A comparison of service users' and service providers' preferences: An application of DCE to paediatric day case surgery

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Introduction

Increasingly child surgery is performed on a day case basis. Currently more than 50% of child surgery is performed on a day case basis. The Royal College of Surgeons of England defines a surgical day case as: “a patient who is admitted for investigation or operation on a planned non-resident basis and who nonetheless requires facilities for recovery” (1). The principal rationale behind the shift from inpatient to day case surgery was to decrease the costs associated with surgery, and to reduce waiting times (2-4). In addition to reducing costs, the proposed advantages of day case surgery include minimal disruption to family life and reduced psychological upset (5-7). It is considered that the incidence of hospital acquired infections also decrease with day case surgery (8).

Day case surgery may be used for operations that are minor or intermediate in complexity. There is currently no general agreement, as to the most appropriate choice of anaesthetic technique (9). Day case surgery involves rapid discharge from hospital, and the anaesthetic regimen must aim to minimise postoperative complications. Common side effects associated with anaesthesia include; agitation on waking; prolonged drowsiness and fatigue; nausea and vomiting; postoperative pain and postoperative behavioural disturbance.

Preoperative anxiety has been reported to occur in 40% to 60% of young children (10). Factors predictive of child’s preoperative anxiety have been reported as being age, previous surgical experience and parental anxiety in the surgical setting and the child’s temperament (10-14). It is important to avoid preoperative anxiety in children as it is associated with a number of psychological and physiological adverse outcomes (10). Specifically preoperative anxiety can result in prolonged induction and maladaptive behaviours. Additionally preoperative anxiety has been associated in adults with increased postoperative pain and prolonged recovery and hospital stay (15).

There is evidence that child day case surgery is acceptable to parents (16-18). Although parents have an increased responsibility for preparing their child for surgery, and for postoperative care when surgery is day case. Additionally in the 1980s it became common practice for parents to be present during induction of anaesthesia (PPIA). This intervention is valued by parents, however whether or not this intervention benefits all children is not clear (19;20). Parental anxiety at induction of anaesthesia has been linked to increased levels of preoperative anxiety in children (21).

Child surgery has been associated with parental anxiety (22). Factors linked with parental anxiety have been reported as being: feeling of insufficient preparation, speaking a foreign language and problems at home such as fever, vomiting, sleep disorders, or postoperative pain (23). Shirley et al reported that parents consider that PPIA and information reduce their levels of anxiety prior to surgery (24). In 2001 Tait et al reported that some parents would like to be involved in making some medical decisions when their children have an anaesthetic (25).

Less seems to be known about the preferences of anaesthetists for anaesthetic care of children having day case surgery. In the UK anaesthetists have been found to be supportive of PPIA (26;27). Additionally a panel of expert anaesthetists considered the which clinical anaesthetic outcomes were both common and important to avoid (28). The top five items were in order of importance: incisional pain, nausea, vomiting, preoperative anxiety and discomfort from IV catheter insertion.

It is not clear how influential parent's preferences are on anaesthetic related care in the child day case surgery setting is uncertain. There is limited evidence that practice has changed to incorporate some aspects of known parents' preference. An example of this is PPIA, this intervention is known to be valued by parents (19;29). Anaesthetic practice changed in the 1980s to incorporate PPIA, apparently to accommodate parents wishes (19). PPIA is now common practice in the UK. (However it is also often reported that this change was a consequence of a letter in the BMJ from a doctor in 1985. The doctor wrote to the BMJ to report his distress at not being permitted to be with his 3 year old daughter when she had an anaesthetic (20)).

Tait et al (2001) reported that in the child day case surgery setting, when parent's expectations are not met, parental dissatisfaction levels are higher (25). It is possible that if preferences differ between service providers and service users in the day case surgery setting, parental dissatisfaction may result. If more is known about the "preference gap" between service users and service providers, it may be possible to more closely align practice with parents preferences. This may increase parents' satisfaction with child day case surgery provision. Additionally if the service provided more closely reflects parents' preferences, parental anxiety in this situation maybe reduced. This may benefit parents and their children.

Study aim

The aim of this study was to use the same discrete choice experiment (DCE) in a population of service users and a population of service providers to explore their views on service provision.

Study methods

This study used a binary choice DCE postal survey sent to two samples of respondents. Child day case surgery was felt to be a good service to apply this technique to, as there is currently no general agreement as to the most appropriate way of providing anaesthetic care in this setting (9).The service users in this case were parents whose children had recently undergone child surgery. The service providers were anaesthetists involved in child surgical services.

The preferences of these two groups of individuals were compared for the following reasons. Parents' relative preferences for attributes of the child day case surgery are currently unknown. Care provided by anaesthetists may reflect the anaesthetist's preferences, as there are currently no clearly defined practice guidelines. Practice is known to vary between anaesthetists (30). Little is known about anaesthetists' relative preferences for attributes of the child day case surgery. It was hypothesized that anaesthetists would have preferences for anaesthetic practices based on factors such as their level of experience and working environment, there is some evidence to support this theory (27).

Recruitment of parents whose children had recently undergone child surgery

The first stage involved a study of parents' preferences in the perioperative care of children aged 3-11 undergoing day case surgery. Two study sites in the North West of England were used to recruit parents for this study. Prior to this study ethical approval was obtained from the relevant ethics committees and the University of Manchester. The study population comprised parents whose children were on surgical admission lists, provided by NHS staff, at two hospitals. One hospital was a specialist children's hospital. The other was a district general hospital with a dedicated child day case surgery unit.

Recruitment of paediatric anaesthetists

The second stage involved a study of anaesthetist's preferences for perioperative care of children aged 3-11 undergoing day case surgery. The sample population in this case were identified from a list of UK resident members of the Association of Paediatric Anaesthetists (APA).

Attribute and level development

The attributes and levels were derived using a literature search in combination with qualitative research techniques. The researcher observed surgery at three different types of NHS hospitals in the North West of England. This enabled the researcher to gain an insight into day case surgery practice and provided information on the ways in which practice may vary between hospitals and clinicians. Additionally the researcher discussed paediatric day case surgery with health care professionals, including anaesthetists and day case surgery staff, in a number of hospitals in the

North West of England. The researcher also conducted fourteen semi structured with parents (8 women, 6 men) from a diverse range of backgrounds. The analysis of transcripts of these interviews was used to define the attributes and levels for this DCE. The attributes and levels were refined following pilot work, described below.

DCE questionnaire design

The attributes and levels are combined to form hypothetical scenarios. A full factorial design for this DCE would have involved using every possible combination of attributes and levels. This would not have been practical, in this study it would have involved using 256 scenarios. A fractional factorial design was therefore used. The computer package SPEED v 2.1 (Stated Preference Experiment Editor and Designer) was used to generate the scenarios. The technique used by SPEED produced an orthogonal main effects design which ensured that there was no multicolinearity between the independent variables. The resulting 16 scenarios were randomly paired with one another to produce 8 choices. Scenarios were paired to maximise design efficiency. When maximising design efficiency four factors need to be taken into account:(31)

- Level balance: levels of an attribute must occur with equal frequency. Table 1 presents the attributes and levels used in the main study. Attributes have either 4 or 2 levels and consequently occur with equal frequency in the scenarios.
- Orthogonality: the occurrences of any two levels of different attributes are uncorrelated. To maintain orthogonality, when the scenarios had been paired the differences in the choice levels were tested for collinearity using Pearson's and Spearman's correlation coefficients.
- Minimal overlap: cases where attribute levels do not vary within a choice set should be minimised. The overlap occurring in the paired scenario choices was minimised, particular care was taken to minimise overlap in the cost attribute, as pilot work indicated that this attribute was not valued highly by respondents. Additionally if welfare estimates are calculated this variable is used. Only one scenario overlapped in the cost attribute. Minimising overlap proved challenging as four attributes had only two levels. The overall level of overlap was 29%.
- Utility balance: the probabilities of choosing alternatives within a choice set should be as similar as possible.

The DCE exercise

The DCE questionnaire comprised three parts. The first part of the questionnaire comprised the DCE exercise. The DCE exercise included eleven pairwise choices. (Example choices from the questionnaires for the parents study and the anaesthetist study are shown as table 1 and 2 below).

Two versions of the questionnaire were used in this study. The DCE exercise was worded differently for each sample group.

Table 1: Example question from the questionnaire for parents

Service characteristic	Service A	Service B
You can be with your child	As much as possible	Only on the ward
The staff are.....	Satisfactory	Good
It costs you....	£50	£100
When medical decisions are made	You can help decide	The doctor decides
Your child's recovery after the operation is...	Good	Good
After the operation your child needs medicine for pain	Not at all	Four times
Which service would you prefer? Tick one box only	☐	☐

Table 2: Example question from the questionnaire for anaesthetists

Service characteristic	Service A	Service B
PPIA is.....	Permitted	Not permitted
Staff attitude is.....	Satisfactory	Good
Cost to parents is....	£50	£100
When medical decisions are made	Parents are involved	You decide
Child's postoperative recovery is...	Good	Good
Postoperative pain relief is required.....	Not at all	Four times
Which service is preferable? Tick one box only	☐	☐

The DCE exercise also included two consistency tests. The first test was a dominance test. Two dominance tests were included, which comprised an option A where all levels of attributes was higher than option B. If the direction of respondent preference was not clear the levels of the attribute were the same in option A and option B. Respondents were expected to choose option A. The dominance tests were presented as choices 4 and 8. Another consistency test was included which tested is for stability of preferences within a task. Here individuals are presented with the same choice or task within the questionnaire survey. The repeated choice appeared as choice 5 and choice 11. Answers from both choices or tasks are compared (32).

Ranking exercise

The second part of the questionnaire was an attribute ranking exercise. Respondents were asked to rank the six attributes in order of importance.

Demographic information

The third section of the questionnaire gathered demographic and background information. This section of the questionnaire differed between the two respondent groups. The parents' questionnaire asked about respondents' age, gender, marital status, occupation, level of education and ethnicity. This section also requested information about the nature of the child's surgery and the respondent's immediate family's surgical history. The anaesthetists' questionnaire gathered information about age, gender, parental status, type of working environment, years of anaesthetic experience and the proportion of paediatric patients treated. This section also requested information about the respondent's immediate family's surgical history.

Pilot study

Prior to formal piloting work, two pre-pilot evaluations of the choices were carried out to establish that the wording used in the DCE scenarios was appropriate. This was necessary as a number of the attributes were qualitative, and it was important to ensure that the wording was meaningful to respondents. The "parent's version" DCE questionnaire was also piloted twice in this study. The first pilot questionnaire was complete by 43 parents who were known to the interviewer, who had children aged between 3 and 11. The questionnaire was amended and re-piloted in a further 10 parents. The data generated by the final version of the questionnaire was analysed to ensure that the design was appropriate. The attributes and levels used in the main study are shown in table 3.

Table 3: Attributes and levels used in the study of preferences in perioperative care of children

Attribute	**Level/type of attribute and effects coding**			
PPIA (qualitative)	Permitted (coded 1)		Not permitted (coded -1)	
Staff attitude (qualitative)	Good – staff are professional and confident, friendly and reassuring (coded 1)		Satisfactory - staff are professional and confident (coded -1)	
Costs to the parents (in lost earnings /travel costs and medicine costs) (quantitative)	£0	£50	£100	£200
Medical decision making (qualitative)	Parents are involved options are explained and parents express their opinion (coded 1)		Parents are not involved – options are not discussed with parents (coded -1)	
Child's recovery (qualitative)	Good – the child wakes quickly and is not upset (coded 1)		Bad – the child may be very drowsy, confused and/or upset (coded -1)	
Doses of postoperative pain relief (quantitative)	Not at all	Once	Four times	Eight times

Main study

The main study involved posting the DCE, with a covering letter and freepost envelope to (a) parents whose children had been admitted to hospital under a surgical consultant, (b) anaesthetists who are members of the APA.

Analysis of Results

As multiple observations were obtained from individuals, data were analysed using a random effects probit model. This model was used to estimate the attribute coefficients, using STATA version 8. The dependent variables was defined as whether A or B was chosen by the respondent. The independent variables were the difference in the levels of the attributes of the hypothetical scenarios. The following model was therefore estimated:

$$\Delta B = \beta_1 PPIA + \beta_2 Staff + \beta_3 Cost + \beta_4 Meddec + \beta_5 Recov + \beta_6 Pain + \varepsilon_1 + \varepsilon_2 \qquad \text{(equation 1)}$$

Where Δ B is the change in benefit in moving from scenario A to scenario B, PPIA is the difference in whether or not PPIA is permitted between scenario A and scenario B, Staff is the difference in staff attitude, Cost is the difference in cost, Meddec is the difference in parental involvement in medical decision making, Recov is the difference in the child's recovery and Pain is the difference in the amount of postoperative pain relief required. The unobservable error terms are represented by ε_1 and ε_2, where ε_1 is the error term due to differences amongst observations and ε_2 is the error term due to differences amongst respondents. $\beta_1 - \beta_6$ are the parameters of the model to be estimated.

The estimated coefficients indicate the relative importance of the attributes on preferences. In general the importance of the attribute is determined by the size of the coefficient. The greater the size of the coefficient the more important the attribute is in determining overall utility. The statistical significance of each attribute coefficient is also reported. The sign of the attribute indicates the direction of preference. For example a positive coefficient implies that an increase in the attribute level would make it more likely that the respondent choose this attribute. The theoretical validity of the DCE exercise is determined based on *a priori* assumptions about directions of preference. *A priori* it was expected that respondents would prefer PPIA, a good staff attitude, lower levels of cost, parental involvement in medical decision making, a good postoperative recovery and a lower requirement for postoperative pain relief. Thus it was expected that all attributes other then cost and number of doses of postoperative pain relief would have positive signs.

The data for each group of respondents were then analysed. The results for the anaesthetists are shown as model 1, and the results for the parents group are shown as model 2, presented in table 7. The data

from both groups of respondents were analysed together as shown in model 3, presented in table 6. This allowed the differences between the two data sets to be explored. A dummy interaction term was used to determine if the coefficients differed significantly between the two groups of respondents, shown in table 8. The statistical significance of the interaction terms was used to determine if the two groups differed.

The Log likelihood ratio statistics are also reported which indicate the goodness of fit of the model.

Results

Parent's DCE

This study sampled parents identified from NHS surgical lists at two hospitals in the North West of England. The characteristics of the sample are shown in table 4. As can be seen, 90.7% of this sample are female, this is not an unusual bias in studies of this type (33;34). Additionally it is reported that in the majority of cases mothers accompany children in hospital (35). It is likely therefore that, even though the questionnaire was addressed to the child's parent, mothers may have found the questionnaire more relevant to them. It appears that most of the children had undergone minor surgery (67.8%). The most commonly reported age group for parents was 30-39 (55.5%). The mean age of the child who had undergone surgery was 7 years. Twenty one per cent of the sample were educated to at least degree level, the number of respondents reporting no qualifications was only 7.3%. It seemed that most respondents were well educated. However 34 respondents who had completed questionnaires omitted this section. It also seemed that respondents' incomes were skewed to the higher end of the income scale used.

Table 4:Characteristics of the parent sample

Characteristic		N (%)
Sample site	Sample site 1, children's hospital Sample site 2, district general hospital	254 (85.5%) 42 (14.5%)
Gender	Female Male	255 (90.7%) 26 (9.3%)
Age	under 20 years 20-29 years 30-39 years 40-49 years 50-59 years 60+ years *Missing	2 (0.7%) 49 (18%) 151 (55.5%) 56 (20.6%) 13 (4.8%) 1(0.4%) 9
Qualifications	Degree plus A level O level Other None *Missing	53 (21%) 24 (9.7%) 105 (42.5%) 47 (19%) 18 (7.3%) 34
Monthly income	Under £250 £251-500 £501-1000 £1001-2000 Over £2000 *Missing	8(2.9%) 41 (15%) 53 (19.3%) 98 (35.8%) 74 (27%) 7
Category of child's surgery	Minor Major Not applicable *Missing	164 (67.8%) 78 (32.2%) 17 21

Response rate

Eight hundred and thirty six questionnaires were sent to parents identified by NHS staff at one study site the response rate was 30%. One hundred and sixteen questionnaires were sent to parents identified by NHS staff at the second site, the response rate was 36%. The over all response rate was 31%. These response rates seem low if compared with response rates recorded for some general population surveys, but are not unusual in DCE postal surveys (36). Although it would appear that the questionnaire was targeted to a suitable sample population. The sample frame provided by NHS staff was found to be less than ideal in both study sites. The DCE questionnaire specified an age range for children of 3-11. Initially the study site providing the majority of the parent's addresses, study site 1, provided surgical admission lists that gave no indication of the child's age. The NHS administrative staff who provided the lists were unable to generate detailed lists. Consequently questionnaires were sent to the parents of all children on the surgical admissions list. Subsequently more detailed lists were obtained from the Trust headquarters, which indicated that 51% of the children on surgical lists were outside of the specified age range.

In addition it was not possible to identify from the surgical lists provided what the child had been admitted for. Some children had been admitted for day case surgery, others for inpatient surgery. Additionally not all patients on children's surgical admission lists had undergone surgical procedures. In two cases parents who been sent questionnaires rang the researcher to say their child had not been admitted to hospital at all. The Trust was unable to explain this.

The second study site provided parents' addresses, but often no other details. Thus questionnaires were sent to all parents. It is possible that an unknown proportion of these children were outside of the age range specified on the questionnaire.

The DCE questionnaire specified that the choice exercise was hypothetical, and that the parent should imagine that their child was between 3 and 11 and needed day case surgery. This questionnaire was therefore applicable to any parent. However 15 of the returned questionnaires were not completed. In some instances the respondent had written on the questionnaire that it was not completed, as it did not apply to them, as their child was not between 3-11 years old, or had not had day case surgery.

Another factor, which may have contributed to the response rate, was the ethnicity of the sample group. It was determined from parent's surnames that 14% of the patients on lists provided for the first study site were of ethnic origin other than white European. In this study the response rate from ethnic groups, was low (7.5%). Ethnic minorities are known to be poor responders to postal surveys (37).

It was not possible to quantify the exact impact of these factors. A corrected response rate of 60% was used because it could be estimated that 51% of the sample population from study site 1 had children outside of the age range specified on the questionnaire.

Anaesthetist's DCE

The anaesthetist DCE questionnaires were posted to the 418 UK resident members of the APA, the response rate was 54%. Of those 32 were not completed. Seventeen were not completed as the anaesthetist was retired. Thus 193 valid responses were analysed. The sample group were predominantly male, and aged over 40. Twenty one per cent of the sample group had no children. The majority of respondents reported that more than 25% of their patients were children. Respondents worked in fairly equal numbers in district general hospitals, children's hospitals and teaching hospitals. Characteristics of this group are shown in table 5.

Table 5 Characteristics of the anaesthetist sample

Characteristic		N (%)
Gender	Female Male	78 (40.6%) 114 (59.4%)
Age	30-39 years 40-49 years 50-59 years 60+ years	48 (25.8%) 90 (48.8%) 44 (23.7%) 4(2.2%)
Type of hospital	District general Children's hospital Teaching hospital Other	55 (28.5%) 69 (35.8%) 59 (30.6%) 10 (5.2 %)
Percentage of patients that are children	Less than 25% 25-50% 50-75% 100%	28(14.4%) 40 (20.6%) 51 (26.3%) 75 (38.7%)
Parental status	Children No children	153 (78.8%) 41 (21.2%)

DCE results

Parents' consistency tests

The dominance test indicated that 96% passed the both dominance tests, and a further 3% passed 1 of the dominance tests. The consistency test was passed by 87% of the sample. All responses were analysed, at a later stage responses from those who failed both dominance tests may be excluded from analysis.

Anaesthetists' consistency test

The dominance test indicated that 99.5% passed the both dominance tests, and only 1 respondent failed 1 dominance test. No respondents failed both dominance tests. The consistency test was passed by 85% of the sample. All responses were analysed, at a later stage responses from those who failed both dominance tests may be excluded from analysis.

Theoretical validity of the results

Theoretical or face validity is determined by the extent to which results comply with *a priori* expectations. It was expected that all attributes other then cost, and number of doses of postoperative pain relief required would have positive signs. Table 6 indicates the coefficients determined for model 1 (anaesthetists) and model 2 (parents). Table 7 show the results for the two groups of respondents analysed together, model 3. The signs of the coefficients are not entirely as predicted. The staff attitude attribute was negative in the joint analysis and in the anaesthetists' model. Additionally the parents'

model indicates that amount of postoperative pain relief required has a positive sign. Possible explanations are given for these results in the discussion.

The data shown in table 6 and 7 indicate the level of significance of attributes to respondents. The size of the coefficients in models indicate the relative importance of the different attributes. When the data from each group of respondents is analysed separately, as shown in table 6. The order of preferences in seen to differ between the groups. All attributes were highly significant in the model to anaesthetists, and all attributes were significant to parents. The size of the coefficients indicate that the order of anaesthetists' preferences, from most important to least important is: parental involvement in medical decision making; quality of the child's recovery; PPIA; staff attitude; amount of postoperative pain relief required and cost. The size of the coefficients indicate that the order of parents' preferences, from most important to least important is: quality of the child's recovery; parental involvement in medical decision making; PPIA; staff attitude; amount of postoperative pain relief required and cost**.**

Table 6: Random effects ordered probit models 1 (anaesthetist data) and 2(parent data)

	Model 2			Model 3		
Variable	Coefficients (95% CIs)	P	Rank	Coefficients (95% CIs)	P	Rank
PPIA (-1=not permitted, 1=permitted)	0.239 (0.187 to 0.291)	0.000	3	0.228 (0.186 to 0.270)	0.000	3
Staff attitude (-1=satisfactory, 1=good)	-0.094 (-0.146to-0.042)	0.000	4	0.050 (0.008 to 0.092)	0.019	4
Cost (£)	-0.006 (-0.007 to -0.005)	0.000	6	-0.006 (-0.007 to -0.005)	0.000	6
Parental involvement in medical decision making (-1=not involved, 1=involved)	0.537 (0.484 to 0.589)	0.000	1	0.399 (0.357 to 0.441)	0.000	2
Child's postoperative recovery (-1=bad, 1=good)	0.469 (0.417to 0.522)	0.000	2	0.553 (0.511 to 0.596)	0.000	1
Doses of postoperative pain relief	-0.042 (-0.059 to -0.026)	0.000	5	0.020 (0.007 to 0.034)	0.003	5
	Number of observations = 2938 Number of individuals = 193 Log likelihood function = -1508.43 Log likelihood ratio = 1056.07			Number of observations = 4372 Number of individuals = 280 Log likelihood function = -2300.80 Log likelihood ratio = 1459.27		

Table 7: Random effects ordered probit model 3(combined data set)

Variable	Coefficients (95% CIs)	P
PPIA (-1=not permitted, 1=permitted)	0.228 (0.195 to 0.260)	0.000
Staff attitude (-1=satisfactory, 1=good)	-0.055 (-0.380 to -.027)	0.739
Cost (£)	-.0060 (-0.006 to-0.006)	0.000
Parental involvement in medical decision making (-1=not involved, 1=involved)	0.450 (0.417 to 0.482)	0.000
Child's postoperative recovery (-1=bad, 1=good)	0.514 (0.481 to 0.547)	0.000
Doses of postoperative pain relief	-0.044 (-0.015 to-0.006)	0.408
Number of observations = 7310 Number of individuals = 473 Log likelihood function = -3847.63 Log likelihood ratio = 2438.55		

Table 8: Interaction term coefficients

Interaction term	Coefficients (95% Cis)	P
PPIA*respondent type	-0.004 (-0.070 to 0.062)	0.912
Staff attitude*respondent type	0.137 (0.071 to 0.203)	0.000
Cost*respondent type	0.0001 (-0.0008 to 0.001)	0.840
Parental involvement in medical decision making*respondent type	-0.148 (-.0214 to -0.082)	0.000
Child's postoperative recovery*respon type	0.109 (0.043 to 0.174)	0.001
Doses of postoperative pain relief*respondent type	0.137 (0.071 to 0.203)	0.000

Discussion

This paper presents a preliminary analysis of the results of a comparative study of parent's and anaesthetist's preferences for perioperative care of children undergoing day case surgery, i.e. a comparison of service users' and service providers' preferences. The same DCE has been used to compare the preferences of different populations previously (38-40). The author is unaware however of DCEs being used to compare the preferences of a population of service users and service providers in the clinical setting. The hypothesis being tested is that service user's preferences differ from those of service providers. The main outcome of interest is that the preferences of these two groups do differ significantly for four attributes. Beta coefficients and interaction term coefficients indicate that preferences differ for staff attitude, parental involvement in medical decision making, the child's postoperative recovery and number of doses of postoperative pain. . Although it seems that there are significant differences between preferences between the

two groups, the three most highly rated attributes are the same. Both groups rated child's recovery, parental involvement in medical decision making and PPIA as being the most important. There was more variation between the two groups in preferences for the less valued attributes

A priori it was expected that respondents would prefer PPIA, a good staff attitude, lower levels of cost, parental involvement in medical decision making, a good postoperative recovery and a lower requirement for postoperative pain relief. The signs of the coefficients did not in all cases concord with those hypothesized *a priori*. This has been reported in other DCEs (36;38).

Parents gave a positive coefficient to number of doses of postoperative relief required. The sign of this attribute indicates that parents value higher levels of postoperative pain relief consumption. It is possible that this attribute may not have been interpreted by respondents, as was intended by the researcher. This attribute was intended to represent levels of postoperative pain. It was worded to be quantitative and realistic. Generally, only operations which are associated with a low level of postoperative pain, are suitable to be carried out on a day case basis. Therefore in the majority of cases postoperative pain will not last for longer than two days following day case surgery, (this is equivalent to eight doses of paracetamol, the pain relief commonly used in children). The sign of the coefficient may reflect an expectation that pain relief is desirable following surgery. (Although it is well-established that parents are often poor at managing their children's postoperative pain (41;42)).Another factor is that the range of the levels of this attribute may not have been wide enough to encourage trading. It is possible that if this attribute had been presented differently and the range of levels had been wider it may have altered respondent's preferences

A surprising finding was the difference in the signs of the coefficients parents and anaesthetists assigned to the staff attitude attribute. Parents preferred the staff attribute level to be "good" and anaesthetists expressed a preference for the "satisfactory" level of this attribute. The attribute levels were defined as being: satisfactory - staff are professional and confident; Good – staff are professional and confident, friendly and reassuring. It seems that parents value friendliness and reassurance form healthcare professionals in the day case surgery setting. Conversely anaesthetists did not appear to value a friendly, reassuring approach. It should be noted however that this attribute was not highly valued by either group of respondents.

As indicated this is a preliminary analysis. Further analysis is required to identify dominant preferences (43). This will indicate the extent to which respondents employed heuristic techniques when completing questionnaires. It is possible that if respondents are using simplifying heuristics to make DCE choices, only the attributes considered most important by the respondent are used when choices are made. Thus the levels of those attributes less highly rated are not considered. The

coefficients, which result form analysing data from non-trading respondents, may be of limited validity. Additionally further analysis by segmentation will identify demographic characteristics which maybe linked to preferences.

In conclusion: Significant differences in the preferences of service users' and service providers' preferences were identified in this study. The two groups sampled in this study did appear in some respects to have diverse expectations of service provision. However the same three attributes were ranked as being the most important to both groups of respondents. Differences in attribute coefficients were most marked in the attributes which were associated with lower coefficients. Specifically the attributes for the need for postoperative pain relief and staff attitude showed different signs for the two sample groups. The differences identified may in some cases be linked to dissatisfaction in service users. There is some evidence that unfulfilled expectations can be linked to patient dissatisfaction (25). How significant these differences are is unclear, particularly as the most marked differences were in those attributes which were relatively less important to both groups of respondents. More research is needed to determine if "preference gaps" are associated with patient satisfaction.

Discussion points:

1. Could dominant or lexicographic preferences have resulted in "false" signs for attributes that have a low level of importance to respondents?
2. Are their other possible explanations of the unexpected signs for some attributes?
3. How are measures of goodness of fit interpreted?
4. What is the current best practice for dealing with inconsistent responders?
5. DCEs are cognitively challenging, is there any evidence of bias in responders to postal DCES?

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