

The relationship of vegetable and fruit consumption to mental health in adolescents and early adults: Scoping review

Hubungan konsumsi sayur dan buah terhadap kesehatan mental pada remaja dan dewasa awal: Scoping review

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Abstract

Mental disorders in adolescents have an adverse impact on their academic performance, lifestyle, and quality of life. Consumption of fruits and vegetables is important to maintain good physical and mental health. The aim is to determine the effect of vegetable or fruit consumption on mental health in adolescents. The research method was scoping review of journals obtained through databased electronic media, namely Pubmed and google scholar. the results of the study were 8 articles found a relationship between the effect of vegetable or fruit consumption on mental health in adolescents while 1 journal showed no effect between consuming vegetables and fruit with mental health. The conclusion of the study is that vegetable and fruit consumption has an influence on mental health. This mental health such as, symptoms of depression, mood, loneliness, anxiety etc.

Keywords: Adolescents, Vegetable consumption, Fruit consumption, Mental health

Abstrak

Gangguan mental pada remaja memiliki dampak buruk terhadap prestasi akademik, gaya hidup, dan penurunan kualitas hidup remaja tersebut. Konsumsi buah dan sayuran penting untuk menjaga kesehatan baik kesehatan jasmani maupun rohani. Tujuannya adalah Untuk mengetahui pengaruh konsumsi sayur atau buah terhadap kesehatan mental pada remaja. Metode penelitian scoping review dari jurnal yang diperoleh melalui media elektronik databased yaitu Pubmed dan google scholar. hasil penelitian adalah 8 artikel ditemukan adanya hubungan antara pengaruh konsumsi sayur atau buah terhadap kesehatan mental pada remaja sedangkan 1 jurnal menunjukkan tidak ada pengaruh antara mengkonsumsi sayur dan buah dengan kesehatan mental. Kesimpulan penelitian adalah Konsumsi sayur dan buah memiliki pengaruh terhadap adanya kesehatan mental. Kesehatan mental ini seperti, gejala depresi, suasana hati (mood), kesepian, kecemasan dll.

Kata Kunci: Remaja, Konsumsi sayur, Konsumsi Buah, Kesehatan mental

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Introduction

Awareness of mental health has continued to rise each year, in parallel with the increasing prevalence of mental health disorders worldwide. One of the most common mental health problems is anxiety disorder. According to *Riskesdas* (2018), more than 19 million individuals in Indonesia aged over 15 years experience

emotional and mental disorders, while over 12 million suffer from depression.¹ Mental health remains an issue for which no definitive solution has been found, either at the national or global level. It requires special attention, as it may lead to self-harm or suicide, which is a serious concern in Indonesia. Mental health problems can also lead to reduced academic achievement, risky lifestyle behaviors, and declined

quality of life. According to *Mental Health America*, mental disorders are often caused by a combination of factors, including genetic predisposition, environmental influences, trauma, lifestyle, diet, brain structure, and others.²

A person's quality of life can be influenced by various factors, one of which is diet. The food we consume plays an important role in determining overall health and well-being. Foods are rich in nutrients, vitamins, minerals, antioxidants, and other components that help maintain and improve health. Fruits and vegetables are excellent sources of essential nutrients. Previous studies have shown that the consumption of fruits and vegetables can help regulate metabolic profiles, including blood pressure, blood glucose levels, blood cholesterol, and even reduce the risk of cancer, cardiovascular mortality, and all-cause mortality, thus contributing to longevity. Interestingly, the benefits of fruits and vegetables are not limited to physical health; they also influence emotional and mental health, including depression, anxiety, mood, quality of life, and other mental health conditions.³

A study by Liu et al. (2020) found a significant correlation between fruit intake and a reduced risk of depressive and anxiety symptoms. Furthermore, other previous research has also identified a significant association between fruit and vegetable intake and the occurrence of anxiety disorders.⁴

Based on the data presented above, it can be concluded that fruit and vegetable consumption may influence mental health. However, many people are still unaware of this potential impact. Therefore, the purpose of this study is to examine the effect of fruit and vegetable consumption on mental health among adolescents, drawing upon evidence from various previous studies.

Methods

Study Design

This study, titled *"The Relationship Between Fruit and Vegetable Consumption and Mental Health Among Adolescents: A Scoping Review"*, employed a scoping review methodology.

The review was conducted to map the extent, range, and nature of research evidence available regarding the effect of fruit and vegetable intake on mental health outcomes among adolescents. The methodological framework followed the Arksey and O'Malley model, later enhanced by Levac et al., and adhered to the PRISMA-ScR guidelines to ensure transparency and methodological rigor throughout the review process.

Information Sources and Search Strategy

A comprehensive literature search was conducted using two electronic databases: PubMed and Google

Scholar. The search strategy on PubMed involved a combination of the following keywords: *"fruit"*, *"vegetable"*, *"young adults"*, *"teen"*, *"youth"*, *"mental health"*, and *"mental balance"*. For Google Scholar, the search was conducted in Bahasa Indonesia using the terms: *"remaja"*, *"konsumsi sayur"*, *"konsumsi buah"*, and *"kesehatan mental"*. Boolean operators such as AND and OR were used to optimize the search results.

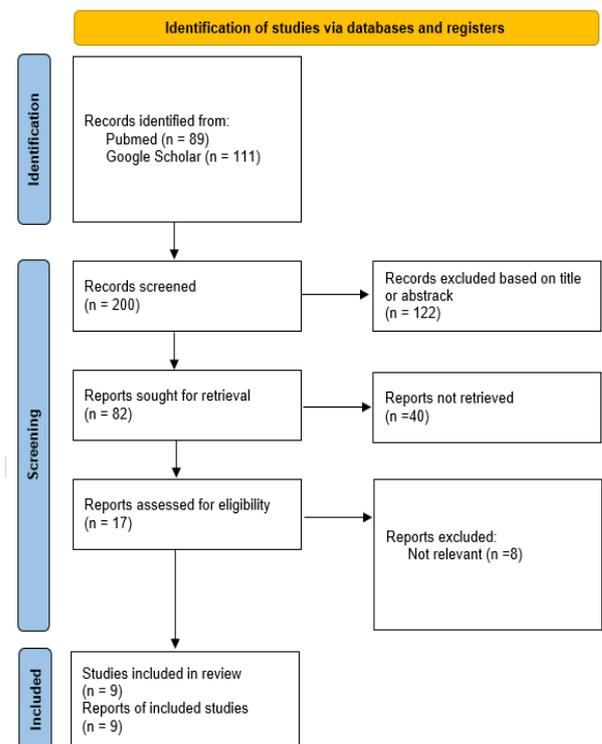


Figure 1. Flow Chart

Eligibility Criteria

The inclusion criteria for selecting studies were as follows: Articles published between 2020 and 2024, studies available in full-text and open access, articles written in English or Bahasa Indonesia, study population consisting of adolescents aged 14–24 years, and studies that examined the relationship between fruit and/or vegetable consumption and mental health outcomes. Exclusion criteria included: Non-original research (e.g., editorials, commentaries, conference abstracts), studies with populations outside the defined adolescent age range, studies not reporting specific outcomes on mental health or fruit/vegetable consumption.

Study Selection

The selection process involved two independent reviewers who screened the titles and abstracts of all retrieved articles. Full texts of potentially relevant studies were then reviewed to determine eligibility. Discrepancies were resolved through discussion or consultation with a third reviewer. The screening and

selection process was documented using a PRISMA-ScR flow diagram to ensure transparency in reporting.

Research Questions

This scoping review was guided by the following research questions: Is there a relationship between fruit and/or vegetable consumption and mental health in adolescents? What assessment tools or instruments are used to measure fruit and vegetable intake? What instruments are used to assess mental health outcomes?

Data Charting and Synthesis

Data extraction was conducted using a standardized charting form that included the following variables:

author(s), year of publication, study location, study design, sample size and age group, instruments used to assess dietary intake, instruments used to assess mental health, and key findings. A descriptive synthesis was used to summarize the results, identify research gaps, and highlight the diversity of methodologies and outcomes across studies.

Result and Discussion

From the research conducted, nine selected articles were found that describe the effect of fruit or vegetable consumption on mental health in adolescents.

Table 1. Effect of fruit or vegetable consumption on mental health in adolescents

Country	Author(s)	Study Design	Sample Size	Participant Characteristics	Assessment Tools	Key Findings
United Kingdom	Erin Hoare et al.	Cohort Study	9369 adolescents	Adolescents born in England	Fruit/vegetable frequency questionnaire, SDQ, SMFQ	Adolescents with mental health issues at age 14 consumed less fruit (OR 0.55; 95% CI 0.46–0.65) and vegetables (OR 0.66; 95% CI 0.52–0.83); similar results found at ages 7 and 14.
Belgium	Nathalie Michels	Cross-sectional Study	495 participants	Aged 15–24	SMFQ, short food frequency questionnaire (sFFQ)	Fruit and vegetable intake was inversely related to anxiety and depression (OR = 0.67).
United States	Yang Bai et al. (2022)	Longitudinal Naturalistic Study	805 participants	UVM undergraduates aged 18–25	Daily health behavior survey	Positive association found between higher fruit/vegetable intake, physical activity, hydration, sleep >8 hrs, and self-reported happy mood.
Canada	Julia Dabravolskaj et al. (2023)	Longitudinal Study	24,274 participants	Adolescents aged 13–18	CESD-R-10, GAD-7	Only 3.9% met fruit and vegetable recommendations. Higher depression scores among those who did not meet the intake; slight decrease in CESD-R-10 (–0.29, 95% CI –0.68 to 0.10) in those who improved intake (non-significant).
South Korea	Hui-Rang Yim et al. (2021)	Cross-sectional Study	187,622 adolescents	Middle and high school students	Korean Youth Risk Behavior Survey (2015, 2017, 2019)	Stress and depression negatively associated with fruit (OR = 0.852) and vegetable (OR = 0.885) intake. Poor mental health linked to poor dietary choices, increasing obesity and reducing overall health.
Indonesia	Poppy Shofialany, Rita Ismawati	Cross-sectional Study	79 respondents	Females aged 18–23	CES-D, SQ-FFQ	Significant relationship found: 48.1% of low fruit consumers had depression symptoms vs. 27.8% with adequate intake. Similar significant results for vegetable intake ($p < 0.01$).
Indonesia	Rezky Aulia Yusuf et al.	Cross-sectional Study	251 samples	Aged 13–15	GSHS 2017 diet and mental health questionnaire	Low vegetable intake linked to school task difficulty (OR = 2.67). Halal diet behaviors associated with loneliness (OR = 1.181).
Indonesia	Silfia Dini Pratiwi, Ratna	Cross-sectional Study	9682 participants	Junior and senior high school	GSHS 2015	Healthy lifestyle (fruit/veg intake, physical activity) significantly

	Djuwita (2022)			students aged 11–18		associated with mental health protection (p = 0.0001).
Indonesia	Patricia Sandiana et al. (2024)	Cross-sectional Study	48 respondents	Senior high school students aged 15–17	GAD-7, FFQ	Fruit intake significantly associated with anxiety reduction (p = 0.005). Frequent vegetable intake also linked to lower anxiety.

In a cohort study involving 9,369 adolescents born in the United Kingdom, it was found that adolescents with mental health problems at age 14 were significantly less likely to consume fruit (OR = 0.55; 95% CI: 0.46–0.65) and vegetables (OR = 0.66; 95% CI: 0.52–0.83) compared to those without such issues. Similar results were observed in those who experienced mental health problems at both age 7 and 14, with even lower consumption of fruit (OR = 0.39; 95% CI: 0.26–0.58) and vegetables (OR = 0.57; 95% CI: 0.35–0.91). These findings highlight a strong inverse association between fruit and vegetable intake and adolescent mental health problems. However, critics note that fruit and vegetable intake may not fully capture broader dietary patterns.⁵

In a cross-sectional study conducted in Belgium, Michels found a significant relationship between fruit and vegetable consumption and mental health among adolescents aged 15–24 years. Those experiencing symptoms of anxiety or depression reported lower intake of these foods, with an odds ratio of 0.67.⁶ This emphasizes the importance of dietary patterns in supporting mental well-being during adolescence and young adulthood.

Bai et al. (2022) conducted a longitudinal naturalistic study in the United States among 805 university students aged 18–25. The results revealed a significant relationship between healthy behaviors—including fruit and vegetable consumption, sufficient sleep, and physical activity—and self-reported positive mood. This study underscores how a holistic lifestyle, including proper diet, contributes to improved emotional health among college students.⁷

Dabravolskaj et al. (2023), in a longitudinal study of 24,274 Canadian adolescents aged 13–18, found that only 3.9% of participants met the recommended fruit and vegetable intake. Those who did not meet the recommendation had higher depression scores (measured using CESD-R-10). Although the decrease in depressive symptoms was not statistically significant among participants who improved their intake (−0.29; 95% CI: −0.68 to 0.10), the trend supports a potential association between diet quality and depressive symptoms.⁸

In South Korea, Yim et al. (2021) conducted a large-scale cross-sectional study with 187,622 adolescents and observed that both stress and depression were negatively associated with fruit intake (OR = 0.852; 95% CI: 0.836–0.868) and vegetable intake (OR = 0.885; 95% CI: 0.855–0.910).

Adolescents with poor mental health reported lower consumption of fruits and vegetables. The study concluded that mental distress may influence dietary choices, contributing to poor nutrition and increasing the risk of obesity and general health decline.⁹

Consistent findings were also observed in Indonesia. Shofialany and Ismawati (2022) demonstrated a statistically significant relationship between fruit and vegetable consumption and depression symptoms among female university students, with a p-value < 0.01. Similarly, Yusuf et al. (2022) found that low vegetable intake was associated with difficulty completing academic tasks (OR = 2.67). Pratiwi and Djuwita (2022) highlighted the protective effect of a healthy lifestyle, including fruit and vegetable intake, on adolescent mental health, with a p-value of 0.0001.¹⁰

Based on the synthesis of findings from nine international studies—conducted in the United Kingdom, Belgium, the United States, Canada, South Korea, and Indonesia—there is strong consistency supporting the relationship between fruit and vegetable intake and mental health in adolescents and young adults. Mental health outcomes in these studies were assessed using validated instruments such as the Strengths and Difficulties Questionnaire (SDQ), Short Mood and Feelings Questionnaire (SMFQ), and Center for Epidemiologic Studies Depression Scale (CES-D), among others.

These results suggest that inadequate fruit and vegetable consumption is consistently linked with increased risk of depression, anxiety, and poor emotional well-being, reinforcing the need for nutritionally focused interventions in public health strategies targeting youth mental health.

Conclusion

Based on the discussion above, it can be concluded that fruit and vegetable consumption has a significant influence on mental health. Mental health outcomes affected include depressive symptoms, mood, feelings of loneliness, anxiety, and others. However, among the nine reviewed journals, one study showed non-significant results. This suggests that while fruit and vegetable intake contributes to better mental health, its effects may be moderated by other lifestyle factors such as sleep patterns, screen time, and physical activity.

Individuals who regularly consume fruits and vegetables tend to have more stable moods, lower risks of depression and anxiety, and better stress management abilities compared to those with lower intake. Therefore, achieving both physical and mental well-being requires the adoption of a healthy lifestyle and consistent health-promoting behaviors.

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Authors' Contributions

The author contributed to all stages of the research, including planning, data collection, data analysis, and manuscript writing.

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