

# Belief about Medicines in Patients with Cardiovascular Disease: A Psychometric Analysis

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## ABSTRACT

In chronic disease, the medication is often first choice in the treatment of disease. Professor Robert Horne and his colleagues developed Belief about Medicine Questionnaire (BMQ) as a method for assessing cognitive representations of medication, which was validated for use in patients suffering from common chronic disease. The BMQ consists of an 18-item questionnaire which assess medication belief into two categories namely General and Specific condition. This Prospective observation study was done to assess the level of Belief about Medicine in cardiac disease patients. Results revealed the mean BMQ Specific Necessity score was 17.61. The statement that generated the highest percentage of agreement was “My medicine prevents my condition from worse” (46.8%). The mean BMQ General Harm was 11.18. The statements “People who take medicine should stop their treatment for a while every now and then” had highest percentage of strongly disagreement 26.3%. In our study, majority of the patient believed in the necessity of their medicine, more than one fourth of the patient had strong concern about their medicines. As concern increases, belief on overuse and harm of medicine also found to be increased in the patients. Adherence and outcome of therapy may be influenced by these factors, so this should be addressed by proper counselling to patients about medicine.

**Keywords:** Belief about Medicine Questionnaire (BMQ), Cardiovascular Disease, Psychometric Analysis.

## INTRODUCTION

Heart disease is the leading cause of death in many countries. [1] In India, about 54.5 million people were affected by this disease in 2016 compared to 25.7 million in 1990, which shows the number of people affected by cardiac disease has doubled. [2]

In chronic disease, the medication is often first choice in the treatment of disease. Questionnaires have been developed to identify individual belief about medicine. [3] The most widely used BMQ (Belief about Medication Questionnaire) is based on necessity-concern framework, where patients with a high necessity and low concern score are more likely to be

adherent. [4-7] Other studies have demonstrated that a high concern and low necessity score is likely to result in low adherence. [8-13] The necessity-concern framework help to identify patients at potential risk of non-adherence but does not elucidate patients individual belief that fall outside this framework and that may also impact on adherence. [3]

Professor Robert Horne and his colleagues developed Belief about Medicine Questionnaire (BMQ) as a method for assessing cognitive representations of medication, which was validated for use in patients suffering from common chronic disease. [14]

The aims of BMQ studies is to provide better understanding of theoretical reasons behind development of such beliefs are based on individuals education and knowledge, and on influence of health care providers, thereby giving rise to mutual relationship between individuals belief and the environment to which they are exposed. [15]

## MATERIALS AND METHODS

This Prospective observation study was done to assess the level of Belief about Medicine in cardiac disease patients. Ethical approval was obtained from the institutional ethics committee of frontier lifeline Chennai. In this study, patients with Cardiac disease who visited the hospital in Out-patient department were selected. Inclusion criteria- Patients taking medications for Cardiac disease, age group of 40-80years. Exclusion criteria- Mentally unstable patients, those who were not willing to participate. The researcher invited the patients to participate in the study. The researcher explained about the study on Belief about Medicine Questionnaire, and requested them whether they can spend few minutes for answering the questionnaire. Consent was obtained from the participants. BMQ is self-administered questionnaire. He/she also explained that there is no correct or incorrect answer; it is completely based on your belief about medication. The researcher was present throughout the period. Finally questionnaire were collected and checked for any missing answers. In order to reduce the risk of bias, participants were informed that the questionnaire would be kept confidential so that it doesn't affect their quality care provided.

**Statistics:** Analyses were performed using SPSS V.23.0. Cronbach's  $\alpha$  was calculated for the internal consistency of the BMQ and a value  $\geq 0.70$  was considered as satisfactory. Descriptive statistics was used to determine the mean, standard deviation and range of the BMQ subscale scores. Bivariate regression analysis was used to study the association between the BMQ

subscales necessity, concern, overuse and harm.  $R^2$ , 95% confidence interval were calculated and  $<0.05$  was considered statistically significant for all analyses.

## STUDY TOOL

The BMQ consists of an 18-item questionnaire which assess medication belief into two categories namely General and Specific condition. The BMQ-General consists of 8 items which are subdivided into two sub scales, namely General-Harm and General-Overuse. In which General-Harm sub-scale, assesses beliefs that medicines are harmful and the other addresses the concept of over-prescription of medication by doctors who placed too much trust in them. Scores are made by 5 point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The BMQ-Specific consists of 10 items which are subdivided into two sub scales, namely Specific-Concerns and Specific-Necessity. Specific-Concern assesses the patient belief about the adverse reaction as a consequence of the prescribed medication. Whereas Specific-Necessity scales assess the patients' belief about their personal need to adhere to the prescribed medication.

High score in General-Harm and General-Overuse scales indicates the overall negative perception of medication. Likewise, high score in the Specific-Concern scale represent the believe that adverse reaction are harmful while taking medication on a regular basis. High score in the Specific-Necessity scale represent patient's need to adhere to medication. A similar approach has been used in Maltese language. [14]

## RESULT

The distribution of age and gender is shown in Table 1. The mean age was  $58.7 \pm 9.09$  years. 60% of the subjects were male and 40% of the subjects were female. The chronic illness/ disease conditions in the study subjects are summarized in Table 2.

Age (years)	Male n (%)	Female n (%)	Total n (%)
41-50	20(24.39)	30(24.39)	50(2.39)
51-60	28(31.71)	39(34.15)	67(32.68)
61-70	26(35.71)	44(31.71)	70(34.15)
71-80	8(8.13)	10(9.76)	18(8.78)
Total	123(60)	82(40)	205(100)
Mean±SD	59.21±9.12	58.02±9.05	58.7±9.09

**TABLE 1: Age and gender distribution(n=205)**

Disease state / illnesses	Number of subjects
Systemic Hypertension	201
Diabetes Mellitus	105
Dyslipidemia	40
Coronary Artery Disease	81
Chronic Obstructive Pulmonary Disease	2
Single Vessel Disease	14
Congestive Heart Failure	8
Hypothyroidism	22
Angina	13
Chronic Kidney Disease	4
Acute Pulmonary Edema	2
Anemia	2
Rheumatic Heart Disease	6
Congestive Heart Failure	2
Congenital Heart Disease	18

**[ Table 2 ]: Disease state / illnesses**  
 19 Subjects had single disease  
 186 Subjects had double or multiple disease

condition from worse” (46.8%) (Table4). More than half of the subjects agreed to the statement regarding the Necessity of their medication. The statement “Without medicine I would be very ill” showed highest percentage of disagreement (20.4%). The mean BMQ Specific Concern score was 13.49. The subjects disagreed medication concern “My medicines are mystery to me” (50.7%), “My medicine disrupts my life” (46.3%), “Having to take medicine worries me” (37.5%). The subjects strongly disagreed to the statement “My medicines are mystery to me “(22.4%) and “My medicines disrupts my life” (22.4%). 10.7% of the subject’s undecided the question “I sometimes worry about long-term effects of medicines”. The statement which showed the highest percentage of agreement was “I sometimes worry about becoming too dependent on my medicines.

The mean BMQ Specific Necessity score was 17.61(Table 3). The statement that generated the highest percentage of agreement was “My medicine prevents my

Subscale	Mean (SD)	Range
Specific-necessity	17.61(5.1)	5-25
Specific-concern	13.49(5.1)	5-25
Specific-overuse	12.39(3.6)	5-20
Specific-harm	11.18(3.8)	5-20

**[Table]3:Mean scores ±SD , range on BMQ**

PARAMETERS/ FACTORS	STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE
n (%)					
<b>HARM</b>					
1. People who take medicine should stop their treatment for a while every now and again	54(26.3)	57(27.8)	10(4.8)	52(25.3)	32(15.6)
2. Most of the medicine are addictive	38(18.5)	84(40.9)	24(11.7)	19(9.2)	40(19.5)
3. Medicines do more harm than good	42(20.4)	59(28.7)	34(16.5)	28(13.6)	42(20.4)
4. All medicines are toxic	28(13.7)	58(28.5)	45(22.1)	44(21.6)	28(13.7)
<b>OVERUSE</b>					
1. Doctors prescribe too many medicines	45(21.9)	85(41.4)	25(12.2)	34(16.5)	16(7.8)
2. Doctors place too much trust on medicines	14(6.83)	19(9.2)	35(17)	70(34.1)	67(32.6)
3. If doctors spent more time with patients, they would prescribe fewer medicines	43(20.9)	38(18.5)	40(19.5)	38(18.5)	46(22.4)
4. Natural remedies are safer than medicines	34(16.7)	24(11.8)	59(29)	36(17.7)	50(24.6)
<b>NECESSITY</b>					
1. Currently, my health depends on my medicines	13(6.3)	26(12.6)	27(13.1)	81(39.5)	58(28.2)
2. My life would be impossible without my medicine	12(5.8)	38(18.5)	28(13.6)	86(41.9)	41(20)
3. Without medicine I would be very ill	12(5.8)	42(20.4)	25(12.2)	75(36.5)	51(24.8)
4. My health in the future will depend on my medicines	26(12.6)	37(18)	36(17.5)	65(31.7)	41(20)
5. My medicine prevents my condition from worse	20(9.7)	27(13.1)	12(5.8)	96(46.8)	50(24.3)
<b>CONCERN</b>					
1. Having to take medicine worries me	40(19.5)	77(37.5)	8(3.9)	40(19.5)	40(19.5)
2. I sometimes worry about long-term effects of medicines.	39(19)	60(29.2)	22(10.7)	40(19.5)	44(21.4)
3. My medicines are mystery to me	46(22.4)	104(50.7)	20(9.7)	17(8.2)	18(8.7)
4. My medicines disrupts my life	46(22.4)	95(46.3)	14(6.8)	24(11.7)	26(12.6)
5. I sometimes worry about becoming too dependent on my medicines.	40(19.5)	66(32.2)	6(2.9)	55(26.8)	38(18.5)

**[Table 4]: Participants response on belief about medicines questionnaire**

The mean BMQ General Harm was 11.18. The statement “People who take medicine should stop their treatment for a while every now and then” had highest

percentage of strongly disagreement 26.3%. The highest percentage of disagreement by the subjects regarding General Harm “Most of the medicines are addictive” (40.9%). The statement that had highest percentage of undecided was “Natural remedies are safer than medicines” (29%). The statement that generated the highest percentage of agreement was “People who take medicine should stop their treatment for a while every now and again” (25.3%). The statement that showed highest percentage of strongly agrees was “Natural remedies are safer than medicines” (24.6%). The mean BMQ General Overuse was 12.39. 21.9% and

41.4% of the subjects strongly disagreed to the statement regarding the general overuse “Doctors prescribe too many medicines”. The statement that had highest percentage of undecided was “If doctors spent more time with patients, they would prescribe fewer medicines” was 19.5%. 34.1% and 32.6% are the highest percentage of agree and strongly agree on the statement was “Doctors place too much trust on medicines”. Bivariate regression analyses with the subscales in the BMQ showed that, there was a significant correlation between the BMQ subscale items concern, overuse and harm. (Table 5)

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	BIVARIATE (P VALUE)(95% CI)
NECESSITY	COCCERN	R <sup>2</sup> =0.02 (0.03) (0.007 to 0.27)
CONCERN	OVERUSE	R <sup>2</sup> =0.14 (<0.0001) (0.25 to 0.48)
	HARM	R <sup>2</sup> =0.27 (<0.0001) (0.41 to 0.61)

[TABLE]5: Associations between subscales of belief about medication questionnaire

## DISCUSSION

During the study period, a total of 205 patients agreed to participate in the study. To our knowledge, this is the first study conducted in Chennai documenting this issue among outpatients with Heart Disease.

It is noted that 42% of the patients had strong beliefs in the necessity of their medicines, which is in line with the findings of Kirsten K Viktil et al that four-fifth of the patients felt their medicines were necessary, [16] and Horne et al were 89% scored for strong need for medication, [17] as well as with Maguire’s results, where 93% scored for need for medication. [18]

About 16% of the patient had strong concern about using their medication, which is in line with the findings of Kirsten K Viktil et al that one-third of the patients were concern about their medication, [16] this study was in agreement with other findings for example, Horne reported that 36% of the patients included from outpatient clinics had strong concerns. [17] Moreover in the study of Maguire et al in hypertensive patients from primary care, 35% were very concerned about the potential adverse effects of drugs. [18] The score for general

subscale overuse and harm were 20% and 16% respectively.

Scores of Specific Necessity and Specific Concern were compared and we found a positive correlation, the higher the necessity score, the higher the concern score. Likely, concern score was associated with General Overuse and General Harm, in which patients with high score of concern had belief that medicines are overused and harmful.

## CONCLUSION

BMQ has been a valuable psychometric tool for measuring Belief about medicines of patients. In our study, majority of the patient believed in the necessity of their medicine, more than one fourth of the patient had strong concern about their medicines. As concern increases, belief on overuse and harm of medicine also found to be increased in the patients. Adherence and outcome of therapy may be influenced by these factors, so this should be addressed by proper counselling to patients about medicine.

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