

Public Knowledge and Perception of Dyslipidemia Management: A Cross-Sectional Study in Malaysia

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Abstract

Dyslipidemia constitutes one of the significant modifiable risk factors for cardiovascular diseases (CVDs). Public knowledge and awareness of dyslipidemia could potentially reduce the CVDs burden. This study aimed to assess the level of knowledge and perception of dyslipidemia with its management among the public. Additionally, it aims to identify the factors associated with the level of knowledge and explore the public's experience and perceived difficulties in the prevention or management of dyslipidemia. A cross-sectional study using a validated questionnaire was conducted among Malaysians aged 35 years and above from Klang Valley, Malaysia. A convenience sampling method was used. The questionnaire was distributed via social media (WhatsApp and Facebook) and face-to-face at the clinic, residential area and academic institution. Of the 257 respondents, a substantial of them (70%) had poor knowledge with a mean knowledge score of 1.85 ± 1.78 . Respondents' medical background was found to be significantly associated with knowledge status. Over half (64.2%) were aware of undertaking regular cholesterol screening tests at healthcare facilities, with 25% of them preferred private hospitals for cholesterol screening. Most respondents (74.4%) reported that diet is the main component contributing to cholesterol management, and hence controlling food intake remains a major difficulty in managing the disease. The public's knowledge of dyslipidemia and its management is still poor.

Keywords: Dyslipidemia, Cardiovascular Disease, Statin, Lipid Modifying Agents, Hypercholesterolemia

Introduction

Dyslipidemia refers to the imbalance of low-density lipoprotein cholesterol (LDL-C), total cholesterol (TC), triglycerides (TG), and high-density lipoprotein cholesterol (HDL-C)⁽¹⁾. It is commonly found in individuals who are with older age, obesity and sedentary lifestyle⁽²⁻⁴⁾. Notably, increased LDL-C coupled with low HDL-C is a major risk factor for developing cardiovascular diseases (CVDs)^(5,6). To date, CVDs remain as the leading cause of death with an estimated 17.9 million deaths worldwide in 2019⁽⁷⁾. Several studies from the United States and Association of

Southeast Asian Nations (ASEAN) countries such as China and Singapore have collectively reported the prevalence of dyslipidemia increased substantially among adults aged 40 years and above^(2,8-10). Likewise in Malaysia, the National Health and Morbidity Surveys (NHMS) showed the prevalence of dyslipidemia had increased significantly from 20.7% in 2006 to 47.7% in 2015⁽¹¹⁻¹³⁾, though with a slight drop to 40% in 2019⁽¹⁴⁾. Alarmingly, more than a third of individuals in the age group of 40 to 59 years old were unaware of their high cholesterol levels⁽¹⁴⁾.

This unawareness could probably cause both the individual and health sector to bear a high cost of illness associated with the management of dyslipidemia complications. This is due to the highest expenses incurred during the first year following a new CVD event, particularly in the first 30 days due to in-patient hospitalization and intervention costs^(15,16). In terms of knowledge about dyslipidemia, a recent nationwide study conducted by Lim et al. (2021) in Singapore involving a multiethnic Asian population showed that there were substantial knowledge gaps among the public on dyslipidemia and its management⁽¹⁷⁾. For instance, more than half of the respondents thought that dyslipidemia is associated with specific signs or symptoms and nearly 70% believed that chronic use of statins could cause kidney or liver damage⁽¹⁷⁾. In addition, there remains misconceptions about cholesterol medications as the public believes herbal medicine is better than conventional medicines for the management of dyslipidemia⁽¹⁷⁾. Similarly, in another study by Golder et al. (2021), which studied the beliefs and attitudes about statins posted on Twitter found that there is an exaggerated fear of the medicine's side effects reported by the statin users (15.7%). The statin users also claimed that they had experienced rhabdomyolysis and muscle stiffness⁽¹⁸⁾. These previous research findings suggest that the lack of public knowledge on the prevention and treatment of dyslipidemia could further compound the control of dyslipidemia. To date, information on Malaysian public perception and knowledge on dyslipidemia and its management remains scarce. Hence, this study aimed to i) assess the level of knowledge and perception of dyslipidemia with its management among the public; (ii) identify factors associated with the level of knowledge and (iii) explore the public's experience and perceived difficulties in the prevention or management of dyslipidemia. The study findings could provide baseline data on public awareness of dyslipidemia and its treatment. The government or non-profit organizations may leverage the findings by encouraging more comprehensive public health research and devising strategies to boost the level of dyslipidemia awareness among the public, especially among those who are most at risk of developing CVDs.

Materials and Methods

Study design

A cross-sectional study using a validated questionnaire was conducted from October 2022 to July 2023 in Klang Valley, Selangor, Malaysia. The questionnaire was distributed via social media platforms (WhatsApp and Facebook) using Google form. The electronic version was disseminated targeting both public groups (community pages, public health awareness groups) and private groups (closed academic groups and personal networks). The use of an electronic questionnaire was chosen to enable wider and faster outreach, allowing participants to respond at their convenience, and to improve accessibility for individuals who may not be reachable through physical distribution. In addition, face-to-face data collection was carried out at public areas including clinics, residential areas, and academic institutions. Convenience sampling was applied in this study, a non-probability sampling method that allows the researcher to conveniently select participants who are willing or self-volunteered to participate in the study. ~~Convenience sampling was used in this study.~~ This sampling method is a non-probability form of sampling that enables the researcher to conveniently select participants who are willing to participate or self-volunteer in the study⁽¹⁹⁾.

Study population

Respondents who fulfilled the following study inclusion and exclusion criteria have consented to the study. The inclusion criteria include; adults aged 35 years and above, Malaysia citizens, with or without dyslipidemia and other diseases, able to read and understand English or Bahasa Malaysia. Those individuals who are illiterate and incomplete questionnaire were excluded in this study.

Sample size calculation

The sample size was calculated using G*Power statistical power analysis software (2020). The goodness-of-fit tests was used. The degree of freedom was then determined by using the largest value of independent variable that represented the largest sample size in the study. Two degree of freedom was obtained by three independent variables present. By considering 30% of dropout, 224 respondents were required in this study. A total of 257 respondents were managed to be recruited in this study.

Study instrument

The study instrument was a structured and validated questionnaire adopted from a previous study⁽¹⁷⁾. The questionnaire consisted of two sections: (1) Ten questions that captured respondents' sociodemographic information; (2) Eight structured questions that assessed public knowledge on dyslipidemia and its management

and five open-ended questions that explored public experiences and perceived challenges in the prevention and management of dyslipidemia.

A questionnaire was developed and its content was reviewed for face and content validity by a panel of three experts comprising two pharmacy academicians and a pharmacist managing the Cardiac Rehabilitation Medication Therapy Adherence Clinic at Hospital Serdang. The expert panel assessed the questionnaire for relevance, clarity, appropriateness of terminology, and suitability for the target population. Based on their feedback, several adjustments were made, including simplifying complex medical terms, rephrasing ambiguous questions, and refining the overall structure for better respondent comprehension. The English version of the questionnaire was then subjected to forward and backward translation to Bahasa Malaysia by a certified language translator to ensure linguistic and conceptual equivalence.

Subsequently, a pilot test was conducted involving eight public respondents to assess the clarity, comprehension, and cultural appropriateness of the questionnaire items. Feedback from the pilot respondents highlighted the need to replace the medical term “dyslipidemia” with the layman’s term “high cholesterol level” for better public understanding. Additionally, minor revisions were made to the instructions for improved clarity and flow. The finalized questionnaire was then made available in both English and Bahasa Malaysia to accommodate the Malaysian population.

Data analysis

Data analysis was carried out using Statistical Package for Social Sciences (SPSS) version 28. The sociodemographic data were analyzed using descriptive statistics. Categorical data were presented as frequencies and percentages. Numerical data were presented as mean $\pm$ standard deviation. The knowledge score was the sum-up of correct responses provided by the respondents which ranged between 0 – 8. The

respondents’ knowledge scores were then classified into poor (had between 0 to 2 correct answers) and good knowledge (had between 3 to 8 correct answers)⁽¹⁷⁾. The association between knowledge score and independent variables was analyzed by using the chi-square test. Fisher’s exact test was used if over 20% of cells with expected frequencies below 5 as this violated the assumptions of the chi-square test⁽²⁰⁾. A p-value < 0.05 was deemed statistically significant. The open-ended questions were analyzed by using qualitative content analysis. Qualitative content analysis is frequently used by pharmacy researchers⁽²¹⁾ as it considers the participant and context when classifying text into groups of comparable categories in order to find patterns, similarities and relationships⁽²²⁾. By using this method, the qualitative data provided by respondents were first grouped into categories. Similar categories were then collapsed to develop overarching themes. Subsequently, the frequency of each theme was calculated by summing up the total responses provided.

Results

Respondents’ sociodemographic characteristics

Table 1 provides a summary of respondents’ sociodemographic characteristics. Of the 257 respondents who provided their responses, more than half of them were female (n = 144, 56%). The majority of the respondents were Malay (n = 249, 96.9%), employed (n = 204, 79.4%), and with a mean age of 45 ± 11 years old. More than two-thirds of them were in the 35 to 50 years old age group (n=194, 75.5%) and had completed tertiary education (n = 172, 66.9%). The majority of the respondents came from a non-medical background family (n = 163, 63.4%) and were from the B40 category (n= 107, 41.6%) which is defined as a household income of less than RM4850 per month⁽²³⁾. Most of the respondents had a family history of cardiovascular disease (n= 185, 72%) with dyslipidemia (n = 65, 25.3%) and hypertension (n = 64, 24.9%) as the two most commonly reported current medical problems.

Table 1. Respondents’ sociodemographic characteristics (n = 257)

Variables	Categories	n (%)
Age (years old), mean $\pm$ SD	45 $\pm$ 11	-
	35-50	194 (75.5)
	51-60	37 (14.4)
	> 60	26 (10.1)
Gender	Male	113 (44)
	Female	144 (56)
Ethnicity	Malay	249 (96.9)
	Non-Malay	8 (3.1)
Employment status	Employed	204 (79.4)
	Unemployed	53 (20.6)
Marital status	Married	226 (87.9)
	Divorced	4 (1.6)

	Never been married	27 (10.5)
Education level	Primary school or less	17 (6.6)
	Secondary school	68 (26.5)
	College or university	172 (66.9)
Medical background	Yes	94 (36.6)
	No	163 (63.4)
Income	Less than RM4850 (B40)	107 (41.6)
	RM4851- RM 10970 (M40)	101 (39.3)
	RM 10970 and more (T20)	49 (19.1)
Family history of CVDs	Yes	185 (72)
	No	72 (28)
Current medical problems	Heart disease	12 (4.7)
	Stroke	4 (1.6)
	Hypertension	64 (24.9)
	Diabetes	32 (12.5)
	Hyperlipidaemia	65 (25.3)

SD = standard deviation; CVDs = cardiovascular diseases

Respondents' knowledge on dyslipidemia and its management.

The respondents' mean knowledge score was 1.85 ± 1.78 . The majority of the respondents

had poor knowledge scores ($n = 180$), 70% of which attained 2 or fewer correct answers (Figure 1).

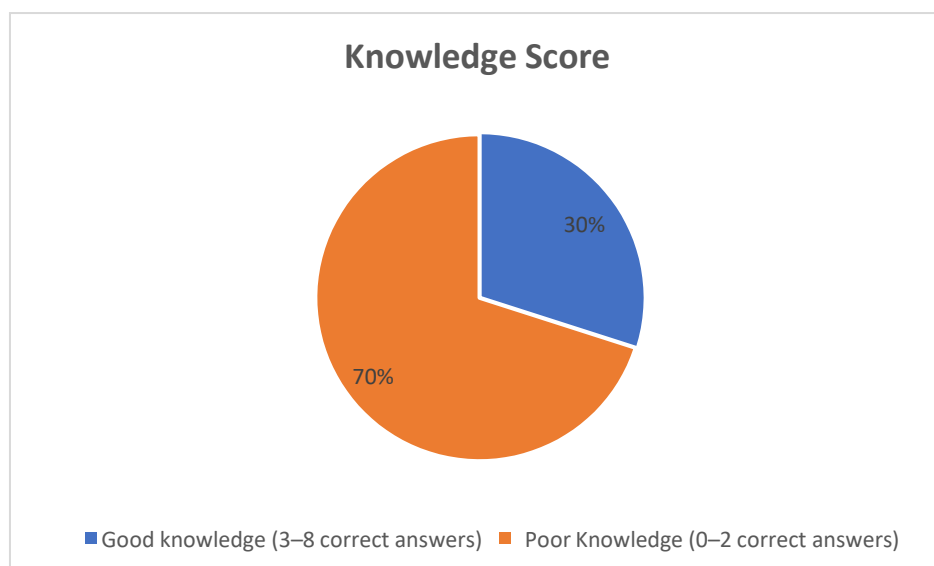


Figure 1. Respondents' knowledge score on dyslipidemia and its management (n = 257)

Figure 2 displays the itemized analysis of knowledge statements. The majority of the respondents (78.2%) believed that difficulty breathing and chest pain are common signs associated with dyslipidemia. Most of them (81.3%) also thought exercise and healthy diet have equal effectiveness to conventional medication in lowering cholesterol levels. Alarming, a substantial number of respondents had misconceptions about cholesterol medications. For instance, more than two-thirds of the respondents

believed that the long-term use of statins or other medications may affect the heart or kidneys (84%) as well as increase the risk of getting cancer (79%). Next, a substantial number of the respondents thought that cholesterol medication could not be safely discontinued (79.8%). A similar high percentage of respondents thought that cholesterol medication can be discontinued once the cholesterol level is under control (86.8%) and that statin should not be consumed in the long term (90.7%).

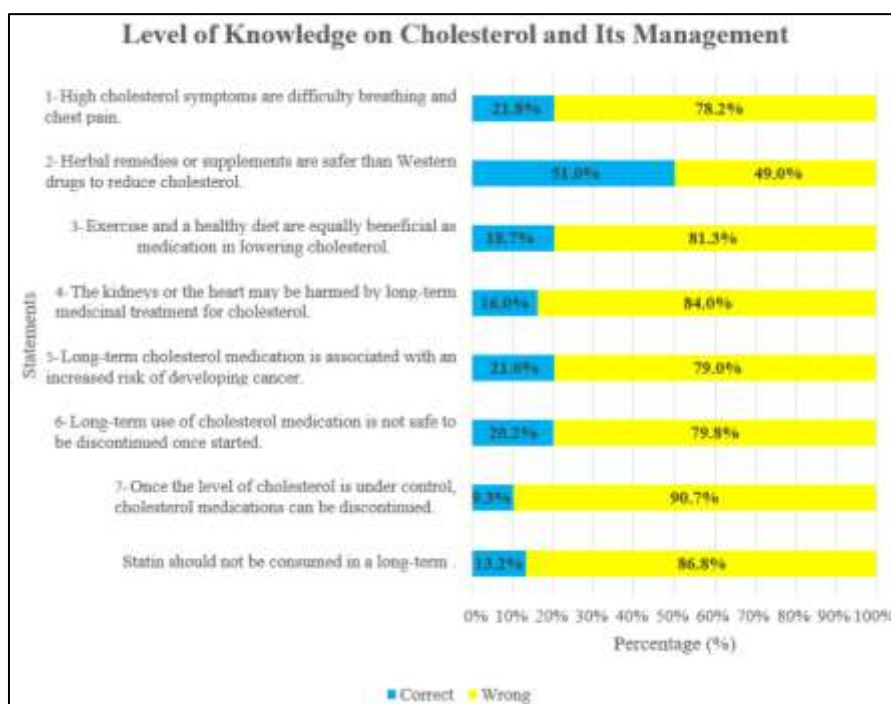


Figure 2. Level of knowledge on cholesterol and its management (n = 257)

Factors associated with knowledge status

Chi-square and Fisher's exact tests were conducted to determine the relationship between sociodemographic factors and knowledge status (i.e. good or poor knowledge) (Table 2). Accordingly, the chi-square test for independence indicated a significant between family medical

background and knowledge status [χ^2 (1, n = 257) = 4.91, p = 0.03]. No significant association was found in other factors including age, ethnicity, gender, employment status, marital status, education level, income, and CVD risk factor (Table 2).

Table 2. Factors associated with knowledge status

Factors	Good knowledge (n=77)	Poor knowledge (n=180)	χ^2	p-value
Age (years old)			0.88	0.65
35-50	61 (79.2)	133 (73.9)		
51-60	9 (11.7)	28 (15.6)		
>60	7 (9.1)	19 (10.6)		
Gender			0.26	0.61
Male	32 (41.6)	81 (45)		
Female	45 (58.4)	99 (55)		
Ethnicity			4.17	0.055*
Malay	72 (93.5)	177 (98.3)		
Non-Malay	5 (6.5)	3 (1.7)		
Employment status			3.92	0.05
Employed	67 (87)	137 (76.1)		
Unemployed	10 (13)	43 (23.9)		
Marital status			0.51	0.47
Married	66 (85.7)	160 (88.9)		
Single/ Divorced	11 (14.3)	20 (11.1)		
Education level			3.91	0.14
Primary school or less	6 (7.8)	11 (6.1)		
Secondary school	14 (7.9)	54 (30)		
College or university	57 (74)	115 (63.9)		
Family with medical background			4.91	0.03

Yes	36 (46.8)	58 (32.2)	3.59	0.17
No	41 (53.2)	122 (67.8)		
Income				
<RM4,850	26 (33.8)	81 (45)		
RM4,851-RM10,970	32 (41.6)	69 (38.3)	0.02	0.90
>RM10,970	19 (24.7)	30 (16.7)		
Family history of CVD				
Yes	55 (71.4)	130 (72.2)		
No	22 (28.6)	50 (27.8)		

*Fisher's exact test

Respondents' overall experience in managing dyslipidemia

a) Respondents' experience in taking cholesterol medication

Out of 257 respondents, 47 of the respondents had been prescribed cholesterol medication. The majority of the respondents (n = 38, 80.9%)

reported taking the medication as directed and only a few respondents (n = 4, 8.5%) reported having experienced medication side effects (Table 3). One out of four respondents reported fatigue as the common side effect associated with cholesterol medication.

Table 3. Respondents' experience of taking cholesterol medication (n = 47)

Experience in taking cholesterol medication	Category	n (%)
Having side effect	Yes	4 (8.5%)
	No	43 (91.5%)
Adhere to medication	Yes	38 (80.9)
	No	9 (19.1)

b) Preferred premises for cholesterol screening

In managing dyslipidemia, respondents were also asked about their preferred premises to have their cholesterol screening. Table 4 provides a summary of the preferred healthcare premises selected by respondents and the reasons for their selection. A total of 195 responses were received. Among the available healthcare premises, private hospitals were the most preferred premise (n = 49, 25%), followed by government primary clinics (n = 45, 23%). Interestingly, private clinics were the least preferred premises for cholesterol screening. The easy and fast results obtained was the most common reason that influenced respondents in

selecting premises for their cholesterol screening. This is tailored with the findings shown as the majority of respondents opted for private hospitals (40.4%), government hospitals (29.2%), pharmacies (48.5%), and private medical laboratories (50%) respectively. While for respondents who opted for a government primary clinic as their preferred choice of cholesterol screening, 32.7% claimed that ease of accessibility, namely near to their house or working area, was the main reason of their selection. In addition, respondents chose private clinics due to health insurance or other benefits offered at certain clinics.

Table 4. Respondents' preferred premises for cholesterol screening and reasons

Preferred premise (n=195)	n (%)	Reasons for selecting the premise (n=245)	n (%)
Private hospital	49 (25)	Easy and can get the result immediately	21 (40.4)
		Have health insurance or facilities at certain health premises	12 (23.1)
		Reputable institutions and value-added services	7 (13.5)
		Get the order from employer	5 (9.6)
		Near to my house/ work at nearby area	4 (7.7)
		Follow the appointment place that has been set or chosen to do cholesterol screening	2 (3.8)
		Flexible	1 (1.9)
		Total (n)	52
Government primary clinic	45 (23)	Near to my house/ work at nearby area	18 (32.7)
		Easy and can get the result immediately	14 (25.5)

		Prices offered are reasonable	9 (16.4)
		Reputable institutions and value-added services	6 (10.9)
		Follow the appointment place that has been set or chosen to do cholesterol screening	6 (10.9)
		Health campaign	1 (1.8)
		Free for government employees/ government pensioners	1 (1.8)
		Total (n)	55
Government Hospital	41 (21)	Easy and can get the result immediately	21 (29.2)
		Near to my house/ work at nearby area	13 (18.1)
		Easy and can get the result immediately	11 (15.3)
		Reputable institutions and value-added services	8 (11.1)
		Prices offered are reasonable	6 (8.3)
		Follow the appointment place that has been set or chosen to do cholesterol screening	6 (8.3)
		Free for government employees/ government pensioners	6 (8.3)
		Get the order from employer	1 (1.4)
		Total (n)	72
Pharmacy	28 (14.1)	Easy and can get the result immediately	16 (48.5)
		Near to my house/ work at nearby area	6 (18.2)
		Prices offered are reasonable	6 (18.2)
		Reputable institutions and value-added services	3 (9.1)
		Get the order from employer	1 (3)
		Health campaign	1 (3)
		Total (n)	33
Private medical lab	18 (9.2)	Easy and can get the result immediately	9 (50)
		Have health insurance or facilities at certain health premises	4 (22.2)
		Near to my house/ work at nearby area	2 (11.1)
		Get the order from employer	1 (5.6)
		Flexible	1 (5.6)
		Reputable institutions and value-added services	1 (5.6)
		Total (n)	18
Private clinic	14 (7.2)	Have health insurance or benefits at certain health premises	8 (53.3)
		Near to my house/ work at nearby area	3 (20)
		Reputable institutions and value-added services	2 (13.3)
		Prices offered are reasonable	1 (6.7)
		Easy and get the result immediately	1 (6.7)
		Total (n)	15

Respondents' perception on measures to prevent or manage dyslipidemia effectively

A total of 246 responses were provided by respondents on the measures or strategies they carried out to prevent or manage dyslipidemia Table 5). Most of the respondents (43.1%) believed that maintaining a healthy diet alone can help in managing dyslipidemia whilst about a third (31.3%)

respondents claimed that practicing a healthy diet and exercise were beneficial in managing dyslipidemia. Interestingly, only a mere 5.7% of respondents reported taking cholesterol medication can help to prevent or manage dyslipidemia. Furthermore, 5.3% reported the need to perform cholesterol screening regularly.

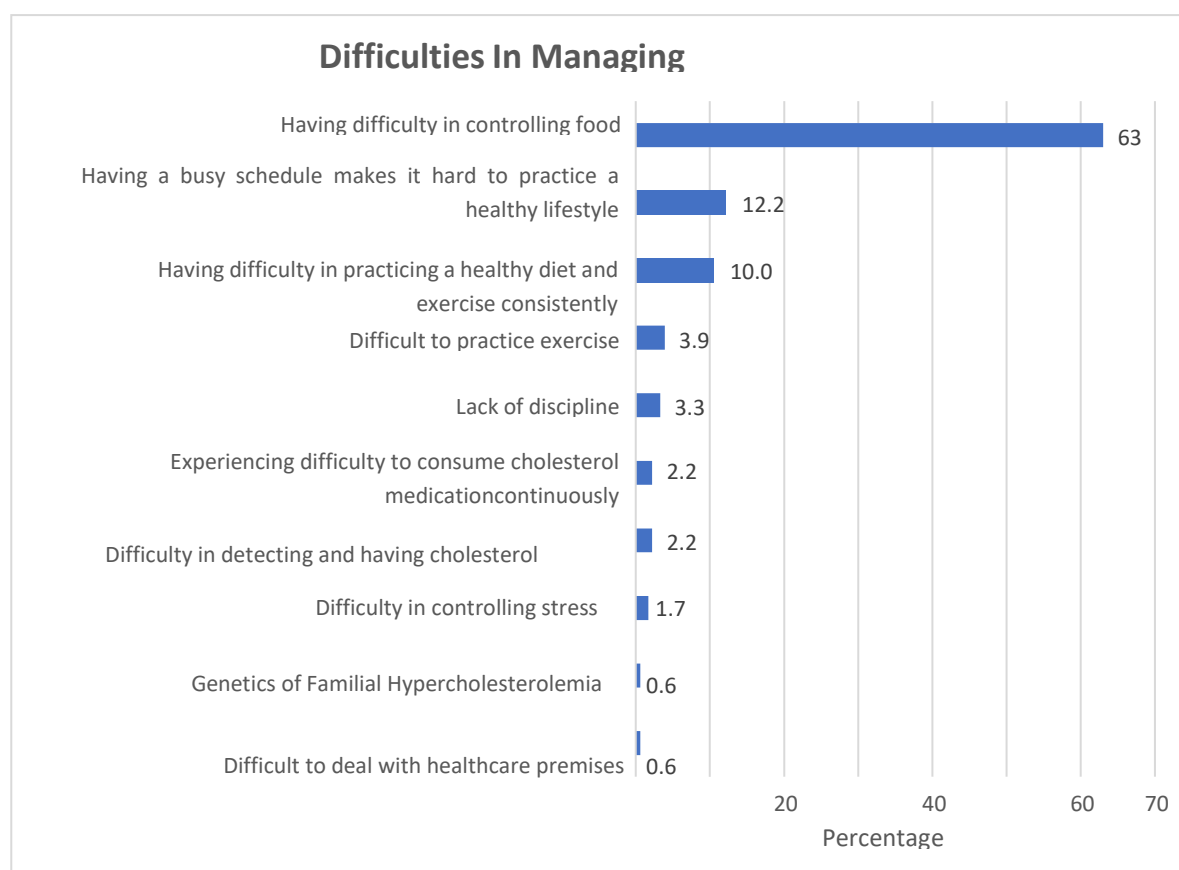
Table 5. Respondents' measures to prevent or manage dyslipidemia (n = 246)

Respondents' perception of measures that can prevent or manage dyslipidemia effectively	n (%)
Practice a healthy diet	106 (43.1)
Practice a healthy diet and exercise	77 (31.3)
Taking cholesterol medications as instructed by doctor	14 (5.7)
Perform regular cholesterol screening	13 (5.3)
Consume health supplements	3 (1.2)
Fasting	2 (0.8)
Control body weight	1 (0.4)

c) Respondents' perceived difficulties in managing dyslipidemia

A total of 181 responses were provided by respondents on the difficulties in managing dyslipidemia (Figure 3). The majority of the

respondents (63%) reported having difficulty in controlling diet whilst dealing with healthcare premises (0.6%) and having genetics of familial hypercholesterolemia (0.6%) were the least reported difficulties.

**Figure 3. Respondents perceived difficulties in managing dyslipidemia (n = 181)**

Discussion

The study examined the level of knowledge and perception of dyslipidemia with its management among the public aged 35 and above in Klang Valley, Malaysia. Our study findings revealed that 70% of the respondents had poor knowledge of dyslipidemia and its management with a mean knowledge score of 1.85 ± 1.78 . Similarly, the previous study from Abha City, Saudi Arabia shows that 77.3% of the patients attending primary health care centers had low

levels of knowledge about dyslipidemia⁽²⁴⁾. The suboptimal dyslipidemia knowledge among the public might influence their attitude and perception toward the management of the disease. This is supported by a previous study in Malaysia that 80.8% of Malaysians who had dyslipidemia were not aware of their conditions, only 12.7% received the treatment and 53.7% had controlled cholesterol levels⁽²³⁾. In this study, the majority of the respondents (78.2%) falsely believed that chest pain and difficulty breathing are common signs associated with dyslipidemia. According to the

qualitative study in the southeastern United States, the lack of understanding in determining dyslipidemia is due to the difficulty in identifying the symptoms of dyslipidemia⁽²⁶⁾. The misalignment of chest pain and difficulty breathing with dyslipidemia among the respondents could be a result of the common thought of a close association between dyslipidemia and CVDs. Most of the participants (81.3%) in this study also thought that exercise and healthy diet have equal effectiveness as conventional medication in lowering cholesterol levels. This finding is consistent with the previous study from Singapore in which a significant number of respondents (65%) thought that diet and exercise alone were just as beneficial as prescription drugs for reducing cholesterol levels⁽¹⁷⁾.

Notably, more than two-thirds (84%) of respondents believed that long-term cholesterol medication use may harm the heart or kidneys. A cross-sectional survey among adults who received statin integrated delivery system care in Northern California, found that the respondents' belief will affect their perception and behavior toward cholesterol management. The study shows that the reported concern of heart and kidney problems constitutes to 31% of the barrier to cholesterol medication adherence⁽²⁷⁾. Moreover, a considerable number of respondents (79%) thought that cholesterol medication consumption over time may increase the risk of cancer. These findings are similar to the nationwide population-based survey that was conducted in Singapore, 70% of the respondents thought that long-term statin use could harm the kidneys or liver and 56% of them believed statin use was linked to an increased risk of cancer⁽¹⁷⁾. Next, a significant number of respondents (90.7%) in this study thought that cholesterol medications should not be taken long-term and are not safe to be discontinued once started (79.8%). Furthermore, a substantial number of the respondents (86.8%) believed that cholesterol medication can be discontinued once the cholesterol level is under control. These findings are consistent with an earlier study that 45% of respondents believed that statin therapy should not be continued for an extended period and that one might discontinue using cholesterol-lowering drugs once cholesterol was under control⁽¹⁷⁾. A previous systematic review highlighted that some participants viewed statins as a continual reminder of their poor health and were hence hesitant to rely on long-term drug consumption⁽²⁸⁾.

In terms of factors associated with the level of knowledge, ethnicity was found to not significantly contribute to the knowledge status. On the contrary, the nationwide population-based survey study in Singapore discovered that Malays

were more likely to have low knowledge compared to the Chinese population⁽¹⁷⁾. In terms of ethnicity, another study conducted by Ma & Ma, (2015) found that African Americans had poorer knowledge and understanding regarding their targeted TC level and body weight than non-Hispanic whites⁽²⁹⁾. The lack of significant results in the current study could be due to the lack of study samples from other ethnicities. In addition to that, the present study reveals that respondents' medical background is significantly associated with knowledge status. Accordingly, respondents without a medical background were found to have poorer knowledge of dyslipidemia (67.8%) when compared to those with a medical background (32.2%). This observation was supported by a recent study on the awareness, knowledge and practice of medical students in Malaysia regarding dyslipidemia management. The study reported that 70.2% of the medical students had good knowledge of disease management⁽³⁰⁾. This could probably be the additional educational exposure with regard to the clinical impact of dyslipidemia and its management.

The study also explored the respondents' experience and perceived difficulties in the prevention or management of dyslipidemia. Out of 257 respondents, 47 of the respondents had been prescribed cholesterol medication and most of them (80.9%) claimed to adhere to the prescribed medication with only one respondent reporting to experience medication side effects. This finding is consistent with a recent systematic review and meta-analysis study that statins have tolerable side effects and few reported adverse events⁽²⁷⁾. Besides, more than half of the respondents (64.2%) had done cholesterol screening and nearly half of them (47.1%) reported having their cholesterol screening done regularly between one to six months. Notably, regular cholesterol screening is essential for early detection and intervention of elevated cholesterol levels which could prevent CVDs⁽³²⁾. According to the National Heart, Lung, and Blood Institute (NHLBI), men and women between the ages of 45 - 65 and 55 - 65 respectively should test their lipid profile every one to two years whilst elderly aged 65 years and above should have cholesterol screening test annually⁽³³⁾. The selection of healthcare premises could also influence the choices of respondents in getting the cholesterol screening test. We observed that the highest selected healthcare premise by most of the respondents was private hospitals (25%). In contrast, a study in Ghana found that the usage of public hospitals (56.4%) was higher than private hospitals (43.6%)⁽³⁴⁾. The same study reported the respondents preferred to visit private hospitals due to better quality service⁽³⁴⁾.

Other than that, our study found that the primary factor influencing the decision to get a cholesterol screening test in most of the healthcare premises in Malaysia was because of it is easy and fast results provided (n=82, 33.5%). This is comparable with another recent study in Oman that revealed strong correlation between the respondents' choices and the hospital's effectiveness⁽³⁵⁾. Our study finding also echoed the previous study that short waiting time is positively related to patient's satisfaction particularly affecting their trust in the healthcare provider as well as the quality of care. Additionally, the increased use of the private facilities in Malaysia was associated with health insurance or benefits offered which was represented by 29.9% of the choice of private settings. Health insurance coverage could possibly increase individuals' access to healthcare⁽³⁶⁾. Likewise, a previous study had demonstrated that respondents who had health insurance were more likely to undergo physical examinations compared to those without health insurance⁽³⁷⁾.

In addition, our study also explored the initiatives taken by the respondents to prevent or manage dyslipidemia. A higher preponderance of respondents (43.1%) in this study believed that maintaining a healthy diet alone while a third of the respondents (31.3%) thought that maintaining a healthy diet and engaging in regular exercise are crucial for lowering cholesterol levels. Likewise, the majority of the respondents (63%) in this study also reported having difficulty in controlling food intake. A nationwide study from China found that food intake and physical activity were significantly associated with dyslipidemia⁽¹⁰⁾. Another cross-sectional study from Malaysia also found that high saturated fats diet increases TC levels, subsequently increasing the prevalence of dyslipidemia⁽³²⁾. Besides, a previous systematic review showed that participants who regularly exercised had a lower risk of developing high blood cholesterol levels⁽³⁸⁾. A few factors can contribute to the difficulty in managing food consumption among Malaysians. The availability of trendy and viral food culture, variability and easy access to food by service delivery were the major reasons of the difficulty in controlling food intake⁽³⁹⁾. Additionally, increased demand for convenience foods and the rise in eating out have been fueled by changing lifestyles, primarily because of work commitments⁽³⁹⁾.

While this study provides valuable insights into public perceptions and awareness, it is not without limitations. The use of a self-administered questionnaire introduces the potential for social desirability bias and relies on self-reported data, which may affect the accuracy of certain responses. Furthermore, as the questionnaire was disseminated through both electronic and face-to-face methods, the convenience sampling approach may limit the

generalizability of the findings. Despite these limitations, the study's strength lies in its bilingual, culturally adapted questionnaire that underwent expert review and pilot testing, ensuring relevance and clarity specifically tailored for the Malaysian population. Additionally, the combination of online and community-based data collection enhanced the diversity of respondents, offering a broader perspective on current public knowledge and practices regarding dyslipidemia.

Conclusion

Public knowledge of dyslipidemia with its management remains suboptimal with 70% reported to have poor knowledge. Respondents' with medical background is the only significant factor associated with the level of knowledge. In general, more than half of the respondents had awareness to undergo cholesterol screening tests at healthcare facilities. Most of them chose private hospital for early detection due to easy and fast result generated. Besides, diet is the main concern among the respondents with regards to dyslipidemia management. Majority of them believe diet contributes to high cholesterol levels, but controlling intake is the main challenge. The study findings highlighted the need to address knowledge gaps in public knowledge of dyslipidemia by increasing public awareness and management of the disease, particularly on the symptoms and misconception of the long-term used of cholesterol medication. Also, it is important to emphasize the importance of annual cholesterol screening among the public, as dyslipidemia is usually asymptomatic.

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Conflicts of Interest

There is no conflict of interest regarding the publication of this manuscript.

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Ethics Statements

The study was approved by the Research Ethics Committee of UiTM, Selangor with the reference number of REC (PH)/UG/053/2023.

Author Contribution

N.G provided the first draft of the manuscript after several discussions and brainstorming sessions with F.F.I and W.Y.Y. Revised version of the manuscript was made by F.F.I and W.Y.Y. H.H.Z was involved in the data analysis step, where guidance was given to conclude the data accordingly using appropriate statistical analysis. All authors reviewed and approved the final version of the manuscript.

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