

Original Article



Public Awareness of Dyslipidemia Among the Korean Population: A Survey Study

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ABSTRACT


Objective: We aimed to assess the level of public awareness regarding dyslipidemia and its management among the Korean population.

Methods: We conducted a web- or mobile-based survey study targeting the general population, using various recruitment methods, between July 25, 2022 and August 26, 2022. The questionnaire consisted of 12 questions designed to collect demographic information and evaluate participants' awareness and knowledge about dyslipidemia.


Results: In total, 2,882 participants who completed the survey were included in the analysis. Among the participants, a substantial majority (89.1%) were familiar with the concepts of "good cholesterol" and "bad cholesterol," while a comparatively lower percentage (just 46.7%) were acquainted with the term "dyslipidemia." Noticeable variations in understanding were observed when examining specific aspects of dyslipidemia management, including diet, exercise, and pharmacotherapy.

Conclusion: The results of this survey underscore the significance of enhancing public awareness about dyslipidemia within the context of health literacy, demonstrating the necessity for a more comprehensive approach that includes education and policymaking to effectively manage dyslipidemia.

Keywords: Awareness; Disease management; Dyslipidemias; Health literacy; Population surveillance

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Conflict of Interest

The authors have no conflicts of interest to declare.

Data Availability Statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Author Contributions

Conceptualization: Bae JH, Jin ES, Jeong IK; Data curation: Jin ES, Jeong IK; Formal analysis: Bae JH, Jin ES, Jeong IK; Funding acquisition: Jeong IK; Investigation: Bae JH, Jin ES, Kim SE, Kang S, Lee JY, Kim M, Jin HY, Shin MJ, Jeong IK; Methodology: Bae JH, Jin ES, Shin MJ, Jeong IK; Project administration: Jin ES, Jeong IK; Resources: Bae JH, Jin ES, Jeong IK; Software: Bae JH; Supervision: Jeong IK; Visualization: Bae JH; Writing - original draft: Bae JH; Writing - review & editing: Bae JH, Jin ES, Kim SE, Kang S, Lee JY, Kim M, Jin HY, Shin MJ, Jeong IK.

INTRODUCTION

Dyslipidemia presents a significant global public health challenge, contributing to mortality and disability.^{1,2} According to the Dyslipidemia Fact Sheet in Korea 2022,³ the crude prevalence of dyslipidemia among Korean adults aged 20 years or older was 48.2% in 2020.³ Dyslipidemia was defined as having hyper-low-density lipoprotein (LDL)-cholesterolemia (≥ 160 mg/dL or taking lipid-lowering drugs), hypertriglyceridemia (≥ 200 mg/dL), or hypo-high-density lipoprotein cholesterolemia (< 40 mg/dL in men; < 50 mg/dL in women).³ The finding that approximately half of the population has dyslipidemia highlights the growing burden of the disease, particularly among the rapidly aging Korean population.

According to the fact sheet, the awareness rate of self-reported physician-diagnosed hypercholesterolemia has been gradually increasing over the past decade. However, in 2019–2020, it stood at 63.0%, with relatively low figures for the treatment rate (self-reported use of lipid-lowering drugs) and control rate (total cholesterol < 200 mg/dL) at 55.2% and 47.7%, respectively. In clinical practice, it has been observed that people may not be familiar with the term “dyslipidemia,” despite being aware of hypercholesterolemia. Understanding the nature of dyslipidemia is crucial for effectively addressing it as a non-communicable disease (NCD), requiring collaboration among healthcare professionals, the government, and individuals. Despite significant efforts by healthcare professionals and the government to enhance awareness of dyslipidemia, it remains uncertain whether this information is effectively reaching the general population. Therefore, we conducted a survey study on behalf of the Korean Society of Lipid and Atherosclerosis (KSoLA) to evaluate public comprehension of dyslipidemia and its management in the Korean population.

MATERIALS AND METHODS

This survey study was conducted from July 25, 2022 to August 26, 2022. The survey was administered using a web or mobile application, allowing participants to access and complete a questionnaire. Various recruitment methods were employed, including subway advertisements with QR codes (**Supplementary Fig. 1A**), website banners on Naver (<https://www.naver.com/>) (**Supplementary Fig. 1B**), and newsletters targeting both non-members and members of the KSoLA. There were no demographic restrictions, and individuals of any age, sex, race/ethnicity, or background were eligible to participate.

The questionnaire consisted of 12 questions, including demographic inquiries (**Table 1**). Except for questions regarding age, sex, and participation source, all other inquiries required a simple “yes” or “no” response. The primary outcome of the study was the proportion of participants self-reporting a “yes” answer to the questions. Since the study involved the analysis of anonymously submitted data through the application, it was classified as nonhuman subject research, and therefore, Institutional Review Board approval was waived.

Out of the 12 questions, 8 were designed to assess participants’ awareness and understanding of dyslipidemia. Based on the number of correctly answered questions, participants were categorized as having limited, moderate, and high levels of knowledge about dyslipidemia if they answered 0–2, 3–5, and 6–8 questions correctly, respectively. As this study was not originally planned as a comparative study, no statistical analysis was conducted to compare different groups based on their responses or levels of awareness of dyslipidemia.

Table 1. Survey questions and participants' responses*

Number	Descriptions	Responses, n (%)	
		Yes	No
Demographics			
Q1	What is your age and race/ethnicity?	NA	NA
Q2	Are you a man or woman?	NA	NA
Q3	Are you a healthcare professional?	443 (15.4)	2,439 (84.6)
Dyslipidemia awareness†			
Q4	Do you know what dyslipidemia means?	1,347 (46.7)	1,535 (53.3)
Q5	Do you know the effects of high cholesterol and triglycerides on the body?	2,071 (71.9)	811 (28.1)
Q6	Are you aware of the different types of cholesterol, including good and bad cholesterol?	2,568 (89.1)	314 (10.9)
Q7	Do you think vegetarians have lower cholesterol levels?	2,304 (79.9)	578 (20.1)
Q8	Can exercise lower cholesterol levels?	2,740 (95.1)	142 (4.9)
Q9	Should meat consumption be discontinued if a person is diagnosed with atherosclerosis?	658 (22.8)	2,224 (77.2)
Q10	Can dyslipidemia be cured by taking cholesterol-lowering medication?	743 (25.8)	2,139 (74.2)
Q11	Can medication be discontinued by adjusting diet and exercise?	1,872 (65.0)	1,010 (35.0)
Participation source			
Q12	How did you find and decide to participate in this survey?	NA	NA

NA, not applicable.

*Participants were categorized based on their knowledge about dyslipidemia into 3 levels: limited (0–2 correct answers), moderate (3–5 correct answers), and high (6–8 correct answers).

†Questions on dyslipidemia awareness had binary response options: “yes” or “no.”

RESULTS

Out of the 3,949 respondents, a total of 2,882 participants who completed the survey were included in the analysis. The largest age group consisted of individuals in their 30s, comprising 830 participants (28.8%), followed by those in their 40s (25.3%), 20s (19.8%), and 50s (15.3%) (**Supplementary Fig. 2**). Women accounted for 54.6% of the participants. The majority of participants were from the Republic of Korea (99.3%), and 15.4% identified themselves as healthcare professionals. The common recruitment channels for participants were website banners (61.5%), subway advertisements with QR codes (25.1%), and mobile applications (6.9%) (**Supplementary Fig. 3**).

The results of survey on public awareness of dyslipidemia are summarized in **Fig. 1** and **Table 1**. Among the participants, 58.5% demonstrated a high level of knowledge about dyslipidemia, while 37.8% had a moderate understanding, indicating a relatively fair overall awareness. Approximately 46.7% of participants responded that they understood the meaning of dyslipidemia. Turning to specific items, most participants (89.1%) recognized the concept of “good cholesterol” and “bad cholesterol,” and 71.9% were aware of the impact of high cholesterol or triglyceride levels on the body or health. Furthermore, 79.9% of participants believed that vegetarians had lower blood cholesterol levels, and 95.1% thought that exercise could lower cholesterol levels. However, only 22.8% of participants indicated that meat consumption should be discontinued if a person is diagnosed with atherosclerosis. There was a lower level of understanding regarding the effect of exercise on cholesterol control, while higher awareness was observed about the influence of diet on cholesterol levels and atherosclerosis. Additionally, 25.8% of participants believed that dyslipidemia could be cured by taking cholesterol-lowering medications, and 65.0% thought that medication could be discontinued after changing one’s diet and engaging more frequently in exercise. Most participants did not recognize the necessity of long-term therapy with lipid-lowering drugs for dyslipidemia, despite knowing that medication alone could not cure it.

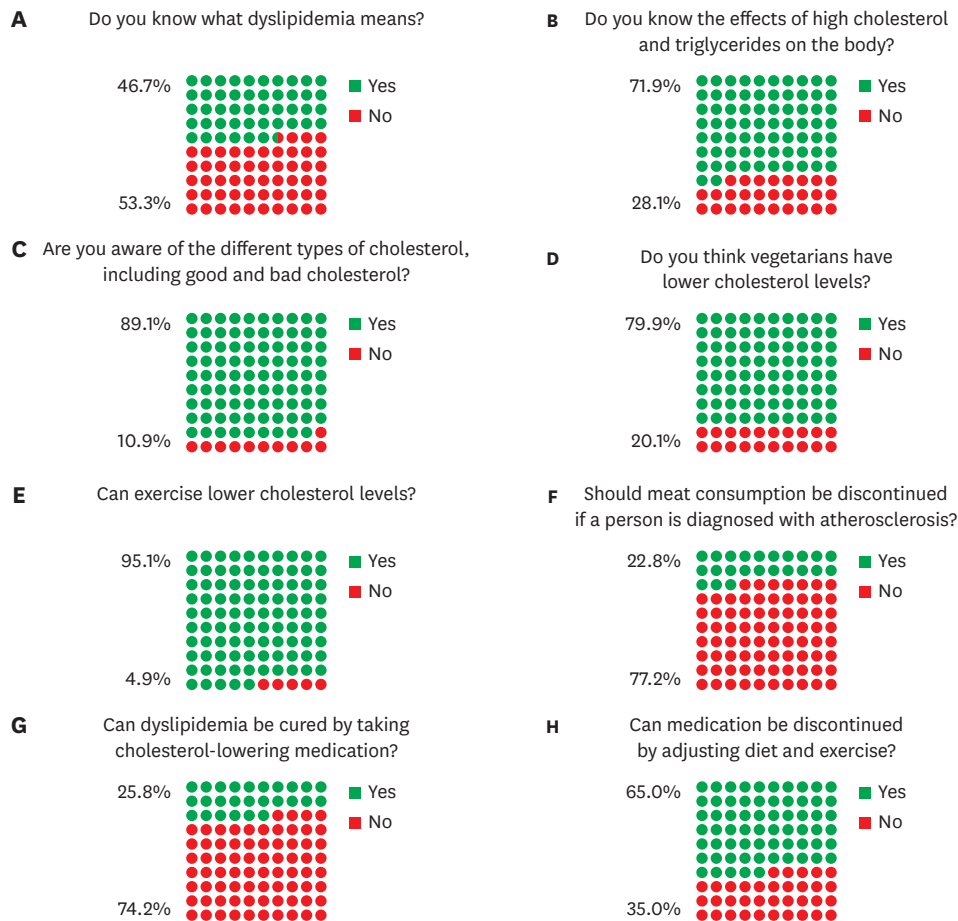


Fig. 1. Public awareness of dyslipidemia in Korea. (A) Do you know what dyslipidemia means? (B) Do you know the effects of high cholesterol and triglycerides on the body? (C) Are you aware of the different types of cholesterol, including good and bad cholesterol? (D) Do you think vegetarians have lower cholesterol levels? (E) Can exercise lower cholesterol levels? (F) Should meat consumption be discontinued if a person is diagnosed with atherosclerosis? (G) Can dyslipidemia be cured by taking cholesterol-lowering medication? (H) Can medication be discontinued by adjusting diet and exercise?

Additionally, a subgroup analysis was conducted to examine the differences in response rates between healthcare professionals and non-healthcare professionals in relation to their answers to different questions. The findings revealed a tendency where healthcare professionals achieved higher accuracy in a significant number of questions, including the overall total score (**Supplementary Table 1**).

After the participants completed the survey, they were given the answers to the questions and received education regarding the importance of dyslipidemia and its management, as outlined in **Table 2**.

DISCUSSION

This survey study provides valuable insights into the low public awareness of the term “dyslipidemia” compared to their knowledge of the health impact of cholesterol or triglycerides. It also highlights the variation in understanding aspects of dyslipidemia management, including diet, exercise, and pharmacotherapy. Unlike the Korean National Health and Nutrition Examination Survey, which primarily focuses on hypercholesterolemia,⁴ this study

Table 2. Dyslipidemia and its management: understanding, impact, and strategies

Topics	Explanations
Dyslipidemia	Dyslipidemia is a term used to describe a condition where one has at least one of the following abnormalities: high levels of LDL-cholesterol, often referred to as “bad cholesterol,” high levels of triglycerides, or low levels of HDL-cholesterol, known as “good cholesterol.” It is the most accurate term that encompasses conditions like hypercholesterolemia, high cholesterol, and hypertriglyceridemia.
The impact of cholesterol and triglycerides on blood vessels	When cholesterol and triglyceride levels are elevated, it can lead to the development of atherosclerosis in the arteries, which increases the risk of serious conditions such as myocardial infarction or stroke.
Good cholesterol and bad cholesterol	LDL-cholesterol, which is mainly responsible for atherosclerosis, is commonly referred to as “bad cholesterol.” Medications are typically used to lower LDL-cholesterol levels. On the other hand, higher levels of HDL-cholesterol are associated with a reduced risk of atherosclerosis, and it is thus referred to as “good cholesterol.”
Food and cholesterol	Cholesterol is a necessary substance for the body and is continuously produced by the liver. Therefore, even individuals who follow a strictly vegetarian diet without consuming fatty foods can still have high cholesterol levels. It is not possible to control blood cholesterol levels through diet alone.
Exercise and cholesterol	Exercise has positive effects on cholesterol levels, lowering LDL-cholesterol and increasing HDL-cholesterol. However, even with exercise and dietary adjustments, LDL-cholesterol typically only decreases by about 10%. Therefore, when medication is necessary, exercise alone cannot replace it.
Discontinuation of meat consumption	If a person has atherosclerosis, it is important to maintain low blood cholesterol levels. However, it is not necessary to completely abstain from consuming meat. Opting for lean cuts of meat and obtaining high-quality protein can contribute to overall health.
Remission of dyslipidemia	Individuals who require cholesterol-lowering medication should continue taking it, as discontinuing the medication can result in elevated cholesterol levels. In rare cases, some individuals may be able to reduce or discontinue medication through active participation in exercise and dietary modifications. However, the decision to discontinue medication should be made in consultation with your healthcare provider.

HDL, high-density lipoprotein; LDL, low-density lipoprotein.

specifically addressed awareness of dyslipidemia, making it the first of its kind in Korea. The findings have significant implications for patient advocacy and future policymaking.

The study was initiated based on the observation that individuals, both with and without dyslipidemia, had limited familiarity with the term “dyslipidemia” compared to terms like “hyperlipidemia” or “hypercholesterolemia.” Although the inclusion of approximately 15% of healthcare professionals in the study indicates a relatively higher level of awareness, there is still an inaccurate understanding of dyslipidemia management.

The development of health literacy is critical in preventing and managing NCDs, including dyslipidemia.⁵ Personal health literacy refers to individuals' ability to find, understand, and use information and services to make informed health-related decisions for themselves and others.⁶ Unfortunately, low personal health literacy is often prevalent among older adults and individuals with low income or education levels, leading to health disparities and exacerbating inequalities in disease management.⁷ While digital technology provides easy access to health information, it also presents risks of encountering inaccurate or misleading information that can potentially harm individuals' health. Additionally, medically accurate and evidence-based healthcare information can be challenging for the general population to comprehend. Given the findings of this study, it is evident that the public acquires information about dyslipidemia and atherosclerosis in a similar manner. This emphasizes the need for collaborative efforts between expert organizations like the KSoLA and the government to ensure that the expansion of health information on dyslipidemia goes beyond quantity and focuses on improving quality.⁸ These efforts aim to foster accurate understanding and informed decision-making among the population, helping individuals navigate the abundance of health information and make well-informed choices regarding dyslipidemia management.

Most participants demonstrated a moderate to high level of understanding regarding dyslipidemia, with over half showing a strong knowledge base. This suggests that targeted

education and information focusing on specific details, rather than general overviews, would be more effective in future educational and policy initiatives. It is important to identify areas where the general population has a good or poor understanding and conduct further research to determine the influencing factors. Such assessments will provide insights into specific knowledge gaps and misconceptions that need to be addressed.

According to the survey, about two-thirds of participants believed that they could discontinue lipid-lowering drugs by adjusting their diet and exercising. However, for LDL-cholesterol, which is a major driver of atherosclerosis, lifestyle changes alone have limited effectiveness in controlling its levels.⁹ Therefore, it is important to maintain proper medication adherence and continue pharmacotherapy, even if LDL-cholesterol levels are within the target range. Inappropriate discontinuation of lipid-lowering drugs can significantly increase the risk of cardiovascular events and mortality in patients with existing atherosclerotic cardiovascular disease or those at high risk.¹⁰ Nonadherence to statins, the primary treatment for dyslipidemia, is a common and challenging issue influenced by various factors, such as a lack of understanding of the disease's pathophysiology and concerns about potential adverse events like new-onset diabetes.^{10,11} However, statins are associated with a small increased risk of new-onset diabetes, especially in individuals with other diabetes risk factors, high-intensity statin use, or older age.¹¹ Monitoring blood glucose levels when starting or intensifying statin therapy, along with emphasizing the importance of lifestyle modifications including a healthy diet and physical activity, can help predict or prevent potential risks. Therefore, effective communication and patient education on these matters are crucial for ensuring proper medication adherence.

This study has strengths and limitations. It conducted a survey at the academic society level to investigate the awareness of dyslipidemia among the general population in Korea. The development and selection of items for the questionnaire involved the expertise of specialists in dyslipidemia and atherosclerosis, ensuring the validity and reliability of the study. However, the sampling method used in this study did not employ statistical techniques; instead, it relied on voluntary participation by individuals with a specific interest, which may affect the representativeness of the participants. Additionally, the survey was conducted through a web or mobile application, potentially excluding individuals without access to digital devices, particularly older people. Moreover, the sample size of approximately 2,800 participants was relatively small, and a detailed factor analysis for each outcome was not performed. Lastly, the higher proportion (15.4%) of healthcare professionals among the participants compared to the general population could restrict the generalizability of the results.

In conclusion, this survey study underscores the importance of raising public awareness regarding the term "dyslipidemia" within the realm of health literacy. It also highlighted the necessity for a more comprehensive approach, encompassing education and policy development, in order to effectively manage dyslipidemia and its various components. Despite the growing interest in health and the abundance of health-related information, there remains significant room for improvement in the proper dissemination and practical application of knowledge.¹² These efforts to assess public awareness of dyslipidemia can play a pivotal role in understanding and addressing the real-world implications of a range of NCDs, including disorders of lipid metabolism and other cardiometabolic diseases. This is particularly crucial given the current upsurge in interest in health and the proliferation of health-related information.

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SUPPLEMENTARY MATERIALS

Supplementary Table 1

Subgroup analysis based on healthcare professional status

[Click here to view](#)

Supplementary Fig. 1

Participation source. (A) Subway advertisements with QR codes. (B) Website banner on Naver.

[Click here to view](#)

Supplementary Fig. 2

Age distribution of study participants.

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Supplementary Fig. 3

Recruitment channel of study participants.

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