Do treatment preferences for patients with angina change? An 18-month follow-up study

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Abstract

Objectives To assess whether preferences for patients with angina changed at 18-month follow-up using the Patient Preferences Questionnaire for Angina treatment (PPQA).

Background Evidence suggests that patients want information about treatment options. Reliable measurement of patient preferences for treatment is important for empowering patients.

Design Postal self-administered questionnaire survey at baseline and follow-up. The preference questionnaire comprised 18 items about the main treatments for angina: medication, angioplasty and coronary artery bypass grafting (CABG).

Setting and participants Patients with diagnosed angina from seven participating general practices across England. The sample comprised 222 patients with angina who responded to both baseline and follow-up treatment preference questionnaires.

Results Most patients' condition and preferences scores for treatment remained stable over 18 months. An exception was angioplasty preference scores, which indicated more negative attitudes towards this procedure over time. People aged over 75 years least preferred angioplasty. There were no associations between any changes in condition and changes in preferences. However, within-subject agreement could vary by ± 5 to 7 points between baseline and follow-up, with stability apparently worst for the medication and best for surgery sub-scales, raising the question of what represents reasonable stability.

Conclusion These results suggest preferences are relatively stable, even where there are changes in health, and provide further evidence of the utility (in particular, reliability) of the PPQA. However, this stability in scores did mask some movement in scale scores and in patients' first-ranked treatment choices, showing changing preferences largely from angioplasty to CABG and vice versa, indicating the complexity of preferences.

Background

In Western health services, patients' views of their treatment, and informed choice of treatment, are important concepts.^{1,2} Evidence suggests that patients want better information about treatment options and to be involved in decisions about which option to take.² Being able to operationalize patient *preferences* for treatment, reliably and validly, particularly for common conditions where different treatments offer potential benefits, is important for empowered patients and potential enhancement of doctor–patient relationships. By 'preference', we mean the expression of a value for alternative options for action after informed deliberation of their risks and benefits.³ This is a largely operational definition; conceptually, the idea of a preference is not well developed in the literature. For example, it is recognized that preferences may be influenced by a variety of factors – including experience, role preference, disease context, treatment context, sociodemographics, personality, information and general attitudes – but the extent to which these affect preferences are yet to be established.³ Nevertheless, it seems reasonable to suggest that preferences – alike to other values and attitudes – will be relatively resistant to change (stable).

Ischaemic heart disease, severe enough to cause symptoms of angina, is one common condition for which there are various equally viable treatments (each with varying benefit-to-risk profiles). There is evidence of wide variations in the age and sex of patients undergoing specific treatments for angina, such as coronary artery bypass surgery (CABG) and percutaneous coronary intervention (angioplasty).⁴ Given that treatment recommendations tend to be made by clinicians rather than patients making active treatment choices, these variations *may* demonstrate inequities in access for women and older people.^{4,5} It has been reported, for example, that justifications for inequitable treatment of older people by clinicians include perceived lack of benefit, the belief that treatments for older people represent an inappropriate use of scarce resources and the perception that such patients

do not want more invasive treatments.⁵ By and large, however, it is unclear to what extent patients themselves have been responsible for their treatment choices and to what extent treatment options have been selected for them by clinicians, as research is limited. Information on preferences is needed to ascertain *whether* patients are receiving the treatment they prefer and to *enable* preferred choice if this is desirable (informing clinical decision making).

Cross-sectional findings reported by Bowling *et al.*⁶ for a newly developed Patients Preferences Questionnaire for Angina treatment (PPQA) showed good psychometric properties. However, it is important to confirm the *stability* of measured preferences over time (assuming that preferences are, like other values, relatively resistant to change), given that angina treatments are significant events that are not easy to reverse or revise once a decision is taken. Basing treatment choice on an instrument that results in variable and inconsistent choices over time would be problematic. Therefore, information on the stability of patients' treatment preferences is required to lend confidence to the utility and validity of preference measures like the PPQA (as reliability is a necessary, though not necessarily sufficient, condition for instrument validity). Existing research on preference stability (more generally) is largely limited to utility studies of *hypothetical* patients, or small convenience samples of actual patients.³ Using data from the same cohort of patients over time, this article reports the stability of patients' preferences for treatment for angina assessed using the PPQA over an 18-month follow-up.

Aims and methods

The aim of this research was to assess changes in treatment preferences for angina 18 months after they were first elicited, using the PPQA both at baseline and follow-up.

The PPQA – developed by this research team (with other colleagues) – comprises 18 attitude statements, each measured on a 5-point Likert scale (*Strongly agree* to *Strongly disagree*) – see

Box 1. The attitude items include statements about treatment for angina with medication (six items), CAGB (six) and angioplasty (six). The instrument was initially developed, reduced and tested using responses from patients in primary care and recently admitted to hospital with angina symptoms [for full details, see⁷⁻⁹]. In the development stage, patients were provided with balanced information about the different treatment options and their risks and benefits (based on British Heart Foundation Literature), and the reasons for their preferences were explored using a repertory grid method. The factor structure suggested three sub-scales, reflecting preferences for the three treatment options. The resulting PPQA was then rigorously tested for its psychometric properties (item redundancy, scaling, reliability, validity and factor structure) with a multisite sample of patients from primary care.⁶

Box 1 Patients' preferences for angina treatment questionnaire (PPQA)

Medication:

The side-effects of medication are worse than those from angioplasty
 Having to carry medication when outside the home would be troublesome
 With medication, the side-effects are often worse than the condition
 Organising regular prescriptions with any medication can be a nuisance
 The side-effects of medication are worse than those from surgery
 Most medication is very difficult to understand

Surgery:

Surgery would prolong my life
 Overall surgery is a good thing
 The balance of risks and benefits of surgery seem better than the risks and benefits of medication
 Surgery gets the treatment over with quickly
 I'd have surgery if I could avoid being a burden on others in the long term
 People who have surgery seem to do well

Angioplasty:

Overall, angioplasty is a good thing
 The balance of risks and benefits of angioplasty seem better than the risks and benefits of medication
 People who have angioplasty seem to do well
 Angioplasty is a last resort
 I'm too old to have angioplasty
 I'd put off having angioplasty

Patients were asked to read a patient information booklet that described the risks and benefits of angina treatments (types of medication, angioplasty and CABG surgery) before completing the questionnaire. The Coronary Revascularisation Outcome Questionnaire (CROQ)¹⁰ was used to measure the impact of angina on the patient's life. Other questions measured the strength of treatment preference, treatment acceptability, preferred mode of decision making,¹¹ treatment history and sociodemographic characteristics (occupational status and housing tenure). These items were essentially used partly to enable us to characterize our samples (to allow comparison between responders and non-responders to the follow-up survey to account for bias) and partly in an exploratory fashion to potentially account for preference differences and changes revealed in the PPQA (i.e. changes could be as a result of instrument unreliability or actual preference change). Not all of the collected data will be discussed here.

The sample

The Medical Research Council General Practice Research Framework (MRC GPRF) has a network of research general practices across Britain, representing about 1% of the British population. The target sample was adult patients with angina. Staff in participating practices searched practice registers for all patients (aged 18+) currently prescribed medication for angina (nitrate or glyceryl trinitrate spray/tablets/patch, etc.) plus one or more of a beta blocker, calcium channel blocker, aspirin or clopidogrel (excluding patients *only* taking the latter). Patients who had undergone previous angiography, CABG or PTCA, patients who were already 'flagged' as not wishing to be contacted about research or those whom doctors decided it would be inappropriate to approach were excluded. Patients were sent a personally addressed letter signed by their doctors inviting them to complete the questionnaire, a consent form, an information leaflet, a booklet about the study and a reply-paid envelope to return the questionnaire and the consent form to the research team.

MRC GPRF approached 97 general practices, of which 15 expressed interest, 24 declined and 58 failed to respond. Seven practices finally undertook patient identification, covering County Durham (one practice), Cleveland (one), Kent (two), Cornwall (one) and Devon (two). They provided a list of 708 patients, of whom 383 (54%) responded to the baseline postal survey. Responders were followed up at 18 months again by post (after checking with practices that there were no exclusions required on grounds of death or vulnerability). The research ethics committee (London MREC) allowed only one reminder to be sent for each survey. (It is well documented that 2–3 reminders produce the optimal response rates).¹²

Analyses included frequency distributions, means, *t*-tests, correlations and chi-square tests to examine the associations between PPQA scores and patients' attitudes and characteristics, and changes in these over time.

Results

Response

Of 708 questionnaires mailed at baseline, 384 (54%) were returned completed after the one reminder; 25 (4%) were also returned blank (14 gave no reason, two denied having angina, five declined to participate, three stated that the person had died and one stated that the person had Alzheimer's disease). Additionally, two patients telephoned saying that they did not have angina (refuting their doctors' diagnosis). The response rate to the follow-up postal survey was 58% (222), again with just one reminder. Thus, 162 respondents from the baseline survey 'dropped out' (42% attrition). Given the 18-month gap between surveys, this seems a fairly good response rate.

Characteristics and circumstances of responders

There were no differences in older or younger age groups in response between waves. Of those who responded, almost half were aged 75+ at baseline (48%/177) and at follow-up

(48%/104). At baseline, 41%/153 of responders were women; at follow-up, a slightly smaller proportion was women (36%/80). All but four (1%) of the baseline sample were white. Baseline characteristics and results were reported earlier.⁶ Additional analyses also showed that there were no differences in baseline preference or CROQ mean scores between responders and non-responders to follow-up.

A small number, 8% (18), of follow-up responders said that they had been admitted to hospital in the past 12 months. Only 2% (4) had undergone cardiac surgery in the past 12 months and 4% (2) had undergone angioplasty. All were taking medication for their condition. (Note: questions asked about experiences in the previous 12 months, although the follow-up questionnaire was presented approximately 18 months after the first because of logistic reasons.) The majority felt that their condition had not changed over the past 12 months. While 14% (31) said that their angina/chest pain had worsened compared with 12 months ago, 61% (134) said it was about the same and 25% (54) said it had improved.

When asked to rate the results of their angina treatment so far, 65% (140) said it was about what they expected, 34% (72) said it was better than expected and 1% (2) said it was worse. Over half, 56% (120), were satisfied with their angina treatment, while 34% (72) were fairly satisfied and 10% (21) said that they were neither satisfied nor dissatisfied. No one expressed dissatisfaction.

Treatment preferences

Consistent with baseline findings,⁶ the Cronbach's alphas for internal consistency reliability at follow-up for the preference sub-scales (each with six items) all exceeded threshold criteria for alpha and were Surgery 0.816; Medication 0.773; and Angioplasty 0.766. The Spearman's rank-order correlations between the preference sub-scales were Angioplasty and Medication ρ : -0.304^{**} ; Angioplasty and Surgery ρ : -0.289^{**} ; and Medication and Surgery ρ : -0.957^{**} . These results are consistent with the hypothesis that

preference for angiography, surgery or medication is inversely associated with preference for the other treatments.

Table 1 compares paired-sample respondents' scored preferences for treatment at baseline and follow-up (see Figure S1 for associated plots). The raw frequency distributions on each scale were remarkably similar. However, within-subject agreement could vary by ± 5 to 7 points between baseline and follow-up (according to Bland–Altman comparisons – see text associated with Table 1), with stability apparently worst for the medication and best for surgery sub-scales, raising the question of what represents reasonable stability.

Table S1a,b compare preferences scale item responses of responders to both the baseline and follow-up waves. The raw frequency distributions on each scale were remarkably similar. Additional analyses of the full sample also showed that there were no differences in baseline score distribution between responders and non-responders to follow-up.

There were no significant associations between preference scale scores for surgery or medication and age, sex or housing tenure (reflecting social status), nor between preference scale scores for angioplasty and sex or housing tenure. However, respondents with *least* preference for angioplasty at *follow-up* were most likely to be aged 75+ (i.e. 51% (47) – compared with 29% (29) of those aged <75 – scored lowest preferences of 18–23) ($\chi^2 = 9.821$, 3 d.f., $P < 0.020$). This is largely consistent with baseline findings that neither of the surgery and medication preference sub-scales was associated with age or sex, while older people – and women – had more positive attitudes to this mid-level invasive procedure.⁶ Table 2 shows *stability* in surgery and medication preference scores between baseline and follow-up, although angioplasty preferences scores significantly increased by a small amount, indicating more negative preferences for this procedure over time. As noted earlier, this might be owing to more elderly respondents becoming more negative about the procedure over time. It is unclear why this is the case and this might merit further

study. Table 2 also shows stability over time in respondents' CROQ scores.

There were significant inverse associations between the Medication preference sub-scale and each CROQ sub-scale (Spearman's rank-order correlations r -0.258 with Symptoms; -0.225 Physical functioning; -0.315 Psychosocial functioning; and -0.217 Cognitive functioning; all $P = 0.01$). These results indicate that the fewer cardiac-related limitations (higher scores on CROQ sub-scales) patients experienced, the greater their preferences for treatment with medication (lower preference scores). This relationship makes considerable intuitive sense. However, there were no significant associations with CROQ scores and the surgery or angioplasty preferences sub-scales. There were no significant associations with preference change scores for any treatment and changes in CROQ sub-scale scores or CROQ change scores.

Respondents were also asked to rank order their preferred treatments. Distributions at baseline and follow-up were similar. The largest proportion of paired-sample respondents at both baseline and follow-up ranked a combination of drugs to prevent symptoms and reduce risks as their first-preferred choice [baseline 34% (69), follow-up 37% (75)], followed by angioplasty [baseline 34% (69), follow-up 33% (67)], CABG surgery [baseline 20% (41), follow-up 19% (40)] and a combination of drugs for prevention only as last [baseline 2% (3), follow-up 4% (9)] [no first preference: baseline 11% (19) and follow-up 7% (15)].

However, paired comparisons can mask changes at the individual level. For example, Table 3 shows that all three of those who preferred a combination of drugs for prevention only as first choice at baseline still held this preference at follow-up, and 76% (53) of those who preferred a combination of drugs to prevent symptoms and reduce risks at baseline still preferred this at follow-up [most of the remainder switching their preference to angioplasty]. However, fewer (54% (37)) of those who preferred angioplasty at baseline still preferred this at follow-up (with 20% switching their preference to CABG and 20% to various medi-

Table 1 Treatment preferences sub-scale distributions – baseline and follow-up (same paired respondents)*

	Follow-up score								
Baseline score	6–8	9–11	12–14	15–17	18–20	21–23	24–26	27–29	Total
Angioplasty preference score									
6–8	2	1	0	1	1	0	0	0	5
9–11	1	6	5	5	2	0	0	0	19
12–14	1	6	21	13	9	0	0	0	50
15–17	1	1	12	23	12	2	0	0	51
18–20	0	0	0	13	20	8	0	0	41
21–23	0	0	0	0	9	8	0	0	17
24–26	0	0	0	0	0	0	0	0	0
27–29	0	0	0	0	0	0	0	0	0
Total	5	14	38	55	53	18	0	0	183
Surgery preference score									
6–8	6	4	2	0	0	0	0	0	12
9–11	3	4	12	4	0	0	0	0	23
12–14	2	7	17	20	6	0	0	0	52
15–17	0	2	13	33	8	2	0	0	58
18–20	0	0	4	15	20	2	0	0	41
21–23	0	0	0	0	2	1	0	0	3
24–26	0	0	0	0	0	0	0	0	0
27–29	0	0	0	0	0	0	0	0	0
Total	11	17	48	72	37	5	0	0	190
Medication preference score									
6–8	2	0	2	1	0	0	0	0	5
9–11	5	5	8	3	2	0	0	0	23
12–14	1	8	43	16	6	2	0	0	76
15–17	0	0	13	20	5	4	0	0	42
18–20	1	1	7	7	7	4	0	0	27
21–23	0	0	0	0	2	1	0	1	4
24–26	0	0	0	1	0	2	1	1	5
27–29	0	0	0	0	0	0	1	0	1
Total	9	14	73	48	22	13	2	2	183

*Bland–Altman plots: Average of baseline and follow-up scores vs. difference between baseline and follow-up scores. Limits of agreement = + and –1.96 SDs of distribution of differences around the mean difference:-

Bland–Altman comparison of Angioplasty preferences sub-scale baseline and follow-up

Limits of agreement: –6.461 to 5.216

Mean difference: –0.623 (CI –1.049 to –0.197)

Range: 7.000 to 22.500. Pitman's Test of difference in variance: $r = -0.004$, $n = 183$, $P = 0.952$

Bland–Altman comparison of Surgery preferences sub-scale baseline and follow-up:

Limits of agreement: –5.617 to 5.112

Mean difference: –0.253 (CI –0.636 to 0.131)

Range: 6.000 to 21.500

Pitman's Test of difference in variance: $r = 0.018$, $n = 190$, $P = 0.810$

Bland–Altman comparison of Medication preferences sub-scale baseline and follow-up:

Limits of agreement: –7.069 to 6.697

Mean difference: –0.186 (CI –0.688 to 0.316)

Range : 7.000 to 25.500

Pitman's Test of difference in variance: $r = -0.058$, $n = 183$, $P = 0.435$

cations); and 51% (22) of those who preferred CABG at baseline maintained this preference, but 35% (15) preferred angioplasty at follow-up, and 7% medication (χ^2 : 24.350, 6 d.f., $P =$

0.001). A small number said they had no first preference.

This ranking question helps to explain the more negative preference scale scores for

Table 2 Mean Preference scale and CROQ scores for same paired sample at baseline and follow-up

Mean scores and <i>t</i> -tests before and after scores	Mean SD	95% limits of agreement	Paired-sample difference in means SD (95% CI difference)	Paired-sample <i>t</i> -test (<i>P</i> =)
Preferences scales				
Angioplasty sub-scale n = 183				
Baseline	15.454 3.582			
Follow-up	16.077 3.594	-6.461 to 5.216	-0.623 2.919 (-1.049 to -0.197)	-2.887 (<i>P</i> = 0.004)
Medication sub-scale n = 183				
Baseline	14.661 3.608			
Follow-up	14.847 3.785	-7.069 to 6.697	-0.186 3.442 (-0.688-0.316)	-0.730 (<i>P</i> = 0.466)
CABG Surgery sub-scale n = 190				
Baseline	14.695 3.486			
Follow-up	14.947 3.442	-5.617 to 5.112	-0.253 2.682 (-0.637-0.131)	-1.298 (<i>P</i> = 0.196)
CROQ scales				
Symptoms n = 174				
Baseline	29.937 5.790			
Follow-up	30.144 6.015	-9.247 to 8.833	-0.207 4.520 (-0.883-0.469)	-0.604 (<i>P</i> = -0.547)
Psychosocial n = 194				
Baseline	58.850 11.501			
Follow-up	58.108 11.233	-12.768 to 14.253	0.742 6.755 (-0.214-1.698)	1.530 (<i>P</i> = 0.128)
Physical functioning n = 168				
Baseline	18.786 4.339			
Follow-up	18.863 4.467	-6.330 to 6.175	-0.077 3.126 (-0.554-0.399)	-0.321 (<i>P</i> = 0.749)
Cognitive functioning n = 215				
Baseline	15.126 3.491			
Follow-up	14.856 3.426	-4.286 to 4.825	0.270 2.278 (-0.364-0.576)	1.737 (<i>P</i> = 0.084)

Raw scale scores entered into analysis and hence degrees of freedom for each *t*-test reflected ceiling of scale scores.

angioplasty over time as it shows that the shift was towards CABG, followed by medication. However, the first-stated preferences also

showed a shift from CABG largely towards angioplasty.

Table 3 First-ranked treatment preferences: change table baseline and follow-up

First-ranked preference follow-up	First-ranked preference baseline				
	Combination of drugs for prevention only % (no)	Combination of drugs to prevent symptoms and reduce risks % (no)	CABG surgery % (no)	Angioplasty % (no)	No first preference % (no)
Combination of drugs for prevention only	–	4 (3)	–	6 (4)	10 (2)
Combination of drugs to prevent symptoms and reduce risks	100% (3)	76 (53)	7 (3)	16 (11)	25 (5)
CABG surgery	–	3 (2)	51 (22)	20 (14)	10 (2)
Angioplasty	–	13 (9)	35 (15)	54 (37)	25 (5)
No first preference	–	4 (3)	7 (3)	4 (3)	30 (6)
No. of respondents (205)	3	70	43	69	20

$\chi^2 = 24.350$, 16 d.f., $P = 0.001$; caution < 5 in several cells.

Conclusion

This study of treatment preferences of patients with angina in primary care provided valuable insights into how individuals perceive various treatments options. The overall frequency distributions and means of their treatment preferences (measured with the PPQA) at baseline were remarkably similar to their expressed preferences at 18-month follow-up, although there was some movement in individuals' scale scores, and the paired-sample mean differences were significantly different for angioplasty. Changes in this preference score decreased with older age (aged 75+), perhaps reflecting the ageing of the sample over time, and with worsening of disease (including the finding that six respondents had since undergone revascularization). Moreover, within-subject agreement could vary by ± 5 to 7 points between baseline and follow-up, with stability apparently worst for the medication and best for surgery sub-scales. This raises the question of what represents reasonable stability.

Preference scores changed little overall, which suggested that these were based on initially stable preferences (attitudes). However, simultaneously, there was some movement and significant shifts towards and away from both CABG and angioplasty as people's first stated preference, although caution in interpretation is needed because of small cell sizes. These results

do indicate the complexity of patients' preferences. Stability in positive and negative attitudes towards each procedure, as reflected in the scale scores, has to be viewed in the context of possibly changing realities of what people believe they might need to maintain health at some stage.

The limitations of the study, although multi-site, were its relatively small size and its non-random sample basis. The results are promising and require replication on a larger scale. In addition, qualitative research is needed to explore reasons underlying changes in preferences.

In conclusion, ideals about the promotion of patient involvement in decisions about their treatment^{1,2} cannot be realized until we possess suitable instruments for operationalizing concepts such as patient preferences. Health-care professionals and managers need to be aware of patients' treatment preferences to provide patient-focused care and, in theory, improve patients' satisfaction, adherence to treatment and potentially outcomes. Results from this study suggest we can now have more confidence in the quality of the PPQA instrument, although the question of what constitutes reasonable stability merits further investigation. Certainly it may be argued that the differences identified over PPQA applications were not great and although some were statistically significant, they would appear to be of little clinical relevance.

Competing interest

All authors declare that they have no competing interests.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Figure S1. Plot display for angioplasty, surgery and medication preferences baseline follow-up.

Table S1. (a) Preferences: same sample before and after preference scale distributions. (b) Treatment preferences sub-scale distributions baseline and follow-up (same paired respondents).

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