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Review

Nutrition Education for Non-Health University Students in Indonesia: A Literature Review

Edukasi Gizi pada Mahasiswa Non-Kesehatan di Indonesia: Sebuah Kajian Literatur

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Abstract: *Nutrition education is a method used to enhance knowledge and improve attitudes and practices regarding nutrition. Although studies prove its effectiveness among school students, there is a lack of evidence showing the effect of nutrition education implemented among university students, moreover those in non-health fields. This article examined various nutrition education programs designed for non-health university students in Indonesia to improve their nutritional knowledge, attitudes, and practices. The literature search was conducted using Google Scholar and Research Gate databases with the keywords in Bahasa Indonesia "edukasi gizi", "intervensi gizi", "pendidikan gizi", and "mahasiswa non-kesehatan", focusing on studies published between 2019 and 2024. Out of the 13 studies identified, 7 reported an increase in knowledge, 4 showed improvements in both knowledge and attitudes, 1 showed positive changes in knowledge, behaviour, and eating habits, and 1 indicated an increase in nutritional knowledge but the level of behavioral change was not consistently achieved.*

Key word: *non-health students, nutrition education, nutrition intervention*

1. INTRODUCTION

Nutritional problems in Indonesia are very diverse. In addition to undernutrition, there is also overnutrition. It shows that nutrition is still a major health problem in Indonesia. Among adolescents, unbalanced nutrition increases the risk of developing non-communicable diseases (NCDs) such as diabetes, hypertension, and cardiovascular disorders later in life (1). Currently, NCDs account for around 64% of all deaths in Indonesia (2), showing the urgency of addressing nutritional behaviors early, particularly during adolescence and young adulthood. University students represent a critical transitional stage where individuals begin to make independent dietary decisions. However, many students adopt poor eating habits influenced by time constraints, academic stress, limited food access, and low awareness of nutrition adequacy (3). These factors often lead to inadequate nutrient intake, irregular eating patterns, and an increased risk of diet-related health issues.

University students are one of the subjects who require a balanced nutritional intake. However, because they are affected by dietary patterns that do not pay attention to nutritional adequacy, university students are vulnerable to restrictions on food intake. Good nutrition knowledge can affect a person's food intake and nutritional status. The most common way to improve knowledge, attitudes, and habits about nutrition is by providing nutrition education. The success of nutrition education in adolescents can be influenced by several factors, including the duration of the intervention provided and the intervention method used (4).

While several studies have investigated nutrition education among health science students (5), less attention has been given to non-health university students, who generally have lower nutrition literacy as evidenced in Indonesian undergraduate cohorts (6). This gap highlights the need to synthesize existing evidence on how nutrition education interventions have been designed and implemented among non-health university students in Indonesia.

Therefore, this review aims to summarize and evaluate current evidence on nutrition education programs conducted among non-health university students in Indonesia, identify the gaps in existing approaches, and provide recommendations for improving future interventions. This is expected to strengthen the understanding of how nutrition education can effectively enhance healthy eating behaviors in this population group.

2. METHODS

The research was conducted from April to May 2024. The method used was a literature review. Published papers were searched through Google Scholar and ResearchGate using the keywords in Bahasa Indonesia such as “edukasi gizi”, ”intervensi gizi”, “pendidikan gizi”, and “mahasiswa non-kesehatan”.
Although this paper was submitted in 2025, the literature search and data collection were completed in May 2024. Therefore, the inclusion range (2019–2024) reflects the period in which data were available during the review process.

The inclusion criteria for the literature used in this study were published within the last five years between 2019 and 2024, studies written in Bahasa Indonesia, studies focusing on nutrition education or intervention programs involving non-health university students in Indonesia, and full-text articles accessible online. The exclusion criteria were studies involving health or medical students, studies published before 2019, review articles or opinion papers without empirical data, and papers not available in full text.

Eligible articles were collected and reviewed to be written into a summary table containing the author, study location, subject, sample size, nutrition education intervention method, nutrition topic provided, and study results. A table was used as an aid in writing the results of this article.

3. RESULTS

Table 1. Description of Published Papers Included in the Review

Description	Reference Number
References	
Aulia et al., (2023)	(7)
Purwanti et al., (2023)	(8)
Yuliana et al., (2023a)	(9)
Yuliana et al., (2023b)	(10)
Dwanggari et al., (2022)	(11)
Imaniar et al., (2022)	(12)
Sufyan & Sufyan, (2022)	(13)
Suprapto et al., (2022)	(14)
Syauqi et al., (2022)	(15)
Farikhah, (2021)	(16)
Ulfa & Perdana, (2021)	(17)
Mulyani et al., (2020)	(18)
Suhartatik et al., (2020)	(19)
Location (Province)	
Central Kalimantan	(17)
Central Java	(8, 11, 15, 16, 19)
East Java	(9, 13)
Jakarta	(7)
South Sulawesi	(14)
South Sumatera	(10)
West Java	(12, 18)
Location (City)	

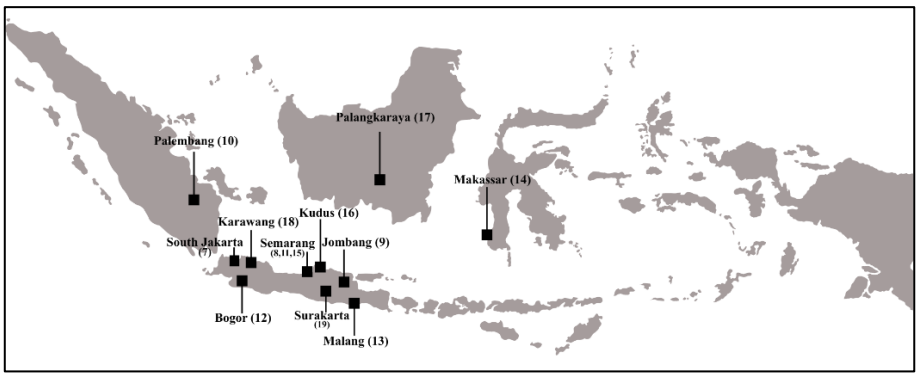

Figure 1. Distribution of nutrition education studies among non-health university students in Indonesia (2019–2024).

Sample Size	
<20	(16)
20-30	(8, 9, 11, 12, 13, 15)
31-40	(7, 10, 17)
>40	(14, 18, 19)
Design of Study	
Pre-post test without control group	(7–15, 17, 18)
Pre-post test with control group	(16, 19)
Nutrition Topics Covered	
Balanced nutrition	(7–17, 19)

Description	Reference Number
Isi Piringku	(8, 13, 15)
Clean and healthy living behavior (*PHBS*)	(13) (16)
Tumpeng Gizi	(9)
Fast food and healthy food cooking demonstration	(7, 11)
Non-communicable diseases/obesity	(17)
Maintaining health during the Covid-19 pandemic	(10)
Reading nutritional labels	(19)
Dietary management in relation to climate change, functional food, and food safety	
Intervention Method	
Online seminar/counselling/lecture	(7, 8, 10, 11, 13, 15, 16, 18)
Offline seminar/counselling/lecture	(9, 12)
Provision of educational media (without seminar)	(14, 17)
Not mentioned	(19)
Intervention Period	
< 7 days	(7, 9, 10, 11, 13, 16, 18)
7-21 days	(8, 14, 15)
> 21 days	(12, 19)
Not mentioned	(17)
Intervention Duration	
45-120 minutes	(9, 11, 12, 13, 18, 19)
Not mentioned	(7, 8, 10, 14–16, 17)
Reported Results	
Improved nutrition knowledge	(9, 10, 11, 13, 15–17)
Improved nutrition knowledge and attitudes	(7, 12, 14, 18)
Improved nutrition knowledge while behavior has not met the target	(8)
Improved knowledge, behavior and eating habits	(19)

Table 1 summarizes the characteristics of the 13 studies included in this review. Based on these articles, 12 articles were using Indonesian language (7–18) and one article using English language (19). The most studies on nutrition education among non-health students were conducted in Central Java province, with three studies conducted in Semarang City (8, 11, 15) and two studies conducted in Kudus and Surakarta City (16, 19). It was followed by studies conducted in East Java, in Jombang and Malang (9, 13) and West Java, in Bogor and Karawang (12, 18). There was only one study in several other provinces. One study in South Sulawesi, namely in Makassar City (14), one study in Central Kalimantan, namely in Palangka Raya City (17), one study in South Sumatra, namely in Palembang City (10), and one study in Jakarta, namely in South Jakarta City (7).

The number of samples used by most studies is around 20-30. The study design of 11 studies used pre-post test without control group (7–15, 17, 18). The other two studies used a pre-post test with a control group (16, 19).

The topic of balanced nutrition was the material provided in the majority of the studies. As for the intervention method, 8 studies employed webinars or online counselling (7, 8, 10, 11, 13, 15, 16, 18). Furthermore, most of the studies were conducted in a short time, with seven of them conducting interventions for less than seven days (7, 9, 10, 11, 13, 16, 18). As for the nutrition education session, most studies did not mention the length of time. However, some studies had a duration of about 45-120 minutes. Majority of the studies reported a result of improved nutrition knowledge (9, 10, 11, 13, 15–17), thus information on the effect of the nutrition education on the eating behaviour was lacking.

4. DISCUSSION

Based on the 13 articles reviewed, the number of subjects used varied, ranging from less than 20 to more than 40 respondents. The majority of studies used between 20 and 40 subjects. However, only three studies used more than 40 participants (14, 18, 19). Studies with a larger number of subjects are considered to have higher statistical power to detect the effects of the intervention given (20).

According to a previous study, the power of statistical analysis is greatly influenced by the number of samples; the larger the number of subjects, the smaller the possibility of type II error, namely the failure to detect the actual effect (20). Thus, the use of a sufficiently large number of subjects is important to increase the validity of the results of nutritional intervention studies. Therefore, studies such as those conducted by Syauqy et al. (15) and Suhartatik et al. (19), which involved a larger number of participants, provide more reliable results compared to studies using a small number of subjects.

There are 11 studies (7–15, 17, 18) that used a pre-post test design without a control group. Only two studies used a pre-post test design with a control group (16, 19). The use of a design with a control group is considered methodologically stronger because it allows researchers to compare changes in the intervention group with the group that did not receive treatment, thereby minimizing bias and increasing accuracy in interpreting the effects of the intervention. Previous research stated that experimental studies with a control group, especially if randomized, are the gold standard in intervention research because they can show cause and effect relationships more clearly (21). Studies that used a design with a control group, such as those conducted by Imaniar et al. (12) and Suhartatik et al. (19), showed stronger results in comparing the effectiveness of nutrition interventions in non-health students than studies without a control group.

Most of the nutrition intervention topics were about balanced nutrition. A total of 12 studies discussed balanced nutrition (7–17, 19) and one study discussed the topic of reading nutritional value information labels (10). In addition to providing education on the topic of balanced nutrition, some articles also discuss the Isi Piringku, non-communicable diseases including obesity, clean and healthy living behavior, nutrition tumpeng, fast food and demonstrations of

cooking food with balanced nutrition, maintaining health during the pandemic, and dietary regulation as urgency in handling climate change and functional food and food safety. The topic of balanced nutrition is the material provided by most studies. This topic is the key basis for connecting various aspects of daily life, including other topics provided in nutrition education. One of the educational topics, such as the nutritious food cooking demonstration, aims to stimulate the target to actively observe and try it themselves so that the educational material is clearer and readable through educational demonstrations (22).

Most studies used webinars, online lectures, or online counselling methods (7, 8, 10, 11, 13, 15, 16, 18), which showed that nutrition education was still carried out despite limitations due to the COVID-19 pandemic. Several studies also used offline seminars or counselling methods (9, 12), educational media such as booklets, infographics, and educational videos (14, 17). Webinar and seminar methods using slides can increase knowledge because there is two-way communication, and the material can be discussed in depth. The use of educational media is also necessary so that the material delivery is acceptable and fun for adolescents (23).

The duration of intervention in most studies tended to be short. Seven studies reported an intervention period of less than seven days (7, 9, 10, 11, 13, 16, 18), while only two study used an intervention period of more than 21 days (12, 19). Meanwhile, only six studies mentioned the duration of the education session, ranging from 45–120 minutes (9, 11, 12, 13, 18, 19). Seven studies did not mention the duration of the education session explicitly (7, 8, 10, 14–16, 17). The short duration may be one of the factors why most studies only showed an increase in knowledge, not behavioural change. A previous systematic review emphasized that the duration and intensity of the intervention are important factors influencing the success of nutritional behaviour change (4).

Based on the 13 articles reviewed, seven studies showed an increase in nutritional knowledge (9, 10, 11, 13, 15–17), four studies showed an increase in nutritional knowledge and attitudes (7, 12, 14, 18), one study showed an increase in knowledge while behaviour has not met the target (8), and one study showed an increase in knowledge, behaviour, and eating habits (19). On average, the results of the interventions showed an increase in nutritional knowledge, but few studies showed an increase in behaviour change. Nutrition education can improve knowledge, but there is no significant difference in attitudes regarding the importance of nutrition for health (24).

The observed improvement in nutrition knowledge indicates that the implemented nutrition education was generally effective. In addition, nutrition education has the potential to improve attitudes and behaviors, as reflected in the increased assessment scores in several studies. However, one study reported that the intervention resulted only in improved knowledge, without a corresponding change in behaviour (8). Given the limited provision of nutrition

education for non-health students that effectively enhances knowledge, attitudes, and dietary habits, there is a need for more intensive nutrition education interventions targeting this population.

The present study aimed to collect evidence and determine whether nutrition education improves nutrition knowledge, attitudes and practices among non-health students in Indonesia. Based on the results of reviewing 13 articles, the researchers found that after nutrition education, all studies showed increased nutrition knowledge. However, only a few studies measured changes in the attitudes, behaviours and eating habits of non-health students. These results may be related to the intervention method and duration. Most intervention methods used were webinars and seminars, which lacked variety. In addition, the average duration of time used in the study was very short, so the results can only show an increase in knowledge level and cannot prove the effectiveness of the intervention methods used. The length of time during the intervention can affect the effect of the intervention provided (25). Therefore, to determine the effectiveness of a given nutritional intervention method, longer intervention period may be needed. The implementation of nutrition education requires proper planning to use intervention methods that are relevant to the target audience and give an adequate period for behaviour change to take place (26). So, the duration of the intervention and the frequency of nutrition education exposure could be the important factors in the success of nutrition education.

Significance

University students represent a critical population for promoting healthy dietary behaviors, as they often experience a transition toward independent living and are at risk of developing unhealthy eating patterns (27). Although university students are generally exposed to nutrition-related information, many particularly those from non-health disciplines, still demonstrate limited nutrition knowledge and suboptimal diet quality (28).

In Indonesia, most nutrition education efforts have focused on health or medical students, leaving a gap in programs targeting non-health students, who also face lifestyle-related health challenges such as irregular eating patterns, high fast-food consumption, and low intake of fruits and vegetables.

Therefore, synthesizing evidence on nutrition education interventions among non-health university students is crucial for developing effective health promotion strategies in higher education settings.

Implications

From a practical perspective, universities and public health institutions can utilize these findings to design more effective and engaging nutrition education programs tailored to non-health students. Evidence from international studies shows that university-based interventions can improve dietary behaviors, nutrition knowledge, and self-efficacy, particularly when programs are interactive, peer-led, or integrated into the university environment (27, 29).

Limitations

This study has several limitations that should be taken into account. The primary limitation lies in the literature search process, which was conducted within a limited timeframe and relied solely on two databases: Google Scholar and ResearchGate. This constraint directly influenced the type and quality of studies included in the review. Consequently, most of the selected studies employed a pre-post test design without a control group and featured short intervention durations, limiting the strength of conclusions regarding the long-term impact of the nutrition education on the nutritional behaviour change. Moreover, the geographical distribution of the studies was uneven, dominated by research conducted in specific areas such as Central Java, and many studies lacked detailed reporting on intervention methods and durations. These factors pose challenges in comparing the overall effectiveness of nutrition education programs. Additionally, the review focused on articles published between 2019 and 2024 because the data collection process was completed in May 2024; therefore, newer studies published after that period were not included.

Future literature reviews are recommended to extend the search period and utilize a broader range of academic databases, such as PubMed, Scopus, or ScienceDirect. Expanding the search strategy in this way will likely yield more diverse studies in terms of design, geographical coverage, and reporting quality, thereby enabling a more comprehensive and accurate understanding of the effectiveness of nutrition education programs among non-health university students in Indonesia.

5. CONCLUSION

Based on a review of 13 studies implementing nutrition education among non-health university students in Indonesia, most interventions demonstrated improvements in nutritional knowledge. However, only a few were successful in enhancing healthy eating attitudes and behaviours. This limited impact may be attributed to several factors, including relatively small sample sizes, study designs lacking control groups, limited variation in intervention methods, and short intervention durations.

To achieve a more substantial and lasting impact, nutrition education programs targeting non-health students should be carefully designed with adequate sample sizes, use robust study designs (including control groups), and interactive, student-centred intervention methods and media. Moreover, longer and repeated intervention periods are highly recommended to facilitate gradual and sustainable behavioural change.

With careful planning and a comprehensive approach, nutrition education holds significant potential to shape healthier nutritional mindsets, attitudes, and behaviours among non-health university students, thereby contributing to the prevention of nutrition-related problems and non-communicable diseases from an early age.

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