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A Study on Patient Adherence and Related Factors in Cardiovascular Disease Related Patients In Pharmaceutical Market

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ABSTRACT

For the successful treatment of any type of disease, patient adherence towards the treatment and medication is very crucial now-a-days in pharmaceutical market. The patient adherence includes the initiation of the treatment properly, implementation of the treatment and at the end discontinuation of pharmacotherapy. More the adherence level of patients more will the probability of improvement from diseases. This study is based on the factors that affect the adherence level in cardiovascular diseases related patients. The survey of 144 patients was collected in various hospitals of Delhi-NCR region. The appliance of factor analysis represented that the major six factors that affected the patient adherence level at highest level are- patient's attitude, assurance factors, unfavourable addiction, insufficient time, lifestyle factors and patience factors.

Keywords-Factor analysis, adherence, cardiovascular diseases

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INTRODUCTION-

The sudden rise in cardiovascular diseases at present time has enforced the individuals to think about it. Talking about the pharmaceutical market and its scenario, WHO reported that in the year 2005, about 17 million people died due to cardiovascular diseases that majorly represents about 30% of all global death. The CVD are considered to be theforemost cause

of death all over the world by various reports. Among the deaths, nearly 7.2 million people died due to heart attacks and 5.7 million people died due to stroke and most of the people were from low and middle income countries. Till 2030, approximately 23.6 million will die from cardiovascular diseases [WHO, 2017]. Also, in the report by Global Burden of Disease study age-standardized estimated in 2010 that about 24.8% of deaths in India are due to cardiovascular diseases [GBD compare]. Hence, the cardiovascular diseases are considered to be one of the most loaded disease in India and worldwide.

Taking the consideration of major reasons that cause the highest death rates in cardiovascular diseases is the poor patient adherence level towards medication and treatment. There are various hitches by poor medication adherence that cause insufficient treatment process, disease development, side-effects in case of inappropriate treatment and sometimes death of patient [Hughes O.A. et.al, 2001]. In many studies, it has been proved that the poor adherence level increases hospitalization rate, poor outcomes from treatment and increased healthcare cost [Pladevall M. et.al. 2004, DiMatteo M.R. et.al. 2002].

The medication adherence level is declining day by day and thus it is very imperative to incorporate such aspects or strategies that will help the patients to fill this break. But to work on the strategies for improving medication adherence, one must be known to the real factors that are responsible for medication adherence. According to WHO 2003, in the report entitled “Adherence to Long Term Therapies: Evidence for Action”, WHO stated that the problem of poor medication adherence is increasing at large scale and is critical issue for health aspect [WHO, 2003]. Thus, WHO identified 5 dimensions or factors that are majorly responsible for affecting medication adherence-

- Social and economicfactors
- Health system and healthcare team relatedfactors
- Therapy relatedfactors
- Condition relatedfactors
- Patient relatedfactors

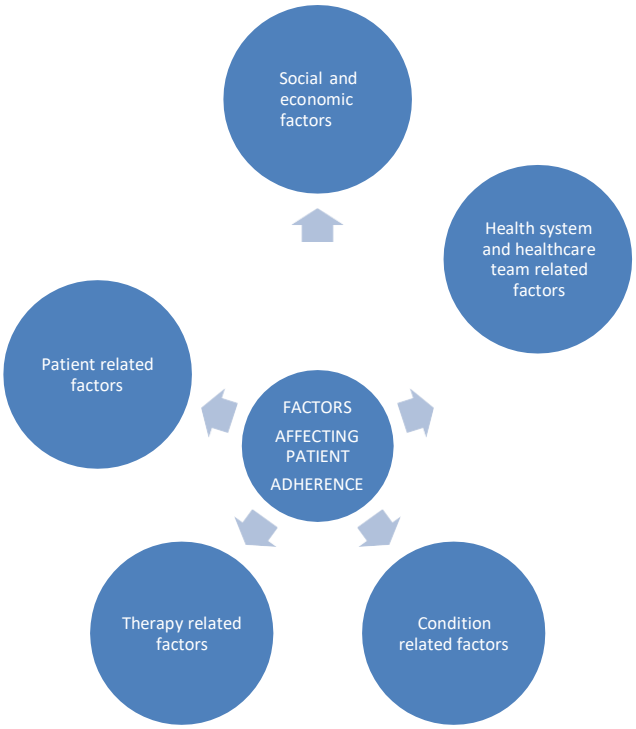

Figure 1- Factors affecting patient adherence

There are various factors that are reported in the studies for individual mentioned factors or we can say that the major factors related to the patient adherence level have further sub- factors that are corelated with them. The following figure shows the related major factors affecting patient adherence [American Society of Consultant Pharmacist, 2006]-

Social and economic dimensions	healthcare system dimensions	condition related factors
• Language issue with thepatients • Low healthliteracy • Lack of social awareness andsocial support E.G.Family • Unstable livingconditions • Monotonous and busyschedule • Limited access tohealthcare facilities • Lack of healthinsurance • Difficulty in accessingpharmacies • High medicationcost • Old cultural beliefsabout treatments • Less support ofelders	• Patient and healthcareprovider relationship • Commmunications skills of ofHCP • Difference between health beliefsof HCP andpatients • Lack of positive feedback fromHCP • Weak system to educatepatients properly • Lack of knowledge onadherence • Lack of facilites forimproving patientadherence • Lack of continous caretowards patient • Long waiting times in hospitalsor clinics • Lack of continous visits withHCP • High drugcost • Limitedformularies	• Chronic or acuteconditions • Lack ofsymptoms • Severity ofsymptoms • Mental illness ordepression • Psychologicalproblems • Mentalretardation

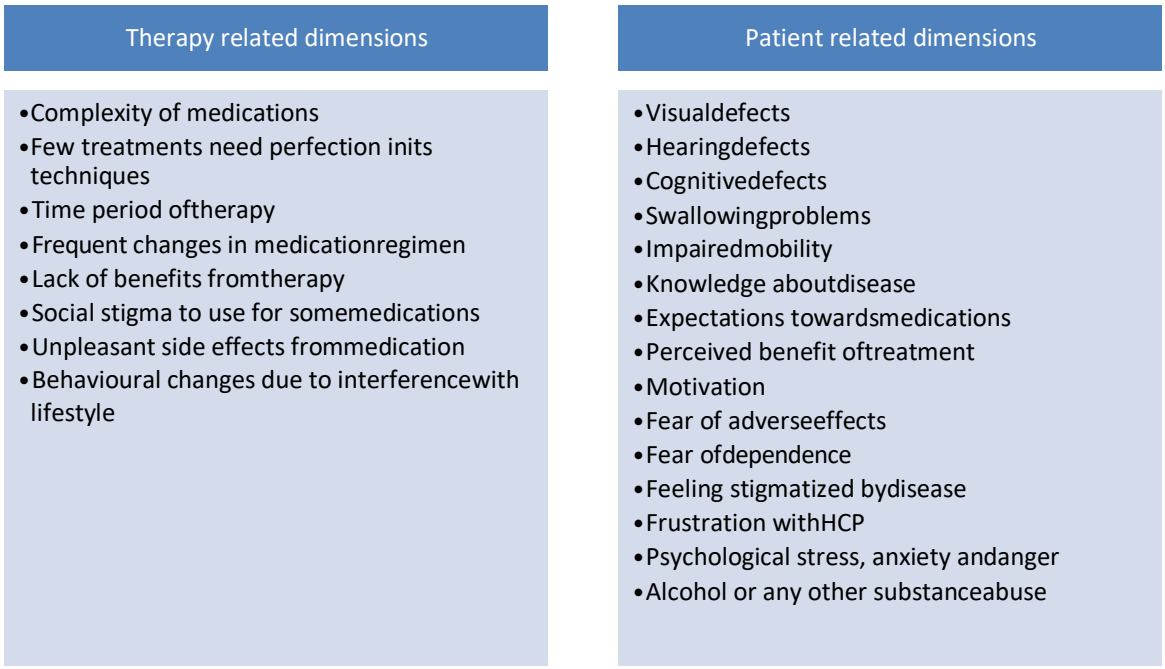

Figure 2- Showing sub-factors affecting patient adherence

LITERATURE REVIEW-

For the successful treatment and desired results of any medication, the main thing is the patient's compliance i.e. the patient should follow their medications properly. According to WHO, in the meeting conducted on adherence in June 2001, adherence is defined as "the extent to which the patients follow medical instructions" [WHO, 2003]. It is very essential for the patients to take their medications, with proper diet including lifestyle changes and agreeing the recommendations of healthcare providers. The adherence includes three basic steps i.e. initiation of the treatment, implementation of the prescribed treatment and discontinuation of the pharmacotherapy [Vrijens V. et.al. 2012]. The medication adherence level has its own benefit in the field of patient wellness to improve the diseased condition and course therapies and forimplementing this it is important to follow the basic steps in adherence.

It is very well said that adherence helps to reduce the whole cost at the time of treatment. In a literature, it has been mentioned that if medication lessen with time then in future the hospitalization rate and total cost of care increases [American Diabetes Association 2018, Choo P.W. et.al. 1999]. Thus, it is very essential for the patients to stick with their treatment procedure so as to get desired results. Adherence is like the capability or eagerness of the patients to stick with the therapeutic course of therapy [Inkster M.E. et.al. 2006]. When the patient doesn't stick to their medications as prescribed by the healthcare provider then it is known as non-adherence or non-compliance. The non-adherence of medications can be due to many reasons such as- taking incorrect dose, delaying in treatment, not following doctor's instructions properlyetc.

There are many researches involved in the meadow of adherence to know the reason by which it is mainly predisposed and in one of the research it has been cited that adherence is mainly affected due to

the factors like- degree and period of diseases, sternness of diseases, intricacy of the treatment routine, expenditure of medications and treatment and education and social sustain to the patients [Haynes R.B. et.al. 2008]. These are some of the general factors that are responsible to increase the non-adherence level among the patients. It has been proved that the medication adherence overall depends on the patient's description, activities, milieu, healthcare system and the disease from which patient is suffering[Desai

M.K. et.al. 02]. To increase the response and potential aspects of the health, the patients needs better improvement in the direction to increase the level of medicationadherence.

OBJECTIVES-

- To study the factors affecting patient adherence in cardiovasculardiseases.
- To analyze the impact of hospitals, patients, doctors, pharmaceutical company and government on patientadherence.
- To develop a holistic framework that will aim for better patientadherence.
- To work for better patient adherence and reducing health carecost.

METHODOLOGY-

The study was conducted in various hospitals of Delhi- NCR region on 144 patients suffering from cardiovascular disease such as- coronary artery disease, heart attack, abnormal heart beat, heart valve disease, aortic disease etc. The respondents taken were from various age groups, gender, education, occupation, type of family, marital status etc. There were about 20 statements based on the level of agreement to the healthcare factors provided by the medical professionals. For each statement, a five-point scaling was done anchored by 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree. Some additional questions were also asked regarding their disease like- type of hospital from where they are getting treated, time when they started the treatment, number of medicines they take daily etc.

RESULT AND DISCUSSION-

Item selection-

The study was done by using about 20 statements. The statements were designed in such a manner so as to effectively bring out the advantageous results regarding factors that affect the patient adherence level towards treatment and medications. The statements were in positive as well negative terms to elicit the overall attitude towards adherence level. The five-point scaling was done for eachstatement.

Pre-testing of the questionnaire-

The pre-testing of the questionnaire was done by taking 35 respondents erratically and they were requested to give the remarks related to language and clarity of the questionnaire. On the basis of the suggestions the changes were done accordingly for cleanness and specificity of thestatements.

Reliability of the survey-

The data collection also needed reliability analysis for assessing the accuracy in the survey process so for this Cronbach's alpha was the result showed the reliability of 0.75. Table 1 showed the value of Cronbach's alpha forthe statements formentioning the level of agreement related to the healthcare factors provided by providers and patients. From the table 1, it is clear by the value 0.75 that the statements showed good reliability.

Table 1- Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.75	.81	20

Judging the correctness of factor analysis-

In series to establish the appropriateness and correctness of factor analysis for the statements KMO and Bartlett's Test was used and the results are mentioned in Table 2. KMO (Kaiser- Meyer-Olkin) measure of sampling adequacy is a type of index which is used to examine the appropriateness of the factor analysis. High value i.e. ranging between 0.5- 1.0 indicates that the factor analysis is appropriate and the values ranging below 0.5 signifies that factor analysis is not appropriate. Similarly, Bartlett's test is used to examine the hypothesis thatthevariables are uncorrelated in the population and in this the probability less than 0.05 is suitable. The hypothesis formulated was-

H0: (Null Hypothesis): There is insignificant correlation between the variables for affecting patient adherence level towards medications and treatment.

H1: (Alternated Hypothesis): There is significant correlation between the variables for affecting patient adherence level towards medications and treatment.

Table 2- Showing Appropriateness of factor analysis by KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.733
Bartlett's Test of Sphericity	Approx. Chi-Square	592.793
	df	190
	Sig.	.000

It can be easily judged from the table-2, the KMO value is greater than 0.5 and also the significance level is 0.000 which indicates that the KMO value is significant at 5% level of significance.

Analysing the number of factors

The factor analysis done on 20 statements and the following table-3 shows the rotated component matrix obtained on the basis of factor analysis.

Table 3- Showing Rotated Component Matrix

	Component					
	1	2	3	4	5	6
I think I have complete knowledge about my disease.	.459	-.670	.076	-.179	.295	-.025
I am aware about the therapies or medications involved for my disease	.628	-.491	-.119	-.311	.208	.001
The addiction towards tobacco, smoking or alcohol usually causes non-adherence to treatment	-.109	.014	.013	-.004	.782	-.116
It is difficult for me to take medications on time.	-.025	.109	.161	.802	.017	-.288
At times, I am not satisfied with the treatment I am getting from my doctor	-.302	.380	.189	.104	.295	.156
The unpleasant side-effects of medications are always present.	-.060	.742	.113	.142	.172	.134
At times, my treatment requires interference with the lifestyle.	-.068	.135	.178	-.053	-.096	.827
When I skipped my medications, the condition of disease got serious	.001	.619	-.028	.031	-.082	.153
I have a good relationship with my healthcare provider	.644	-.127	-.280	-.058	-.443	-.153
If I am aware about my disease, it helps me to stick to the treatment	.596	-.313	-.441	-.055	-.209	-.065
I am satisfied with the communications skills of healthcare provider	.673	-.110	.110	.095	-.295	-.024
Sometimes, I feel dissatisfied with my healthcare provider due to long waiting times	-.544	.269	.339	.199	-.051	.323
My doctor shows personal concern during my visits	-.002	.477	.193	-.329	-.088	-.260
I am satisfied with the cost of medications I used to pay for my treatment	.195	-.192	-.021	-.570	.022	-.301
My family members are with me during my visit to doctor.	.025	.046	.868	.057	.180	.135
My family members pay for my medications	-.383	.076	.717	.077	-.177	.027
Usually, I feel dissatisfied with the language of doctor's prescription or any other medical practitioner when they explain the medications	-.164	.629	.120	.121	.269	-.066

I am aware about the medical insurance policies	.671	.181	-.011	-.208	.065	-.144
I am careless at times due to hectic schedule of medications	.435	.436	-.025	.377	.292	.329
Sometimes, due to cultural issues or beliefs, I skipped my medications	.769	-.196	-.246	.075	-.072	.261

Following are the 6 number of factors that came out from rotated component matrix-

Factor 1- Patient's attitude (It includes knowledge, awareness, relationship with healthcare providers, cost of medications etc.)

Factor 2- Assurance factors (It includes satisfaction from doctors, unpleasant side-effects, results by skipping medications, personal concern with doctors etc.)

Factor 3- Patience factors (It includes long waiting times in hospitals and clinics, support of family members)

Factor 4- Insufficient time (It includes time management from patient's side and healthcare providers)

Factor 5- Unfavourable addiction (It includes addiction towards tobacco, smoking and alcohol)

Factor 6- Lifestyle factors (It includes lifestyle changes) The variable component of each factor is as follows-

Factor 1- 0.459* × 1 + 0.628* × 2 + 0.644* × 9 + 0.596* × 10 + 0.673* × 11 + 0.195* × 14 + 0.671* × 18 + 0.435* × 19 + 0.769* × 20

Factor 2- 0.380* × 5 + 0.742* × 6 + 0.619* × 8 + 0.477* × 13 + 0.629* × 17 Factor 3- 0.339* × 12 + 0.868* × 15 + 0.717* × 16

Factor 4- 0.802* × 4

Factor 5- 0.782* × 3

Factor 6- 0.827* × 7

The above factors categorised are responsible for non-adherence of medications and treatment by the patients. At times, patients due to their careless behaviour discontinue their medications and causes harmful affects to their body. In the results, it was analysed that thehealthcare providers are also responsible for non-adherence level as they directly or indirectly require the interference that is may be due to their poor communication or poor relationship. The sudden changes in lifestyle of the patients contribute in lowering the chances of cure of chronic disease. It is very essential for the patients to stick to their treatment for better results in overall aspect. The following table 3 shows the demographic pattern of respondents participated in the study-

	Category	No. of people	Percentage	Cumulative percentage
Age in years	18-25 years	106	49.1	49.1
	26-30 years	59	27.3	76.4
	31-40 years	35	16.2	92.6
	>40 years	16	7.4	100.0
	Total	216	100.0	
Gender	Male	114	52.8	52.8
	Female	102	47.2	100.0
	Total	216	100.0	
Education	Undergraduate	8	3.7	3.7
	Graduate	141	65.3	69.0
	Post graduate	67	31.0	100.0
	Total	216	100.0	
Occupation	Student	77	35.6	35.6
	Service	75	34.7	70.4
	Business	13	6.0	76.4
	Academics	29	13.4	89.8
	Housewife	12	5.6	95.4
	Government employee	10	4.6	100.0
	Total	216	100.0	
Annual household income	0-3 lakhs	92	42.6	42.6
	3-6 lakhs	61	28.2	70.8
	6-10 lakhs	29	13.4	84.3
	>10 lakhs	34	15.7	100.0
	Total	216	100.0	

Table 4- Frequency distribution showing demographics of respondents

CONCLUSION-

The poor non-adherence level of patients not only affects the health of patients but also has negative impact on the other patients regarding disease cure and the negative feedback for healthcare professionals. The study identifies that the poor adherence level of patients depends on various factors that may differ from region to region. The data compilation was done by reducing number of factors with the help of factor analysis that showed 6 major factors responsible for poor adherence level of patients towards medications and treatment and were summarised as- patient attitude, assurance factors, unfavourable addiction, insufficient time, lifestyle factors and patience factors. In overall conclusion, one can say that poor adherence level of cardiovascular disease related patients may affect

the control and prevention of disease in future aspects. It is like a major limiting factor in terms of improving the disease related conditions for the patients and also for the healthcareprofessionals.

There is too much pressure on the functioning on the ethical aspects of the pharmaceutical industry and hence, there is a huge scope to work in different directions that should not only improve profitability of pharmaceutical market in terms of improving patient adherence level but also work towards better doctor-patient relationship. The difference or the gap has been recovered by the technology. So, the patients can tap their illness on web. In this field, the pharmaceutical industries have now having its key role to improve the patient adherence level by different campaigns or programs.

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