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MEDICATION ADHERENCE TO STATINS IN PATIENTS RECEIVING TELEPHARMACY SERVICES AT NATIONAL CARDIOVASCULAR CENTRE HARAPAN KITA FOR THE PERIOD OF JULY – DECEMBER 2021

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ABSTRACT

Introduction: Statins are one of the prophylactic therapies aims to prevent the progression of cardiovascular diseases. Medication adherence, especially in the use of statin group, is important to achieve the target of treatment therapy. One indirect method to measure medication adherence is by calculated the amount of drug that patient have at home, called Medication Possession Ratio (MPR). This method measures compliance by calculating the repetition of prescription drug purchases/refill. During the pandemic, National Cardiovascular Center Harapan Kita has provided telepharmacy services to improve patient compliance in redeeming prescriptions. This study aims to determine the adherence to statin after being given telepharmacy services. Methods: a cross-sectional study was conducted by collecting the Electronic Medical Record (EMR) from online polyclinic patients who received telemedicine services at National Cardiovascular Centre (NCC) Harapan Kita. Data collection on repetition of statin drug prescriptions at period from July to December 2021. The sampling technique used is total sampling. Results: Out of 138 EMR, 54 patients was prescribed with statins. The majority of statins were prescribed to male patients (36; 66.7%), the oldest aged 65 years and above (33; 61.1%), most of them were in the tertiary education level (30; 55.6%), the majority of patients were active workers (32; 59.3%). The type of statin group that was most widely used by patients was atorvastatin (37; 68.5%), and the major disease suffered by the most patients was coronary heart disease (33; 61.1%). The majority of online polyclinic patients are less compliance to statins, given the MPR score below 0,8 (38; 70.4%). There is no significant correlation (p-value >0.05) between the patient's socio-demographic characteristics and the level of adherence to statins. Telepharmacy service at NCC required evaluation to improve services and patient medication adherence.

Keywords: *Statins, Medication possession ratio (MPR), Telepharmacy*

INTRODUCTION

Cardiovascular diseases are the main cause of mortality & morbidity which deteriorate the heart function and blood vessels (1). Based on the 2018 Basic Health Research (RISKESDAS) data, the prevalence of heart disease based on a doctor's diagnosis in the population of all ages in Indonesia is 1.5% or around 1,017,290 people. Meanwhile for DKI Jakarta province, the prevalence of heart disease based on a doctor's diagnosis is 1.9% or around 40,210 people(2).

One of the hospitals in Jakarta that is a referral for patients with cardiovascular disease is the National Cardiovascular Centre Harapan Kita (NCC Harapan Kita) (3). Compliance with taking medication is important to achieve the therapeutic effect of treatment and reduce the incidence of complications (4). From research conducted by P. Michael Ho. et al. explained that non-adherence to taking statin class drugs can cause myocardial infarction and can increase the risk of death by 12% to 25%. In addition, non-compliance with taking medication for cardiovascular disease can increase the number of emergency room visits to hospitals (5) Research conducted by Nurmalita et al. 2019 explained that there is a correlation between medication adherence and patient quality of life. The poores the medication adherence, the

worse will be the patient's quality of life. Therefore adherence in taking medication is very important to improve the quality of life of patients (6) One of the drugs for cardiovascular disease therapy is statins. Statins are recommended for primary prophylaxis in type 2 diabetes mellitus patients who have no other cardiovascular disease risk factors, while for secondary prophylaxis, statins are recommended for type 2 diabetes mellitus patients who have one or more cardiovascular disease risk factors. This is done to slow the development of macrovascular complications (7).

However, due to the Corona Virus Disease 2019 (COVID-19) pandemic that emerged at the end of 2019 until now, to avoid crowds and the spead of viruses at health service facilities, hospital have reduced the schedule for routine visits to prevent the spread of COVID-19 (8). Therefore, telepharmacy is the right choice for patients to order drugs. Telepharmacy is a part of the aspect of telemedicine (online consultation) where a pharmacist uses telecommunications technology to provide patient care services, drug review and monitoring, medication therapy management, counseling. patient, clinical consultation, and drug information (9). This is one of the right ways for patients during a pandemic to still be able to redeem their prescriptions. Even though this media has several advantages, the study related to telepharmacy services in Indonesia is limited. Therefore this study aims to investigate how telepharmacy impact on medication adherence, particularly the statin group. The background of this research on the description of adherence to the use of statin class drugs in patients receiving telepharmacy services at National Cardiovascular Centre Harapan Kita for the period of July – December 2021.

RESEARCH METHODS

This study used a cross-sectional method to determine adherence to the use of statin drugs in patients receiving telepharmacy services at National Cardiovascular Centre Harapan Kita for the period July – December 2021. The target population in this study were online polyclinic patients who received statin prescriptions. A total sampling method has been applied in which the sample is the same as the total population, namely 54 samples with the inclusion criteria of patients who received statin prescriptions from July to December 2021 and the exclusion criteria of patients with incomplete drug purchase data and medical record data. Data analysis in this study used univariate analysis and t-test. Univariate analysis of frequency distribution to determine the sociodemographic characteristics of online poly patients who received statin prescriptions, the patient's adherence to drug use, the patient's main disease, and the use of the statin drug class prescribed for the patient. Independent t-test analysis was used to analyze whether there were differences in medication adherence based on MPR scores and sociodemographic characteristics.

RESULTS AND DISCUSSION

The results of research related to compliance with the use of statin drugs based on sociodemographic characteristics in online poly patients at NCC Harapan Kita showed that the majority of male patients were 36 patients (66.7%) compared to 18 female patients (33.3%). These results are in line with the research of Siti Fadillah et al., where men have a higher risk of developing cardiovascular disease 11% than women due to unhealthy lifestyles such as smoking (10).

Age is a risk factor that can cause cardiovascular disease, especially the heart. Based on the results of the study, it was found that 33 patients (61.1%) had more statin prescriptions given to patients ≥ 65 years old. These results are in line with the 2018 RISKESDAS report where the prevalence of heart disease based on a doctor's diagnosis in the age group 65-74

years was 4.6% and ≥ 75 years was 4.7% greater than the age group 55-64 years which was 3.9%.

Education is one of the important factors in order to achieve the desired therapeutic effect. The study showed that the respondents who were recorded as receiving the highest statin prescriptions were at the tertiary education level, with 30 patients (55.6%). This result is not in line with the basic health research report in 2018 (Riskesdas), where the proportion of higher total cholesterol levels in people who have never/never attended school is higher (10%) than people who have graduated D1/D2/D3/PT (9.8%) (2).

Patients who received statin prescriptions were mostly given to patients with working status, namely 32 patients (59.3%). These results are in line with the 2018 RISKESDAS report, where the proportion of total cholesterol levels with levels higher than normal in people who work is higher (60.1%) than people who don't work (9.4%). Physical activity, lifestyle, and food are factors determinant of cholesterol levels. The lifestyle of people with working status are usually more inclined to choose fast food that prioritizes speed of service because they prioritize speed of service (11).

Table 1. Sociodemographic Characteristics of Patients Receiving Telepharmacy Services from Online Polyclinic at National Cardiovascular Centre Harapan Kita July-December 2021

No.	Characteristics	N (%) =54
1.	Gender	
	Female	18 (33,3)
	Male	36 (66.7)
2.	Age	
	<65 y.o	21 (38.9)
	65 y.o and above	33 (61.1)
3.	Education Level	
	Elementary-Secondary	24 (44.4)
	Tertiary (higher education)	30 (55.6)
4.	Working Status	
	Actively working	32 (59.3)
	Unemployed or retired	22 (40.7)
	Total	54 (100)

Table 2 describe the statin class of drugs used by the majority of online clinic patients at NCC Harapan Kita, namely 37 patients (68.5%) used atorvastatin, 15 patients (27.8%) used simvastatin, and 2 patients (3.7%) used atorvastatin & simvastatin. A study conducted by Indian J. showed that atorvastatin significantly reduced lipid levels (LDL-C, TC, TG, VLDL) when compared to simvastatin and pravastatin after the 3rd and 5th months of treatment. Atorvastatin significantly increased HDL-C levels when compared with simvastatin and pravastatin after 5 months of treatment (12). In addition, giving atorvastatin can be taken morning/afternoon/evening compared to simvastatin which must be given at night before going to bed (13). This is in line with the research of Gaviria Mendosa et al, of 93.5% of patients who received statin prescriptions, as many as 78% of patients used atorvastatin.

Table 2. The types of statin group being prescribed at National Cardiovacular Centre Online Polyclinic July-December 2021

No.	Drug name	N (%)
1.	Atorvastatin	37(68.5)
2.	Simvastatin	15 (27.8)
3.	Atorvastatin & simvastatin	2 (3.7)
	Total	54 (100)

Based on the analysis results in table 3, it shows that the main disease suffered by the most patients is coronary heart disease with 33 patients (61.1%). Coronary heart disease is one of the cardiovascular diseases caused by the accumulation of fatty materials and cholesterol along the arteries and causes arteriosclerosis or narrowing of the arteries (1,14). Coronary heart disease can be prevented by administering statins as a blood cholesterol lowering agent in the treatment of dyslipidemia (15).

Table 3. The Primary Diagnosis of Patients receiving Telepharmacy service from Online Polyclinic at NCC Harapan Kita July-December 2021

No.	Major Diagnosis	N (%)
1.	Coronary heart disease	33 (61.1)
2.	Hypertension	12 (22.2)
3.	Heart failure	6 (11.1)
4.	ASD (Atrial Septal Defect)	1 (1.9)
5.	CVI (Chronic Venous Insufficiency)	1 (1.9)
6.	Post MVR (Mitral Valve Replacement)	1 (1.9)
	Total	54 (100)

Compliance with treatment plays an important role in achieving therapeutic effectiveness, especially in coronary heart disease (4). One step indirectly to measure the level of patient compliance in statin treatment is by using the Medication Possession Ratio (MPR) method. Compliance with taking medication in patients using the MPR method, namely by comparing the number of days of drug supplies received by patients during a certain period of time with a fixed number of time intervals. However, this method has a weakness, namely the drug received by the patient is not necessarily consumed. Therefore it is essential to have other supporting data such as outcome results on cholesterol levels and interviews with patients and caregivers (16). In this study, repetition of statin prescribing in patients was seen every month at a fixed interval, namely July - December 2021 (184 days). MPR value ≥ 0.80 indicates that the patient is adherent to statin treatment while MPR value < 0.80 indicates a lack of patient adherence to statin treatment (17). The results of the study in table 4, there were 16 patients (29.6%) adherent in drug use and 38 patients (70.4%) were less compliant in drug use.

Table 4. Medication adherence to Statins in Patients receiving Telepharmacy service from Online Polyclinic at NCC Harapan Kita July-December 2021

Medication Adherence	N (%)
Adherent ((MPR score ≥ 0.80)	16 (29.6)
Non-adherent (MPR score < 0.80)	38 (70.4)
Total	54 (100)

The level of adherence to statin use based on the MPR value and gender obtained an average compliance score for women and men, namely 0.64 and 0.63. The results of the p-value > 0.05, which means that there is no significant correlation between the sex of the patient and compliance with the use of statin drugs. Female patients usually have higher adherence than men because female patients have a high level of anxiety about their illness (18).

The average MPR values at the age of < 65 years and ≥ 65 years are 0.70 and 0.59. Bivariate analysis between the level of adherence with patients who are < 65 years old and ≥ 65 years old obtained a p-value > 0.05, which means that there is no significant correlation between adherence to the use of statin drugs and the patient's age. This is in line with the research of Jasmine, et al. where there is no correlation between age and the level of medication adherence. Patients of reproductive age have a busy life which causes this age group to forget to take medication. However, unemployed & retired group also have similar issues with adherence to treatment. This might be due to forgetfulness, the need for caregivers, or less awareness to cardiovascular complication risks.

The average MPR score at the elementary-secondary and tertiary level is 0.63. The results obtained from adherence to statin use with education level p-value > 0.05, which means there is no significant correlation between patient education level and adherence to statin drug use. This is in line with the research of Jasmine, et al. where there is no correlation between education level and medication adherence. Higher education can influence mindsets about the importance of taking medication regularly to achieve therapeutic effects (19).

Table 5. The Correlation between sociodemographic characteristics and medication adherence to statin based on MPR scores

No.	Characteristics	MPR scores (Mean)	p-value* (Cl 95%)
1.	Gender		
	Female	0.64	0.850
	Male	0.63	
2.	Age		
	<65 y.o	0.70	0.930
	65 y.o and above	0.59	
3.	Education level		
	Elementary-secondary	0.63	0.978
	Tertiary	0.63	
4.	Working Status		
	Actively working	0.64	0.854
	Unemployed or retired	0.62	

**independent t-test, significant difference if p<0,05*

The MPR values obtained in patients with working and non-working status were 0.64 and 0.62. The level of adherence to the use of statins with the patient's employment status resulted in a p-value > 0.05, which means that there was no significant correlation between the patient's employment status and compliance with the use of statin drugs. This is not in line with the research by Sailan et al., where there is a correlation between employment status and medication adherence (20).

Medication adherence in chronic diseases has been facing many challenges from internal and external factors. The lack of compliance may correlate with the drug storage management particularly the elderly who is more likely to experience polypharmacy. A family support and caregivers are factors associated with drug management behaviour at home (p=0.005,

OR=5.092) (21). Statins group are essential for primary and secondary prevention to cardiovascular events, yet mostly patients are unaware of the risks. Study by Benner[22] described in the long-term, persistence to statins treatment has been declined substantially over after 120 months. Independent predictors of this case was lower income, older ages, and geriatric syndrome such as dementia (22). Telepharmacy services at National Cardiovascular Center Harapan Kita may also require telecounseling dan drug reminders for patients who did not take medication refills. The involvement of technology in pharmacy practice is beneficial to reduce workload at hospital pharmacy department and provide easy access to medication.

CONCLUSION

Based on the results of the research that has been done, it can be concluded that of the 54 patients who received the most statin class drugs in the male gender, namely 36 patients (66.7%), the patient's age was given more to elderly patients with age ≥ 65 years as many as 33 patients (61.1%), the most recent level of education was at the tertiary level of education as many as 30 patients (55.6%), and the patient's employment status was mostly given to working patients, namely 32 patients (59.3%). The type of statin class that was used more by online polyclinic patients at NCC Harapan Kita, namely atorvastatin was used in 37 patients (68.5%) compared to simvastatin in 2 patients (27.8%). The main disease suffered by online poly patients who were prescribed the most statins was coronary heart disease in 33 patients (61.1%). Of the 54 patients, 38 patients (70.4%) were less compliant in using statin drugs. The results of the study mean MPR values based on sociodemographic characteristics show that online poly patients are less compliant in using statin drugs. Bivariate analysis between adherence to statin drug use based on the MPR value and sociodemographic characteristics obtained a p-value > 0.05, which means that there is no significant correlation between socio-demographic characteristics and the level of adherence to drug use.

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REFERENCES

1. Setiadi AP, Halim SV. Penyakit Kardiovaskular; Seri Pengobatan Rasional [Internet]. Graha Ilmu. 2018. XII+204. Available from: http://repository.ubaya.ac.id/37369/7/Seri Pengobatan Rasional 1-Penyakit Kardiovaskular.pdf
2. Balitbangkes. Laporan Nasional RISDESKAS 2018. Badan Penelitian dan Pengembangan Kesehatan [Internet]. 2018;198. Available from: http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf
3. RSJPDHK. Rencana Kinerja Tahunan (RKT) Rumah Sakit Jantung dan Pembuluh Darah Harapan Kita Tahun 2021. Jakarta; 2021.
4. Jimmy B, Jose J. Patient Medication Adherence: Measures in Daily Practice [Internet]. Vol. 26, Oman Medical Specialty Board Oman Medical Journal. 2011. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3191684/
5. Ho PM, Bryson CL, Rumsfeld JS. Medication adherence: Its importance in cardiovascular outcomes. Ciculation AHA Journal [Internet]. 2009 Jun 16 ;119(23):3028–35. Available from: https://drive.google.com/file/u/2/d/1tBktI_zW4xwuMK6XR8Pzxmd6WD3N-3DL/view?usp=embed_facebook

6. Nurmalita V, Annisaa E, Pramono D, Sunarsih ES. Hubungan Kepatuhan Minum Obat Antihipertensi Terhadap Kualitas Hidup Pada Pasien Hipertensi. Jurnal Kedokteran Diponegoro [Internet]. 2019;8(4):1366–74. Available from: https://ejournal3.undip.ac.id/index.php/medico/article/view/25813
7. Elnaem, M. H., Mohamed, M., Huri, H. Z., Azarisman, S. M., & Elkalmi RM. Statin Therapy Prescribing for Patients with Type 2 Diabetes Mellitus: A Review of Current Evidence and Challenges. Journal of Pharmacy & Bioallied Sciences [Internet]. 2017; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5508420/
8. Keputusan Menteri Kesehatan Republik Indonesia. Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/MenKes/413/2020 Tentang Pedoman Pencegahan dan Pengendalian Corona Virus Disease 2019 (Covid-19). MenKes/413/2020. 2020;2019:207.
9. ASHP. ASHP Statement on Telepharmacy [Internet]. Available from: www.medicaid.gov/Medicaid-CHIP
10. Siti Fadlillah, Adi Sucipto TA. Usia, Jenis Kelamin, Perilaku Merokok, dan IMT Berhubungan dengan Resiko Penyakit Kardiovaskuler. Jurnal keperawatan [Internet]. 2019;11(4):261–8. Available from: https://journal.stikeskendal.ac.id/index.php/Keperawatan/article/view/558
11. Keperawatan J, Universitas F, Soedirman J. Perbedaan Kadar Kolesterol Darah Pada Pekerja Kantoran Dan Pekerja Kasar Di Desa Majasari, Bukateja Kabupaten Purbalingga. Jurnal Keperawatan Soedirman [Internet]. 2018;3(3). Available from: https://jks.fikes.unsoed.ac.id/index.php/jks/article/view/200
12. Pharmacol IJ. A comparative effect of atorvastatin with other statins in patients of hyperlipidemia [Internet]. 2012. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3326925/
13. Awad K, Serban MC, Penson P, Mikhailidis DP, Toth PP, Jones SR, et al. Effects of morning vs evening statin administration on lipid profile: A systematic review and meta-analysis. Journal of Clinical Lipidology [Internet]. 2017;11(4):972-985.e9. Available from: http://dx.doi.org/10.1016/j.jacl.2017.06.001
14. Gaviria-Mendoza A, Machado-Duque ME, Machado-Alba JE. Lipid-lowering drug prescriptions in a group of Colombian patients. Biomedica [Internet]. 2019;39(4):759–68. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7363356/
15. Putri BFJ, Nurmainah, Pratiwi L. Evaluasi Penggunaan Statin dan Prediksi Risiko Penyakit Kardiovaskular Aterosklerosis pada Pasien Dislipidemia dengan Metode Pooled Cohort Risk Assessment Equation. Jurnal Kesehatan Tanjungpura [Internet]. 2013; Available from: https://jurnal.untan.ac.id/index.php/jmfarmasi/article/view/46088
16. Leslie SR, Gwadry-Sridhar F, Thiebaud P, Patel B V. Calculating medication compliance, adherence and persistence in administrative pharmacy claims databases [Internet]. Vol. 1, Pharmaceutical Programming. 2008. Available from: https://www.researchgate.net/publication/233672442
17. Tang KL, Quan H, Rabi DM. Measuring medication adherence in patients with incident hypertension: a retrospective cohort study. BMC Health Services Research [Internet]. 2017;17(1):1–16. Available from: https://pubmed.ncbi.nlm.nih.gov/28193217
18. Compliance to Anti-Diabetic Drugs: Observations from the Diabetic Clinic of a Medical College in Kolkata, India. Journal of Clinical Diagnostic Research [Internet]. 2013;7. Available from: https://pubmed.ncbi.nlm.nih.gov/23730641
19. Jasmine NS, Wahyuningsih S, Thadeus MS. Analisis Faktor Tingkat Kepatuhan Minum Obat Pasien Diabetes Melitus di Puskesmas Pancoran Mas Periode Maret – April 2019.

Jurnal Manajemen Kesehatan Indonesia [Internet]. 2020;8(1):61–6. Available from: https://ejournal.undip.ac.id/index.php/jmki/article/view/24742

20. Sailan MZ, Sari L, Kusumadewi P, Farmasi J, Kemenkes P. Faktor – Faktor yang Berhubungan dengan Kepatuhan Minum Obat pada Penderita Hipertensi. Jurnal Kesehatan Poltekkes Kemenkes RI Pangkalpinang [Internet]. 2021;9(2):76–82. Available from: https://jurnal.poltekkespangkalpinang.ac.id/index.php/jkp/article/view/312
21. Kurniawan A, Fajri P. Factors Associated with The 'Dagusibu' Drug Management Behavior Via Home Pharmacy Care for Community in Central Jakarta District. SANITAS [Internet]. 10Dec.2020 [cited 27Nov.2022];11(2):122-35. Available from: https://sanitas.e-journal.id/index.php/SANITAS/article/view/20201201-kurniawan
22. Benner JS, Glynn RJ, Mogun H, Neumann PJ, Weinstein MC, Avorn J. Long-term persistence in use of statin therapy in elderly patients. JAMA. 2002;288(4):455-461. doi:10.1001/jama.288.4.455