Efficacy of Medical Adherence on Quality of Life Among Cardiac Patients

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A B S T R A C T

Background: Nonadherence is linked to poor outcomes and impaired QOL. The objective is to find out the efficacy of medical adherence on quality of life among CAD Patients.

Methodology: A descriptive cross-sectional study was conducted among 130 cardiac patients, who were coming in OPD of various urban centres of Bhopal. Data collection was done from September to October 2022 using a purposive sampling framework. Medical adherence and quality of life were assessed using self-administered MAS-CAD and WHOQOL-BREF respectively.

Statistical analysis: Chi-squared test, Fisher's exact test, Kruskal Wallis and Mann Whitney test were used. The correlation between medication adherence and quality of life was analysed using the Spearman rank correlation coefficient.

Results: The majority of the participants reported high (58.0%) medical adherence and were significantly correlated with variables like gender, occupational status, level of physical activity, and surgical history. Qol (<0.001), and its domains (physical, psychological and environmental) were also significantly correlated with medical adherence.

Conclusion: Better Medical adherence was associated with a high quality of life among CAD patients. Males and Homemakers or unemployed had better medical adherence. A better understanding of the factors affecting medical adherence and quality of life is necessary.

Keywords: Medical Adherence, Cardiac Patients, Quality of life

INTRODUCTION

Adherence to cardiac medications makes a significant contribution to the avoidance of morbidity and premature mortality in patients with cardiovascular disease. Coronary artery disease is a huge health problem as it affects the physical, mental, functional, as well as social roles of an individual thereby influencing the quality of life.[1] Major risk factors related to coronary artery disease include inappropriate diet, tobacco use, alcohol intake, obesity, high body mass index, high blood pressure, high fasting plasma glucose, and lack of physical activity. Lifestyle modifications for managing CAD include smoking cessation, weight loss, diet change, and exercise.[2,3]

According to the WHO, adherence to long-term disease conditions is poor and at around 50%.[4] Studies have shown that medication non-adherence is associated with greater morbidity and mortality, Hospitalization and higher cost of care and patients who reported impaired quality of life (QOL) have reported low medication adherence in various studies.[5–7] In modern medicine, quality of life is an indicator of general well-being. Several determinants have been reported to influence adherence, like nature and duration of therapy, characteristics of the disease, side-effects of medication, treatment cost, characteristics of health service facilities, the relation between the physician and patient, patient characteristics, and patient's perspective about the illness and therapy.[8]

Quality of life in coronary heart disease patients is affected by many components such as gender, social support, personality, socioeconomic factors, psychological symptoms, depression and anxiety. Health care providers must be aware of factors which influence adherence to medication and quality of life so that these might be explored during the hospital visits so that a management plan can be agreed between the prescriber and the patient.[9]

So, it is felt need of the researcher to assess the relationship between medication adherence and the quality of life among coronary artery disease patients to produce evidence which helps healthcare professionals form a therapeutic relationship with patients and their families and encourages them to better adhere to medication regimens and live a better quality of life.[10,11]

METHODOLOGY

A descriptive cross-sectional study was conducted between September 2022 to October 2022 at a selected urban centre, in Bhopal, India to assess the efficacy of medical adherence on quality of life among 130 coronary artery disease patients using purposive sampling.

Diagnosis (CAD) was made as per treating physicians. Participants were included in the study if they were of age 18 years or older, attending the outpatient department (OPD) in cardiology, cardiovascular and thoracic surgery (CTVS) department of urban centres, and were diagnosed with cardiac disease as per the treating doctor and patient records and can read or speak Hindi or English. Those currently suffering from comorbid illness (Neurological disorder, psychiatric illness) and patients who are terminally ill were excluded from the study. The questionnaire explaining the objectives of the study was distributed and written consent was taken. They were given the freedom to withdraw at any point of time during the study. It took approximately 15-20 min to complete the questionnaires. The Confidentiality and anonymity of the participants were maintained. Ethical Approval was obtained from the Institutional Ethics Committee Ref No. IHEC-PGR/2021/MSc Nursing/July/08, dated 08/07/2021. However, data could be collected from only 130 study participants. The data were collected using standardized questionnaires. A demographic sheet was created to elicit information related to socio-demographics (age, gender, area of residence, educational status occupation etc.), clinical variables (Duration for CAD treatment, past medical and surgical history) and personal history (level of physical activity, smoking, drinking and dietary habits). The level of physical activity was categorized using the International Physical Activity Questionnaire (IPAQ) as per total minutes of walk/week (low:<600, Moderate: 600-3000, High =>3000 minutes/week).[12] For assessing medical adherence, a medication adherence scale -coronary artery disease (MAS-CAD)[13] was used. MAS-CAD is a 5-point Likert scale 5 (disagree = 1, somewhat disagree = 2, neutral = 3, somewhat agree = 4, agree = 5) consisting of 25 items related to knowing, storing medication, and self-regulation in taking medication correctly. Based on the mean score, adherence was further divided into higher (mean score>3.67), moderate level (mean score: 2.34-3.67) and low level (mean score <2.34). Total score ranges from 25 to 125 with a higher score corresponding to higher medical adherence. An average score for the scale was calculated. Mean Scale values were interpreted as the degree of compliance based on class interval (area/ number of classes). S CVI (scale content validity index) = 0.99. Reliability was tested by using internal consistency. Cronbach alpha (α) = 0.70.[13]

WHOQOL-BREF[14] was used to measure the quality of life among CAD patients. It consists of 26 items and assesses QoL across four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environment (8 items). The domain score is calculated from the mean score of all items within each domain. One of the two remaining questions assesses individuals' overall perception of QoL (item number 1) and the other assesses the overall perception of health satisfaction (item number 2) for these items also mean score is calculated. To make domain scores comparable to WHOQOL-100, mean scores are multiplied by 4. According to the mean of these component scores, patients were divided into two groups in each component: mean

score = 56 and higher for the physical component, mean score = 58 and higher for the psychological component, mean score = 59 and higher for social component and, mean score = 56 and higher for the environmental component. A higher score on this questionnaire indicates a better quality of life.[15]

Statistical analysis: The data were analysed using SPSS version 21. The data were collected and coded in master datasheets. Both descriptive (frequency, percentage and median (IQR) and inferential statistics were used for the analysis. The correlation between medication adherence and quality of life was analysed using the Spearman rank correlation coefficient. The association between medication adherence with selected socio-demographics was analyzed using the Chi-squared test and Fisher's exact test whereas the association between Qol and satisfaction with health scores with selected socio-demographics was analyzed using the Kruskal Wallis test and Mann-Whitney test.

RESULTS

Patients' characteristics: A total of 140 patients were included and completed the questionnaire in this study. Their age ranged from 18 to 68 years. Almost double (67.0%) of patients were males, 94 % were married, and 43.0% had an education up secondary level. Table 1 shows the demographic and clinical characteristics of patients.

Medical Adherence and QoL among CAD patients: The median value of the medication adherence scale score was 3.68 among participants, having a minimum value of 3 & maximum value of 4.32 while the interquartile range was 3.52 to 3.80. Overall, 58.0% of patients had high adherence, 42.0% had moderate adherence (Table 2). The median value of QoL was 75 and of the physical, psychological, environmental and social domains 56,62.5,69, and 62 respectively were within participants. The median value of overall satisfaction with health was 75 (Table 3). Table 4, shows the proportion of patients with moderate to high adherence to medication according to socio-demographic and clinical characteristics. Adherence to medicine was significantly co-relate with socio-demographic variables and clinical variables like gender, occupational status, level of physical activity and surgical history (Table 4).

In Table 5, Medical adherence was also significantly associated with Qol (<0.001), QoL domains (physical, psychological, environmental) and overall satisfaction with health score (<0.001). Total QOL was significantly associated with sociodemographic variables like marital status, and diagnosis (CAD and MI). Talking about QoL domains, educational status (with physical, social and environmental domain), level of physical activity (with Physical and psychological domain), dietary habits (with Physical and psychological domain), smoking (with Physical and Social domain), drinking alcohol (with social domain) and

duration of treatment (with Environmental domain) were the predictors which were significantly associated (Table 5).

Table 1: Distribution of samples based on their socio-demographic, personal and clinical variables (N=130)

Characteristics	Frequency(%)
Age (years)	
18 - 25 years	1 (0.8)
26 - 35 years	3 (2.3)
36 - 55 years	63(48)
More than 55 years	63(48)
Gender	
Male	87 (67)
Female	43(33)
Marital status	
Married	122(94)
Unmarried	7(5.4)
Widowed	01(0.8)
Divorced	0(0)
Family history of CAD	
Present	3(2.3)
Absent	127(98)
Monthly Family Income	
Less than 10000	0(0)
10001 - 20000	4(3.1)
20001 - 30000	38(29)
More than 30000	88(68)
Educational status	
Illiterate	19(15)
Primary	40(31)
Secondary	56(43)
Graduate & above	15(12)
Occupational status	
Unemployed / Homemaker	29(22)
Private employee	38(29)
Govt. employee	15(12)
Self-employed	31(24)
Others	17(13)
Level of physical activity	
Low (low:<600 minutes/week).	25(19)
Average (Moderate:600-3000min/walk)	102(78)
High (High=>3000 minutes/week).	3(2.3)
Current smoking	
Present	52(40)
Absent	78(60)
Habit of Drinking Alcohol	
Present	35(27)
Absent	95(73)
Dietary Habit	
Vegetarian	43(33)
Non-vegetarian	87(67)
Clinical variables	
Diagnosis	
Coronary artery disease (CAD)	103(79)
Myocardial infarction (MI)	27(21)
Duration of treatment	
1-6 month	4(3.1)
6month-1 year	43(33)
More than 1 year	83(64)
Past Medication history	
Present	126(97)
Absent	4(3.1)
Surgical history	
Present	31(24)
Absent	99(76)

Table 2: Medication adherence scale score in CAD patients (N=130)

Medical adherence scale score- Category	N (%)
Low level (mean<2.34)	0 (0)
Moderate level (mean=2.34-3.67)	55 (42)
High level (mean>3.67)	75 (58)

Medication adherence scale –
Score (Median: 3.68, IQR:3.52-3.80)

DISCUSSION

QoL is considered to be important as a primary outcome and predictor of medical regime among cardiac disease patients. In the present study, the majority of the participants reported a high level of medical adherence (58%) whereas a study done by Silvanich et. al.[16] reported about the medium level (50.0%) of medical adherence among cardiac disease patients. In a present study reported adherence to medical regime was significantly associated with total QoL and its domains. Contrary to the present study findings study conducted by Aalsaqabi et al.[17] in 2020 did not find a significant association of medication adherence with any of the four (physical, psychological, social relationship, and environmental) domains of WHOQOL-BREF. However, poor medication adherence was associated with poor perceived QOL, p=0.018) among hypertensive patients. Medical adherence was associated with socio-demographic variables like gender(p<0.028), occupational status(p<0.001), levels of physical activity(p<0.001) and adherence of men's scores were significantly higher than women, consistent results reported a positive relationship between medical adherence and quality of life.

A study done by Lee[18], reported that adherence to lifestyle modification tended to be higher in females and those who were less educated and lifestyle medication factors such as a low salt diet, regular exercise, drinking alcohol and smoking cessation were associated with higher medical adherence, however in the present study, only level of physical activity was associated. A study done by Zuriati et al.[19,20] reported that educational status, income and occupation were significantly associated with QOL but such findings were not reported by the present study, however, the domains of QOL (Physical, social and environmental) were associated with educational status which indicates that participants with a higher level of education were more likely to have a better quality of life in terms Physical, social and environmental domain. Present findings indicate that QOL

was significantly associated with sociodemographic variables like marital status, this indicates that married people have a support system as a life partner, and consistent results were also reported by Zuriati et al.[19] and Hung et al.(2010)[21] and they concluded that the support system had a significant direct impact on quality of life and decreased the readmission rate among CAD patients. Luttik et al.[22] also concluded regarding supportive resources that help participants in adaptation and survival among cardiac patients. Zuriati et al.[19] concluded that income had a positive impact on quality of life and its domains (physical and environment) whereas occupation was associated with all three domains of quality of life except psychological and it reflects that the employed participants were more likely to have a higher quality of life than those who were unemployed but the present study didn't report as such. In various Studies[23,24] it has been the men's scores were significantly higher than the females' in all four domains of QoL among cardiac disease, although such results were inconsistent with the present study. In the present study findings, age and gender did not statistically significant relationship with any of the study variables (QOL and its domain, medical adherence and overall satisfaction with health scores), consistent findings were also reported by Zuriati et al.[19] in which age and gender were not associated with QOL.

Another analogous study conducted by Ghasemi et al.[25] in 2014, coronary artery disease (CAD) as a chronic disease can affect physical, mental, and social aspects of health as well as the perception of well-being. There was a significant relationship between QOL and marital status (P = 0.004), education (P = 0.007), income (P < 0.001) and disease duration (P = 0.047). However, there was no significant association between QOL and age, job and comorbidity. Ghasemi et al.[25] reported that married patients, higher educated people, average or good income had higher QOL. This study has several strengths First, participants were recruited at different urban centres. The limitation was that it's a cross-sectional study, which can only suggest factors affecting medical adherence and QoL and cannot provide evidence of causality. The study was conducted in busy clinical cardiac settings where the cardiac patients were asked to complete questionnaires shortly after a doctor's visit so, tiredness may have affected the attention to the survey questions, and the reported medication non-adherence rates may not have been completely accurate.

Table 3: Distribution of participants as per the categorical division of the domains

QOL Domain	QOL-Categories			
	Median (IQR)	Moderate (26-50)	Good (51-75)	Very Good (76-100)
Physical domain	56 (56, 56)	31(24)	99(76)	0
Psychological domain	62.5 (56.2, 62.5)	11(8.5)	119(92)	0
Social Domain	69 (59, 75)	2(1.5)	99(76)	29(22)
Environmental domain	62 (56, 69)	15(12)	113(87)	2(1.5)

Total QOL Median: 75 (75,75); Overall satisfaction with health Median: 75, Range: 50-75

Table 4: Proportion of patients with moderate to high-level adherence to medication according to sociodemographic and clinical variables

Characteristic	Moderate Adherence, (N=55)[1]	High-level Adherence, (N = 75)[1]	P-value[2]
Age (years)			
18 - 25 years	0 (0)	1 (1.3)	0.2
26 - 35 years	1 (1.8)	2 (2.7)	
36 - 55 years	32 (58)	31 (41)	
More than 55 years	22 (40)	41 (55)	
Gender			
Male	31 (56)	56 (75)	0.028*
Female	24 (44)	19 (25)	
Marital status			
Married	54 (98)	68 (91)	0.2
Unmarried	1 (1.8)	6 (8.0)	
Widowed	0 (0)	1 (1.3)	
Family history (CAD)			
Present	3 (5.5)	0 (0)	0.073
Absent	52 (95)	75 (100)	
Family Income/month			
10001 - 20000	0 (0)	4 (5.3)	0.089
20001 - 30000	13 (24)	25 (33)	
More than 30000	42 (76)	46 (61)	
Educational status			
Illiterate	12 (22)	7 (9.3)	0.11
Primary	19 (35)	21 (28)	
Secondary	19 (35)	37 (49)	
Graduate & above	5 (9.1)	10 (13)	
Occupational status			
Unemployed / Homemaker	23 (42)	6 (8.0)	<0.001*
Private employee	6 (11)	32 (43)	
Govt. employee	5 (9.1)	10 (13)	
Self-employed	15 (27)	16 (21)	
Others	6 (11)	11 (15)	
Level of physical activity			
Low = <600	20 (36)	5 (6.7)	<0.001*
Moderate = 600 - 3000	35 (64)	67 (89)	
High = > 3000 minutes/ week	0 (0)	3 (4.0)	
Current habit of smoking			
Present	20 (36)	32 (43)	0.5
Absent	35 (64)	43 (57)	
Habit of Drinking Alcohol			
Present	14 (25)	21 (28)	0.7
Absent	41 (75)	54 (72)	
Dietary Habit			
Vegetarian	18 (33)	25 (33)	>0.9
Non-vegetarian	37 (67)	50 (67)	
Diagnosis			
CAD	41 (75)	62 (83)	0.3
MI	14 (25)	13 (17)	
Duration of treatment			
1 - 6 months	0 (0)	4 (5.3)	0.074
6 months - 1 Year	23 (42)	20 (27)	
More than 1 Year	32 (58)	51 (68)	
Past Medication history			
Present	53 (96)	73 (97)	>0.9
Absent	2 (3.6)	2 (2.7)	
Surgical history			
Present	18 (33)	13 (17)	0.042*
Absent	37 (67)	62 (83)	

[1]n (%); [2]Chi-squared test; Fisher's exact test; * = statistically significant

Table 5: Association of socio-demographic variables and medical adherence with Qol and overall satisfaction

Characteristics	QOL Domain				Overall QoL[1]	Overall satisfaction with health score[1]
	Physical domain[1]	Psychological domain[1]	Social Domain[1]	Environmental domain[1]		
Age (years)	0.091	0.3	0.9	0.13	0.7	0.2
Gender	0.7	>0.9	0.5	0.9	0.3	0.6
Marital status	0.080	0.2	0.3	0.5	0.002*	0.2
Family history (CAD)	0.4	0.2	0.6	0.5	>0.9	>0.9
Family Income/month	0.2	0.2	0.7	0.3	0.056	0.2
Educational status	0.013*	0.2	0.035*	0.009*	0.15	0.6
Occupational status	0.089	0.3	0.074	0.3	0.2	0.4
Level of physical activity	0.004*	<0.001*	0.9	0.4	0.094	0.6
Current Smoking habits	0.003*	0.3	0.012*	>0.9	0.5	0.075
Habit of Drinking Alcohol	0.094	0.3	0.027*	0.3	0.4	0.084
Dietary Habit	0.003	0.019*	>0.9	0.5	0.7	0.8
Clinical variables						
Diagnosis	0.4	0.9	>0.9	0.9	0.012*	0.4
Duration of treatment	0.3	0.056	0.7	<0.001*	0.2	0.020*
Medication history	0.13	0.3	>0.9	0.3	>0.9	0.018*
Surgical history	0.6	0.2	0.8	0.9	0.2	0.3
Medical adherence[2]	<0.001	<0.001	0.811	<0.001	<0.001	<0.001

[1]Kruskal Wallis test (>2 groups), Mann Whitney test (2 groups); [2] Spearman rank correlation; * = statistically significant

Our results largely depended on self-reports and recall, which can be unreliable for many patients. Although patients were willing to share their feelings, many responses could have been exaggerated or under-reported.

CONCLUSION

It has been concluded that medication adherence was statistically associated with better quality of life. Caregivers should identify patients with poor medication adherence and monitor their medication use. Additionally, the implementation of motivational education programs can also be implemented to promote medication adherence.

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