INTERNATIONAL JOURNAL IN PHARMACEUTICAL SCIENCES

Journal Homepage: https://www.ijpsjournal.com

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Research Article

A Community Based Study To Assess The Effectiveness Of Home Medication Review Based On Their Knowledge About Disease And Drugs In Hypertensive Geriatric Patients Of Dakshina Kannada

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ARTICLE INFO

Received: 04 Nov 2023
Accepted: 07 Nov 2023
Published: 15 Nov 2023
Keywords:
HMR, Hypertension, Geriatrics, HCPS, HMM
DOI:
10.5281/zenodo.10138421

ABSTRACT

Home Medicines Review (HMR) is a health care service aimed to address various home medication management (HMM) issues which includes services like maximizing knowledge regarding disease and its management. HMM issues are highly prevalent in geriatric patients owing to their chronic diseases like hypertension. The study aimed to educate hypertensive geriatrics about management of pharmacotherapeutic issues by providing HMR at their residences. The main objective of the study was to assess the impact of HMR in hypertensive geriatric patients in Dakshina Kannada. The study included 50 subjects of either gender over the course of 6 months on improving patient knowledge. A pre-validated questionnaire was used to analyse and categorise disease & drug knowledge (poor, good) out of which 50% of participants had poor knowledge and the other 50% had good knowledge. Pre-intervention study included pharmacist's interventions by oral counselling using PIL, pill card, pill box, medication reminder alarms and mobile apps. After 2 months, post-intervention study showed improvement in knowledge level. In conclusion findings suggested pharmacist-led HMR is effective in improving patient health outcomes and highlights the potential of HCPS to improve disease insight and HMM among hypertensive patients, provided if the service is utilised fully.

INTRODUCTION

Home Medicines Review (HMR) is a consumer-focused, structured and collaborative health care service provided in the community setting, to optimize quality use of medicines and patient understanding. It is a service designed to assist patients at their home to maximize the benefit of their medication regimen & prevent medication related problems. Being a patient – focused process it advocates the optimal and quality of

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

medication at the patient's home. It involves systematic assessment of the patient's medication in order to identify and meet the medication related needs as well as to identify, resolve and prevent drug related problems [1]

HMR was introduced into the Medical Benefits Scheme in October 2001 as support for the National Medicines Policy 2000 by the Australian Federal Government to reduce unnecessary drug induced hospital admissions. In many developed countries such as Australia, New Zealand, UK and USA, the models of pharmacist-led medication review in the community or residential aged care setting are very well established. Numerous studies have demonstrated that HMR could benefit patients with multiple chronic conditions, increasing age, or adverse social circumstances. The benefits were also observed among patients with complex drug regimen and those with a lack of knowledge or skill on using medications or medication-related devices. In India though there are provisions for in-home patient counseling involving psychotherapy no initiatives have been taken to implement HMR as an approach to achieving better therapeutic outcomes.

In developing countries including India, the HMR service can be implemented aiming for constructive results aiding patients to deal with medicines at their homes. Trained pharmacist conducting HMR will be helpful in implementing goals of therapeutic regimens effectively to achieve maximal benefits in patients. The geriatrics are the proposed target population for HMR in India because of higher risk of drug related problems. This can be attributed to their lack of awareness regarding wellbeing, regular check-ups, monitoring of illness. Chronic diseases like hypertension are of great health concern in India and about a few million individuals are influenced by different chronic diseases. According to 2021 Union Ministry of Family and Health Welfare (MoFHW) report 1 in every 3 senior citizens are diagnosed with HTN[2]. Specific target populations like geriatrics can be initially given HMR services for chronic diseases as a preliminary approach to study their feasibility and acceptability in Indian scenario which can later be expanded to entire patient population.

MATERIALS AND METHODS

4.1.1 STUDY DESIGN: A Prospective and interventional study was carried to assess the effectiveness of HMR in hypertensive geriatric patients of Dakshina Kannada. Data was collected from 50 samples using convenient sampling method between January – July 2022. Medication review was provided to participants at their residences.

4.1.2 ETHICAL CLEARANCE: The study protocol was approved by the Institutional Ethics Committee (IEC) of Srinivas Institute of Medical Science, Mukka, Mangaluru. In addition, written informed consent was obtained from all the participants in this study.

4.1.3 STUDY CRITERIA:

Inclusion criteria:

- The study population were geriatrics from both genders. In addition, who are able to read and write English / Kannada language and agreed to participate in the study were included.
- All the patients taking medications for Hypertension during the period of study
- Patients with age greater than 60 years.

Exclusion criteria:

- Patients below the age of 60 years.
- Mentally handicapped.
- Who declined to participate in the study.

4.1.8 SOURCE OF DATA: Data collection tool. Data was collected using data collection form through direct interaction with the study subjects at their residences. The current study included geriatrics who were hypertensive.

4.1.9 STUDY METHOD

Preparation of Inform Consent Form: Inform consent form were prepared in English, Kannada and Malayalam and same were used before selection of subjects. In the study only the participants willing to fill ICF were included. ICF were orally explained to the participants before filling it and nonverbal by taking help of caregiver.

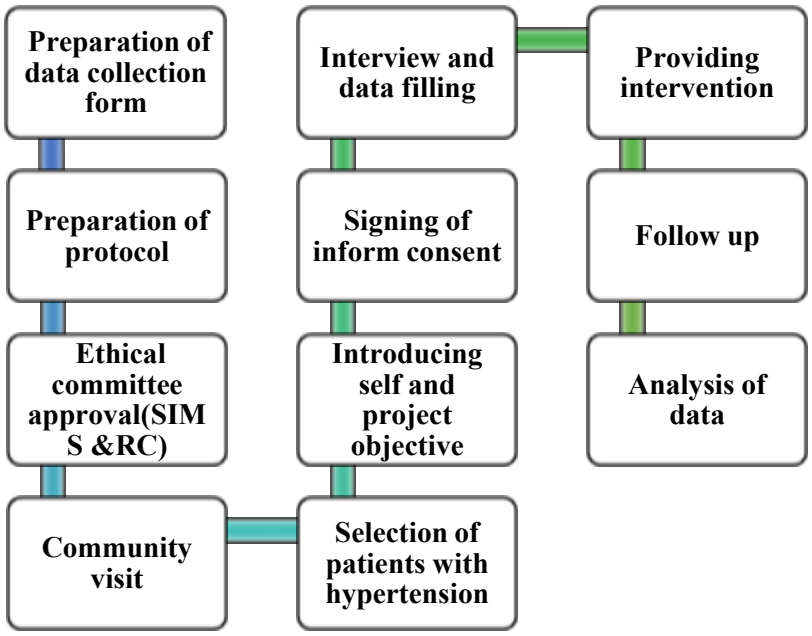
Data(s) collection method: Data was collected using questionnaire after subjects were given information regarding the aim of the study and confidential statement of respondents' information. Data was collected using patient's daily medication list and through direct interaction with the patient at their homes. Data collected include patient name, gender, age, BMI, BP levels, social history prescription medications and self-medication if any. The collected data(s) were analysed for knowledge level using pre-validated questionnaire. All the data(s) were kept confidential. The average time needed to answer the questionnaire and complete the HMR session was between 20-30 minutes.

4.1.10 DATA ANALYSIS: Statistical analysis involves collecting and scrutinizing of every data sample in a set of items from which samples were drawn. Chi-square and Student-t test was applied to analyse the data using Social Sciences Statistical Software.

4.2 OPERATIONAL MODALITY

A prospective and interventional study was conducted for a period of 6 months in various localities of Dakshina Kannada with an aim to assess the effectiveness of HMR in hypertensive geriatric patients. Initially a sample of 60 subjects was identified with equal number of males and females. 10 subjects were excluded as they did not meet the inclusion criteria which resulted in unequal gender distribution. The study methodology was divided into 3 phases; the first phase involved preparation for the study in which informed consent forms, data collection forms, Counselling Aids such as counselling points on disease and drugs, PIL, Pill card were prepared.

After the ethics approval, the phase-2 commenced and the study subjects meeting the inclusion criteria were selected and patient home was visited. Average of 20-30 mins was spent each session. The participants were explained about the study and consent was obtained for data collection. BP and BMI screening was provided. Based on the data collected, knowledge of the subjects regarding disease and drugs was analysed, categorised and were given interventions accordingly. Interventions were given using oral counselling, PIL, Pill card, Pill Box, SMS alerts, Adherence mobile apps, medication reminder alarms. The post-intervention phase was started 2 months in which the subjects were analysed using the same data collection form and checked for improvement. The data obtained was then analysed by applying Chi square and Student t test.



RESULT

Socio Demographic Characteristics of Study Participants

A total of 50 subjects were included in the study and it started with collection and assessment of patient demographics from various localities of Dakshina Kannada. Initially patient demographics was collected followed by assessment of knowledge, adherence as well as DRP. Geriatric population was included in the study and subjects were distributed according to age group. Majority of participants were of 60-69 age group (66%), 14 participants of 70-79 age group (28%). Only 3 participants were of the range 81-90 (6%). Among the 50 subjects, 28 (56%) were female and 22 (44%) were male.

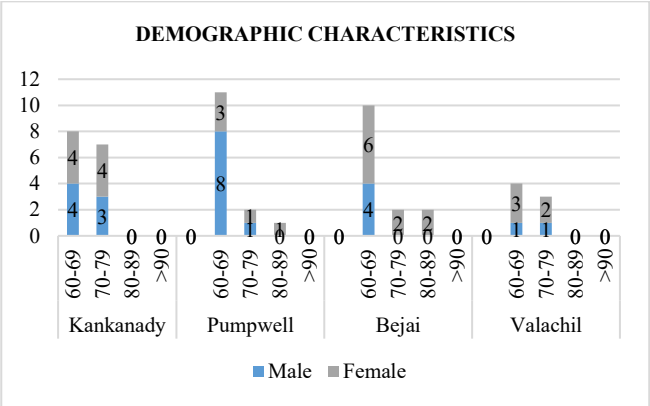


Figure 2: Demographic characteristics of study participants

Description of physical characteristics of subjects

Table 1: Physical characteristics of subjects

Sl. No	Variables		Mean	Std. deviation
1	Height (m)		1.622	0.095
2	Weight (kg)		62.76	9.49
3	BMI (kg/m^2)		23.81	2.82
4	SBP (mmHg) DBP (mmHg)	PRE-TEST	135.4 83.6	12.96 6.92
	SBP (mmHg) DBP (mmHg)	POST-TEST	132.6 83.4	11.91 5.19

Modifiable risk factors

A strong association between hypertension and modifiable risk factors are well accepted and the present study also analysed the same. Out of 50 subjects, the prevalence of alcohol consumption, smoking were 8 and 10% respectively, 18% of the

study subjects did not follow salt restriction and physical inactivity was observed in 66% of the respondents. 17 patients were overweight and it was also found that only 3 subjects were underweight.

Table 2: Modifiable risk factors

Sl. No	RISK FACTORS	% OF PATIENTS (n=50)
1	Alcohol Consumption	8%
2	Smoking	10%
3	High Sodium Diet	18%
4	Physical inactivity	66%
5	Overweight/Obesity	34%

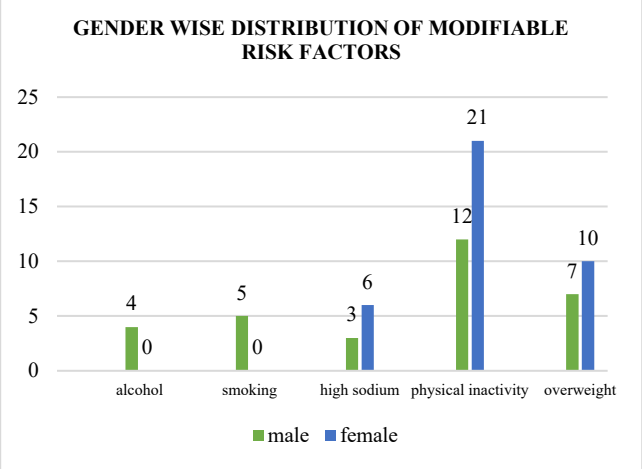


Figure 3: Gender wise distribution of modifiable risk factors

Knowledge

Knowledge about the disease and drugs is an essential prerequisite for ensuring appropriate clinical success in every patient**.**

A pre-validated structured data collection form including 15 questions was used to interview the patient to assess the disease and drug information in the study subjects. Knowledge assessment was carried out by scoring method. Each question was scored individually (yes=1, no=0). Total knowledge was assessed by adding up individual scores (disease + drug knowledge); further pre and post data were compared to assess outcome. The questionnaire enquired patients knowledge regarding normal BP values, disease, drug, modifiable risk factors (diet, smoking/alcohol use, and obesity), symptoms, complications, dosing & frequency. Special instructions and side effects of the drug which in turn indirectly assessed the role of physician or pharmacist. Based on the collected data only 42 % (21) of the study participants had both disease and drug knowledge,

20% (10) had only disease knowledge, 20% (10) had only drug knowledge and remaining 18% (9) had neither drug nor disease knowledge.

The knowledge levels were once again assessed after a period of 2 months to observe the impact of the pharmacist led HMR. Significant improvement was seen in knowledge of disease (57% to 79%) and drug knowledge (51% to 67%). The individual score was summated to evaluate the complete knowledge of disease and drug among the study subjects and it was found to be 50% and significant improvement was observed post-test (82%). The results were analysed using Social Science Statistics software. Chi-square test was employed for results analysis of knowledge level. The p-values for individual questions were found significant at $p<0.05$ implying the intervention given was effective in knowledge improvement.

Table 3: Knowledge assessment

		PRE-TEST		POST-TEST		P value
Sl. No	DISEASE RELATED QUESTIONNAIRE	Yes	No	Yes	No	
1	Do you know normal level of blood pressure?	19	31	47	3	<0.05
2	Do you know the complications of hypertension?	21	29	35	15	<0.05
3	Do you know the symptoms of hypertension?	20	30	34	16	<0.05
4	Do you think smoking and drinking alcohol cause HTN?	42	8	49	1	<0.05
5	Do you think obesity is associated with hypertension?	34	16	44	6	<0.05

6	Do you think salt reduction can control hypertension?	41	9	49	1	<0.05
7	Do you do any physical exercise?	17	33	28	22	<0.05
8	Regular follow up?	34	16	45	5	<0.05
	AVERAGE	228 (57%)	172 (43%)	331 (79%)	69 (21%)	
	DRUG RELATED QUESTIONNAIRE					
9	Do you know the names of your drugs prescribed?	26	24	37	13	<0.05
10	Do you know the reasons for taking the medicines?	37	13	46	4	<0.05
11	Do you know the dose and frequency of your medicine?	39	11	47	3	<0.05
12	Do you know the special instructions given to you for your medicines?	11	39	24	26	<0.05
13	Do you ever take double dose?	8	42	1	49	<0.05
14	Do you think only regular medications can control hypertension?	20	30	32	18	<0.05
15	Do you store your medication as recommended?	39	11	47	3	<0.05
	AVERAGE	180 (51%)	170 (49%)	234 (67%)	116 (33%)	

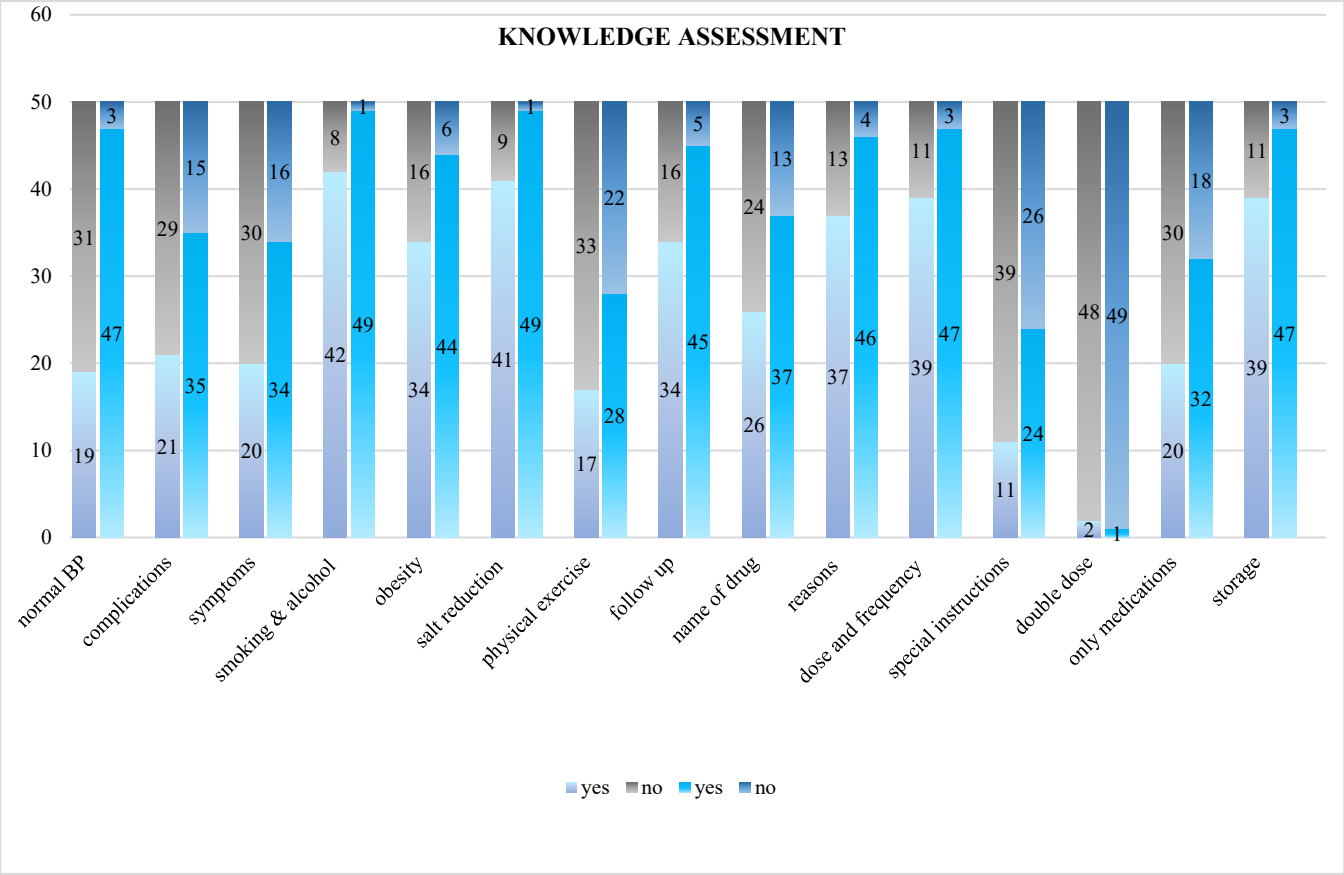


Figure 4: Knowledge assessment

5.3 Trends of Home Drug Storage among study participants

If the storage guidelines are not followed, drug stability may be impacted, which could result in suboptimal drug therapy. The present study analysed storage pattern of the participants. Storage in box (50%), was the most common method of storage followed by open racks of kitchen (16%), bathroom cupboard (14%) and 10% in plastic bag and top of fridge. From the

study it was noted that 50% of the people stored their medication inappropriately so, the subjects were counselled regarding optimal storage of medications by oral counselling.

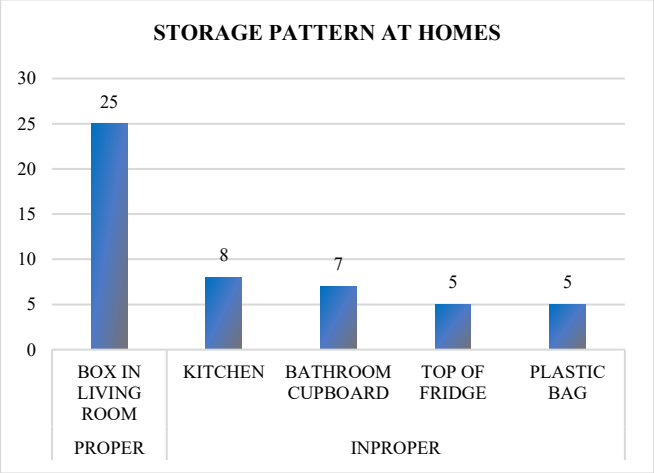


Figure 5: Storage pattern at homes

DISCUSSION

Home Medicines Review (HMR) is a service designed to help patients living at home to maximise the benefits of their medication regimen and avoid medication-related problems especially in geriatric population with chronic diseases like hypertension. Numerous studies in other countries have previously established the impact of pharmacist-led HMR[1,3,4,5,6]

The current study was aimed to assess the impact of HMR in hypertensive geriatrics in various Mangalore localities. Offering HMRs was an effective way for a community-based pharmacist to make acceptable medication therapy management recommendations for older patients.

HMR SERVICES

The present study provided various services to achieve proper medication management which are explained below:

BP Monitoring: The current study offered free blood pressure checks to participants in an attempt to encourage participation, as hypertension necessitates titrimetric dose adjustment, regular blood pressure monitoring assists physicians in making drug or dosage modification decisions. According to JNC-7 guidelines, follow-up should be done at least once every three months. The guidelines also state that in the general population of hypertensive adults aged 60 and up, systolic blood pressure should be less than 140 mmHg and diastolic blood pressure should be less than 90 mmHg[7].

The present study participants had a normal mean range of blood pressure in pre-study. The importance of regular follow-up was stressed to the subjects by oral counselling. During post intervention study subjects showed positive attitude in BP check-up. Mean BP was slightly lower compared to pre-intervention mean BP. Similar reduction in post-intervention mean BP was found in study conducted by K.R. Thankappan et.al, in Kerala[8]

BMI: Maintaining optimal BMI is a requirement rather than a compulsion as obesity can activate RAS, insulin and leptin resistance and endothelial dysfunction. [9,10].

In the present study pre intervention started with measurement of BMI, based on this study participants were categorized. Majority of the participants were in “overweight & obese” category and they were provided with counselling about importance of physical fitness and harmful effects of being obese, educated about dietary modifications and exercise wherever applicable. Post intervention study witnessed the acceptance of these interventions by participants, by incorporating advised changes in their lifestyle.

Risk Factors: Previous research has hypothesised that modifiable risk factors have a negative impact on blood pressure control[11,12]. Excessive salt, alcoholism, obesity, physical inactivity causes increased BP. Exercise increases blood flow through all of the body's arteries, causing release of natural hormones and cytokines that relax blood vessels, lowering BP. Alcohol raises blood levels by activating RAS. Smoking increases the risk of atherosclerosis, which accelerate BP[10,13,14]

In the current study physical inactivity was highly prevalent in subjects followed by overweight and obesity. Counselling was given for the same. Consumers of alcohol and tobacco didn't significantly improve after the intervention. Additional information was given regarding the rehabilitation programmes available in the nearby localities. Post-intervention analysis showed increase in proportion of participants who were physically active and who adopted a reduced sodium diet.

Knowledge Assessment and Interventions on Drug and Disease: Empowering patients with accurate information about the disease and its treatment can help them overcome misguided beliefs and associated misconceptions. This, in turn, can lead to a improvement in patient knowledge about the disease as well as various lifestyle changes that aid in hypertension management. Inadequate knowledge on disease, especially regarding normal BP level, symptoms, complications was observed in the present study. Similar knowledge gap was found in study conducted by Malik. A et.al, on hypertension-related knowledge[15]. Participants with a low score were provided with educational intervention by oral counselling and PIL. An interventional study done by Ho TM et al., reported similar improvement in patient knowledge on hypertension after providing intervention[16]

Patient's understanding of prescribed medication is an important factor in determining compliance and the ultimate outcome of a disease. The current study sought to examine medication knowledge, and the findings indicate that 49% patients lacked necessary knowledge of medication. Similar observations was found in the previous research on patients' knowledge on medication[17,18].

Drug information was collected from various databases like Lexicomp, Medscape and was used to counsel subjects. Intervention was given focusing on the domains where the patient lacked information and post-interventional analysis showed improved drug knowledge. An interventional study conducted by C. Magadza et al. indicated that through educational intervention, there was an increase in medication knowledge[19].

Multiple storage sites may lead to medication disorganisation. Elderly population are more likely to be harmed by this unfavourable association as they have more prescribed drug at home with increased likelihood of medication error. A reduced adherence was reported in earlier researches with patient practicing multiple storage site[20]. In the present study majority of the subjects practiced this, so the participants were counselled regarding proper storage as per recommended guidelines[21]. Pill box was introduced to the subjects as an innovative way to store medication.

CONCLUSION

From the present study it can be concluded that, the HMR can emerge as an important tool of pharmacist to provide pharmaceutical care to the patient. This study highlighted issues on home medication management among hypertensive patients and possible factors associated with it. Findings indicate lack of knowledge of disease and drugs, its storage, missing regular health check-up are associated with medication mis-management at home. Providing information on use of PIL, pill cards pillbox and also blending of new technologies like medication reminder mobile application, medication SMS reminders/alerts, can improve adherence and prevent confusion.

Findings also shed light on the benefits of Home Care Pharmacy Services (HCPS) and good disease insight towards patients' home medication management. HMR improved rational use of medicines and also improved patient healthcare outcomes. Thus, with improved implementation of HCPS as well as thorough patient education by pharmacists, home medication management among hypertensive patients may perhaps be improved.

ACKNOWLEDGEMENTS

Authors would like to extend deepest gratitude to Srinivas College of Pharmacy and would like to extend our thanks and appreciation to the study participants for smooth completion.

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HOW TO CITE: Satish S., Ashika M.*, Ramakrishna Shabaraya A., A Community Based Study To Assess The Effectiveness Of Home Medication Review Based On Their Knowledge About Disease And Drugs In Hypertensive Geriatric Patients Of Dakshina Kannada, Int. J. in Pharm. Sci., 2023, Vol 1, Issue 11, 326-335. https://doi.org/10.5281/zenodo.10138421