ORIGINAL ARTICLE

Compliance to medical advice among patients having non-communicable disease in Jamnagar, Gujarat

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Abstract

Background: The low compliance by patients with non-communicable diseases to treatment and medical advice is a major therapeutic challenge. WHO study estimates that only 50% of patients suffering from chronic diseases in developed countries follow treatment recommendations. **Aims & Objective**: To estimate compliance to medical advice among patients with non-communicable diseases and to find out association between various socio-demographic factors and compliance to medical advice. **Materials & Methods**: It was a community based cross sectional study. Total 450 subjects (225 each from Urban and rural areas of the district) were studied using pre-tested and semi-structured questionnaire. **Result:** Medicines were taken as prescribed by 71.78% participants. Dose was missed on previous day and once in previous week by 26% and 35.78% participants respectively. Adherence to medical advice was found among 43.33% participants. Proportion of adherence was significantly low among participants more than 50 years of age (38.40%), among males (35.74%), among financially dependent (39.30%) and those having disease since 6years or more (36.92%). **Conclusion:** Large number of study subjects were found to be non-compliant to medical advice and also the compliance was lower in participants more than 50 years of age, among males and among those who were financially dependent. These risk groups may be targeted through counselling or health education sessions to increase compliance.

Keywords

Adherence; Compliance; Medical Advice; Non-Communicable Disease

Introduction

Non-communicable diseases (NCDs) also known as chronic diseases or life style diseases are of long duration and generally slow progression. Non-communicable diseases kill 3.8 crore people each year, principally cardiovascular diseases, diabetes, cancers and chronic respiratory diseases. Nearly 80% of NCD deaths occur in low-and middle-income countries.(1) It is estimated that the overall prevalence of diabetes, hypertension, Ischaemic Heart Disease and Stroke is 62.47, 159.46, 37.00 and 1.54 respectively per 1000 population of India.(2) Large-scale clinical trials have shown that pharmacological treatment can reduce the morbidity and mortality associated with cardio vascular

diseases and that long-term or lifelong treatment is often indicated.(3) Patient compliance or adherence is defined as the extent to which a person's behavior coincides with health-related advice.(4) According to the World Health Organization, non-compliance with long-term medication for chronic conditions is a common problem that leads to compromised health benefits and serious economic consequences.(3) Non-compliance has also been identified as the predominant reason for the failure of medical therapy and disease progression.(5) Estimates from the World Health Organization (2003), indicate that only about 50% of patients with chronic diseases living in developed countries follow treatment recommendations.(6) This results in less than optimal management and control of the illness. Poor adherence is the primary reason for suboptimal clinical benefit.(7)

Aims & Objectives

To assess the compliance to medical advice among patients with hypertension, diabetes mellitus or coronary heart disease and the factors responsible for non-compliance in the district.

Material & Methods

The present study was a community based analytical cross-sectional study carried out in urban and rural areas of the study districts. The study was carried out from August 2015 to August 2016 over a period of 12 months. The study population included all men and women aged 30 years and above who were suffering from non-communicable disease like hypertension, coronary heart disease or diabetes and already receiving treatment for at least six months prior to data collection. The sample size was calculated assuming the prevalence of compliance to medical advice as 50%. Using the formula for estimating the population proportion with specified relative precision;

$$n = Z^2_{(1-\alpha/2)} P (1-P) / \varepsilon^2$$
Where,
n = Sample size
$Z_{(1-\alpha/2)}$ = is the function of confidence level. At 95% confidence level this value is 1.96
P = is anticipated proportion
ε = relative precision which is taken as 10% of P

At prevalence of 50% i.e. 0.5 using the formula, sample size was calculated as 384. Non-response rate of ten percent was added to the sample size that

makes it 422 which was rounded up to 450. Fifty percent of the study sample i.e. 225 subjects were selected each from the rural and urban areas of the district. There are 6 talukas consisting of 425 villages in the district. To get study subjects from rural area, 9 villages were selected by simple random technique and 25 subjects from each of these 9 villages constitutes 225 rural study subjects. Municipal Corporation area of study city is divided in 19 wards. To get study subjects representing urban area, 9 wards were selected by simple random sampling and 25 subjects each from these 9 wards constitutes 225 urban study subjects. Thus, total 450 subjects were selected from study district. House to house visit was done in each of these selected villages or wards till 25 sample subjects suffering from non-communicable disease like hypertension, diabetes or coronary heart disease were achieved. The study subjects were interviewed using pre-tested and pre-structured questionnaire. Questionnaire included information regarding socio-demographic characteristics, personal history, medical history, treatment and advice given by physician. Compliance to medical advice was determined based on the information provided by patients about whether they follow the treatment given by health care providers. Participant who pays regular follow up visit and has regularly taken medicines as prescribed by physician in last one month were said to be compliant to medical advice. Data were entered and analyzed using epi info software version (3.5.4).

Statistics: Pearson's chi-square test was used as a test of significance. A P value of < 0.05 was deemed statistically significant. Ethical approval was taken before the commencement of the study from the institutional ethical committee.

Results

Present community based cross sectional study includes 450 subjects (225 each from urban and rural areas) of study district.

Of the total 450 participants 159 (35.33%) belonged to age 50-60 years followed by 133 (29.56%) from 40-50 years and 117 (26%) were more than 60 years of age. Age distribution was almost similar in rural and urban areas. More than half (58.44%) were male and 41.56% were female. Proportion of male in urban was higher (i.e. 61.78%) compared to rural area (i.e. 55.11%). Literacy rate among the studied participants was 86.00%. More than one third of the

respondents (37.11%) had completed primary school, 23.56% had completed secondary school and 13.56% completed higher secondary school. Only 11.78% had completed university education and majority of them were from urban areas. More than half (57.11%) participants were financially dependent and this proportion was higher among rural participants (62.22%) as compared to urban participants (52.00%). (Table-1)

Out of total 450 studied patients, 325 (72.22%) had hypertension, 257 (57.11%) had diabetes and 51 (11.33%) had history of coronary heart disease. Three fourth of the participants had history of any of the non-communicable disease since 5 years, followed by 11.33% who were suffering from disease since 10 years. Only 14 respondents (i.e. 3.11%) had history of disease for more than 10 years. Majority of the subjects were attending the government hospital (65.78%) followed by 26.22% to private consultant, and 8.00 % were availing health services from trust hospital. Participants from rural areas were utilizing government health facilities more (70.67%) when compared participants from urban area (60.89%). Nearly three fourth (71.11%) participants were regularly attending health facility and this proportion was almost equal in urban (72.00%) and rural (70.22%) area. (Table–2)

On asking whether the participants take medicines as prescribed by consultants, 323 (71.78%) responded that they follow the prescription and this proportion was higher in urban area (78.22%) as compared to rural area (65.33%). Medicines were taken regularly in last one month by 289 (64.22%) participants while this proportion was higher for rural (72.44%) than urban (56.00%) participants. Rest of the participants reported missed dose on one or more occasions during last one month. Regular follow up visits to health institution were paid by 320 participants (i.e. 71.11%).(Table–3)

Participants were considered as compliant to medical advice if regular follow up visit at health facility was paid; medicines were taken as prescribed and dose of medicine was not missed in last one month. Total 195 (43.33%) participants were found to be compliant to medical advice. This proportion was almost same among urban (44.89%) and rural (41.78%) participants and difference was not statistically significant. (Table–4)

The main reasons narrated by participants for not taking medicine as prescribed were feeling better (24.73%) followed by fear of side effects (20.11%),

frequent travelling (18.90%), complexity of the regimen (18.11%), to avoid dependency (9.51%), medicines not effective (9.24%), affect daily routine (5.51%), want to try alternative medicine (3.15%) and high medicinal cost (2.36%).

Compliance was highest among 40-50 years subjects (51.88%) and least among 50-60 years subjects(36.48%), highest among those diagnosed with NCDs within the previous 1 year (65%) and least among those having NCDs for 6-10 yrs (36.92%), better among females (54.01%) compared to males (35.74%), literates (44.19%) compared to illiterates (38.10%), financially independent (48.7%) compared to financially dependent (39.3%).However only gender, financial dependence and duration of illness were found to have a statistically significant association with compliance. (Table–5)

Discussion

In present cross-sectional study compliance to medical advice among patients having non-communicable disease was studied. Since non-communicable diseases are chronic in nature; patients have to take medicines for lifetime and regular follow up is also very important to prevent any complication.

More than one fourth (i.e. 28.22%) participants in our study were not taking medicine as prescribed. Rao CR. *et al*. Observed in their study that 16% participant were not taking their medications regularly.(8) Reason for not taking medicine as prescribed were feeling better, fear of side effects, frequent travelling, regimen complexity, to avoid dependency, affect daily routine, want to try alternative medicines and high medication cost. In other study done by Mukherjee S. *et al*. it was observed that forgetfulness (44.7%), financial constraints (32.7%), busy with work (23.1%), too many medicines (15.6%), feeling of well-being and cure (11.6%), frequent side effects (7.0%) and trying alternative medicines (5.5%) were the reasons for not taking medicine as prescribed.(9) Thakur K *et al* in their study regarding awareness and treatment compliance for hypertension among women observed the main reasons for discontinuing the treatment were ignorance about the need of regular treatment (33.3%) and high cost of medicines (19.44%).(10) Rao CR. *et al* also revealed in their study that nearly half (47.8%) of the diabetics and 35.3% of the hypertensive patients presumed that the disease was under control, as they had no signs

and symptoms and therefore were not taking medicines.8 Study conducted by Joho AA revealed that 23% subjects stopped using medication when feeling well (when there is no symptoms), 16.3% of respondents frequently stopped medication to avoid drug addiction and 21% did so due to fear of side effects.(11) Girma F. *et al* also observed similar findings related to skipping the dose of medicine in their study.(12)

Only 195 (43.33%) participants were found to be compliant to medical advice that includes regular follow up and adherence to prescribed dose and schedule of medicines. Proportion of compliance decreases as the age advances. Similar findings were reported by Mukherjee S *et al* that the compliance to the anti-diabetic drugs decreased significantly (p = 0.039) with an increase in age and that it was lowest (48.3%) in the age group of 60 years.9 Joho AA also found similar association between age and adherence to treatment but it was not statistically significant.(11) Different result was documented by Thomas Akpan Edo that respondents who were 44 years and older were more compliant with treatment than respondents who were younger than 44 years of age and found this association statistically significant.(13) The said study included hypertensive patients only and it is possible that younger patients with no other risk factor may perceive the condition less serious compared to older patients . In present study female were found to be more compliant to medical advice than male and the difference was statistically highly significant. Similar finding were revealed in study done by Rao CR *et al*, (8) Joho AA (11) and Mukherjee S *et al*(9) who reported that the compliance rate was significantly lower among males. Thomas Akpan Edo *et al* (13) also reported significant relationship between gender and treatment compliance with females being more compliant than the males. The compliance was better among literate participants compared to illiterate in the present study but this association was not statistically significant. Girma F *et al* showed in their study that participants who completed their education from grade 9 – 12 were 6 times more compliant with antihypertensive medication compared to those who were illiterate (OR=6. 95% CI: 1.8-20.9).(12) Mukherjee S *et al* also reported that the compliance rate was significantly lower among those who were illiterate (p = 0.022). (9) Joho AA observed different finding in her study that proportion of treatment compliance decreases as the level of education increases, that is participants with primary school education and no formal education were treatment compliant compared to those with secondary school education, although it was not statistically significant. This may be due to the reason that patients with lower educational level might have more trust in physicians' advice compared to those with higher level of education.(11) Since non communicable diseases are chronic in nature they require lifelong treatment, frequent consultations and laboratory investigations which may incur additional medication, investigation or transportation cost. Financial dependency showed significant impact on compliance to medical advice as 48.70% participants who were not financially dependent were following medical advice while this proportion was 39.30% in dependent participants. Sankar UV *et al* in their study done at Kerala also reported that patients with lower per capita expenditure were more likely to report poor adherence.(14) Another study done by Divya S *et al* in a tertiary care hospital in South India also mentioned that economic problems to buy medications was one of the major patient-centric factors that was found to be higher in non-adherent patients (39%).(15) Present study revealed that recently diagnosed patients were more compliant to medical advice (65%) and this proportion decreases as the duration of illness increases. In a retrospective cohort study on variance in adherence among hypertensive patients, it was found that the factors that had the strongest positive effect on adherence included duration of hypertension (better adherence in patients with shorter duration).(16) But Ramli A *et al* in their study done at Malaysia mentioned that the predictor variable "duration of hypertension" was not shown to affect medication adherence or blood pressure control. The reason may be that the participants in her study were established hypertensives with mean duration of 8.5 years since being diagnosed as having hypertension.(17)

Conclusion

Nearly three fourth participants were regularly attending health facility. Majority of the participants said that they take medicine as prescribed by consultant. One fourth of the participants reported to have missed the dose on previous day and one third have missed at least one dose of medicine in previous week. The main reasons for not taking medicines as prescribed were feeling better, fear of

side effects and frequent travelling. Two fifth of the participants were found to be compliant to medical advice. Compliance to medical advice was lower in participants more than 50 years of age, among males and those who were financially dependent. Patients with history of disease for more than six years also showed significantly lower compliance to medical advice. Hence these risk groups may be targeted through counselling or health education sessions to increase compliance.

Recommendation

All the health care providers i.e. from health workers to doctors should counsel the patients with non-communicable disease about need of regular follow up and emphasize on compliance to medical treatment.

Limitation of the study

Study was done only in nine villages and nine wards of urban areas of the district with small sample size. Hence findings cannot be generalized to entire country or world. Assessment of compliance to medical advice was based on responses of participants and correctness of the responses were not verified. Detailed information was not assessed pertaining to treatment complexities and how it affects the compliance.

Relevance of the study

Non-communicable diseases are chronic in nature. Patients have to take medicines regularly for lifetime and frequent follow up is also very important to prevent any complication and premature mortality. So, it is essential to understand the factors that determine compliance to medical treatment and use this knowledge to increase it.

Authors Contribution

All authors have contributed in this research.

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Tables

TABLE 1 SOCIO-DEMOGRAPHIC PROFILE OF PARTICIPANTS

Socio-demographic Variables	Urban (n=225) Number (%)	Rural (n=225) Number (%)	Total (n=450) Number (%)
Age (in years)			
30-40	24 (10.67%)	17 (07.56%)	41 (09.11%)
40-50	61 (27.11%)	72 (32.00%)	133 (29.56%)
50-60	73 (32.44%)	86 (38.22%)	159 (35.33%)
>60	67 (29.78%)	50 (22.22%)	117 (26.00%)
Gender			
Male	139 (61.78%)	124 (55.11%)	263 (58.44%)
Female	86 (38.22%)	101 (44.89%)	187 (41.56%)
Education			
Graduate	44 (19.56%)	9 (04.00%)	53 (11.78%)
Higher secondary	41 (18.22%)	20 (08.89%)	61 (13.56%)
Secondary	51 (22.67%)	55 (24.44%)	106 (23.56%)
Primary	64 (28.44%)	103 (45.78%)	167 (37.11%)
Illiterate	25 (11.11%)	38 (16.89%)	63 (14.00%)
Financial Dependency			
Yes	117 (52.00%)	140 (62.22%)	257 (57.11%)
No	108 (48.00%)	85 (37.78%)	193 (42.89%)

TABLE 2 CLINICAL PROFILE OF PARTICIPANTS

Clinical profile	Urban (n=225) Number (%)	Rural (n=225) Number (%)	Total (n=450) Number (%)
Disease			
Hypertension	172 (76.44%)	153 (68.00%)	325 (72.22%)
Diabetes	121 (53.78%)	136 (60.44%)	257 (57.11%)
CHD	24 (10.67%)	27 (12.00%)	51 (11.33%)
Duration			
≤ 1 year	26 (11.56%)	14 (06.22%)	40 (08.89%)
2 to 5 year	166 (73.78%)	179 (79.56%)	345 (76.67%)
6 to 10 year	22 (09.78%)	29 (12.89%)	51 (11.33%)
> 10 year	11 (04.89%)	3 (01.33%)	14 (03.11%)
Health facility			
Government	137 (60.89%)	159 (70.67%)	296 (65.78%)
Private consultant	65 (28.89%)	53 (23.55%)	118 (26.22%)
Trust hospital	23 (10.22%)	13 (05.78%)	36 (08.00%)
Regularly attending health facility			
Yes	162 (72.00%)	158 (70.22%)	320 (71.11%)
No	63 (28.00%)	67 (29.78%)	130 (28.89%)

TABLE 3 REGULARITY IN TAKING MEDICINES AND FOLLOW UP VISIT AT HEALTH INSTITUTION

Regularity in taking medicine and follow up	Urban (n=225) Number (%)	Rural (n=225) Number (%)	χ^2 At df=1	p value
Take all prescribed medicines (323, 71.78%)	176 (78.22%)	147 (65.33%)	9.23	0.002
Regular in taking medicines (289, 64.22%)	126 (56.00%)	163 (72.44%)	13.24	0.0002
Regular in health check up (320, 71.11%)	162 (72.00%)	158 (70.22%)	0.17	0.67

TABLE 4 COMPLIANCE TO MEDICAL ADVICE

Compliant to medical advice	Urban	Rural	Total	χ2	p value
	Number (%)	Number (%)	Number (%)	at df=1	
Yes	101 (44.89%)	94 (41.78%)	195 (43.33%)	0.44	0.50
No	124 (55.11%)	131 (58.22%)	255 (56.67%)		
Total	225 (100.0%)	225 (100.0%)	450 (100.0%)		

TABLE 5 ASSOCIATION BETWEEN SOCIO DEMOGRAPHIC PROFILE AND COMPLIANCE TO MEDICAL ADVICE

Socio demographic variables	Compliance to medical advice		χ2	p value
	Yes (n=195) Number (%)	No (n=255) Number (%)		
Age group (in years)				
30 to 40 (41)	20 (48.78%)	21 (51.22%)	χ2 = 7.75, at df = 3	0.05
40 to 50 (133)	69 (51.88%)	64 (48.12%)		
50 to 60 (159)	58 (36.48%)	101 (63.52%)		
> 60 (117)	48 (41.03%)	69 (58.97%)		
Gender				
Male (263)	94 (35.74%)	169 (64.26%)	χ2 = 14.86, at df = 1	0.0001
Female (187)	101 (54.01%)	86 (45.99%)		
Literacy				
Illiterate (63)	24 (38.10%)	39 (61.90%)	χ2 = 0.82, at df = 1	0.36
Literate (387)	171 (44.19%)	216 (55.81%)		
Financial dependency				
Yes (257)	101 (39.30%)	156 (60.70%)	χ2 = 3.97, at df = 1	0.046
No (193)	94 (48.70%)	99 (51.30%)		
Duration of illness (in years)				
≤ 1 (40)	26 (65.00%)	14 (35.00%)	χ2 = 9.23, at df = 3	0.026
2 to 5 (345)	145 (42.03%)	200 (57.97%)		
6 to 10 (51)	18 (35.29%)	33 (64.71%)		
> 10 (14)	6 (42.86%)	8 (57.14%)		