SHORT REPORT

Beliefs about medicines among Norwegian outpatients with chronic cardiovascular disease

Kirsten K Viktil,[1,2] Hilde Frøyland,[1] Maria Rogvin,[3] Tron Anders Moger[3,4]

[1]Diakonhjemmet Hospital Pharmacy, Oslo, Norway
[2]School of Pharmacy, University of Oslo, Oslo, Norway
[3]Department of Health Management and Health Economics, Institute of Health and Society, University of Oslo, Oslo, Norway
[4]Department of Biostatistics, Institute of Basic Medical Sciences, University of Oslo, Oslo, Norway

Correspondence to
Dr K K Viktil, Diakonhjemmet Hospital Pharmacy, PO Box 23, Vinderen, Oslo NO-0319, Norway; kirsten.viktil@diakonsyk.no

ABSTRACT

Objective To investigate the beliefs of Norwegian outpatients about medicines, and to explore if some patient-specific factors and drug use are associated with the beliefs.

Methods Patients from an outpatient clinic for chronic cardiovascular diseases were referred by physicians to a pharmacist-led medication outpatient clinic. Here the patients were asked to complete the Beliefs about Medicines Questionnaire.

Results 150 patients were included (mean age 70.0 years (range 31–91), 50 (33.3%) women), using a total of 1061 drugs. 91.2% strongly believed in the necessity of their medicines and 29.7% had strong concerns. Multivariate regression analyses showed that with an increasing number of drugs, the score for necessity was significantly increased (p<0.01). Women were significantly more concerned than men (p=0.03). The older the patient, the higher the score for general harm of medicines (p=0.01).

Conclusions Although the majority of the patients in this study believed in the necessity of their medication, one-third had strong concerns.

INTRODUCTION

The adherence rate for chronic medications may be as low as 50%.[1] This is of concern as low adherence may negatively affect morbidity and mortality.[2] To increase adherence, patient information leaflets have been included in the medication box. However, a study showed that after reading information leaflets on their own, patients became concerned and stopped taking their medication.[3] This illustrates that patients act according to their own thinking and beliefs. To obtain a better understanding of patients' beliefs, questionnaires have been developed—for example, the Beliefs about Medicines Questionnaire (BMQ).[4] It is important to elucidate the patients' beliefs as this influences adherence and the outcome of treatment.[5–8] Furthermore, as healthcare systems and cultures differ between various countries, patients' beliefs about medicines may also vary. There are few studies of beliefs about medicines among outpatients in Norway, and thus we aimed to investigate cardiovascular outpatients' beliefs about medicines, and explore if patient specific factors and drug use were associated with their beliefs.

METHODS

The Norwegian Regional Committee for Medical Research and the Norwegian Social Science Data Services approved the study. Patients from an outpatient clinic of internal medicine for cardiovascular diseases at Diakonhjemmet Hospital, Oslo, were consecutively referred by physicians to a pharmacist led medication outpatient clinic at the hospital pharmacy. Eligible patients were ≥18 years who regularly used at least two medications and handled their medications at home on their own. Patients gave written informed consent. At the pharmacist medication clinic, the patients were asked to complete the BMQ. Patient specific factors as age, gender, and drugs used regularly and as needed were recorded. The drugs were classified according to the anatomical therapeutic chemical (ATC) classification system.[9]

Beliefs about Medicines Questionnaire

The BMQ consists of various statements with regard to specific beliefs about necessity and concern for personal medicines as well as statements with regard to general beliefs about overuse and harm of medicines.[4] The BMQ is translated and validated to the Norwegian population and used in a study of patients with severe mental disorders.[10] The questionnaire contains six statements for the subscale concern, five for the subscale necessity, four for overuse and four for harm. Patients indicate their degree of agreement with these statements on a 5 point Likert scale: 5=strongly agree and 1=strongly disagree. The higher the score, the stronger the beliefs: for example, a high score corresponds to a high degree of concern and strong need for the medication.[4] The necessity–concern differential was calculated. Scores were dichotomised to assess the strengths of the beliefs. Strong believes were assessed as scores greater than the midpoint of the scale. However, in most of the analyses, the score was measured as a continuous scale to gain as much information as possible according to Horne.[5]

Statistics

A database was established and analysed by SPSS V.19.0 for Windows. Group differences for categorical outcomes were analysed using χ^2 tests, and Mann–Whitney tests were used for continuous variables. Cronbach's α was calculated for the internal consistency of the BMQ and a value ≥0.70 was considered satisfactory. To study the association between the BMQ subscales necessity, concern, overuse and harm, in addition to their relationship to number of drugs and the demographic variables gender and age, multivariate regression analyses were used. As the BMQ subscales consist of several statements, each with scores 1–5, they were treated as continuous variables by using the subscale mean

score per patient in all analyses. For patients with missing single answers within each subscale, we used the mean score calculated from the statements answered by the patient for that item.

RESULTS

A total of 150 patients (50 (33.3%) women) were included in the study, with a mean age of 70.0 years (range 31–91, SD 11.1). A total of 1061 drugs (mean 7.1, range 1–16, SD 7.1) were recorded, of which 122 were used as needed. Women used significantly more drugs than men (mean 8.1 drugs and 6.6 drugs, respectively, p=0.01, 95% CI (0.42 to 2.60) for the difference in drugs between the gender). Drug groups most often used were: ATC C (cardiovascular system), recorded 471 times; ATC B01A (antithrombotics), 159 times; ATC A (alimentary tract), 117 times of which 29 were drugs for diabetes; ATC R03 (obstructive airway diseases), 58 times; ATC N02 (analgesics), 50 times; ATC N05C (hypnotics), 32 times; N06A (antidepressants), 14 times; and N05B (anxiolytics), 13 times.

Two patients did not complete any of the statements for necessity and concern, and could not be used in analyses concerning these items. Three patients did not complete the subscales for overuse and harm. The numbers of patients with one or two missing single answers within each BMQ subscales were 20 for necessity, 14 for concern, eight for overuse and seven for harm. A total of 135 (91.2%) of the 148 patients who answered the statements for necessity and concern strongly believed in the necessity of their medicines, and 29.7% of patients had strong concerns about using their medicines. Furthermore, 22.5% had strong beliefs that medicines in general were overused and 17.7% had strong beliefs that medicines harm. Necessity scores were higher than concern scores for 94.6% of patients. For the total BMQ, Cronbach's α was 0.82.

Multivariate regression analyses with the subscales in the BMQ (mean score for necessity, concern, overuse and harm) as dependent variables showed that with an increasing number of regularly used drugs the score for necessity was significantly increased (p<0.01) (table 1). Furthermore, women were significantly more concerned than men (p=0.03). Men scored significantly higher than women with regard to the general view that medicines were overused (p=0.04), and the older the patient, the higher the score for general harm from medicines (p=0.01). There were no differences between men and women with regard to the score for necessity. Finally, there were significant correlations between the mean scores of the BMQ subscale items concern, overuse and harm, which were found by including them as independent variables in the analysis (table 1).

DISCUSSION

It is noteworthy that as many as one-third of patients with a chronic disease from an outpatient clinic at a department of internal medicine (secondary care in Norway) had strong concerns about using their medications, as they were taken care of by specialists and trained nurses. To our knowledge, this is the first study in Norway documenting this issue among outpatients with chronic cardiovascular disease. Cronbach's α value was in line with a previous study among patients with mental disorders in Norway.[10] Other studies in this field have been performed in different groups of patients and hence different medications, and direct comparison between studies is therefore difficult. However, our value is in agreement with others findings—for example, Horne reported that 36% of patients with chronic illness included from outpatient clinics had strong concerns[5] and Granas found that 31% of patients included from primary care in the UK were worried.[11] Furthermore, in the study of Maguire et al in hypertensive patients from primary care, 35% were very concerned about the potential adverse effects of their drugs.[12] Also, in a study among patients with rheumatoid arthritis, the score for concern was even higher (47.4%).[13] Studies have shown that the reason for patients not taking their medications as prescribed is more related to their concern about the medications than failings in the patients, physicians or systems.[14] This is important to remember when searching for systems to optimise drug use.

Our finding that women were more concerned than men is in line with a population based study where women were more often negative to medicines than men.[15] However, another study did not find any association between gender and concern or necessity among hypertensive patients in secondary care.[7] Furthermore, this study showed that younger hypertensive patients had more concerns than older ones, but older patients

Table 1 Associations between patients' beliefs about medicines as dependent variables and patient characteristics

Dependent variable	Independent variable	Bivariate (p value) (95% CI)	Multivariate (p value) (95% CI)
Necessity item mean score			R^2=0.09 (<0.01)
	Total No. of drugs	0.06 (<0.01) (0.02 to 0.09)	–
	Regularly used drugs	0.07 (<0.01) (0.03 to 0.11)	0.07 (<0.01) (0.03 to 0.11)
	Concern	0.14 (0.04) (0.01 to 0.27)	–
Concern item mean score			R^2=0.38 (<0.01)
	Gender	−0.39 (<0.01) (−0.67 to −0.10)	−0.27 (0.03) (−0.51 to −0.03)
	Necessity	0.22 (0.04) (−0.01 to 0.42)	0.26 (<0.01) (0.10 to 0.42)
	Overuse	0.71 (<0.01) (0.52 to 0.90)	0.55 (<0.01) (0.33 to 0.77)
	Harm	0.57 (<0.01) (0.40 to 0.74)	0.26 (0.01) (0.07 to 0.46)
Overuse item mean score			R^2=0.40 (<0.01)
	Gender	−0.05 (0.64) (−0.27 to 0.16)	0.18 (0.04) (0.01 to 0.35)
	Concern	0.39 (<0.01) (0.28 to 0.49)	0.25 (<0.01) (0.15 to 0.36)
	Harm	0.51 (<0.01) (0.39 to 0.63)	0.39 (<0.01) (0.26 to 0.52)
Harm item mean score			R^2=0.39 (<0.01)
	Age	0.01 (0.03) (0.00 to 0.02)	0.01 (0.01) (0.005 to 0.03)
	Gender	−0.34 (0.06) (−0.58 to −0.10)	−0.20 (0.04) (−0.40 to −0.01)
	Concern	0.40 (<0.01) (0.28 to 0.52)	0.17 (0.01) (0.05 to 0.30)
	Overuse	0.66 (<0.01) (0.50 to 0.81)	0.53 (<0.01) (0.36 to 0.70)

R^2 (p value) given for multivariate models (n=150 patients*).
*A few patients left some of the rows empty (see statistics under the methods section). Both the dependent and independent variables are mean scores. Only those variables exhibiting a significant relationship in either bivariate or multivariate analyses are shown (see statistics under the methods section for which variables that were included in the analyses).

scored higher for the necessity of their medicines, which is in contrast with our findings of no association between the scores for either necessity or concern and age.

More than four-fifth of patients had strong beliefs in the necessity of their medicines, which is in line with the findings of Horne *et al* that 89% of patients felt their medicines were necessary,[5] as well as with Maguire's results, where 93% scored for strong need for medication.[12] Our findings also correspond to Modig's study where 93% of the patients considered that the benefits outweighed the costs or concern.[16] The abovementioned high scores for necessity are higher than the findings of 74.3% among a patient population with rheumatoid arthritis.[13] The study design and different patient populations may have influenced the different findings: in Neame's study, patients completed the questionnaire at home whereas in our study patients answered the BMQ at the pharmacist led medication outpatient clinic (sitting alone) on the same day as they had seen their physician at the internal clinic. As beliefs are dynamic, this could partly explain the different results.[17]

Scores for the general subscales overuse and harm were associated with the specific subscale concern but not with necessity —that is, patients with a high score for concern had, in general, a view that medicines are overused and harmful for the population as such, not just for themselves. Interestingly, we found that the higher the score for necessity, the higher the score for concern. It might have been expected that the concern would have been less as it could be anticipated that patients consider the cost benefit when using medicines—that is, the cost, which might be viewed as as concern, would be outweighed if the benefit or the necessity of the medications was assessed as high. However, the number of regularly used drugs was associated with the subscale necessity but not with concern. More research is needed to explore other factors (eg, disease burden) that could affect the degree of concern.

The study has some limitations. Patients were included from only one department of internal medicine and the main diagnosis was cardiovascular disease. Hence the results cannot be generalised to other patient groups with other diseases. Also, some patients did not answer all items in the BMQ, and even though this was taken into account when analysing the data, this may have influenced the results. It could be problematic to treat the BMQ scores as continuous variables; however, as we used the mean of sum scores, continuous analyses were chosen to gain as much information as possible. A similar approach has been used by others.[5] [10] A strength is that patients were sitting in a quiet room alone and completed the BMQ themselves without worry about a time limit, compared with having an interview with health personnel, a situation that could influence the answers.

CONCLUSIONS

Although the majority of patients in this study believed in the necessity of their medicines, one-third had strong concerns about their medicines. As this may influence adherence and the outcome of therapy, this should be addressed when counselling about medicines.

REFERENCES

1. Haynes RB, McDonald HP, Garg AX. Helping patients follow prescribed treatment: clinical applications. *JAMA* 2002;288:2880–3.
2. Simpson SH, Eurich DT, Majumdar SR, et al. A meta-analysis of the association between adherence to drug therapy and mortality. *BMJ* 2006;333:15–19.
3. Horwitz A, Reuther L, Andersen SE. [Patient information leaflets seen through the eyes of patients in a general practice]. *Ugeskr Laeger* 2009;171:599–602.
4. Horne R, Weinman J, Hankins M. The beliefs about medicines questionnaire: the development and evaluation of a new method for assessing the cognitive representation of medication. *Psychol Health* 1999;14:1–24.
5. Horne R, Weinman J. Patients' beliefs about prescribed medicines and their role in adherence to treatment in chronic physical illness. *J Psychosom Res* 1999;47:555–67.
6. Gatti ME, Jacobson KL, Gazmararian JA, et al. Relationships between beliefs about medications and adherence. *Am J Health Syst Pharm* 2009;66:657–64.
7. Ross S, Walker A, MacLeod MJ. Patient compliance in hypertension: role of illness perceptions and treatment beliefs. *J Hum Hypertens* 2004;18:607–13.
8. Peterson GM, Fitzmaurice KD, Naunton M, et al. Impact of pharmacist-conducted home visits on the outcomes of lipid-lowering drug therapy. *J Clin Pharm Ther* 2004;29:23–30.
9. WHO Collaborating Centre for Drug Statistics Methodology. ATC classification index with DDDs. Oslo: WHO Collaborating Centre, 2010. http://www.whocc.no/atc_ddd_index/ (accessed 25 Jan 2012).
10. Jonsdottir H, Friis S, Horne R, et al. Beliefs about medications: measurement and relationship to adherence in patients with severe mental disorders. *Acta Psychiatr Scand* 2009;119:78–84.
11. Granas AG, Bates I. Patients' understanding and management of their illnesses and prescribed medicines—a descriptive study. *Pharm World Sci* 2005;27:321–8.
12. Maguire LK, Hughes CM, McElnay JC. Exploring the impact of depressive symptoms and medication beliefs on medication adherence in hypertension—a primary care study. *Patient Educ Couns* 2008;73:371–6.
13. Neame R,, Hammond A. Beliefs about medications: a questionnaire survey of people with rheumatoid arthritis. *Rheumatology* 2005;44:762–7.
14. Pound P, Britten N, Morgan M, et al. Resisting medicines: a synthesis of qualitative studies of medicine taking. *Soc Sci Med* 2005;61:133–55.
15. Isacson D, Bingefors K. Attitudes towards drugs—a survey in the general population. *Pharm World Sci* 2002;24:104–10.
16. Modig S, Kristensson J, Ekwall AK, et al. Frail elderly patients in primary care—their medication knowledge and beliefs about prescribed medicines. *Eur J Clin Pharmacol* 2009;65:151–5.
17. Goodacre LJ, Goodacre JA. Factors influencing the beliefs of patients with rheumatoid arthritis regarding disease-modifying medication. *Rheumatology (Oxford)* 2004;43:583–6.