Impact of Pharmacist Counseling on Patients Medication Adherence: A Prospective Cross Sectional Study

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Abstract

Background: Patient compliance is one of the main barriers to positive treatment outcomes. Many studies have demonstrated that effective patient counselling by pharmacists about medications improves outcomes and can reduce morbidity and mortality. **Aim**: To compare medication adherence before and after pharmacist counselling by improving their knowledge about the medicine intake at the right time in the right way as prescribed by the physician. **Settings and Design:** A Prospective cross Sectional Study **Methods:** A prospective cross-sectional study was conducted in a South Indian tertiary caremultispecialty teaching hospital for three months. Patients over 18 years, irrespective of gender, and those willing to participate in the study were enrolled. 150 type -2 diabetes patients enrolled as a covenant sample. Patients' demographic characteristics were collected before performing the Medication Adherence Rating Scale-8(MARS) questionnaire to understand the age, gender, and co-morbidities associated with medication adherence. Results were compared using a student t-test after four weeks of post-pharmacist counselling**. Statistical analysis used:**Paired sample T-test **Results:** Post-counselling values of MARS after 4 weeks showed significant differences ($P<0.01$) in both genders and age group 25-35, showing better response than other age groups. Therefore, treatment adherence by counselling patients using the MARS questionnaire showed significantly increased outcomes after counselling. **Conclusion**: Pharmacists are essential in increasing medication adherence rates among patients, as they have extensive knowledge of medications and their effects. Appropriate treatment and improved drug effectiveness will increase treatment compliance and save lives.

Keywords: Medication adherence, Patient counselling, Medication Adherence Rating Scale

Key Messages: Through this study, we conclude that the patient's medication adherence was improved by giving patient counselling. Also improves the patient's willingness and ability to take their prescribed medications as instructed by their healthcare providers.

Introduction

Medication adherence can be characterized as the degree to which the patients take medications as endorsed by healthcare providers[1,2].Pharmaceutical non-adherence frequently leads to destitute well-being results and contains a noteworthy negative financial effect[3,4].The MARS was developed by Thompson et

al.The Medication Adherence Rating Scale (MARS) describes three dimensions of a person's medication adherence: Adherence behaviour, attitudes toward medication, and negative side effects[5]. MARS questionnaire developed by combining a medication adherence questionnaire and medication attitude inventory[6].By patient's response surveys are used to measure non-adherence make a difference for clinicians and well-being care experts to distinguish fundamental issues[7,8].Pharmacist will be compensated for conveying pharmaceutical treatment administration to their patients[9,10]. Pharmaceutical care requires a coordinated relationship between a pharmacist and an individual patient[11]. Drug specialists are balanced to play an imperative part in progressing pharmaceutical administration amid moves of care and diminishing readmission rates[12,13]. Drug specialist intercessions are cruel in understanding the drug treatment issues recognized in pharmaceutical care[14].Pharmacists also be understanding teachers, refer patients to the doctors in case of illness or medication-related issues, and screen quiet medicine utilization[13–17]. Three fundamental approaches specifically instruction, behavioural and a combination of both approaches. Behavioural-based administrations point to improved conduct. Combining these approaches can cover both regions and give better results in altering conduct than the partitioned approaches[13,18–20].

Research question:

Question no.1
What is the impact of pharmacist counselling on patient medication adherence among type-2 diabetes mellitus patients in south Indian tertiary care multispecialty teaching hospitals?
Null hypothesis:
No significant change will occur in type-2 diabetes mellitus patients after pharmacist counselling.
Alternative hypothesis:
There is a significant change in type-2 diabetes mellitus patients after pharmacist counselling.
Question no.2
To what extent the morbidity and mortality rate was reduced after pharmacist counselling?
Null hypothesis:
There is no significant reduction in morbidity and mortality rates after pharmacist counselling.
Alternative hypothesis:
There is a significant reduction in morbidity and mortality rates after pharmacist counselling.

Methodology

A prospective cross-sectional observational study was conducted at a tertiary care multispecialty teaching hospital in South India over three months. Patients older than 18, irrespective of gender, and those willing to participate in the study were enrolled. Lactating mothers, paediatrics, pregnant women, and psychiatric patients were excluded from the study. One hundred fifty patients enrolled in the study as a covenant sample. Patient's demographic characteristics are collected before performing the MARS questionnaire to understand the age, gender, and comorbidities associated with medication adherence. MARS questionnaire was performed at baseline and after four weeks of post-pharmacist counselling for the assessment of patient's medication adherence and the results were compared between pre-counselling and post-counselling data using paired sample statistics and paired sample correlation. Then the paired t-test was performed to compare the means and significant difference of paired data.

Results

The medication Adherence Rating Scale (MARS) questionnaire was performed initially before and after the patient counselling for assessing the medication adherence for the patient as shown in **Table: 1** Patient counselling was performed by providing medication information orally to the patients on the direction of use, dosage, advice on side effects, precautions, diet, and lifestyle modifications, importance of medication for the treatment outcome.

Table: 1 *Pre-counselling and post-counselling MARS rating*

Questionnaire	Patients response	No. of patients answered positively		Percentage %	
		Pre	Post	Pre	Post
Do you ever forgot to take your medicines?	○ Yes ○ No	68	120	45%	80%
Are you careless at times about taking your medications?	○ Yes ○ No	58	118	38.6%	78.6%
When you feel better, do you sometimes stop taking your medicine?	○ Yes ○ No	63	106	42%	70.6%
Sometimes if you feel worse when you take your medicine, do you stop taking it?	○ Yes ○ No	57	128	38%	85.33%
I take my medication when I am sick?	○ Yes ○ No	36	119	24%	79.3%
It is unnatural for my mind and body to be controlled by medication?	○ Yes ○ No	60	116	40%	77.3%
My thoughts are clearer on medication?	○ Yes ○ No	110	99	73.3%	66%
By staying on medication I can prevent getting sick?	○ Yes ○ No	101	104	67.3%	69.3%
I feel weird, like a 'zombie', on medication	○ Yes ○ No	120	145	80	96.6%
Medication makes me feel tired and sluggish	○ Yes ○ No	72	120	48	80%
Cumulative Mean		**74.5**	**117. 5**	**49.6%**	**78.3%**

Kolmogorov- Smirnov statistic and Shapiro- Wilk statistic test assesses whether the data in each group follows a normal distribution.Overall, table: 2 provides a comprehensive summary of the statistical analysis conducted on the paired data, including descriptive statistics, and correlations. This column displays the p-value obtained from each normality test. The "Paired Samples Statistics" section shows descriptive statistics for the two related (paired) data sets. The correlation coefficient is 0.03749, indicating a moderate to strong negative correlationbetween Pre counselling and Post Counselling data, the negative correlation and the significant p-value suggest a significant difference
between the two groups as shown in **Table: 2**

*MARS questionnaire was extracted from (Reliability and validation of a new Medication Adherence Rating Scale for the psychoses, Table no :1)

Title	Pre counselling	Post counselling
Kolmogorov- Smirnov statistic	0.237(p value=0.114)	0.224(p value=0.164)
Shapiro- Wilk statistic	0.903(p value=0.241)	0.928(p value=0.456)
Paired sample statistics		
Mean	74.5	117.5
Standard deviation	26.84	13.08
Standard error mean	8.49	4.14
Degree of freedom	10	10
Paired sample correlation		
Correlation	0.03749	
Significance	0.92	

Table: 2 ***Statistical Evaluation***

Table: 3

The paired sample test compares the means of the paired data sets while considering the correlation between them. Confidence Interval represents the range within which the difference between the two groups. While sig indicates p value for the paired data sets

Paired Samples Test									
		Paired Difference					t value	df	Sig. (2-tailed)
		Mean	Std. deviation	Std. error mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	No. of patients answered positively (Pre counselling) - No. of patients answered positively (Post Counselling)	43	29.4165	9.3023	24.768	61.232	4.622	9	.00125

Table: 3*Paired sample T-test*

Discussion

The study evaluates the impact of pharmacist counselling on medication adherence in managing type-2 diabetes mellitus.Our study of Pharmaceutical Adherence patients by pharmacist was done on up to 150 patients, counting 70(47%) male and 80(53%) female patients; less gender variation was included in our study. It was inverse to the study by Patricia L. Darbishire et al April 2014[7]. Also, this study is very much similar to the study done by KV Ramanath et al and co April-June 2012[21].MARS survey was utilized to decide adherence to the drugs by the patients. Whereas investigating the information collected on pre and post-advising, marks gotten by the patients from the pharmacist calculated on the MARS have essentially expanded in post-guiding results, which appears to change adherence due to directing. Patient counselling was performed orally by providing medication information on the direction of use, dosage, advice on side effects, precautions, diet, and lifestyle modifications. The impact of pharmacist counselling on improving medication adherence was studied in type 2 diabetes mellitus patients by MARS (Medication Adherence Rating Scale) scaling before and after counselling. In pre counselling, MARS scaling shows 74.5 and 49.62% cumulative mean and cumulative percentage, respectively. In post-counselling, results showed improved MARS scaling of 117.5 and 78.30% of cumulative mean and cumulative percentage, respectively. In various statistical methods showing prominent significance from MARS scaling for pre counselling patients Kolmogorov- Smirnov statistic P=0.114, Shapiro- Wilk statistic p= 0.241 and for post-counselling patients Kolmogorov- Smirnov statistic P=0.164, Shapiro- Wilk statistic p=0.456. The sample correlation between pre and post-counselling results shows a significance of p=0.92. Finally, the paired T-test was performed to compare pre and post-counselling impact on medication adherence at a 95% confidence interval and degree of freedom 7, showing the significance of p=0.00125, indicating a significant difference between the two groups.

From the above statistical results relay on the research questions are,

1. There is a significant change in type 2 diabetes mellitus patients before and after pharmacist counselling.

2. There is a significant reduction in mortality and morbidity rates before and after counselling.

Pre-counselling studies show that most people forget to take their medication on time. They even stop taking them when they start to feel better and don't complete the course of medicines. Some patients think they might get sicker if they continue the medications due to some simple side effects. Due to these reasons, medication adherence was very low before counselling. Post-counselling results show a significant rise in medication adherence, and various factors influencing the non-adherence rate were reduced due to the pharmacist's practical oral training of the patients. Patients have explained the common side effects and the need to complete the medication course and take them on time. They were advised to consult the doctor if they felt uneasy during their treatment with the medications and not to stop them on their own.Pharmacists significantly increase medication adherence rates among patients and their family members as they possess a vast knowledge of medicines and their effects. So, they are obliged to provide proper information to the patients and educate them about the proper benefits of the medicines, which will tend to increase the rate of medication adherence and saving of lives due to proper treatment and improved efficacy. 78.30% patients of the patients are satisfied with the clinical pharmacy service. Strongly suggested that pharmacists should provide clinical pharmacy service and provision of patient counselling had an excellent impact on hospital settings and public service.

Conclusion

This study shows that patient counselling has a strong positive impact on creating awareness about the disease and its management by increasing medication adherence. This study also concluded that

pharmacists' need is very important in other chronic disease management by preventing disease recurrence and its progression and minimizing hospital admissions.

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