Hypercholesterol Care Movement for Study Mothers in Gang Rempong South Jakarta

Royani Chairiyah [a,1,*], Ulfah Nur Aini Karim

[a] Universitas Binawan, Jl Dewi Sartika no 25-30 Kalibata Kramat Jati, Jakarta Timur 13630, Indonesia
[b] Universitas Binawan, Jl Dewi Sartika no 25-30 Kalibata Kramat Jati, Jakarta Timur 13630, Indonesia
[1] royani.chairiyah@binawan.ac.id; [2] ulfah@binawan.ac.id
* Corresponding Author royani.chairiyah@binawan.ac.id

ABSTRACT

Hypercholesterolemia is a common metabolic condition characterized by high blood plasma cholesterol levels and can be a risk factor for developing cardiovascular disease. The proportion is more women than men. But not all people know the causes, risk factors, long-term health impacts and prevention methods including solutions. The purpose of this activity is to increase awareness of mothers studying hypercholesterol. The method of activity was given in the form of providing health education and checking blood pressure and cholesterol which was carried out directly at one of the houses of the recitation mothers of gang rempong, South Jakarta. From the results of the service, it was concluded that 1) The knowledge of study mothers increased by 14.4% with pre-test results 76, posttest 89. 2) 5 people who had elevated blood pressure or suspected hypertension (20.27%) and 3 people who had hypercholesterolemia (21.62%). Advice with a healthy lifestyle and good diet can prevent hypercholesterol.

KEYWORDS
Care for hypercholesterol;
Mothers;
Healthy lifestyle;
Diet;

This is an open-access article under the CC–BY-SA license

1. Introduction

The incidence of non-communicable diseases (NCDs) is increasing in developing countries [1]. More than 85% of NCD deaths occur in low- and middle-income countries [2]. More than 80% of deaths are caused by cardiovascular disease [3]. The current era of globalization brings changes in human health can occur in the form of lifestyle changes and changes in food consumption patterns, causing an increase in cholesterol levels in the body this often occurs in women of childbearing age (WUS), from the age of 15-49 years [4].

Hypercholesterolemia is a common metabolic condition characterized by high blood plasma cholesterol levels and can be a risk factor for developing cardiovascular disease [5]. Excess LDL cholesterol levels in the blood will easily attach to the inner wall of blood vessels and through the oxidation process will form clots, where if the clot gets bigger it will form a lump that will result in narrowing of the blood vessel [6]. This process is usually called atherosclerosis [7]. The results of Riskesdas in 2018 showed that the proportion of the Indonesian population with total cholesterol levels in the borderline (200–239mg/dL) and high (≥240 mg/dL) categories was more common in women, namely by 24% and 9.9% compared to men by 18.3% and 5.4% [8]. Some of the factors that influence total cholesterol levels are a low-fiber diet, a high-fat diet, smoking habits, gender, obesity and physical activity [9]. The proportion of Indonesians with obesity is 12.1% males and 15.1% females. However, the percentage of the proportion of people with less physical activity by sex is highest found in men, namely 36.4% while women 30.7% [10].

Gang Rempong is a densely populated village in the South Jakarta area, in the village of East Pejaten there are many areas whose conditions can be said to be densely populated, one of which is in the Java village area precisely in Gang Rempong is a place for community service to be carried out. Conditions in the environment are quite crowded and a lot of it is occupied by women over the age of 35 years. This makes it a target that most of them may suffer from high cholesterol, therefore the choice of place is very suitable for the purpose of dedication to increase the care of mothers studying hypercholesterol by socializing the dangers. High cholesterol disease that can cause various complications of other diseases, even death

2. Method

The implementation of community service is carried out directly or face-to-face using Power points The stages of the method of implementing community service are as follows

2.1. Coordination/Licensing

This is the initial stage of implementing Community Service. Community Service Partners to follow up on the cooperation contract. The adultery starts from the licensing of RT. 009 RW. 009 Pejaten Timur, Pasar Minggu, South Jakarta.

2.2. Preparation of Activities

This activity is the management of the PKM implementation team in the form of the distribution of duties of the leader and team members, coordination of preparatory meetings and assertive communication between teams and introduction to the potential of each personnel to strengthen activities.

The first preparatory activity carried out was deliberation to the group to determine the location of community service risk of cholesterol disease. Community service activities to the community have been determined in Gang Rempong Pasar Minggu, South Jakarta. We also prepare plans - what plans we will fill in community service activities later. After determining the location of the activity, we confirmed to the campus to make an official letter so that our community service activities were known by the campus and also known by the mothers of Gang Rempong recitation that we were officially holding community service from campus. Based on the letter, Mr. RT allowed us to carry out community service activities in Gang Rempong on Friday, January 13, 2023, then distributed invitations to the mothers of Gang Rempong recitation.

The 2nd activity determines the participants, namely all recitation mothers in the rempong alley. 3rd activity . Preparation of supporting tools for activities, such as preparing material to be delivered through power point media and laptops, as well as preparing rooms to be used, and mobile phones for documentation. Activity 4. Evaluation of activities to the extent to which preparations have been made.

2.3. Implementation of Community Service

The community service activity with the theme "Hypercholesterol Care Movement in Gang Rempong, South Jakarta" will be held on Friday, January 13, 2023 for 4 hours. In general, community service activities are carried out by presenting material on the importance of recognizing the risk of cholesterol disease by discussing causative factors, symptom diagnosis, the importance of prevention, risk factors, long-term health impacts, how the solution and how to live a healthy lifestyle. Before presenting, we provide a video as an opening introduction to cholesterol disease. We check blood pressure and cholesterol using Easy Touch Strip Test.

This activity uses the method of delivering lectures through PowerPoint media and is also continued with a question and answer session. The implementation of community service activities is shown in Figure 1 of the Implementation Method. The delivery of the material is seen in figure 2. The presentation of material uses a) The lecture method is one of the learning methodologies to convey learning information to participants which is carried out orally and face-to-face directly. By using this method, the speaker will more easily explain the material, the speaker uses PowerPoint as a supporting media. b) Question and answer method, this method is carried out after the material is given to the study mothers. This is so that mothers can understand comprehensively the material presented, so that it can be implemented in everyday life. c) Evaluation is carried out by inviting study mothers to explore and recall the material previously described by distributing questionnaires. This questionnaire sheet is shared with two sessions, the first session is distributed before the material starts and the second session is distributed when the material delivery is complete. We provide a questionnaire sheet where the sheet contains questions about cholesterol disease. Our purpose in doing this is to find out whether the mothers of Gang Rempong studies already know what cholesterol disease is. Respondents who answer the questionnaire well and appropriately will be given souvenirs as appreciation.

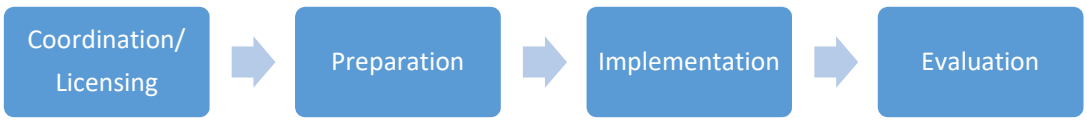

Fig. 1. Implementation Method

Vol. 3, No. 8, 2023
E-ISSN 2807-7679 | P-ISSN 2807-792X

2.4. Blood pressure and Cholesterol checks

After the examination, the mother was informed of the results of the examination.

2.5. Door Prize Distribution

At the end of the event we held a door prize distribution that we had previously planned by preparing several household items and household materials in the form of doormats, tools for spraying clothes, towels, floor cleaners, clothes cleaners, clothes deodorizers etc. To get a door prize we look at the attendance list and then write the name in the lucky wheel application, the concept is that if the instructions in the application stop in the box containing the participant's name then the name gets the door prize

3. Results and Discussion

The implementation of hypercholesterol care movement activities for recitation mothers is a form of a series of events that are carried out in a structured manner as shown in Figure 3. Participants in dedication. The picture shows that the topic of the material chosen is in accordance with the research subject, namely the mothers of recitation. Community service activities attended by 22 mothers from Gang Rempong can be seen in table 1 of respondents' characteristics. The pretest and postest results show an average pre-test result of 76. Posttest result average score 89. The increase from Pre test to Post Test was 14.4%. Blood pressure and cholesterol test results Of the 22 participants examined, there were 5 people who had increased blood pressure or suspected hypertension (20.27%) and 3 people who had hypercholesterolemia (21.62%). Normal cholesterol levels in the blood are < 200 mg / dl.

Cholesterol is more prevalent in women and factors that affect total cholesterol levels are a low-fiber diet, a high-fat diet, smoking habits, gender, obesity and physical activity [11]. The proportion of Indonesians with obesity is 12.1% males and 15.1% females [12]. High levels of total cholesterol in the blood are a trigger factor for high mortality and morbidity rates caused by heart and blood vessel disorders [13]. Based on the prevalence of men and women, men with higher levels have a higher risk of heart and blood vessel disease [14]. According to Darmojo, men's risk for heart and blood vessel disease exceeds the risk in women after adolescence to the age of about 50 years and above [15]. In the pre-menopausal years, women are protected by the hormone estrogen, which is not owned by men [16]. The hormone estrogen can prevent plaque formation in the arteries by raising HDL levels and lowering LDL levels, but after menopause passes estrogen levels in women decrease [17]. Therefore, women who have experienced menopause have a higher risk than before menopause. Thus the hormone estrogen is considered as protection against the occurrence of excessive cholesterol levels [18].

In addition to gender, age is also one of the factors that can affect the increase in total blood cholesterol levels [19]. As explained above, there is a relationship with the work of the hormone estrogen in women aged 55 years, estrogen levels decrease dramatically which results in risk factors for increased cholesterol levels in women. In Listiana and Purbosari's study of 30 respondents who checked cholesterol levels in May-June at Bhayangkara Porong hospital, an average cholesterol level of 231.90 mg / dL was obtained and an average age of 37 years.

Exercise and physical activity can also affect blood lipid profiles. Based on research conducted by Galih Tri Utomo et al in 2012 in elementary school students there was a decrease in weight, percent body fat and blood cholesterol levels caused by increased physical activity in samples who originally exercised only once a week at the time of sports lessons at school to 3 times a week with low intensity [20]. With the increase in physical activity, it causes burning of body fat reserves to meet the body's caloric needs during aerobic exercise. While low physical activity and lack of exercise coupled with excessive food intake are factors in fat accumulation in the body which can result in high levels of cholesterol in plasma [21].

The incidence of hypercholesterolemia is associated with risk factors due to lifestyle changes so that the causative factors can still be modified [22]. Therefore, appropriate management must be balanced with lifestyle interventions, such as diet therapy, physical exercise, smoking cessation and weight loss [23]. Diets that can be used to lower LDL cholesterol are unsaturated fatty acid diets such as MUFAs (Monounsaturated Fatty Acids) and PUFAs (Polyunsaturated Fatty Acids) because the most influential dietary factor on increasing LDL cholesterol concentration is saturated fatty acids. In general, foods derived from animals (fatty meat, cheese, butter and milk cream) in addition to containing saturated fatty acids also contain cholesterol [24]. Thus, reducing the intake of animal products will be more beneficial in the form of limiting cholesterol intake. Every 4 (four) ounces of beef or chicken meat contains 100 mg of cholesterol which in animal foods and saturated fatty acids can increase K-LDL levels (LDL cholesterol) [25]. Saturated fatty acids besides being found in animal fats are also found in coconut oil, palm oil and other oils that have been used for frying (used cooking oil), although at first they were unsaturated fatty acids [26]. The results of subclinical and clinical studies show that the replacement of saturated fatty acids with unsaturated fatty acids in the diet, successfully reduces total cholesterol and K-LDL levels without lowering K-HDL (HDL cholesterol), thereby reducing the risk of coronary heart disease [27]. Foods such as fried bananas, fried sweet potatoes, croquettes, fried tempeh, fried cassava and flour fried chicken contain trans fatty acids. In fact, when viewed from the type of food (vegetable food) does not contain trans fatty acids [28]. The highest trans fatty acid content is in fried foods (flour fried chicken, fried eggs and tempeh mendoan), ruminant products (rawon meat, oxtail soup and beef cheese burgers), and finished food products (using hydrogenated margarine or noodles) such as chocolate, biscuits and crois-sant [29]. The process of deep frying will cause a change in the unsaturated fatty acid form of cis to a trans form , and an increase in the amount of trans fatty acids is proportional to a decrease in the unsaturated fatty acid form of cis (oleic acid) [30].

Daily activities that are routinely carried out by study mothers are included in the category of light physical activity. Some of the things that patients do are cooking for family breakfast, doing homework such as sweeping, mopping, and washing clothes and every few days shopping at the market. After finishing cooking and tidying up the house, the patient's activity is to sit while watching television. At noon, the patient begins to prepare for a family lunch. while chatting with his youngest child who has returned from school. By late afternoon, the patient again prepared dinner for her son and husband who had just returned home. The activity is carried out by patients every day with a duration of >30 minutes per day. Twice a week, patients and their families gather in the living room to chat together. Every Monday patients attend regular recitation events at the mosque near home. Study mothers include rarely exercising.

Table 1. Characteristics of Respondents

	Number of respondents (people)	Percentage (%)
Age		
Early adulthood (26-35years)	9	40,91
Late adult (35-45 years)	7	31.82
Early Elderly (46-55 years)	6	27.27
Education		
End of SMP	2	9,09
Graduated from High School	18	81,82

Graduated from PT	2	9,09

Fig. 2. Material Delivery

Fig. 3. Community Service Participants

4. Conclusion

This Community Service activity was attended by 22 participants starting from health education and checking blood pressure and total cholesterol levels running smoothly. Blood pressure and cholesterol level checking activities are carried out after health education activities about cholesterol. Public interest is very high for these two types of examinations. This shows good public self-awareness to detect early the possibility of suffering from hypertension and hypercholesterol.

The implementation of empowerment for mothers of gang rempong studies that have been carried out regarding the hypercholesterol care movement, can be used as provisions to prevent hypercholesterol. So it can be concluded that the majority of study mothers have not been able to apply prevention against Hypercholesterol. They are often negligent as mothers in consuming a low-fiber diet, high-fat diet, affected by obesity and lack of physical activity. Based on the results of empowering these mothers, it is necessary to have education and regular checks on blood pressure, cholesterol. It is hoped that with the implementation of empowerment about the hypercholesterol care movement can understand and apply it in daily life by eating in moderation, reducing sugar, and reducing bad fatty foods. This activity will proceed to the research stage such as the effect of fiber consumption, high fat consumption, activity on hypercholesterol.

Acknowledgment

This service activity was carried out with the help of students and mothers of gang rempong recitation. Therefore, we would like to thank Mr. RT. 009 RW. 009 Pejaten Timur, Pasar Minggu, South Jakarta who has given permission and helped carry out this empowerment activity.

Author Contribution

The activity plan in order to implement the solutions offered that there are four series of activities, namely coordination, preparation, implementation, and evaluation.

Funding

This service is funded by the service implementation team independently.

Conflict of Interest

The authors declare no conflict of interest.

References

[1] E. A. Arafat, E. M. I. Youssef, and H. A. Khalaf, "The possible alleviating effect of garlic supplement on the neural retina in a rat model of hypercholesterolemia: a histological and immunohistochemical study," *Eur. J. Histochem.*, vol. 65, no. 4, Dec. 2021.

[2] N. Thakur, D. Gupta, D. Mandal, and T. C. Nagaiah, "Ultrasensitive electrochemical biosensors for dopamine and cholesterol: recent advances, challenges and strategies," *Chem. Commun.*, vol. 57, no. 97, pp. 13084–13113, 2021.

[3] M. M. Dobrolińska *et al.*, "The influence of high-density lipoprotein cholesterol on maximal lipid core burden indexing thin cap fibrous atheroma lesions as assessed by near infrared spectroscopy," *Cardiol. J.*, vol. 28, no. 6, pp. 887–895, Dec. 2021.

[4] T. D. Antonić *et al.*, "Cholesterol homeostasis is dysregulated in women with preeclampsia," *Polish Arch. Intern. Med.*, Nov. 2021.

[5] H. Y. Choi, I. Ruel, S. Choi, and J. Genest, "New Strategies to Promote Macrophage Cholesterol Efflux," *Front. Cardiovasc. Med.*, vol. 8, Dec. 2021.

[6] L. Dewangan, J. Korram, I. Karbhal, R. Nagwanshi, and M. L. Satnami, "N-Doped Carbon Quantum Dot-MnO 2 Nanowire FRET Pairs: Detection of Cholesterol, Glutathione, Acetylcholinesterase, and Chlorpyrifos," *ACS Appl. Nano Mater.*, vol. 4, no. 12, pp. 13612–13624, Dec. 2021.

[7] L. Sletner *et al.*, "Maternal Glucose and LDL-Cholesterol Levels Are Related to Placental Leptin Gene Methylation, and, Together With Nutritional Factors, Largely Explain a Higher Methylation Level Among Ethnic South Asians," *Front. Endocrinol. (Lausanne).*, vol. 12, Dec. 2021.

[8] R. Supriyadi, N. Agustanti, and M. Adisuhanto, "Increase Serum Tumor Necrosis Factor Alpha decreased Serum Cholesterol Level, but not Albumin, in Hemodialysis Patients with Non-Fibrotic Hepatitis C Infection," *Open Access Maced. J. Med. Sci.*, vol. 9, no. B, pp. 614–619, Jun. 2021.

[9] F. Fisayo Ajayi, P. Mudgil, C.-Y. Gan, and S. Maqsood, "Identification and characterization of cholesterol esterase and lipase inhibitory peptides from amaranth protein hydrolysates," *Food Chem. X*, vol. 12, p. 100165, Dec. 2021.

[10] H. Tada *et al.*, "Effects of artificial intelligence-SsupporTed Automated NutRiTional Intervention on LDL cholesterol Control in Patients with Familial Hypercholesterolaemia (iSTART-FH): protocol for a randomised controlled trial," *BMJ Open*, vol. 11, no. 12, p. e053453, Dec. 2021.

[11] Y.-W. Ting, M. Y. Jalaludin, A. A. Zaini, and R. Mohamed, "Triglyceride to high-density lipoprotein cholesterol ratio is an independent predictor of liver fibrosis among pediatrics non-alcoholic fatty liver disease," *Front. Endocrinol. (Lausanne).*, vol. 13, p. 126549, Dec. 2022.

[12] K. Hosoya, S.-I. Miyashita, S. Karatsu, I.-H. Huang, and Y. Sagane, "Species-specific gene duplication in Clostridia produces variations of cholesterol-dependent cytolysin with different cytotoxicity," *Biochem. Biophys. Res. Commun.*, vol. 637, pp. 240–246, Dec. 2022.

[13] Y. Cheng *et al.*, "Association between serum uric acid/HDL-cholesterol ratio and chronic kidney disease: a cross-sectional study based on a health check-up population," *BMJ Open*, vol. 12, no. 12, p. e066243, Dec. 2022.

[14] H. Park, T. N. Sut, B. K. Yoon, V. P. Zhdanov, N.-J. Cho, and J. A. Jackman, "Unraveling How Cholesterol

Affects Multivalency-Induced Membrane Deformation of Sub-100 nm Lipid Vesicles," *Langmuir*, vol. 38, no. 51, pp. 15950–15959, Dec. 2022.

[15] R. Rong *et al.*, "Targeting Cell Membranes, Depleting ROS by Dithiane and Thioketal-Containing Polymers with Pendant Cholesterols Delivering Necrostatin-1 for Glaucoma Treatment," *ACS Nano*, vol. 16, no. 12, pp. 21225–21239, Dec. 2022.

[16] F. Xu, J. Yan, Z. Peng, J. Liu, and Z. Li, "Comprehensive analysis of a glycolysis and cholesterol synthesis-related genes signature for predicting prognosis and immune landscape in osteosarcoma," *Front. Immunol.*, vol. 13, Dec. 2022.

[17] H. Liu *et al.*, "Diaporisoindole B Reduces Lipid Accumulation in THP-1 Macrophage Cells via MAPKs and PPARγ–LXRα Pathways and Promotes the Reverse Cholesterol Transport by Upregulating SR-B1 and LDLR in HepG2 Cells," *J. Nat. Prod.*, vol. 85, no. 12, pp. 2769–2778, Dec. 2022.

[18] P. Bhattacharjee, N. Rutland, and M. R. Iyer, "Targeting Sterol O -Acyltransferase/Acyl-CoA:Cholesterol Acyltransferase (ACAT): A Perspective on Small-Molecule Inhibitors and Their Therapeutic Potential," *J. Med. Chem.*, vol. 65, no. 24, pp. 16062–16098, Dec. 2022.

[19] I. M. Braithwaite and J. H. Davis, "Orientation of Cholesterol in Polyunsaturated Lipid Bilayers," *Langmuir*, vol. 38, no. 50, pp. 15804–15816, Dec. 2022.

[20] R. Dai *et al.*, "CYP2C19 metabolizer phenotypes may affect the efficacy of statins on lowering small dense low-density lipoprotein cholesterol of patients with coronary artery disease," *Front. Cardiovasc. Med.*, vol. 9, Dec. 2022.

[21] X. Liang, X. Luo, T. Chang, F. Han, C. Xu, and E. Li, "Positive effects of optimal dietary cholesterol levels on the ovary development and health of female Pacific white shrimp, Litopenaeus vannamei broodstock," *Aquaculture*, vol. 577, p. 739987, Dec. 2023.

[22] G. Dikmen, "Surface enhanced Raman spectroscopy sensor based on silver nanoparticles/multi wall carbon nanotubes for ultrasensitive detection of cholesterol," *Spectrochim. Acta Part A Mol. Biomol. Spectrosc.*, vol. 303, p. 123235, Dec. 2023.

[23] C. Nie *et al.*, "Shenlian extract protected ox-LDL-loaded macrophages against ER stress by promoting LAL-LXRα mediated cholesterol flux," *J. Ethnopharmacol.*, vol. 317, p. 116721, Dec. 2023.

[24] Y. Kim, G. Mavodza, C. E. Senkal, and C. G. Burd, "Cholesterol-dependent homeostatic regulation of very long chain sphingolipid synthesis," *J. Cell Biol.*, vol. 222, no. 12, Dec. 2023.

[25] B. Kumar and S. K. Sinha, "Nanostructured Cu2O deposited on TiO2 nanotube arrays for ultra-sensitive non-enzymatic cholesterol electrochemical biosensor," *Mater. Today Commun.*, vol. 37, p. 107171, Dec. 2023.

[26] Y. Huo *et al.*, "Tafolecimab in Chinese patients with non-familial hypercholesterolemia (CREDIT-1): a 48-week randomized, double-blind, placebo-controlled phase 3 trial," *Lancet Reg. Heal. - West. Pacific*, vol. 41, p. 100907, Dec. 2023.

[27] I. Sabovic *et al.*, "Legacy perfluoro-alkyl substances impair LDL-cholesterol uptake independently from PCSK9-function," *Toxicol. Reports*, vol. 11, pp. 288–294, Dec. 2023.

[28] J. S. Dantas Alves *et al.*, "A ketogenic diet pattern during lactation increases visceral fat, glucose, and cholesterol levels and reduces beneficial fecal bacteria in dams and offspring," *Food Biosci.*, vol. 56, p. 103158, Dec. 2023.

[29] Y. Wu *et al.*, "Association of remnant cholesterol with hypertension, type 2 diabetes, and their coexistence: the mediating role of inflammation-related indicators," *Lipids Health Dis.*, vol. 22, no. 1, p. 158, Sep. 2023.

[30] M. Zhang, H. Liu, and X. Wang, "Cholesterol oxidase-immobilized MXene/sodium alginate/silica@ n -docosane hierarchical microcapsules for ultrasensitive electrochemical biosensing detection of cholesterol," *J. Mater. Chem. B*, vol. 11, no. 7, pp. 1506–1522, 2023.