A SURVEY ON MEDICATION ADHERENCE AND KNOWLEDGE ON HYPERLIPIDAEMIA AMONG HYPERLIPIDAEMIA PATIENTS ATTENDING THE IIUM FAMILY HEALTH CLINIC, KUANTAN

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ABSTRACT

Introduction: Hyperlipidaemia is one of the major diseases that could lead to cardiovascular related death and affects nearly half of the Malaysian population. Adherence to hyperlipidaemia medications is important to ensure good control of the disease. **Objectives:** This study aims to evaluate the level of patients' adherence to hyperlipidaemia medication, to identify the level of knowledge on hyperlipidaemia and its treatment medication and lastly to determine the significant associated factors for poor adherence among hyperlipidaemia patients at the International Islamic University Malaysia (IIUM) Family Health Clinic (FHC). **Methodology:** This cross- sectional study was conducted through the distribution of a self-administered questionnaire at IIUM FHC to assess the level of medication adherence and knowledge. The total cumulative score derived from the knowledge section was categorised into high and low knowledge based on the median score. The significant associated factors of adherence level were analysed using the chi-square test. **Results:** The results showed that only 41.3% of patients adhered to medication and 62.4% demonstrated a high level of knowledge. Factors including gender, age, educational level, employment status, income, religion, race, marital and living status, duration of illness and level of knowledge were not significantly associated with adherence level (p> 0.05). **Conclusion:** This study determined low level of adherence and a high level of knowledge regarding hyperlipidaemia and its treatment. Two significant association was found between all variables or factors present because of limitation in sample size and other items of measurement. Forgetfulness was found to be the main reason for non-adherence to medication by six other factors. **Implication**: This study is important to help the clinicians to understand more about their patients and initiate measures to improve adherence to treatment among hyperlipidaemia patients. This study may promote awareness among patients and the community.

Keywords: Hyperlipidaemia, Knowledge, Adherence, Compliance, Medication, Pahang.

INTRODUCTION

Hyperlipidaemia is the formation of plaque by the build-up of excessive cholesterol in the blood that can lead to cardiovascular diseases. According to Lum (2018), cardiovascular disease has become the primary cause of death in Malaysia in 2016 which has increased by 39.6% since 2005. Furthermore, according to the World Health Organization (2018) in its Global Health Observatory data, the prevalence of hyperlipidaemia in Europe is approximately 54%, 48% in America, 22.6% in Africa and 29.0% in South East Asia.

Meanwhile, Malaysia's National Health and Morbidity Survey (2015) reported the total number of hyperlipidaemia patients in Malaysia is almost half of the population, approximately 47.7% which warrants great national concern. According to the Ministry of Health, approximately 72.6% of cardiovascular disease (CVDs) patients have a known history of hyperlipidaemia (Clinical Practice Guidelines, 2017). Thus, it shows that the number of hyperlipidaemia cases is quite serious among CVDs patients in Malaysia. On top of that, the Ministry of Health reported that in 2016, CVDs has become the highest cause of death in both government and private hospitals and ranking first in the ten principal causes of death in Malaysia (Ahmad et al., 2018). Therefore, government or specific authority should play their role to control this issue through offering better management and treatment in order to reduce this prevalence.

Approximately 50% of patients with a chronic disease in developed countries do not adhere to medication. It causes the majority of the clinically effective treatments to become less effective due to the non-adherence of the patients (Usherwood, 2017). The US National Library of Medicine National Institute of Health defines adherence as the medication possession ratio (MPR), where the ratio is the number of drug doses taken to the number of the drug doses prescribed in a certain period of time (Morrison et al., 2015).

According to the National Health and Morbidity Survey, Pahang has the highest prevalence of hyperlipidaemia among all the states in Malaysia, which is 56.2% (Institute for Public Health, 2015). This may be due to a lower level of knowledge of hyperlipidaemia among patients thus leading to a lack of awareness on the serious complications of uncontrolled hyperlipidaemia. Therefore, this study aimed to investigate the level of adherence to medication, the level of knowledge and significant associated factors for poor adherence among patients with hyperlipidaemia who visited the IIUM Family Health Clinic (FHC) in Kuantan, Pahang.

METHODOLOGY

This cross-sectional study was conducted using a self-administered questionnaire among hyperlipidaemia patients attending the IIUM FHC, Kuantan. The data was collected from December 2018 to April 2019. The study population included patients who were 18 years old and above and

patients on hyperlipidaemia medication. The exclusion criteria were patients who did not understand Malay or English; and also pregnant women. A purposive sampling of 109 patients with hyperlipidaemia were enrolled into the study.

A pilot study with 10 patients (not included in the final sample). Cronbach alpha values showed good internal consistency for items in the Medication Compliance Assessment (MCA) (0.927), Knowledge (0.882) and for both items, MCA + Knowledge (0.846). The questionnaire consisted of three parts which were socio demographic data of the subjects, the medication compliance assessment and the knowledge on hyperlipidaemia. The first part was on socio-demographic data which consisted of name, gender, age, educational level, employment status, income, religion, race, marital status, living status, duration of illness and smoking status.

The second part consisted of seven questions. The questions in the Medication Adherence Scale was originally taken from the combination of Morisky Medication Adherence Scale and Hill-bone Scale to form the modified new Medication Adherence Scale (Ramli et al., 2012). This new Medication Adherence Scale consisted of a four-point Likert-type response format for each question. The scoring system for each response is stated in Table 1.

Table 1: Scoring Interpretation of MCA

Marks	Interpretation
1	All of the time
2	Most of the time
3	Some of the time
4	None of the time

Note: MCA is Medication Compliance Assessment

The total scores for each patient were added as 7 points for minimum range and 28 points for maximum range. The result of poor adherence to medication will give a lower score. The total of full score is 28 points. Adherence was defined as either a score of 28; or a score of 27 where one point of deduction came from "unintentional adherence" questions (question 1 or 6). Whereas non-adherence was defined as either a score of 27 where one point was deducted from other questions apart from questions 1 or 6; as well as the score of 26 points and below (Ramli et al., 2012). The details could be referred to Table 4.

The third part was adopted from Devaraj et al. (2017) and consisted of three sections which included knowledge on hyperlipidaemia, knowledge on lipid lowering medication and knowledge on component of lipid profile. The knowledge section consisted of 16 questions; one point was contributed for each correct answer scored regarding hyperlipidaemia and lipid-lowering therapy medication, one point if all answers were correct in component of lipid profile section, and zero if wrong. Thus, a total of score was drawn a maximum of 16 points and a minimum of 0 points.

In this study, the knowledge scores were interpreted according to the guidelines given by Said & Chia (2017). The level of knowledge was divided into two levels as stated in Table 5 below where the score of total cumulative derived from the knowledge section was categorised into high and low knowledge by referring to the median score. The median knowledge score in this study was 10. Therefore, patients who scored less than 10 were categorised as having low knowledge and patients that scored equal to or more than 10 were categorised as having high knowledge.

Ethical approval was applied from the IIUM Research Ethics Committee (IREC), with ID number IREC 2019-063. Data was analysed using Statistical Package for Social Sciences (SPSS) Version 25. The α-value was set up to be less than 0.05 (95% Confidence Interval). Scoring and description were used for the first (the determination of level of adherence to medication among hyperlipidaemia patients) and the second objective (which is identification on the level of knowledge). The Chi-square test was used to assess the third objective (determination on the significant associated factors for poor adherence among patients with hyperlipidaemia).

RESULTS

The data was collected for a total of 109 patients and was summarised in Table 2. Among the sample size collected, 67 (61.5%) were males and 42 (38.5%) were females. 37.6% of were of the age range 51 years old to 60 years old. 39.4% of patients had obtained a primary education 47.7% were employed with 25.7% had an income of between RM 2501 to 5000. All of them were Muslims and the majority were Malays (99.1%). 99 patients were married (90.8%). 92.7% of the patients lived with family. 61.5% of patients had hyperlipidaemia for less than 5 years and 76.1% were non-smokers.

Table 2: Socio-demographic data of hyperlipidaemia patients

Characteristics	Variables	Numbers (n)	Percentage (%)
Gender	Male	**67**	**61.5**
	Female	42	38.5
Age	31-40	3	2.8
	41-50	19	17.4
	51-60	**41**	**37.6**
	61-70	35	32.1
	71-80	9	8.3
	81-90	2	1.8
Educational level	No Formal Education	8	7.3
	Primary (School level)	**43**	**39.4**
	Secondary (Degree/Diploma)	42	38.5
	Tertiary (Master/PHD)	16	14.7
Employment status	Employed	**52**	**47.7**
	Unemployed	12	11.0
	Retired	45	41.3
Income	No Income	23	21.1
	<2500	26	23.9
	2501-5000	**28**	**25.7**
	5001-7500	17	15.6
	7501-10000	11	10.1
	10001 and above	4	3.7
Religion	Islam	**109**	**100.0**
Race	Malay	**108**	**99.1**
	Others	1	0.9
Marital status	Married	**99**	**90.8**
	Single	2	1.8
	Windowed	7	6.4
	Divorced	1	0.9
Living status	Alone	8	7.3
	With family	**101**	**92.7**
Duration of illness	<5 years	**67**	**61.5**
	6-10 years	25	22.9
	11 years and above	17	15.6
Smoking status	Yes	14	12.8
	No	**83**	**76.1**
	Ex-smoker	12	11.0

Note: n, number of patients (n=109); the total of highest frequency from each category are highlighted in bold.

Table 3 illustrated the two categories which are the adherence and non-adherence groups. 45 of 109 patients, or 41.3% belonged to the adherence to medication group and about 58.7% or 64 patients belonged to the non-adherence group.

Table 3: Adherence to medication groups

Characteristic Adherence to Medication	Frequency	Percentage (%)
Yes	45	41.3
No	64	58.7

Note: Adherers were those that scored a full score of 28 or score of 27 (due to only one point deducted from Question 1 or Question 6), as described in the method section.

Table 4 compares the adherence score between the adherence and non-adherence group. Among the 45 adherers, 26.6% obtained full score of 28 and about 14.7% got 27 points. Meanwhile for non-adherers, out of 64 patients, only five of them obtained 27 points and about 59 patients reached the maximum score of 26 points which was about 54.1%.

Table 4: Adherence score between adherence and non-adherence

Adherence score	Adherence status	Frequency (N)	Percentage (%)
Full score (28)	Adherers	29	26.6
27 (one point deducted from either question 1 or 6)	Adherers	16	14.7
27 (one point deducted due to other questions)	Non-adherers	5	4.6
7 – 26	Non-adherers	59	54.1
Total		109	100.0

Note: Adherers were those that scored a full score of 28 or score of 27 (due to only one point deducted from Question 1 or Question 6), as described in the method section.

Table 5 showed the level of knowledge of hyperlipidaemia patients who visited the IIUM Family Health Clinic. The level of knowledge was categorised into two levels ranging from high to low. The ranging score had been made as mentioned in the methodology part. About 62.4% or 68 patients had high level of knowledge while only 37.6% or 41 patients had low level of knowledge.

Table 5: Level of Knowledge

Category Level of Knowledge	Frequency	Percentage (%)
High	68	62.4
Low	41	37.6

Notes: Knowledge Scores Scales: 10-16, high knowledge; 0-9, low knowledge.

Table 6 showed the adherence level related to the level of knowledge. Majority of the patients in both the adherence group and non-adherence group had high knowledge levels which were about 68.9% and 57.8% respectively. Meanwhile, only minority of the patients had low knowledge levels which were about 31.1% and 42.2% respectively.

Table 6: Percentage of adherence level related to knowledge level

Variables		Adherence Level	
		Adherence n=45 (41.3%)	Non-adherence n=64 (58.7%)
Knowledge level	High	31 (68.9%)	37 (57.8%)
	Low	14 (31.1%)	27 (42.2%)

Figure 1 shows the mean score of the several reasons associated with non-adherence to lipid lowering therapy. The items of MCA was divided into seven categories which included the reasons for forgetting, decide not to take, feeling better, decide to take less, sick of side effect, forget to bring along during travel and lastly run out of medications at home. The result showed that the lowest mean value reason was for the item "forget" while the highest mean value was for the item of "sick of side effect".
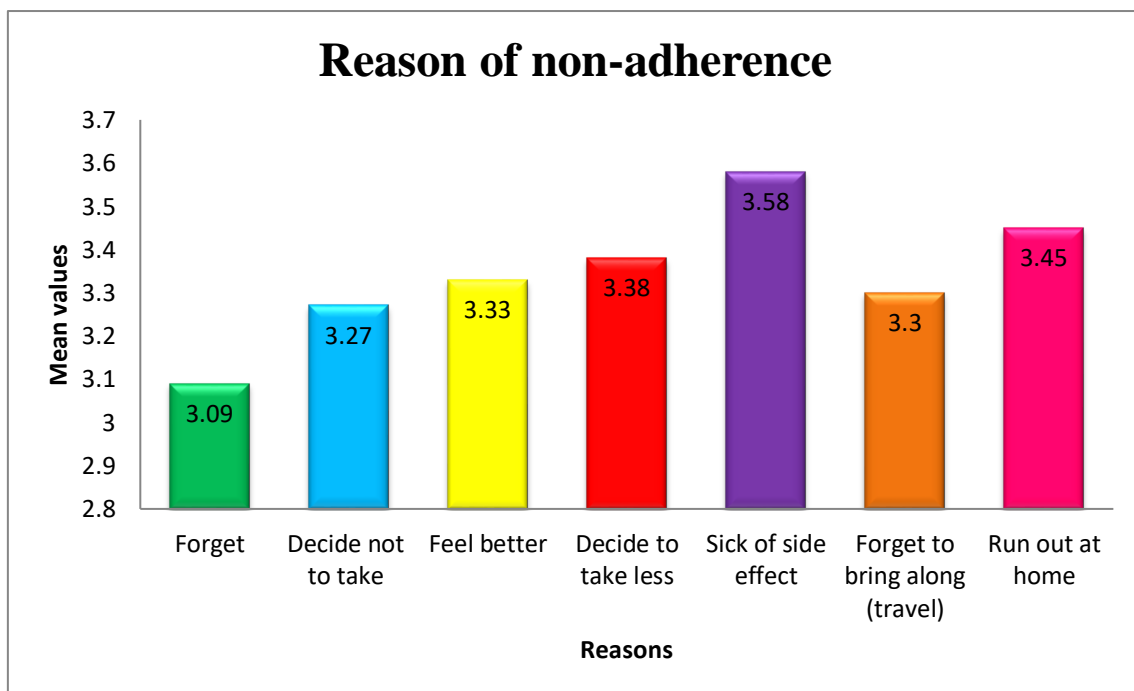

Figure 1: Reasons of non-adherence to medication

DISCUSSION

The Medication Compliance Assessment is a tool used to look for level of adherence to medication among patients. As illustrated in Table 3, more than half of the patients did not adhere to their medications. Thus, the prevalence of lipid lowering medications adherence among the 109 patients was quite low.

A study done in Malaysia by Devaraj et al., (2017) showed that the prevalence of adherence to lipid-lowering therapy in the primary care clinic at the University Malaya Medical Centre (UMMC), Petaling Jaya was high (82.4%). The number of prevalence and the response rate on questionnaire for this study were quite high and reliable enough which was about 90.7%. The higher prevalence of adherence may be due to the sample differences in educational level and patient history with hyperlipidaemia, promoting better understanding of their condition and commitment to follow-up.

In contrast, Ganasegeran and Rashid (2017), determined that non-adherence was very high in Malaysia which is 74%. This is in contrast with a study by Devaraj et al. (2017) which showed positive adherence in medication. The difference in adherence level between the studies could be due to variation in sample size where the minimum sample size collected for Ganasegeran and Rashid was 217 meanwhile for Devaraj et al., (2017) was almost 400 patients. Furthermore, the studies were conducted at different health care settings as Devaraj et al., (2017) conducted the study at a primary care clinic at UMMC to assess hyperlipidaemia patients while the other study was conducted at Hospital Serdang to assess post myocardial infarction patients. The difference in the type of illness might also influence the level of adherence.

Knowledge level assessment

The majority (62.4%) of the patients had high level of knowledge. The difference between high and low knowledge percentages was more than 20%. This may be due to the fact that the majority of patients was among IIUM Kuantan community who are familiar with the knowledge related to health issues and may have acquired the knowledge through relevant brochures provided at the health clinic.

There were limited studies conducted in assessing knowledge among hyperlipidaemia patients. However, there was one study from Hari Babu et al., (2012) which assessed the knowledge, attitude and practice of hyperlipidaemia patients in a tertiary care setting. The results showed poor level of knowledge among hyperlipidaemia patients in both the adherence and non-adherence group. The difference in results between this study and the study from Hari Babu et al., (2012) maybe because of the differences in health care setting and population. The physician-patient's relationship also plays a role to ensure patients visiting the health care setting are aware about their disease. Referring to Hari Babu et al. (2012), the tertiary care setting in India may be visited by too many patients which somehow

contribute to the lack of provision of education on disease and treatment due to limited time of consultation given as compared to IIUM FHC.

Another study in Malaysia done by Devaraj et al (2017) also demonstrated similar result with the current study which showed good level of knowledge. This may be due to both studies focusing on university health care clinics which may attract patients who had been on treatment longer.

Associated reasons for non-adherence group

Figure 1 demonstrated seven reasons associated with non-adherence to lipid lowering therapy based on the mean score. The mean score values in this study falls in the average score of 3 which is equivalent to the "Some of the time" category on the Likert scale of the questionnaire. The higher the mean score value means the better the adherence level. Among all seven probable reasons, the patients scored 'forgetfulness' (mean score of 3.09) as the lowest, followed by the other reasons such as 'decide not to take', 'forget to bring along during travel', 'feeling better', 'decide to take less', 'run out at home' and lastly 'sick of side effects'. This means that 'forgetfulness' was the main reason for the patients to not adhere to their medications in this study, while 'sick of side effect' was the least reason chosen. No significant association was observed between all variables or factors present (see Appendix).

Once again, this is different from the finding in Devaraj et al. (2017) study where the main reasons which lead to non-adherence among their patients was therapy related factors such as side effects experience and poly-pharmacy. Poly-pharmacy or also known as multiple drugs taken was one of the main reasons of forgetfulness among the patients. They may have forgotten to take the cholesterol medication due to complex drugs regime for other illnesses. In addition, patients may have purposely missed the cholesterol medication to avoid facing additional side effects due to different medication combinations. Patients may also have chosen to lower the dose of drugs by taking less than required to lower the side effect experiences (Daughton and Ruhoy, 2013).

Limitations of the study

Several limitations were observed in the present study. This study used a purposive type of sampling where only hyperlipidaemia patients who fulfilled the inclusion and exclusion criteria were recruited. Hence, it was prone to researcher bias. Besides, other factors such as multiple illnesses were not considered as associated factors in this study.

Based on these limitations, it is recommended that future research should apply simple random sampling method in order to reduce the bias. Other than that, more items of measurement should be added in future work as there may be other factors related to medication adherence. Lastly, conducting a research on management strategy in order to increase the adherence level to medication is highly recommended.

CONCLUSIONS

In conclusion, the level of adherence rate in this study was low with approximately 41.3% while majority of patients (62.4%) had high level of knowledge. The main reason for non-adherence to medication was forgetfulness followed by other six factors. There was no significant association between all variables or factors present.

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Factors associated with adherence to lipid lowering therapy

Variables		Adherence level		Chi-square statistic (df)	p-value
		Adherence n=45 (41.3%)	Non adherence n=64 (58.7%)		
Gender	Male	30 (66.7)	37 (57.8)	0.875 (1)	0.350
	Female	15 (33.3)	27 (42.2)		
Age	Below 60	23 (51.1)	40 (62.5)	1.405 (1)	0.236
	60 and above	22 (48.9)	24 (37.5)		
Educational level	Primary (School and below)	20 (44.4)	31 (48.4)	0.169 (1)	0.681
	Secondary (Diploma to PHD)	25 (55.6)	33 (51.6)		
Employment status	Employed	20 (44.4)	32 (50.0)	1.022 (2)	0.600
	Unemployed	4 (8.9)	8 (12.5)		
	Retired	21 (46.7)	24 (37.5)		
Income	5000 and below	29 (64.4)	48 (75.0)	1.420 (1)	0.233
	5001 and above	16 (35.6)	16 (25.0)		
Religion	Islam	45 (100.0)	64 (100.0)	-	-
Race	Malay	45 (100.0)	63 (98.4)	0.710 (1)	0.400
	Others	0 (0.0)	1 (1.6)		
Marital status	Married	41 (91.1)	58 (90.6)	4.015 (3)	0.260
	Single	2 (4.4)	0 (0.0)		
	Widowed	2 (4.4)	5 (7.8)		
	Divorced	0 (0.0)	1 (1.6)		
Living status	Alone	2 (4.4)	6 (9.4)	0.944 (1)	0.331
	With family	43 (95.6)	58 (90.6)		
Duration of Illness	<5 years	28 (62.2)	39 (60.9)	0.024 (2)	0.988
	6-10 years	10 (22.2)	15 (23.4)		
	11 years and above	7 (15.6)	10 (15.6)		
Smoking status	Yes	7 (15.6)	7 (10.9)	0.519 (2)	0.771

Variables		Adherence level		Chi-square statistic (df)	p-value
		Adherence n=45 (41.3%)	Non adherence n=64 (58.7%)		
	No	33 (73.3)	50 (78.1)		
	Ex-smoker	5 (11.1)	7 (10.9)		
Knowledge level	High	31 (68.9)	37 (57.8)	1.381 (1)	0.240
	Low	14 (31.1)	27 (42.2)		