Effectiveness of Educational Interventions to Improve Medication Adherence among Hypertensive Patients

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Abstract: ***Aim***: **To assess the impact of pharmacist's interventions on awareness and knowledge of hypertension among patients.** ***Methods***: **This study was a prospective cross- sectional study conducted in different areas of Dakshina Kannada district, used a study group comprised 150 individuals, diagnosed with hypertension and on oral antihypertensive agents. Study was conducted for duration of 6 months (September 2019 to March 2020). For education intervention, the patients were categorized into highly adherent, medium adherent and low adherent based on 8 item MMAS (Morisky Medication Adherence Scale) . High adherent patients were provided with teach- back patient counseling. Medium adherent patients were provided with teach-back method patient counseling and patient information leaflet. Low adherent patients were provided with audio-visual aids, teach-back method patient counseling and patient information leaflet. After 2 months, patients were followed up for review and their medication adherence will be checked again using 8 items MMAS (Morisky Medication Adherence Scale).** ***Results***: **The results of medication adherence rates using Morisky scale in the Pretest, among study participants only 11.3% of the population was found to be high adherent which significantly shows the decrease in the adherence rates. 34% had moderately adherence and the remaining 54% were low adherent. After follow-up (Posttest), 54 subjects were found to be high adherent which shows the significant increase in adherence rates. 43 subjects were still moderately adherent and the remaining 53 subjects low adherent.** ***Conclusion***: **This study showed that pharmacist intervention has a incredible potent unambiguous impact in creating awareness about the disease, and its maintenance by escalating their medication adherence. It helps the patients initiate a routine of day by day self-medication and potentially improves their long-term clinical outcomes.**

Keywords: **Medication adherence, interventions**

1. Introduction

Hypertension (HTN) is the foremost gamble issue causing cardio metabolic disease burden globally and two of the complications, ischemic concern disease and stroke, contributed one-fourth of the comprehensive aggregate deaths in 20161. Cardiovascular disease are contemplated as the primary instigate of death worldwide [2].

According to WHO medication adherence is defined as "the extent to which a person's behavior in taking medications corresponds with agreed recommendations from a health care provider" 3. Preponderance of hypertension is mounting exponentially in India. Hence hypertension has been turned out into a compelling public health hindrance in India. Patient's awareness regarding concerning hypertension and its complications additionally their beliefs and attitudes are approximately of the vital factors in achieving acquiescence to medication and managing of blood pressure. Indirect methods used to measure acquiescence in the outpatient situation comprise self-report, electronic adherence monitoring (e.g. medication event monitoring system, pharmacy refill rates, and pill counts. Direct monitoring of the patient taking the pills is an alternative direct method; however, it is impractical in the outpatient setting, more than ever for long-term treatment. Perhaps via a combination of methods may give the consummate true assessment of adherence [6]. A combination of methods is endorsed to determine adherence, with electronic monitoring and drug measurement being the most accurate. Re-packing of prescription is also integer utilized as a method of improving adherence.4-7. Several factors induce adherence to pharmacological and non-pharmacological therapeutic measures and be able to be associated to social and cost-effective context, disease-related, patient- related, healthcare-related and therapy-related [5].

2. Materials and Methods

Study Site: The present study is a prospective cross sectional study conducted in Kankanady, Valachil, Valencia, Jeppu, Padil of Mangalore in Karnataka.

Sample Size: The study was limited for a sample of 150 patients based on the time schedule allotted for the project including other circumstances.

Ethical clearance: Ethical committee clearance was obtained prior to the study from the Institutional Ethics Committee

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(IEC), Srinivas Institute of Medical Sciences and Research Centre, Mukka, Mangaluru, India (Ref no. 2019/10/2820/1 dated 31/10/2019). We recruited patients diagnosed with hypertension and on oral antihypertensive agents who met the study criteria. Study was conducted for duration of 6 months. (September 2019 to March 2020)

Study criteria: Inclusion criteria:
- Patients of age 31-70years of either sex with hypertension
- Patients on oral antihypertensive agents.
- Patients who are willing to participate in the study

Exclusion criteria:
- Patients with visual and hearing impairment
- Pregnant and lactating women
- Terminally ill patients
- Patients <18years or >70years
- Patients who did not agree to participate in the study

Source of data: Data (s) for the study were collected using data collection form subjects. Area –wise they were distributed from different parts of Dakshina kannada district. The data was collected through direct interaction with the patients. Measuring medication adherence/ Counseling tool used: Electronic monitoring, pill count, pill box, SMS reminders and diary. Recent attention has been given to electronic monitoring with systems such as medication event monitoring systems (MEMS).

Study method: Preparation of inform consent form (ICF)

Inform consent form were prepared in Kannada and English and the same was used. Before selection of subjects, the consent form was orally explained to the participants before filling it and verbally and made they understood. In the study only the participants willed to fill ICF were included. Data(S) Collection: Data(S) were collected using data collection form and morisky medication adherence scale (mmas-8) for the assessment of medication adherence and later it was correlated to find impact of pharmacist's interventions on medication adherence among patients. With the hypertensive patients from selected areas of Mangalore Dakshina Kannada district. The obtained data(s) were kept confidential.

A. Interventions

The present study included three of these interventions:

Teach-back method: The Teach Back Method is a teaching technique used to determine the patient's or family's baseline knowledge about medication adherence. This method can then be used to evaluate the patient's or families' understanding of the material that was taught.

- *Patient Information Leaflet*: The Patient Information Leaflet (PIL) is the leaflet included in the pack with a medicine usually. It is written for patients and gives information about taking or using a medicine or any information regarding a particular disease.
- *Audio-visual aid:* Audio Visual Aids are also called instructional material. Audio literally means "hearing" and "visual" means that which is found by seeing. So all such aids, which endeavor to make the knowledge clear to us through our sense are called "Audio Visual Aids". Therefore, any device which can be used to make the learning experience more concrete and effective, more realistic and dynamic can be considered audio visual material. Our audio-visual is a 5 minute pre validated video its content included facts about hypertension and importance of medication adherence.

B. Process validation of audio visual aid

Double validation of the video was carried out by a panel of two medical practitioners belonging to two reputed medical colleges in Mangalore and obtained encouraged results with good remarks the reports are documented in department file for future use. Thevideo is available online @ youtube https://www.youtube.com/watch?v=wyKNutWX8F0&t=65s

The contents of the video included the following:

Table 1

Duration	Content
00:04 – 00:32	Introduction to hypertension
00:33 - 00:52	Complications of hypertension
00:53 - 01:02	Medication adherence
01:03 – 01:33	Reasons for non-adherence
01:34 – 01:53	Consequences of non-adherence
01:54 – 04:27	Interventions
04:28 – 04:56	Conclusion

Based on the contents included in the video, the validation was done using a 5 point rating scale: 1. Poor, 2. Fair, 3. Average, 4. Good, 5. Excellent

Data Analysis: Statistical analysis involves collecting and scrutinizing every data sample in a set of items from which samples can be drawn and were analyzed using Microsoft Excel.

3. Results

A. Demographic characteristics of study population

A total of 150 patients participated in our study. The majority of the study population was fallen in age's between 51 to 70 year. The basic variables of patients showed at, the age group of 51-70 (76.6%) and 71-90 (16%) was found that increasing age can be attributed to decrease medication adherence. In gender wise females 82 (54.6 %) were more than males 68(45.3%). After a post test out of 82 female subjects, 31 were high adherent, 23 were medium adherent and 28 were low adherent whereas out of 68 male subjects, 23 were high adherent, 20 were medium adherent and 25 were low adherent. This data shows that gender has no significant place in medication adherence. Education occupation and annual income showed more literates and annual income 10000-100000 respectively.
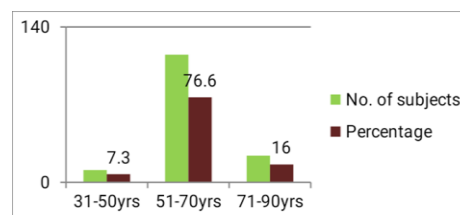

Fig. 1. Distribution of study population according to age (N=150)

B. Categorization of patients to different type of medication adherence

The results of medication adherence rates after assessment using Morisky scale, Only 11.3% of the population was found to be high adherent which significantly shows the decrease in the adherence rates. 34% had moderately adherence and the remaining 54% were low adherent.

Table 2
Assessment of medication adherence using Morisky scale.

	Pre test
Category	No. Of patients
High Adherence (=8)	17(11.3%)
Medium Adherence (6-<8)	52(34%)
Low Adherence (<6)	81(54%)

C. Categorization of patients to different type of interventions

As a pre-test to the study, the knowledge and awareness of the participants regarding hypertension was assessed using Morisky scale. Based on the scores subjects were categorized into high adherent, medium adherent and low adherent after which they were educated using different interventions high adherent group had education using teach-back method, Medium adherent group was given teach-back and patient information leaflet, Low adherent group were provided Teach-back, PIL as well the audio-visual aid on hypertension. The subjects were followed-up after 2 months and their knowledge and awareness on hypertension and adherence to antihypertensive therapy was rechecked using the same questionnaire and adherence scale used for the initial assessment.17 subjects who were high adherent were educated using teach-back method, 52 subjects who were moderately adherent were given teach-back and patient information leaflet and the remaining 81 low adherent subjects were given teach-back, PIL as well the audio-visual aid on hypertension.

Table 3
Different types of education intervention provided to patients

Teach-back Method NO'S	Teach-back+Patient Information Leaflet NO'S	Teach-Back+ Patient Information Leaflet + Audio Visual Aid NO'S
17	52	81

D. Impact on medication adherence pre & post-test

Follow-up of medication adherence assessment shown

54 subjects were found to be high adherent which shows the significant increase in adherence rates.43 subjects were still moderately adherent and the remaining 53 subject's low adherent.
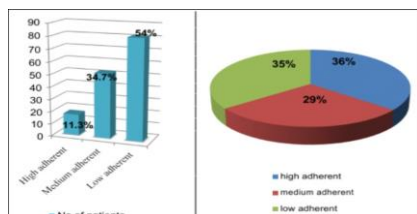

Fig. 2. Medication adherence rate of Pre-test and Post-test

Table 4

	Post test
Category	No. Of patients
High Adherence (=8)	54(36%)
Medium Adherence (6-<8)	43(29%)
Low Adherence (<6)	53(35%)

4. Discussion

Among 150 patients which includes 45.3% males and 54.6% females of age group 51- 70years (76.6%), 71-90 years (16%) and 31- 50years (7.3%) shows the descriptive characteristic so female patients were found to be more compliant than female patients after controlling other demographic characteristics. This is consistent with another study shows that adherence rate was low in females and older patients due to non-adherence was side effects and forgetfulness [11]. Knowledge of hypertension during pretest were more in low adherence 54% followed by medium adherence 34% and high adherence 111.3%, in posttest, more in high adherence 36% followed by low adherence 35% and medium adherence 34%. In this study medication adherence were significantly increased after getting the knowledge. The studies regarding pre posttest of the patients knowledge showed the average percentage of population had good knowledge increased from 70.66% to 88.05% and patients with poor knowledge increased from11.95%to29.33%12.

In the present study, subjects were classified into high adherent , medium adherent and low adherent which was done using Morisky scale (MMAS-8) after which they were educated using different interventions such as teach-back method, patient information leaflet or an audiovisual-aid on hypertension. Teach-back method was used to educate 17 subjects, 52 subjects who were moderately adherent were given teach-back and patient information leaflet and 81 subjects were low adherent was educated by giving teach-back, PIL as well the audio-visual aid on hypertension. The gradually controlled blood pressure in the patients associated with the education provided on medication adherence and the result a higher compliance rates for regular medication use (table1). In the medication adherence education, we emphasized the importance of risk factors continuation of medication even after an anticipated side effects. In a study by Beune conducted a cluster and omised trial in Dutch PHCCs, Among146study subjects (intervention n= 75, control= 71) intervention group:3 sessions of educationat 2, 8and 20 weeks with hypertension care and Control group: hypertension care and education intervention was given for duration 6months by pharmacists It was found that intervention led to an improved adherence to lifestyle recommendations, medication adherence8. At the study completion the regular medication adherence was improved in Posttest (after intervention provided)

Comprehensively, the present study, as well as those previously published has shown a education positively impacts hypertension, knowledge side effects, regular medication use and medication adherence. Education provides by Pharmacist

about hypertension and life-long antihypertensive medication therapy will inevitably provide increased success in blood pressure control. Health professionals, even if they do not have the opportunity to give a long-term education, must be aware of the fact that responding to questions of hypertensive patients is influential in incrementing compliance to medication and enabling them to choose a healthy lifestyle .Individual patient education has positive effects on controlling hypertension witnessed by observing rise in medication adherence in post education. The use of patient counseling tools and methods, such as video and PIL, after education had a moderate to large effect on adherence to antihypertensive agents.

5. Conclusion

This study showed that pharmacist intervention has incredible potent unambiguous impact increasing awareness about the disease, and its maintenance by escalating their medication adherence. In this study MMAS-8 is used with the purpose to screen patients with stage of medication adherence. Patients who participated in counseling sessions with a pharmacist after pretest make evident better medication adherence and persistency in the post test assessment. This interference moderates the eminent take the risk of non-adherence and discontinuation; it helps patients initiate a routine of day by day self-medication and potentially improves their long-term clinical outcomes.

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