

## Postnatal care:

development of a psychometric multidimensional satisfaction questionnaire (the WOMBPNSQ) to assess women's views

### Abstract

#### Background

Postnatal care is the neglected area of pregnancy care, despite repeated calls to improve it. Changes would require assessment, which should include women's views. No suitable satisfaction questionnaire exists to enable this.

#### Aim

To develop a multidimensional psychometric postnatal satisfaction self-completion instrument.

#### Setting

Ten maternity services in south west England from 2006–2009.

#### Method

Sources for questions were literature review, fieldwork, and related published instruments. Principal components analysis with varimax rotation was used to develop the final WOMen's views of Birth Postnatal Satisfaction Questionnaire (WOMBPNBSQ) version. Validity and internal reliability were assessed. Questionnaires were mailed 6–8 weeks postnatally (with one reminder).

#### Results

The WOMBPNSQ comprises 36 seven-point Likert questions (13 dimensions including general satisfaction). Of 300 women, 166 (55.3%) replied; of these 155 (95.1%) were white, 152 (93.8%) were married or cohabiting, 135 (81.3%) gave birth in a consultant unit, 129 (78.6%) had a vaginal delivery; and 100 (60.6%) were multiparous. The 12 specific dimensions were: support from professionals or partner, or social support; care from GP and health visitor; advice on contraception, feeding baby, the mother's health; continuity of care; duration of inpatient stay; home visiting; pain after birth. These have internal reliability (Cronbach's alpha varying from 0.624 to 0.902). Various demographic and clinical characteristics were significantly associated with specific dimensions.

#### Conclusion

WOMBPNBSQ could be used to assess existing or planned changes to maternity services or as a screening instrument, which would then enable in-depth qualitative assessment of areas of dissatisfaction. Its convergent validity and test-retest reliability are still to be assessed but are an improvement upon existing postnatal satisfaction questionnaires.

#### Keywords

patient satisfaction; postnatal care; primary care; questionnaires; quality of health care

### INTRODUCTION

The organisation of maternity services is determined by trusts and foundation hospitals, in line with government policy.<sup>1–3</sup> Models of care vary across the country, for various reasons, such as historical provision, geography, or size of maternity unit.<sup>4–6</sup> The area of maternity care that is most criticised, and most in need of improvement, is postnatal care, both in the UK<sup>7–9</sup> and internationally.<sup>10–12</sup> High-quality postnatal care is essential to achieve targets in such areas as breastfeeding and reducing inequalities.

Maternal and perinatal mortality and morbidity are the traditional national and international clinical measures of the quality of care.<sup>13</sup> To complement them, one needs a patient-centred measure such as women's satisfaction.<sup>14</sup> Although questionnaires have been used to assess women's views,<sup>15</sup> there is no published valid, reliable, multidimensional, quantitative questionnaire (instrument) that can be utilised to compare and contrast their satisfaction with different models of care or service configuration, or to assess changes over time. Such a questionnaire would need to be multidimensional,<sup>16,17</sup> and to be sensitive to differences in settings and women.<sup>10</sup>

Measurement of patient satisfaction is not easy.<sup>17–21</sup> Medical and nursing psychometric satisfaction measures exist,<sup>22–26</sup> but few have been published for maternity care.<sup>27,28</sup> When designing a satisfaction questionnaire, one must

consider a range of potential dimensions,<sup>18–20,29–34</sup> and, if not formally developed, they tend to overestimate satisfaction, as do those that ask satisfaction questions in general terms.<sup>30,34</sup>

The aim of this work was to produce a valid, reliable multidimensional psychometric satisfaction questionnaire to measure maternal satisfaction with care following childbirth. Such a questionnaire would enable the formal comparative assessment of maternal views of postnatal care as maternity services continue to evolve, as maternal views should complement those of clinicians and commissioners.<sup>1,4–6,35,36</sup>

### METHOD

The methodology followed that used generally to develop satisfaction questionnaires,<sup>24–26</sup> and, more specifically, to develop multidimensional instruments in the areas of antenatal and labour patient satisfaction.<sup>27,28</sup> Over 4 years, 10 maternity services in the south and west region of England (a mixture of units and including home births: small midwife-led community units, district general hospitals, and teaching hospitals) distributed questionnaires by post to women 6–12 weeks after birth. One reminder was sent anonymously 2 weeks later. Based on previous work, a response rate of 50–70% was expected,<sup>27,28</sup> which would be sufficient to permit a robust statistical analysis in relation to the likely number of dimensions and questions.<sup>33</sup>

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**Submitted:** 4 November 2010; **Editor's response:** 11 January 2011; **final acceptance:** 28 April 2011.

#### ©British Journal of General Practice

This is the full-length article (published online 26 Sep 2011) of an abridged version published in print. Cite this article as: **Br J Gen Pract 2011; DOI: 10.3399/bjgp11X601334.**

## How this fits in

Postnatal care is the neglected area of pregnancy care, despite repeated calls to improve it. Any changes being considered should take into account women's views. The questionnaire developed here enables the assessment of parental satisfaction with the full spectrum of postnatal care provided to them. No suitable tool existed previously.

### Development of questionnaire, face and content validity

Each questionnaire comprised 'questions' worded as statements, which required responders to ring one option on a 7-point Likert scale, from totally disagree to totally agree, to enhance the sensitivity of subsequent dimensions.<sup>37</sup>

There were three rounds of development, resulting in a final fourth version. For each version, after the formal statistical analysis, the remaining questions were checked to ensure content validity. Questions that were frequently skewed or not answered were discarded or modified. New questions were added where either important topic areas were missing (reduced content validity), or the internal reliability of a dimension was low and the next version evolved.

Questions for the first round of development were drawn from four sources, to ensure content and face validity. These were: an earlier unpublished pilot study of women in Wiltshire in 1998, which had produced a pilot questionnaire comprising 22 questions across seven dimensions (377 women replied 12 weeks after birth); a review of published instruments assessing patients' satisfaction with care;<sup>38</sup> questions from the WOMB (WOMen's views of Birth) antenatal and labour questionnaires that have already been published;<sup>27,28</sup> and specially written questionnaires derived from an initial literature review of primary research on patients' and professionals' views of continuity, satisfaction, and quality maternity care.<sup>10</sup>

Because of the large number of questions generated by the literature and instrument review, two pilot versions (WOMen's views of Birth Postnatal Satisfaction Questionnaire [WOMBPNQ]1a and b) were developed for round one of development; these had mutually exclusive questions. Following analysis, a single second-round questionnaire was developed (WOMBPNQ2); following analysis of this version, a third version was developed (WOMBPNQ3). Before posting, two

additional sections were added to the latter: one asking some clinical and demographic questions (to permit testing of construct validity), and one asking women to list up to three areas they thought were best about their postnatal care and up to three more areas needing most improvement (to permit testing of content validity). Analysis of this produced the final version (WOMBPNQ4).

### Dimension generation, internal reliability, and scale generation

Questionnaires were each analysed using the SPSS-PC statistical package. Repeated stepwise principal components analysis (PCA) with varimax rotation was used to produce factors (dimensions),<sup>33,37</sup> which each consisted of one or more questions that were reread as a group to intuitively label the dimensions. Each dimension was assessed for internal reliability using Cronbach's alpha; any with persistently low values were discarded.

Scale scores were generated to allow easily comprehensible comparisons between individual dimensions, thus enabling the questionnaire to be used in future to assess the relative strengths and weaknesses of various aspects of postnatal care in different settings. To produce a scale score for each of the dimensions identified, constituent scale questions were added (with negatively worded questions being reversed), and the total transformed so that the minimum possible score will always be 0% (total lack of satisfaction on that dimension) and the maximum possible score 100% (total satisfaction on that dimension).

### Construct validity

Construct validity was assessed in the final round of development, by examining the compatibility of dimensions with primary research evidence about how different groups of patients should score. In addition, individual dimensions were tested against a transformed general satisfaction dimension. There should be moderate correlation between dimensions which are related to, but distinct from, 'satisfaction' as a global concept.

The transformed individual dimensions were tested against a range of maternal self-reported variables: (a) patient's age, and duration of inpatient postnatal stay (Pearson correlation coefficients calculated); (b) educational level (maternal university education or not), marital status (married or cohabiting, or not); (c) place of birth (consultant unit delivery, yes/no), delivery type (any vaginal birth or any section),

**Table 1. Parameters of the final and three development versions of the WOMen's views of Birth Postnatal Satisfaction Questionnaires (WOMBPNQ)**

	WOMBPNQ1		WOMBPNQ2		WOMBPNQ3		WOMBPNQ4	
	Pre-test	Post-analysis	Pre-test	Post-analysis	Pre-test	Post-analysis	Pre-test	Post-analysis
Year tested	2006		2007		2008		2009	
Responders	300/300	128/143	400	230	400	260	300	166
Factors (dimensions) <sup>a</sup>	8/9		14+1	12+1	12+1	10+1	16+1	12+1
KMO statistic	-	0.784/0.888	-	0.801	-	0.781	-	0.720
Bartlett's statistic, <i>P</i> -value	-	<0.001/<0.001	-	<0.001	-	<0.001	-	<0.001
% variance explained	-	76.5/67.9	-	76.0	-	77.6	-	77.5
Factors	Number of questions	alpha	Number of questions	alpha	Number of questions	alpha	Number of questions	alpha
All	66/69		76		38		49	
General satisfaction	0.880	4	4	0.886	4	4	0.874	4
Partner support	0.843	4	4	0.816	3	4	0.865	3
Continuity of care	0.880	4	4	0.859	4	4	0.843	3
Professional support	0.902	7	7	0.366	2	7	0.806	3
Duration of hospital stay	0.105	4	4	0.565	3	5	0.902	3
Contraceptive advice	0.864	3	3	0.875	3	3	0.863	3
Woman's health	0.759/0.637	3/4	7	0.837	4	3	0.862	3
Feeding baby	0.821	4	4	0.748	3	3	0.777	3
Social support	0.753	3	3	0.743	3	3	0.729	3
Home visiting	0.883	3	3	0.787	3	3	0.784	3
Pain after birth	0.781	2	2	0.743	2	2	0.796	2
Communication	0.882	4	4	0.882	4	3	-	0
Time with woman	0.837	3	3	-	0	5	-	0
Interpersonal skills	0.901	4	4	-	0	-	-	-
GP/medical care	na	5	5	-	0	6	0.624	2
Impersonal care	na	1	1	-	0	3	-	0
Mood	6	-	0	-	-	-	-	-
Health visitor care	5	0.675	2	-	-	-	-	-

<sup>a</sup>Excluding a general satisfaction dimension at all stages; pretest refers to the state of the questionnaire as it was sent to women; post-analysis refers to the reduced questionnaire after analysis. alpha = Cronbach's alpha. KMO = Kaiser-Meyer-Olkin. na = non applicable.

induction (yes/no), feeding method (current breastfeeding, yes/no), birth complications (yes/no), induction of labour (yes/no), parity (primiparous/multiparous; one-way analysis of variance to all dichotomous independent variables listed).

## RESULTS

### Demographics

Of 300 women sent version 4 of the questionnaire, 166 (55.3%) returned them and these were analysed. The median age of mothers was 31 years (interquartile range [IQR] = 28–35 years); 155 (95.1%; 3 not known) were white; 70 (43.5%; 5 not known) were university educated; 101 (62.3%; 4 not known) gave non-manual as the occupation of the main wage earner. When their baby was aged 7–13 weeks, 139 (83.7%) mothers completed the questionnaire; 135 (82.8%; 3 not known) were born at term; 100 (60.6%; 1 not known) were still being breastfed at that time; 135 (81.3%) gave birth in a consultant unit, 21 (12.7%) in a midwife-led unit, and 9 (5.5%; 1 not known) at home; 100 (60.6%; 1 not known) were multiparous. A total of 117

(71.3%; 2 not known) delivered vaginally; 12 (7.2%) had an instrumental vaginal delivery; 19 (11.4%) were emergency sections and 16 (9.6%) were planned sections; 24 (14.6%; 2 not known) were induced; 42 (25.8%; 3 not known) reported birth complications; 13 (7.9%; 1 not known) babies were admitted to a special care baby unit (SCBU); the median inpatient stay postnatally was 1 day (IQR = 1–3 days).

### Development

The results of the principal components analysis of all versions are shown in Table 1. Version 1 was actually two questionnaires with mutually exclusive questions on analysis apart from one dimension (maternal health); those questions retained after analysis were merged into version 2. Analysis of open questions in version 3 (Table 2) suggested a further six areas that were important to women, and questions on these areas were included in version 4; of these new areas, three were retained after final analysis: GP care, health visitor care, and 'environment' dimensions.

**Table 2. Numbers of comments (positive and negative) made to open questions appended to end of version 3 of the WOMBPNSQ, categorised by areas that arose from women's response patterns**

	Positive	Negative	Total
Interpersonal skills of midwife	172	20	192
Home visiting	43	47	90
Professionalism of midwife	55	28	83
Health visitor	63	18	81
Facilities/environment	43	37	80
Communication	29	51	80
Continuity	41	38	79
Feeding	44	29	73
GP/medical care	31	16	47
Other staff	27	18	45
Inpatient stay	0	23	23
Pain control	0	9	9

### Final questionnaire

The final version (WOMBPNQ4; Appendix 1) comprised 36 questions covering 13 dimensions (including a general satisfaction one). The 12 specific dimensions were: support from professionals or partner, or social support; care from GP and health visitor; advice on contraception, feeding baby, the mother's health; continuity of care; duration of inpatient stay; home visiting; pain after birth. Each question loaded highly onto only one dimension (Appendix 1). The individual dimensions generally had acceptable or good internal reliability (Cronbach's alpha varied from 0.624 to 0.902), with excellent question completion rates. Cronbach's alpha for the whole instrument, excluding the general satisfaction subscale, was 0.836.

### Construct validity

The individual dimensions were tested against the general satisfaction one and found to be generally moderately correlated

(Table 3). Various dimensions were significantly associated with maternal self-reported variables (Table 4). Maternal age was inversely correlated with: satisfaction with professional support (Pearson correlation coefficient = -0.226,  $P=0.004$ ,  $n=163$ ). Duration with inpatient stay was inversely correlated with: continuity (Pearson correlation coefficient = -0.245,  $P=0.002$ ,  $n=164$ ) and social support (Pearson correlation coefficient = -0.204,  $P=0.010$ ,  $n=158$ ); and positively with satisfaction with pain control after birth (Pearson correlation coefficient = 0.272,  $P=0.001$ ,  $n=161$ ).

Poor pain control after birth was also associated with: caesarean section (mean score = 67.9) compared to any vaginal birth (49.5; standard error [SE] = 2.18,  $F=12.91$ ,  $P=0.001$ ,  $n=160$ ), and with maternal self-reported birth complications (mean score = 68.1) compared to suffering no complications (mean score = 49.3; SE = 2.20,  $F=15.11$ ,  $P=0.001$ ,  $n=159$ ). Those women

**Table 3. Correlation coefficient matrix between all subscales including general satisfaction**

	GS	WH	HS	CA	FB	PS	Co	Ho	SS	Pr	Pa	HV	GP
General satisfaction (GS)	1												
Woman's health (WH)	0.654	1											
Hospital stay (HS)	0.290	0.293	1										
Contraceptive advice (CA)	0.409	0.361	0.216	1									
Feeding baby advice (FB)	0.397	0.359	0.161	0.247	1								
Partner support (PS)	0.016 <sup>a</sup>	0.084 <sup>a</sup>	0.084 <sup>a</sup>	0.001 <sup>a</sup>	-0.002 <sup>a</sup>	1							
Continuity (Co)	0.288	0.101 <sup>a</sup>	0.200	0.129 <sup>a</sup>	0.149	-0.120 <sup>a</sup>	1						
Home (Ho) visiting	0.490	0.332	0.095 <sup>a</sup>	0.253	0.297	0.100 <sup>a</sup>	0.176	1					
Social support (SS)	-0.077 <sup>a</sup>	-0.067 <sup>a</sup>	-0.118 <sup>a</sup>	-0.076 <sup>a</sup>	-0.087	0.042 <sup>a</sup>	0.059 <sup>a</sup>	0.034 <sup>a</sup>	1				
Professional care (Pr)	0.594	0.551	0.359	0.311	0.345	0.161	0.156	0.337	0.035 <sup>a</sup>	1			
Pain after birth (Pa)	0.222	0.242	0.090 <sup>a</sup>	0.068 <sup>a</sup>	0.074 <sup>a</sup>	-0.095 <sup>a</sup>	-0.018 <sup>a</sup>	0.055 <sup>a</sup>	-0.029 <sup>a</sup>	0.134 <sup>a</sup>	1		
Health visitor care (HV)	0.518	0.324	0.141 <sup>a</sup>	0.225	0.344	0.084 <sup>a</sup>	0.205	0.356	0.007 <sup>a</sup>	0.349	-0.026	1	
GP care	0.121 <sup>a</sup>	0.097 <sup>a</sup>	0.063 <sup>a</sup>	0.217	0.003 <sup>a</sup>	-0.088 <sup>a</sup>	0.073 <sup>a</sup>	0.096 <sup>a</sup>	0.058 <sup>a</sup>	0.110 <sup>a</sup>	-0.120 <sup>a</sup>	0.184	1

All coefficients are significant unless marked. <sup>a</sup>Correlation not significant at  $P<0.05$  level.

**Table 4. Testing of construct validity of dimensions against length of inpatient stay, maternal age, parity, birth site, type of birth, birth complications, breastfeeding, admission to SCBU, marital status, and level of education**

	Duration of inpatient stay <sup>a</sup>	Maternal age <sup>a</sup>	Parity	Birth site	Type of birth	Birth complications	Breastfeeding	Admission to SCBU	Marital status	Level of education
Woman's health	-	-	-	-	-	-	-	-	-	-
Hospital stay	-	-	-	-	-	-	-	-	-	0.05
Contraceptive advice	-	-	-	-	-	-	-	-	-	-
Feeding baby advice	-	-	-	-	-	-	-	-	-	-
Partner support	-	-	0.05	-	-	-	-	0.01	-	-
Continuity	0.01	-	-	-	-	-	-	-	-	-
Home visiting	-	-	-	-	-	-	0.01	-	-	0.05
Social support	0.01	-	0.001	-	-	-	-	-	-	-
Professional care	-	0.01	-	-	-	-	-	-	-	0.05
Pain after birth	0.001	-	-	-	0.001	0.001	-	-	-	-
Health visitor care	-	-	-	-	-	-	0.05	-	-	-
Medical care	-	-	0.01	-	-	-	-	-	-	-

Significant associations are shown at three levels of significance; all others were not significant at  $P < 0.05$  by analysis of variance (except \*by Pearson correlation coefficient). SCBU = special care baby unit

whose babies were admitted to a SCBU reported reduced satisfaction with continuity of care (mean score = 43.0) compared to those whose babies were not admitted (mean score = 60.7; SE = 1.83,  $F = 7.14$ ,  $P = 0.008$ ,  $n = 164$ ).

Parity was significantly associated with three subscales: partner support, social support, and GP care (Table 5); breastfeeding with health visitor care and home visiting; and university education with satisfaction with duration of inpatient stay, home visiting, and professional support.

## DISCUSSION

### Summary

This work has achieved its objective. It has produced a valid reliable multidimensional questionnaire (WOMBPN SQ), which assesses maternal satisfaction with postnatal care. It is well documented that postnatal care is the neglected part of pregnancy care and that its quality needs improving.<sup>7,8,13,39-43</sup> The WOMBPN SQ could thus be used to compare different models of existing postnatal care to ascertain which

women are most satisfied with their care, and to assess consequent changes in models of care, or compare the postnatal care of various components of an existing maternity service.<sup>44</sup> It has excellent face and content validity, being based on literature review, previous satisfaction instruments, prior fieldwork, and the views of women who have completed it during its development. Its construct validity has been tested and found acceptable. Its different dimensions vary, as would be expected a priori, in their association with different aspects of the woman's clinical care, and demographic characteristics.

The WOMBPN SQ should be useful to the future commissioners of maternity services as well as to trusts or maternity service liaison committees who wish to assess existing or future planned service changes. Postnatal care is the neglected area of pregnancy care, and there have been repeated calls over some years to improve it. The impact of any changes needs to be assessed for clinical outcomes, staff experiences, and maternal satisfaction with

**Table 5. Mean satisfaction scores (%) on subscales categorised by parity, level of education, and breastfeeding**

	MP	PP	F-value (SEM)	P-value (n)	UE	Non-UE	F-value (SEM)	P-value (df)	BF	Not BF	F-value (SEM)	P-value (df)
Hospital stay			ns		26.6	34.4	5.01	0.027 (152)				ns
Partner support	27.8	19.7	6.00	0.09 (161)			ns				ns	
Home visiting			ns		37.1	31.0	5.16	0.024 (160)	37.2	29.0	9.21 (1.36)	0.003 (164)
Social support	54.7	42.7	22.80 (1.32)	0.001 (158)			ns				ns	
Professional care			ns		23.7	29.7	4.29	0.040 (160)			ns	
Health visitor care			ns				ns		35.6	28.5	5.84 (1.46)	0.017 (161)
GP care	42.8	53.5	8.56 (1.83)	0.004 (163)			ns				ns	

Means are only given for significant associations. BF = breastfeeding, df = degrees of freedom, MP = multiparous, ns = non-significant F-value, PP = primiparous, SEM = standard error of the mean, UE = university educated.

care. WOMBPNSQ could also be used to provide quantitative comparisons, or as a screening tool which then enables in-depth qualitative assessment of areas where women were particularly dissatisfied.

### Strengths and limitations

Established methodology was used to develop this questionnaire. It has good content validity in that its questions were developed from literature review, interview fieldwork,<sup>45,46</sup> existing instruments,<sup>27,28,47</sup> and women's comments. It also has construct validity: its dimensions relate to a range of clinical and demographic variables, which previous work has suggested alters women's perceptions of their pregnancy care — knowing one's carer,<sup>31,33,39,48–56</sup> the place of delivery,<sup>27,28,45,46</sup> expectations of care,<sup>57</sup> professional competence,<sup>31,32,40,43,51,54,56,58–65</sup> breastfeeding advice,<sup>40,41,44,53,60,64</sup> paternal involvement,<sup>43,54,58,63,65,66</sup> maternal wellbeing,<sup>40,43,58,61,63</sup> time,<sup>42,51,53,61,67</sup> and pain.<sup>32,64</sup> However, there is little published evidence to support the subscales of: postnatal visits, health visitor or GP care, duration of inpatient stay, or contraceptive advice. The WOMBPNSQ does not address, per se, two areas thought to be important to women: information,<sup>51,54,58,61,62,68</sup> and communication,<sup>52,61,65,67,68</sup> although these may have been subsumed into the other subscales such as professional, health visitor, or GP support.

As one might expect, the instrument has construct validity. It can discriminate between women's experiences after giving birth in different settings, having different types of birth, and having complications.<sup>46,47,49</sup> As expected, both marital status<sup>40,45</sup> and education level<sup>9,31,40</sup> were associated with some of the dimensions of satisfaction, but these differences are difficult to interpret. Certain clinical characteristics were also associated with maternal age<sup>62,67</sup> and parity.<sup>51,62</sup> Most dimensions were moderately correlated with overall satisfaction but not too strongly; if a subscale were too strongly correlated, then it is likely that it would be measuring general satisfaction rather than a component of it.<sup>23,24</sup>

The WOMBPNSQ has good internal reliability, which explains much of the variance in the data. Overall, the good alpha figures suggest the dimensions are internally consistent and also separate from 'global satisfaction'.

External reliability is yet to be tested, although satisfaction is likely to change over time, so such testing will have to use a short time scale; women may not respond twice when they have a new baby and their own

health problems to contend with. Two of the dimensions have Cronbach's alpha<sup>33</sup> values of 0.6–7, which, although lower than the others, are still acceptable. Responders were mainly white and married or cohabiting, so the WOMBPNSQ needs assessing in more diverse populations. It has not yet been used to assess services or service change. The response rate could have been better, although it is comparable to other survey work in postnatal women.<sup>9,42,55,61,64</sup>

The instrument still has some weaknesses. Further work is needed to assess its test-retest reliability and its generalisability: responders were predominantly middle social class, in stable relationships, and of good educational achievement. However, it is robust enough to be used in evaluating service developments as one component of assessing the quality of postnatal care that women receive.

### Comparison with existing literature

Other questionnaires have been published to assess women's satisfaction with postnatal care; all have been developed outside of the NHS, in Canada, and all have limitations. The Newcastle scale was developed to assess inpatient medical and surgical care,<sup>69</sup> and subsequently tested in the assessment of postnatal care that women received in one large hospital, again by nurses; it has one unidimensional satisfaction scale comprising 19 items. The Care in Obstetrics: Measure FOR Testing Satisfaction (COMFORTS) scale was developed to assess combined labour and inpatient postnatal care,<sup>70</sup> in one hospital recruiting only low-risk pregnant women who completed questionnaire 48 hours post delivery; 94% had vaginal deliveries. It has 40 items and six subscales; it explains 70% of the variance, as does the WOMBPNSQ. Both of these published instruments use five-point Likert scales rather than 7-point ones; they were tested in just one maternity service on a limited range of patients.

The Six Simple Questions (SSQ) scale was tested as part of a trial;<sup>71</sup> this utilised 7-point Likert scales and had a Cronbach alpha of 0.86; it is unidimensional and assesses overall pregnancy care. Similarly, the older LADSI Labor And Delivery Satisfaction Index (LADSI) assesses labour and not postnatal care;<sup>72</sup> its authors state that its two dimensions are not robust enough [satisfaction with technical aspects [alpha = 0.78] and caring aspects [alpha = 0.11]] to use separately. Future development of the WOMBPNSQ could use one or more the

### Funding

This work was supported by R&D Support Funding for NHS Providers (Budget 1).

### Ethics committee

This work was approved by the Northern & Yorkshire MREC (MREC3/3/28) and the regional R&D offices of each maternity unit that participated.

### Provenance

Freely submitted; externally peer reviewed.

### Competing interests

The author has declared no competing interests.

### Acknowledgements

I would like to thank Dr Paul Ewings for statistical advice, the midwifery departments of participating trusts, and all women who kindly returned questionnaires.

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other questionnaires to assess convergent validity, which has yet to be tested, although none are a gold standard.

**Implications for research and practice**

The WOMBPNSQ needs further development in non-white populations and its convergent validity needs testing if a suitable gold standard can be found. It could be used also in any future postnatal research which focuses on postnatal care

where a numerical indicator of women's views is desired alongside traditional morbidity indicators of care.

Where commissioners wish to change maternity care the WOMBPNSQ could be used as a key component of a wide ranging evaluation of any resulting changes; alternatively if qualitative service evaluation suggest areas of concern it could be used to provide comparative quantitative data.

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## Appendix 1 Summary of WOMBPNSQ

	Coefficient
<b>General satisfaction scale (alpha = 0.848, mean score = 41.8, sd = 21.8)</b>	
My postnatal care went nearly exactly as I had hoped it would	na
There are some things about the postnatal care that I received that could have been better (-).	na
The postnatal care that I received was just about perfect	na
<b>Inpatient stay (alpha = 0.861, mean score = 31.0, sd = 21.6, % = 7.2)</b>	
I could have done with more time for my body to adjust after the birth before going home (-)	0.828
It would have been so much better if I had had a longer hospital stay after the birth (-)	0.900
I needed more time in hospital to get used to caring for my new baby (-)	0.809
<b>Maternal health (alpha = 0.825, mean score = 37.3, sd = 19.8, % = 7.1)</b>	
Everyone concentrated just on my physical health after the birth and not on how I was feeling (-)	0.703
A little more time being spent on my health would have been welcome (-)	0.748
I would have liked more chance to talk to my carers for medical advice about care of myself (-)	0.773
<b>Contraceptive advice (alpha = 0.855, mean score = 40.5, sd = 23.8, % = 7.1)</b>	
My carers explored adequately with me my contraceptive needs	0.858
I was given little advice on contraception following the birth of my baby (-)	-0.841
My carers discussed the full range of contraception options following the birth of my baby	0.838
<b>Feeding baby (alpha = 0.778, mean score = 41.7, sd = 13.6, % = 7.0)</b>	
I would have liked more time to discuss feeding problems during carers' visits (-)	0.670
Sometimes I was given conflicting advice from health visitors and/or other carers (-)	0.521
I was given lots of help on how to feed my baby	-0.741
I would have liked more advice on feeding my baby (-)	0.822
<b>Partner support (alpha = 0.839, mean score = 24.5, sd = 21.6, % = 6.9)</b>	
My partner met all my needs after the birth	0.896
I could have had just a very little more help from my birth partner/husband (-)	-0.838
My partner/husband was the best possible help to me after the baby was born	0.854
<b>Postnatal visiting (alpha = 0.756, mean score = 34.0, sd = 17.4, % = 6.3)</b>	
The visits I received in my home were always convenient	0.773
My postnatal check-ups were always at a very convenient time	0.897
The visiting times of health visitors were sometimes inconvenient (-)	-0.624
<b>Social support (alpha = 0.744, mean score = 49.9, sd = 16.6, % = 6.2)</b>	
Meeting in the postnatal days/weeks other women who had given birth was of no use to me (-)	-0.814
It was reassuring to meet other women like me after my baby was born	0.866
I made new friends during the days/weeks after the birth of my baby	0.752
<b>Professional support (alpha = 0.758, mean score = 27.5, sd = 18.7, % = 6.0)</b>	
My carers were never insensitive nor lacked understanding	-0.591
I sometimes had problems understanding what my carers were saying to me (-)	0.712
The carers who treated me should sometimes have given me just a little more respect (-)	0.715
<b>Pain after birth (alpha = 0.779, mean score = 53.9, sd = 27.8, % = 5.3)</b>	
I didn't need a lot of pain relief after the birth	-0.860
I was in a fair bit of pain in the first few days/weeks after the birth (-)	0.883
<b>Health visitor care (alpha = 0.675, mean score = 33.0, sd = 18.7, % = 5.2)</b>	
The health visitors were really good at helping me to feed my baby	0.815
The caring approach of the health visitor really helped me and my new baby	0.767
<b>Continuity (alpha = 0.735, mean score = 59.4, sd = 23.4, % = 5.0)</b>	
I was usually visited at home by different carers (-)	-0.896
I saw the same carer at postnatal visits rather than different ones each time	0.849
<b>GP care (alpha = 0.624, mean score = 47.1, sd = 23.4, % = 4.5)</b>	
My GP had no role in my postnatal care (-)	0.860
My GP was really helpful in the weeks after the birth	-0.755

Scales derived by PCA of final WOMBPNSQ; they are intuitively named followed by their constituent questions. Dimension means, standard deviations, percentage of total variance explained by scale and Cronbach alpha given for each dimension. Negatively worded questions are shown by a minus sign in brackets after the question. na = non applicable. sd = standard deviation.