

Development of school canteen and school gardens guidelines as prevention against cardiovascular disease

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ABSTRACT Cardiovascular diseases are considered as the deadliest diseases in the world. According to WHO data, deaths caused by coronary heart disease in Indonesia reached 138,380 or 9.89% of the total deaths. The age adjusted mortality rate is 82.30 per 100,000 population with Indonesia ranked #97 in the world. Kulon Progo Regency is located in the western part of the Special Region of Yogyakarta. The average monthly food expenditure in Kulon Progo is Rp365,012 (\$27.49). While a healthy diet is known and promoted to benefit health, only a small portion is used to buy fruits and vegetables (2.24% and 1.76%). Cardiovascular disease is the main cause of morbidity in Kulon Progo. This study aimed to examine the process of developing guidelines for healthy school canteens and school gardens and promote fruit and vegetable consumption. This study used a qualitative research design. The data were collected through in-depth interviews and focus group discussions. A preliminary survey was conducted in 10 private and public schools in Kulon Progo district, Yogyakarta Province, Indonesia. Guidelines related to healthy lifestyles through Canteen- and school garden were successfully arranged for in-school programs. Interviews and focus group discussions explored possibilities of permanently establishing the programs with local and national funding. Some disagreement was voiced concerning the loss of revenue incurred by local food vendors. Stakeholder involvement is crucially important for the preparation and development of the school canteen - and school gardens guidelines. Follow-up is recommended to carry out the dissemination of the guidebook.

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1. Introduction

Cardiovascular disease (CVD) is the number one cause of death (COD) in the world and places a huge burden on regional and national health systems as well as on the patients suffering from the disease. The most common CODs are stroke (21.2%) and heart attacks (8.9%).¹ CVD can cause premature death as a result of increased blood pressure, elevated levels of blood fat and blood sugar, which are caused by lack of physical activity, smoking habits, poor diet, and

alcohol abuse.² On Java island in Indonesia, Kulon Progo is one of the 5 Regencies/ Cities in the Special Region of Yogyakarta (DIY). The area's Medium-Term Development Vision is "The realization of a healthy, independent, high-achieving, fair, safe, and prosperous Kulon Progo Regency based on faith and piety." Optimum health is one of the priorities to be achieved through the current vision of the Kulon Progo district.

Based on the results of the recent National Health Survey (*Riskesdas*) in 2018,³ the incidence of coronary heart disease in Indonesia was 2.0%; heart failure 2.0%; and stroke 7/mille. In the provincial area of DIY, the incidence of coronary heart disease was 0.6%; heart failure 0.25%; and stroke 10.3/

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mile. Whereas in Kulon Progo, coronary heart disease incidence was 0.4%; heart failure 0.7%; and stroke 14.2/mile.⁴ Based on recent research in Kulon Progo Regency, the highest cause of death was stroke (22.1%) followed by hypertension (9.4%).⁵ These data are in accordance with the data on the prevalence of stroke in Kulon Progo Regency that indicated the highest prevalence was in DIY with 33.7%. Meanwhile, the prevalence of hypertension in Kulon Progo Regency ranks the third-highest among the four other districts in the Province of DIY, amounting to 27.3%.

Diet control is one of the most appropriate interventions to be done in efforts to prevent CVD, especially by increasing consumption of fruits and vegetables.^{6,7} Based on the results of a systematic study conducted to determine the effectiveness of giving fruits and vegetables to children and adolescents at school and home, it was concluded that interventions conducted at school were more effective in increasing fruit and vegetable consumption than at home.⁸

Risikesdas data showed that only 18.2% of school-age children (10-14 years old) consume the 3-4 servings/day of vegetables and fruit that are recommended. In Yogyakarta, people who consumed vegetables and fruits ≥ 5 servings were only 7.7% and school-age children (10-14 years) who consumed fruits and vegetables ≥ 5 servings were only 4.2%. Whereas in Kulon Progo, people who consume more than 5 servings of fruits and vegetables per day are only 14.4%.²

The high prevalence of stroke and hypertension in Kulon Progo Regency is in line with the low proportion of fruit and vegetable consumption as one of the main risk factors that can increase stroke and hypertension. The number of people who consume fruits and vegetables more than 5 servings a week is still very low, and most residents only consume 1-2 servings or 3-4 servings of fruits and vegetables a week.⁹ Increasing consumption of fruits and vegetables in the school environment can be done through the procurement or improvement of the school canteen or cafeterias as the main provider of food in schools. A healthy canteen is one that meets food and beverage standards, is clean and safe, while

providing a menu that looks fresh and attractive, tastes good, and varies with seasoning according to the taste of the type of food. The composition of vegetables can be increased gradually, while new menus and recipes are developed, and if necessary cooked more by using oven roasting and steam to preserve the nutritional value. With a district-wide school program, food can be processed in a central location and distributed immediately to other places for equal accessibility among all schools.

Health promotion is one of the primary prevention efforts to change public health behavior and prevent future diseases. Health promotion needs to be done efficiently and effectively so that it prioritizes diseases that cause a high health burden and thereby save health care costs. The most effective step of health promotion is through habituating healthy behaviors that are acquired early in a person's life, namely at the school age, whether elementary, junior high, or high school.¹² Unfortunately, in the Kulon Progo Regency there are still no CVD prevention school programs nor healthy diet and lifestyle promotion programs that target school-age children even though these ages are the ideal time to form healthy habits and behaviors.

Based on the high prevalence of CVDs in Kulon Progo Regency, early intervention is needed at the primary level, especially in school-age children particularly targeting CVD early prevention. Prevention can be done in the form of procurement or improvement of the school canteens in order to increase the availability and affordability of fruits and vegetables for daily consumption.

This program aimed to develop an implementation guideline that schools can practice to shape the consumer behavior of active and healthy children and thereby increase the consumption of fruits and vegetables. The implementation guidelines that were formed are divided into two parts, namely the Implementation Guidelines for Healthy Canteens and the Implementation Guidelines for School Gardens. After the implementation of the guidelines, efforts can be continued with the socialization and educational promotion of the new programs which should engage key leaders in the schools and related stakeholders.

2. Method

The program began with a preliminary survey phase of representatives of elementary schools in Kulon Progo Regency consisting of 10 schools. The selection of schools was based on the location and status of the school, where one school from each area was selected to represent urban, rural, mountainous, lowland, public schools, and private schools reaching a total of 10 schools.

The preliminary survey was conducted to see the current implementation of school canteens and school gardens in the ten schools. The qualitative methods used included interviews and direct surveys of the state of the school environment. We used open questions to conduct the interviews. The standard of healthy canteen is the one made by *Badan POM* (Indonesian Food and Drugs Agency) and The *Ministry of Education and Culture* (Kemendikbud). The participants in this study consisted of principals, School Health Unit (UKS), teachers, students, school canteen managers, and food sellers outside the

school. Direct surveys were done by looking directly at the canteen in the schools and the vendors outside the school related to the menu being sold. This activity was expected to provide a clear and accurate picture of the behavior of students in consuming fruits and vegetables and see the extent to which the school supports the program of a healthy canteen.

The next stage was a cross-sectoral meeting in the Kulon Progo Regency which involved, among others: The Health Service, the Education Service, the Agriculture Service, the Food Security and Agricultural Extension Service, the Agency for Regional Development, the Local Parliament, and related sectors. This meeting discussed what was needed to implement a healthy canteen program and school gardens. It also discussed sources of funds that will support these activities. Next, a Drafting Team of the Instructional Guidelines and Technical Guidelines started organizing healthy canteens in schools in Kulon Progo Regency.

Outputs and indicators of success of this activity are data in the form of an initial description of the



Figure 1. The atmosphere of eating at school



Figure 2. The atmosphere of processing food at school



Figure 3. Meeting with school personnel



Figure 4. Meeting with representatives

behavior of consuming fruits and vegetables in school children in Kulon Progo Regency and the formation of a Guideline Team for the Implementation of healthy canteens and school gardens.

The source of funds for the application of the implementation guidelines was obtained by submitting further research proposals to relevant partners. In addition to partners, it is hoped that there will be a collaboration with the Kulon Progo Regional Government and the school committee to help maintain the funding for the long-term sustainability of the program. Ethical approval was granted from the appropriate institutional review board in DIY. Informed consent included permission to use photos and interview statements which were given by all participants, including parents and guardians of the school-age children.

3. Result

A preliminary survey was conducted with 10 schools in Kulon Progo which included elementary, schools spread out in several different districts. The ten schools have different facilities but all of them expressed their agreement with the plan for the healthy canteen, but only 2 schools objected to the school garden. This is due to the insufficient planting area and the difficulty to keep the garden from being destroyed by younger children.

All school principals, school committees, teachers, student guardians, and students agreed with the existence of a healthy canteen program and a school garden because it can help children to learn the importance of eating a healthy and nutritious diet. Unfortunately, funding continues to be a significant problem. Therefore, several schools have proposed making a legal basis for the use of School Operational Assistance (BOS) for healthy canteens and school gardens, or else it can become an education program for all parents of students. Some canteen managers, canteen food sellers, and vendors outside the school refused to support the healthy canteen. The rejection of a healthy canteen occurs because of feelings of fear of losing their livelihoods, so it is advisable to offer them jobs as healthy canteen employees which is being considered as a

viable option and solution to this challenge.

The survey was conducted through interviews with several parties related to the school including the principals, school committee, teachers, students, canteen managers, and vendors outside the school, and student guardians. The first question was: "*Do you agree if the cafeteria program is implemented?*". Most of the subjects expressed agreement with the provision of the program on the grounds that it is more controlled and the nutrition intake of children is better, but there were some participants in the meeting who disagreed such as canteen managers and food vendors outside of school for economic reasons.

S1: "*I strongly agree with this cafeteria because the children's food is maintained and the children can control their healthy food.*"

S2: "*Disagree because my main income is from the school canteen other than as a school guard.*"

Good enthusiasm from various parties was followed by concerns about several aspects, namely the lack of funds, location, and cafeteria management. The cafeteria program is planned to be given free of charge. However, stakeholders expressed questions about the source of funding. Some subjects answered that they could not collect fees from their parents. Other subjects answered that if they use BOS funds, they cannot be arbitrary because there is a separate allocation for BOS funds. Also, the presence of cafeterias requires additions to the workforce and a secure source of payroll. Therefore, the school can discuss with student guardians and should work together across sectors to discuss the issue of the funding needed.

Cafeteria location is also a matter of consideration. Some schools claim to have an empty room or vacant land that can be used. However, if it is still in the form of land, the development also requires funds. As for the school garden program, observations concluded that there was not much land that could be used for growing vegetables. But some schools also have their own gardens planted with flowers or vegetables. In addition, if minimal land exists then space can be planted in a polybag planting or the use of vertical gardening techniques.

S3: "The RAPBS also cannot be budgeted, so cooperation with policymakers is needed. The committee might agree, but if there are parents for example 10 people don't agree it could be a problem. If there is a grant from the district available to make the cafeteria building, land doesn't matter. Even existing rooms can also be transformed. Cafeteria management is absolutely necessary in order to run continuously."

Some subjects said there had to be a collaboration with the school committee to supervise the provision of food in the cafeteria even though the school was the organizer. Supervision can be done by checking regularly what foods or drinks are sold in the canteen. Then, the food provided for the cafeteria is ensured to be healthy and balanced so that it can meet the nutritional needs of the students. Schools should also work together with cross sectors such as BPOM to conduct supervision. This is because several schools have been routinely visited by BPOM for checking but some schools already have a canteen, unfortunately there is no checking from the BPOM.

S4: "Agree as long as there is a cooperation between the school committee and the school. School as the executor."

S5: "The canteen is examined by the POM agency every 2 years and the school is invited to socialize from the POM every two years and it is attended by UKS teachers."

Before the cafeteria discussion and planning were held, several schools already had a school canteen. Some schools allow traders to sell outside

the fence, but some prohibited this vending because the food and drinks sold contain sweeteners, preservatives, and coloring that can harm children. The existence of an in-school canteen is also an option for students because the break time is not long so that the closer location makes students choose to shop at the school canteen. In addition, there is also the manager of the guardian of students so that the food provided is clean and guaranteed.

S6 : "There used to be snacks outside for the children with lots of chiki-chikis (junk food), with preservatives and sweeteners, eventually schools and committees deliberated to set up a canteen where food was provided by the guardians of students who still had sons at school, because if the sons ate the food provided it was automatically healthy food. The canteen is also environmentally friendly by providing self-made food and reducing food sold in plastic."

After the interviews, several suggestions for the cafeteria program emerged, such as students want the program for lunch crossbecause some had skipped breakfast at home. Also, there is initial education by other sectors such as the health department on healthy food and balanced nutrition so students will be interested in the food provided. The type and amount of food provided vary so students do not become bored. In addition, there is periodic supervision from the BPOM to determine the quality of food produced from the canteen and cafeteria.

After the preliminary survey, the team held a cross-sector team meeting to discuss writing the implementation guidelines. The cross-sector meeting was attended by representatives from the Health Service, Education Office, Agriculture Office,



Figure 5. School canteen handbook



Figure 6. School garden handbook

Legal Bureau, and Food Security Office. This agenda produced conclusions to make operational and technical guidelines in an implementation manual so that at the end of the activity, two guidebooks were created, namely the School Canteen Implementation Guidelines and the School Garden Implementation

After the discussion of the guidelines implementation, the process continued with meetings with some school representatives and representatives of the cross-sector team to explain the points that exist within the guidelines. The government in the area of Kulon Progo promised to follow up the guidelines for implementing to be a legal decree by the Head of the District called "*Peraturan Bupati*" and using district funds for the implementation of this program. He also urged that the manufacture of "*Peraturan Bupati*" be done quickly and precisely so that it can be included in the book guideline implementation for dissemination to the schools.

At present, the implementation guidelines have been completed in the form of an implementation manual so that all that remains is waiting for the "*Peraturan Bupati*" from the Kulon Progo Regency Government. After the district head's regulation is available, the next step is to socialize these guidelines to the schools and ensure that there are sources of funding that can be used by schools to practice this program.

4. Discussion

The result of a preliminary survey conducted in several schools included in this study found that many schools and students strongly support having a healthy canteen and school garden. The provision of healthy canteens and school gardens can help children to learn the importance of a healthy diet. As a result, students appear to be healthier and perform better in school and daily life activities.

With the increased consumption of vegetables and fruit, participants of this program met the fiber intake recommendations for a healthy diet. Research on fruit and vegetable consumption habits in five countries in Asia, including Indonesia, still show that the amount of fruit and vegetable consumption in rural populations is low,⁹ leading to increased risk of

CVD. Regular consumption of vegetables and fruit together or consumed separately in varied portions is proven to reduce the incidence of CVD and cancer.⁷ Many programs can be implemented to increase the awareness of school children about the importance of fruit and vegetable consumption.¹⁰ Two of these health interventions include a healthy canteen and a school garden program. As stated in the introduction, insufficient fiber intake may result in increased CVD risk. The most feasible way to overcome this issue may be done by early habituation and introduction in healthy eating habits and improving the relation to fiber-rich foods, such as vegetables and fruits. As carried out in this study, implementation of the healthy breakfast in combination with healthy canteens and school gardens may support this.

Breakfast time is important but sometimes it is missed due to several reasons including, being in a hurry to go to school, having stomach problems or food that is less appetizing. In fact, the energy from breakfast can increase concentration when receiving lessons at school. A unique breakfast program was tested with students in Minnesota called Grab and Go Breakfast. This program allows students to be able to have breakfast at school at a low price. The number of students participating in this activity increased by around 21.9%.¹¹ The breakfast program at school is also conducted at kindergartens in the state of Utah in the USA. The teachers were asked for opinions about this program and stated that this program could significantly reduce hunger for children in school. However, generally, teachers prefer traditional breakfasts at home compared with those provided in schools and consider there may be a potential for waste in such in-school programs.¹²

In this study found that several suggestions for the cafeteria program emerged, such as students want the program for lunch because some students did not have the habit of eating breakfast at home. School food contributes significantly to healthy eating behavior because it can form healthy eating habits and increase preference for new and diverse foods. The program can run smoothly if supported by guidelines and regulations which regulate the provision of food in schools. The lunch program conducted by several schools in San Diego, California, also has a positive impact on students. When the

consumption of food from home is compared with food at school, it is seen that there is a higher quality of food provided at school. In addition, consumption of dairy products and fruits was also more than those consumed when at home.¹³

Therefore, it is necessary to have a policy or regulation regarding healthy food consumption as a guideline in a healthy food program implemented by the schools so that children's food intake can be guaranteed and quality assured.¹⁴ Several countries such as the United Kingdom, Sweden, and Australia have provisions, regulations, and improvements to preschool and elementary school meals. Many countries' laws require the provision of nutritious food, but Australia and surrounding areas are adopting specific guidelines for school cafeteria food, especially using a "traffic light" approach, providing information about foods that are recommended and not recommended. Unfortunately, most children bring food from home which is less nutritious. Therefore, with a good healthy diet program, policies and implementation must be added consistently so that children can be provided a healthy diet and balanced food intake.¹⁵

Further, it was found that a school garden is an innovative strategy to provide more healthy food choices and become more knowledgeable about varieties of fruits and vegetables. Additionally, school gardens create educational opportunities for fun physical activity during gardening. Implementation guidelines and local regulations regarding school gardens are urgently needed. One recent study shows that the existence of local regulations that support school gardens can facilitate some of the supply needs for the implementation of nutrition services in schools.¹⁶

During this study the government in the area of Kulon Progo promised to follow up the guidelines for implementing to be a legal decree by the Head of the District called "*Peraturan Bupati*" and using district funds for the implementation this program. He also urged that the manufacture of "*Peraturan Bupati*" be done quickly and precisely so that it can be included in the guideline book of implementation for dissemination to the schools.

5. Conclusion

The preparation of the Healthy Canteen Implementation Guidelines and the School Garden Implementation Guidelines involves many parties, including teachers, parents, students, teacher group stakeholders, as well as representatives from the Department of Primary and Secondary Education. The guideline is accompanied by funding requirements as one of its provisions. These guidelines were made as a pilot project. Active stakeholder involvement is urgently needed to ensure the implementation of this guideline runs smoothly. After the implementation guidelines are established, it should be applicable in other cities or districts in Indonesia. Follow-up requires dissemination of the manuals to schools with relevant stakeholders so that the guidebooks can be immediately implemented. Besides that, there needs to be a commitment from policymakers in the district so that the canteen programs and school gardens can be run continuously in the schools, and even become a reference standard for other regions outside of Indonesia.

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Conflict of interest

There is no conflict of interest.

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