Evaluating Teaching Material Needs for Active Adults in West Java: A Study on Cholesterol, Blood Sugar, and Uric Acid Examinations

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ABSTRACT

Background: West Java is the province with the highest number of productive age population in Indonesia. The productivity of this age group is significantly influenced by health and education factors, with health teaching materials serving as educational tools. Among the challenges that hinder the productivity of active adults, chronic disease poses a significant threat.

Purpose: This study aimed to describe the cholesterol, blood sugar, and uric acid examinations in active adults, including the need for health teaching materials.

Method: The sampling method used was purposive sampling, with inclusion criteria being active adults aged 18 to 60 years, who work or study at an educational institution in Bandung Regency. Meanwhile, adults with mental illness were excluded, resulting in a sample size of 70 participants. The method for checking cholesterol, blood sugar, and uric acid used a Glucose Cholesterol Uric acid (GCU) meter.

Results: The results showed that 12 adults had high cholesterol levels, while 6 had elevated blood sugar and uric acid levels. In the young age group (aged 18-44 years), 2 adults experienced hypercholesterolemia. The most sought-after teaching material for chronic disease was preventing sugar intake in soft drinks and the benefits of enhancing a healthy lifestyle through education. Furthermore, establishing prevention programs in educational institutions is an essential requirement to prevent the development of chronic and safeguard the productivity of active adults.

Conclusions: Based on the results, it was recommended that productive and active adults receive training in chronic disease awareness and facilitate regular general check-ups (GCUs). This proactive approach was expected to contribute to the development and health security of the country.

Keywords: blood glucose, cholesterol, health security, health promotion, uric acid

BACKGROUND

The Indonesian productive age population in 2022 was 189 million out of the 274.8 million people. In the same year, West Java Province reported a population of 50.6 million, consisting of 70% working age (15 to 64 years old), accounting for 35.1 million people (Kemenkes RI, 2019). Based on these figures, the province has the highest number of productive age population in Indonesia.

The development of a country is significantly influenced by a healthy, high-capacity productive age population, essential for advancement in various sectors due to the specific functions and roles. Although the factors affecting productivity are complex health and education play a significant role, including stability, security, and the stable position of the country. The health status is majorly influenced by healthy lifestyle behaviors, including consuming nutritious food, engaging in regular physical exercise at least twice a week, ensuring sufficient sleep and rest with at least 6 hours of sleep per night, managing stress, maintaining ideal body weight, and avoiding smoking, alcohol, and drugs.

Food consumption among the young generation and productive age population has specific trends. From the ages of 2 to 15, the prevalent trend is the consumption of fast and frozen food, including beverages with high sugar and soda content. In the 15 to 17 age group, there is a habit of consuming caffeine from coffee and similar sources(Drewnowski & Rehm, 2016) as well as energy drinks.

Regarding physical activity habits, there are several supporting factors such as the development of applications capable of tracking the number of steps taken by users, workout apps, and other measurement apps. However, the convenience of technology and transportation has led some groups to select an easy life, showing reluctance towards physical movement.

Based on the eating and exercise patterns mentioned above, there is a significant risk of accumulating metabolic waste products and an excess of unnecessary substances in the body. The accumulation of free radicals that are not balanced with antioxidants from vegetables and fruits can lead to high blood sugar, cholesterol, and uric acid levels. Consequently, a significant intervention is required to promote healthy behaviors in the community.

These healthy behaviors have a significant impact on the functioning of the heart, lungs, and body system, resulting in normal blood pressure, sugar levels, cholesterol, and uric acid levels within a tolerable range. Several studies reported that regular physical exercise with light to moderate intensity has a positive impact on heart health, including lipid and blood sugar metabolism. However, excessively strenuous physical exercise can have effects on heart and lung health, leading to an increase in blood sugar levels.

Face-to-face methods and counseling are commonly used in interventions to improve healthy lifestyle(Lee et al., 2015). In the age of technological advancement, the use of websites and social media offers promising potential to enhance health knowledge (Nohara et al., 2015). Several studies examined efforts to change healthy lifestyle habits through various methods, including promoting nutritional behavior or physical activity by improving drinking habits and increasing the consumption of fruits, vegetables, and grains. These strategic measures are implemented with a 9-week monitoring period to improve daily walking habits, muscle exercises, and body immunity (Weishaupt et al., 2022).

Previous studies showed that interventions to improve a healthy lifestyle through online general check-ups (GCUs) and telecounseling had enhanced awareness of a healthy lifestyle (Nohara et al., 2015). Consequently, this study recommends the use of machine

learning artificial intelligence methods in developing countries to improve the quality of health status that supports productivity. The results show that GCUs examinations provide benefits by comprehensively and regularly examining various health indicators, ensuring the health status of the productive age population falls in the optimum level of function (OLOF) range.

METHOD

This study was carried out using quantitative and descriptive methods with a cross-sectional design. The sample was selected using purposive sampling, with the criteria of being at least 16 years old, mentally sound, and providing consent to participate in this study. The measurement of variables such as blood sugar, cholesterol, and uric acid levels was conducted using an easy-to-carry GCU meter device which it calibrated before being used at the study site. This study was conducted in one educational institution in Bandung in Oktober 2022. Subsequently, data analysis was performed using differential and comparative statistical tests. To ensure ethical standards, this study obtained informed consent and received approval from the ethics committee Universitas Padjadjaran with the number 100/UN6/KEP/EC/2023.

RESULTS

GCU study at the Educational Foundation in the Bandung Regency area was conducted in December 2022. Based on Table 1, a total of 12 adults had high cholesterol levels, exceeding the normal range (200 mg/dL), showing the presence of hypercholesterolemia. In the very young age group (18-44 years), there were 2 participants who already had high cholesterol levels. Moreover, the age group with the highest prevalence of hypercholesterolemia was between 45 and 60 years. The results also showed that 6 participants had high blood sugar levels above 200 mg/dL, showing diabetes mellitus. A total of 4 participants under the age of 60 had diabetes mellitus, requiring treatment from doctors and nurses. Blood sugar levels based on age are shown in Table 1.

Table 1. Frequency distribution of cholesterol levels based on age

Assessment	Category	Age					Total
		< 18	18-30	31-44	45-60	>60	
Cholesterol	normal	2	10	3	21	2	38
	>200	0	1	1	8	2	12
	total	2	11	4	29	4	50
Uric acid	normal	0	7	2	20	4	33
	>8	0	1	3	6	1	11
	total	0	8	5	26	5	44
Blood sugar	normal	18	15	5	24	3	65
	>200	0	0	0	4	2	6
	total	17	15	5	28	5	70

The results showed that among the productive age group of 45 to 60 years, six participants were experiencing high uric acid levels. In the age group of 18 to 30 years, it was observed that 1 participant had elevated uric acid levels. These varying results showed the need for Health education materials, as presented in Table 2.

Table 2. Knowledge and health education need (n=70)

Question topic	Correct answer	Percentage (%)	Wrong Answer (f)	Percentage (%)
Healthy Lifestyle according to participants	46	65.71	24	34.29
Benefits of a healthy lifestyle	41	58.57	29	41.43
A healthy lifestyle that has been implemented	17	24.29	53	**75.71**
List of foods that contain the least fat	46	65.71	24	34.29
Benefits of booster vaccines	43	61.43	27	38.57
Total sugar in soft drinks	24	34.29	46	**65.71**

Based on Table 2, educational needs in the academic environment are related to the benefits of enhancing a healthy lifestyle and controlling sugar consumption.

DISCUSSION

The result showed that participants from educational institutions required special attention to their health status. Elevated levels of blood sugar, cholesterol, and uric acid were also observed. Furthermore, regarding knowledge about healthy lifestyles and non-communicable disease prevention, the result showed the need for education showing the benefits of a healthy lifestyle, improving habits, and controlling sugar consumption. Sugar intake is related to soft-drink consumption which is popular among the young generation. Some studies reported that sugar consumption can be unbeneficial for liver(Zenone et al., 2021) and oral health status(Singh et al., 2018). Research on employees in Japan showed that there was an association between soft drinks with Diabetes Mellitus(Sakurai et al., 2014). So that, health education material regarding the harmful effects of different types of soft drinks and the effect of soft drink consumption on the economy are needed (Tahmassebi & BaniHani, 2020).

The level of work productivity is influenced by both the physical and mental health of individuals. Previous results showed that a lack of physical activity and an unhealthy diet affected the occurrence of diseases, leading to decreased work productivity (Grimani et al., 2019). This is because productive age groups suffering from a particular illness have a higher tendency to take more sick leave and require a longer healing period. Mental and emotional instability occurs when someone is ill, and experiencing physical disruptions, which significantly impacts productivity.

Elevated uric acid and cholesterol levels are associated with problems in cardiovascular health and kidney function (Lee et al., 2015). Experiments on animals have shown that high serum cholesterol levels affect gut microbiota activity, leading to steatosis, steatohepatitis, and fibrosis, potentially causing liver cancer or hepatocellular carcinoma (HCC)(Zhang et al., 2021).

The workplace is an ideal setting to promote health status and reach a significant portion of the working population, including individuals from diverse backgrounds and hard-to-reach rural areas. This setting can effectively engage the young age group, particularly those with low socioeconomic status. The workplace can also motivate its staff to adopt healthy lifestyle by promoting physical activity and nutritional behavior through initiatives to enhance employee health and improve performance.

The need for education in an academic environment is related to the benefits of a healthy lifestyle, improving living patterns, and controlling sugar consumption. Similarly,

previous studies reported that a comprehensive lifestyle modification approach included sugar restriction and increased physical activity (Kundapur, 2023). These lifestyle modifications should be addressed in the workplace. Consequently, a total of 14 workplace nutrition and physical activity intervention studies were carried out, showing statistically significant changes in absenteeism, work performance, workability, and productivity (Grimani et al., 2019) , 2019).

The provision of health education material could also be delivered through nurses responsible for the school health program. Previous study showed that behavioral changes and compliance attitudes tended to last longer when taught by nurse compared to school teachers (Borawski, 2016). Efforts to monitor and improve health status during productive age can begin with health examinations or GCUs, which provide foundational results for individual disease prevention actions. Furthermore, GCUs serve as accurate data for monitoring the development of individual health status. The annual health examination other than measuring blood glucose, uric acids, and cholesterols includes medical history, physical examination, anthropometric measurements, and measurements of HbA1c are needed among teachers, employees, and students in educational institutions.

CONCLUSION

In conclusion, this study showed that productive age, specifically in the range of 45 and 60, had a high risk of increased blood sugar, cholesterol, and uric acid levels. However, those under 30 years old experienced an increase in uric acid. The results showed that essential preventive efforts included managing blood sugar, cholesterol, and uric acid levels through proper meal nutrition and age-appropriate physical activities. Health promotion efforts could also be carried out continuously through a multi-professional approach. Further studies were recommended to examine educational programs, diet management, and physical exercise, including the effects on blood sugar, cholesterol, and uric acid levels in productive age group.

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CONFLICT OF INTEREST

We declare there is no conflict of interest related to this study.

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