of the respondents. There were more female respondents than male respondents. The majority of respondents were in their 20s and 30s. Most respondents had a high school or college education, and their income was below 5 million Rupiah. This uneven demographic distribution was caused by accidental sampling. The distribution of the questionnaire via the researcher's social media accounts contributed to the limited reach of the respondents.

Correlation Between Variables

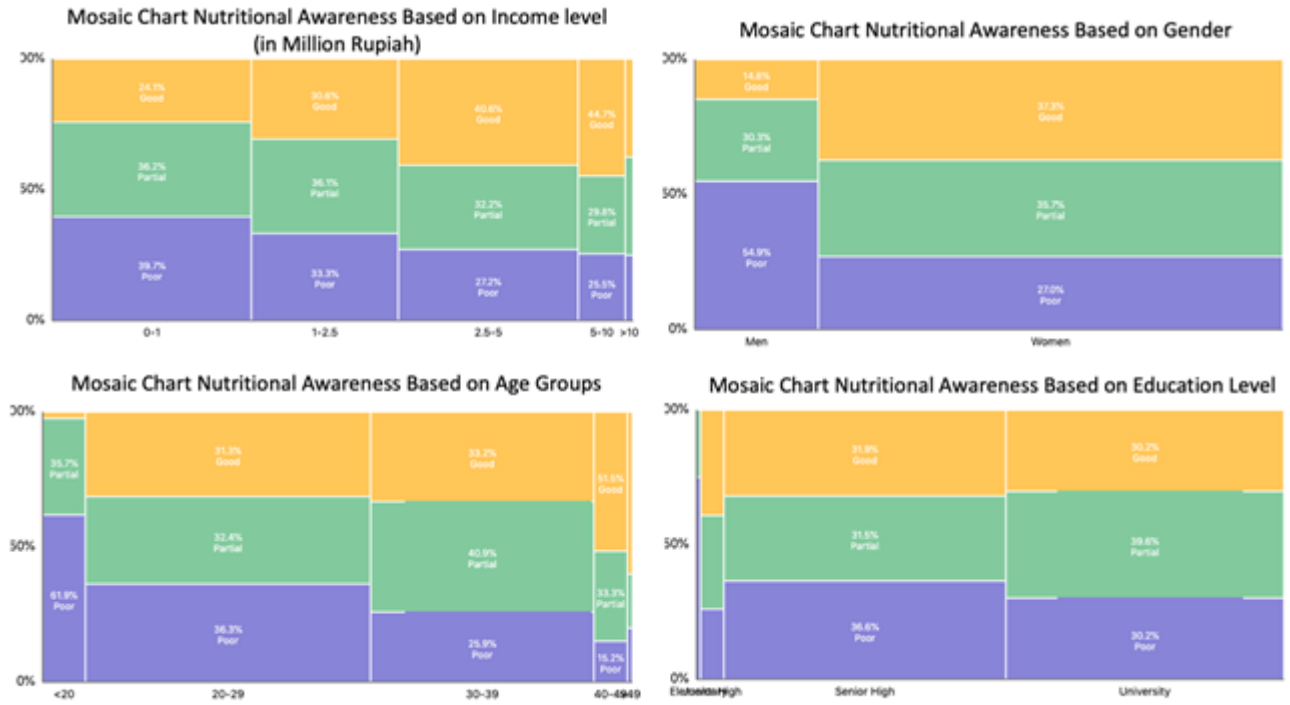
After conducting the data analysis, we found that some variables were significantly correlated with nutritional awareness, while education showed no correlation. The details are described in the following paragraph.

Table 1. Statistical test result demographic attributes with dietary awareness

Independent Variables	Statistical Test	P-value	Correlation Coefficient
Sex	Chi-Square	0.000	0.252
Age Group	Spearman's	0.000	0.207
Education	Spearman's	0.512	-0.022
Income	Spearman's	0.000	0.162

Based on the data in Table 2, it can be concluded that income level, age group, and gender are positively correlated with the level of public nutritional awareness (P = 0.000). While the level of education has no relationship to the level of public nutritional awareness with a P value = 0.512.

Graph 1 illustrates the relationship between sociodemographics and respondents' nutritional awareness. The percentage of respondents with low nutritional awareness tended to be higher among those with low incomes, men, and young age. Conversely, respondents with higher incomes, women, and more mature ages had good nutritional awareness. The data also show that both good and poor nutritional awareness were distributed across all educational levels, indicating no correlation between educational level and nutritional awareness.



Graph 1. Mosaic Chart on Relationships between Demographic Attributes and Nutritional Awarenesss

Discuss

Gender On Nutritional Awareness Level

The data reveal an association between gender and balanced diet awareness. This finding aligns with numerous studies indicating that women are more health-conscious and likely to visit healthcare providers than men (Coombs et al., 2022; Jacob & Panwar, 2023).

There are several reasons why women have higher awareness of balanced diets compared to men. First, the social expectation that women are caregivers at home requires them to have more knowledge about health than men (Mello et al., 2019). Second, women experience reproductive phases (pregnancy and childbirth), which increases their health awareness (Ara et al., 2022). Third, women are more aware of balanced nutrition because of body image, which makes them want to have an ideal weight for beauty (Jackson et al., 2024; Margiyanti, 2021; Rasidah et al., 2025).

Although women are more aware of balanced diets and body image, they are still at a higher risk of experiencing nutritional problems due to various biological reasons, such as pregnancy, menopause, limited breastfeeding duration, and side effects of hormonal contraceptives. Another biological reason is the difference in brain structure between men and women, which causes women to experience greater cravings than men. Sex disparities also cause men to have higher levels of education and job opportunities than women, leading to better lifestyles and a reduced risk of obesity. Therefore, even though awareness of balanced nutrition is better, it does not necessarily reduce the risk of nutritional problems (Burnatowska et al., 2023; Fowler et al., 2023).

Various programs need to be implemented to overcome obesity and overweight in society. Various programs are needed because no single program can serve as a magic bullet to solve the issue of obesity. Policies that encourage awareness of a balanced diet and strict regulations will be more effective among male respondents. Meanwhile, increasing physical activity and adopting a psychological approach may be more effective for women. A program to enhance physical activity is necessary, as excess weight in women is often caused by a lack of physical activity. A psychological approach is also needed to reduce cravings in women (Faronbi et al., 2024; Liu et al., 2021).

Age Towards Balance Diet Awareness

Age is a variable positively correlated with awareness of balanced nutrition. In other words, as age increases, awareness of the importance of balanced nutritional intake increases. This phenomenon is caused by a decline in physical condition due to increased age. This decline triggers individuals to adopt a healthier lifestyle to maintain their health. This supports the need for a program to increase awareness among young people, considering their low nutritional awareness (Lombardo et al., 2024).

Increasing age correlates positively with increased awareness of balanced nutrition. Age affects an individual's ability to comprehend and their way of thinking. As people grow older, their cognitive abilities and ways of thinking develop, leading to improved knowledge. With enhanced understanding and a more mature mindset that come with aging, adults are more likely to recognize the importance of nutritional intake because as they mature, their nutritional needs evolve based on their activity levels, gender, dietary needs, eating patterns, and body mass index (Al Rahmad et al., 2021; Sabatini et al., 2022).

The study results indicate that improvements in nutrition for young people are necessary. Young individuals do not yet possess mature ways of thinking, leading them to make short-term decisions, including those regarding eating patterns. This is further supported by the physical conditions typical of youth, leading to a tendency to consume high-sugar, high-salt, and high-fat foods. Increasing nutritional awareness from a young age is expected to help prevent degenerative diseases and improve overall health levels from the outset (Mizia et al., 2021).

Level Of Education Towards Nutritional Awareness

The results of the study showed no relationship between education and nutritional awareness. This is contrary to various studies that indicate that education enhances literacy and skills in disease prevention, thereby improving health. Additionally, education is associated with the ease of obtaining a decent income, which facilitates access to better nutrition (Alrougui et al., 2025; Faronbi et al., 2024; Rippin et al., 2020).

The lack of a relationship between education level and nutritional awareness may be attributed to respondents not reflecting the general demographics of the population. Most respondents in this study were high school and college graduates. The education levels in the Indonesian population range widely, from no schooling to high school completion, and only a small portion has attended college.

Income Level Towards Nutritional Awareness Level

Research has demonstrated a direct correlation between income levels and nutritional awareness. The findings of this study align with the concept of social determinants of health, indicating that quality of life and well-being enhance health outcomes. Economic welfare increases access to information regarding healthy foods and choices that are nutritious, thereby improving overall dietary quality. Welfare also enhances the ability to purchase healthier food options (Sumińska et al., 2022).

Nutrition education should focus more on individuals with low incomes, who typically have less access to information than their higher-income counterparts. Nutrition messages need to utilize language and channels that are accessible and easily understandable by low-income individuals. Furthermore, assistance programs that promote the

use of nutritious, affordable local foods should be considered, given the financial constraints of this demographic (Nandi et al., 2021; Rippin et al., 2020; Ssentongo et al., 2021).

The results of this study are consistent with other research, which indicates that the correlation between sociodemographics and dietary practices is generally weak or moderately significant (Hung et al., 2019; Osuna & Ailshire, 2023; Oviedo-Solís et al., 2022; Venegas-Aviles et al., 2025; Weil et al., 2023). This is because sociodemographic factors represent only a small part of the many other factors that shape balanced dietary practices (Alkerwi et al., 2015). Other factors that can influence dietary practices include stress levels (Barberis et al., 2022; Liu et al., 2021), family and social pressures, and the food environment (availability, accessibility, and affordability) (Golzarand et al., 2022).

The limitations of this study are that it was conducted online using accidental sampling. The sampling method impacts data distribution, making it less representative of the general Indonesian population. Variability in sex distribution, with an overrepresentation of women, a younger age group, and a very low income (as many respondents are undergraduate students), can be noted.

Conclusion

The research results show that gender, age group, and income are significantly related to balance diet awareness, while education has no correlation with balance diet awareness. Young age, man and low income group are related to lower awareness to balance diet. In contrast, women have better awareness of a balanced diet; however, women are more prone to emotional eating. Program to promote balance diet awareness should take this result as consideration.

Conflic of Interest Declaration

There is no conflict of interest in this research. The research is funded by Strada Indonesia University

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