Elective Cesarean Section and Decision Making: A Critical Review of the Literature

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ABSTRACT: Background: *The cesarean section rate continues to rise in many countries with routine access to medical services, yet this increase is not associated with improvement in perinatal mortality or morbidity. A large number of commentaries in the medical literature and media suggest that consumer demand contributes significantly to the continued rise of births by cesarean section internationally. The objective of this article was to critically review the research literature concerning women's preference or request for elective cesarean section published since that critiqued by Gamble and Creedy in 2000.* **Methods:** *A search of key databases using a range of search terms produced over 200 articles, of which 80 were potentially relevant. Of these, 38 were research-based articles and 40 were opinion-based articles. A total of 17 articles fitted the criteria for review. A range of methodologies was used, with varying quality, making meta-analysis of findings inappropriate, and simple summaries of results difficult to produce.* **Results:** *The range and quality of studies had increased since 2001, reflecting continuing concern. Women's preference for cesarean section varied from 0.3 to 14 percent; however, only 3 studies looked directly at this preference in the absence of clinical indications. Women's preference for a cesarean section related to psychological factors, perceptions of safety, or in some countries, was influenced by cultural or social factors.* **Conclusions:** *Research between 2000 and 2005 shows evidence of very small numbers of women requesting a cesarean section. A range of personal and societal reasons, including fear of birth and perceived inequality and inadequacy of care, underpinned these requests. (BIRTH 34:1 March 2007)*

Key words: *cesarean section*, *decision making*, *choice*, *childbirth*

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The cesarean section rate has continued to rise in most developed countries, but contributing factors remain unclear. One reason suggested in several contexts is that increasing numbers of women are requesting to have an elective cesarean section in the absence of clinical indications. Indeed, some commentators have suggested this is a major factor in driving rising cesarean section rates (1,2). The debate was influenced by a small study of obstetricians' preferences, suggesting that a significant minority of obstetricians would choose a birth by cesarean section for themselves or for their partner (3,4). Media reports added to the growing number of professional commentaries and letters, with features and headlines such as "too posh to push." However, little evidence

to date supports the view that maternal request was a significant contributor to the rising cesarean section rate. The conclusion of Gamble and Creedy's (5) critical review of literature, published before 1999, was that "few women request a cesarean section in the absence of current or previous obstetric complications."

The subsequent United Kingdom's *National Sentinel Caesarean Section Audit Report* (6) recorded that in 7 percent of births by cesarean section (n = 32,082), the primary reason recorded by obstetricians was maternal request. However, the audit was unable to identify what proportion of these operations had associated medical indications, and of what type, nor did it explore women's views of their role in decision making. Wide variations were found between different units and different obstetricians. In Phase 2 of the audit, 5.3 percent of women (n = 2,475) returning questionnaires from a random sample of 40 units reported they would prefer a cesarean section, but those who gave this preference were more likely to have had a previous cesarean section. Consultant obstetricians (n = 162) responding to the Phase 2 survey reported that about 3 percent of women requested a cesarean section in the absence of medical indications. The obstetricians would agree to about 50 percent of these requests, and reported being more likely to agree if the mother was older and pregnant for the first time. Limitations of the audit approach with respect to specified research parameters revealed that it did not investigate choice and decision making. Nonetheless, no evidence suggested a large demand from women for cesarean section.

Although available evidence suggests that few women want a cesarean section in the absence of any clinical reason, several recent articles have called for a trial of routine cesarean section versus vaginal birth in low-risk women (7,8). The lack of clarity of clinical evidence about the risks or benefits of cesarean section for low-risk women, and perceived demand for cesarean section among women, have been cited as justification for conducting a trial. Since the weight of available clinical evidence suggests that risk of maternal mortality is 3–5 times higher with cesarean section, and risk of major maternal morbidity is greater, even with elective cesarean section when confounding factors are controlled for (9–11), the "demand" for cesarean section among women would need to be extremely strong to justify such a trial from an ethical standpoint (12).

The aim of this article is to critique research literature published since 2000 that relates to women's preferences or requests for cesarean section and determine the extent to which women request cesarean section in the absence of clinical indications. We outline the review methods and search results, and discuss key findings and their limitations along with the methodological and quality issues that emerged in reviewing the articles. A subsequent article discusses conceptual issues that emerged during the review, in particular those related to the social, cultural, and political-economic contexts of maternity care and decision making.

Methods

We conducted a search of the major databases: MEDLINE, CINAHL, Cochrane, Sociological Abstracts, and PsychINFO to obtain English language publications from 2000 to January 2005. This search replicated Gamble and Creedy's original search. We also searched MIDIRS, EMBASE, and the British Nursing Index and checked the reference lists of each article included to ensure that important sources had not been missed.

We adopted the search terms used in the previous literature search as follows: "cesarean section" with "maternal request," "decision making," "patient participation," "decision-making patient," "patient satisfaction," "patient preference," and "maternal choice." Since the number of articles published was likely to have increased, and the nature of the discourse changed, we included additional search terms, identified during an exploratory search, to reflect this "consumer demand" and "on demand."

Research articles were included that used any methodology and had any focus on the involvement of women in the decision to have a cesarean section. Opinion articles such as letters to the editor and commentaries were identified and placed in a separate, nonreview category. One researcher (S.B.) read abstracts of all potentially relevant articles and excluded those that were not relevant. Where relevance was not clear, 2 researchers (S.B. and J.W.) read abstracts of articles independently and made a decision on relevance. Studies were excluded if they only examined subgroups of women with a previous cesarean section or other specific clinical/medical complications. The search strategy and process are summarized in Fig. 1.

Review Process and Criteria

Of the 80 articles concerned with decision making and cesarean section initially identified as being relevant, 38 were research-based articles and 42 opinion-based articles. Of the research-based articles, 15 were identified for review as focusing on women's request or preference for cesarean section. Two further relevant articles were added after review of the references cited by these articles, giving a total of 17 research articles for review.

Two researchers read and reviewed each article independently. Key findings were initially tabulated using the following headings: study design, sample, outcomes measured, data collection procedure, and relevant results, and then according to quality criteria set out below. Findings were then compared across reviewers to assess similarities or differences in the reviews and to draw conclusions.

We assessed quality criteria using critical appraisal guidelines appropriate to the type of research and summarized key features onto data extraction sheets developed for the review. Core criteria for the critical review process were based on principles of critical appraisal for nonexperimental designs, including quantitative or qualitative methods (13–15).

Results

The 17 studies reviewed used a range of designs and methods, ranging from epidemiological studies of all women giving birth in a single country over a 5-year period (16), through varying questionnaire surveys to qualitative interviews with 6 nulliparous women who "chose" cesarean section (17) (Table 1). Thus, simple summaries of results were difficult, and meta-analysis of findings inappropriate. Furthermore, although the studies were from a range of countries, a concentration of reports came from some known to have very high cesarean section rates, such as Brazil (18–20) and Chile (21). The settings of studies also varied, including several private facilities. Therefore, in addition to summarizing the key findings, we discuss both methodological and quality issues raised by the studies reviewed.

Summary of Findings

When compared, the reviews conducted independently showed high levels of agreement about study quality, methods, and findings. All included studies

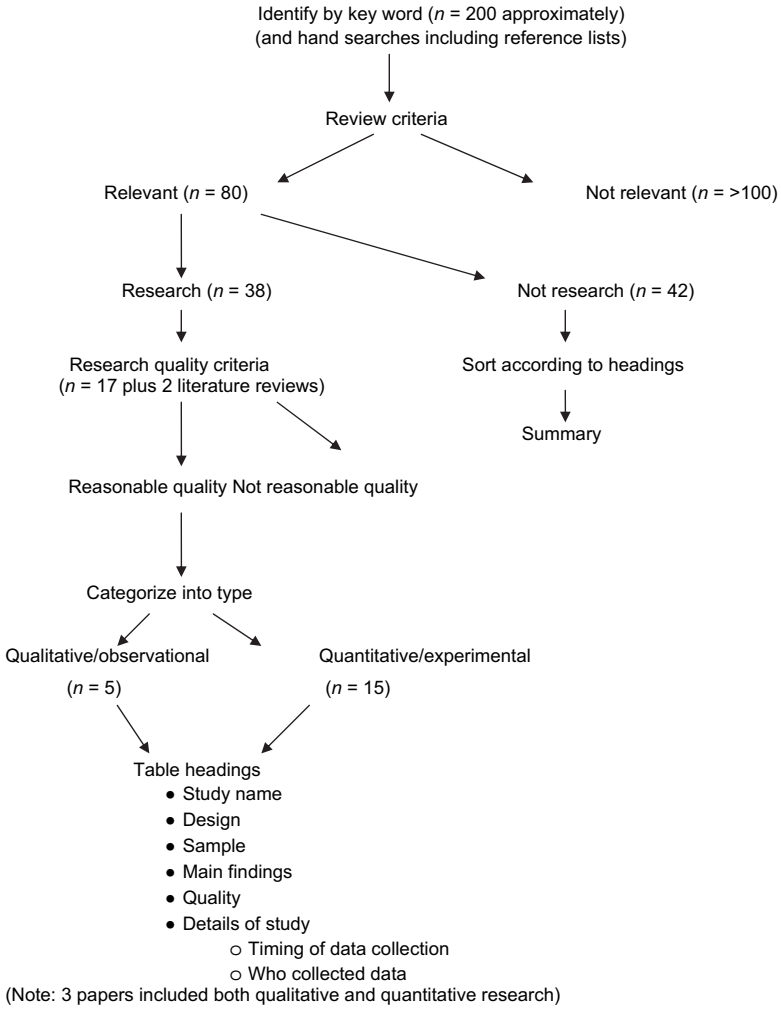

Fig. 1. Flow chart for review process.

Table 1. Summary of the Reviewed Studies, Methods, and Findings

Study	*Design*	*Sample*	*Numbers*	*Outcome*	*Summary of Main Results*	*% Requesting CS in Absence of Complicating Obstetric Factor*	*Timing of Data Collection*	*Who Collected the Data?*
Lin and Xirasagar, Taiwan, 2005 (16)	Epidemiological: population cohort	All women having CS, without a recorded clinical indication 1997–2001	904,657 More detailed analysis of 280,149 births in year 2000	Rates of CS in the absence of a clinical reason	Overall rise in maternal request from 2 – 3.5%; rates increase with maternal age	NR	Retrospective from National Health Insurance database	Routine records by OBs; analysis by public health researchers
Lee et al, Hong Kong, 2001 (17)	Qualitative exploratory: taped semistructured interviews	*Nulliparous* private patients who chose CS	6 women; 1 had history of infertility	Reasons for choosing CS birth	4 thematic categories: avoiding fetal/maternal risks; exercising autonomy; Chinese belief system; rejoicing and regretting	NR	2 days post CS, on postnatal ward	Unclear
Behague et al, Brazil, 2002 (18)	1. Epidemiology	1. All 1993 hospital births in Pelotas	1. Birth cohort of 5,304	Rates of CS and associated factors	1. Rates of CS relate strongly to socioeconomic factors	NR	Retrospective	Public health researchers
	2. Ethnography (postnatal interviews and interviews with health professionals)	2. Stratified random sample of cohort and health professionals	2. 80 women + 19 professionals (6 OBs, 6 pediatricians, 4 GPs, 3 nurses)	Reasons for preferring CS	2. Reasons for CS preferred: fear of inequality in and substandard care, safety of baby, excessive pain, and vaginal trauma			Interviewer not a health professional
Potter et al, Brazil, 2001 (19)	Longitudinal interviews: structured, face-to-face; early pregnancy, late pregnancy, and 1 mo postnatal	Stratified; private and public hospitals; recruited <22 wk gestation	1,612 women in routine antenatal care; 1,093 public; 519 private; high, uneven dropout rates	Birth preferences	No significant difference in preferences public/ private; 31 and 72% had CS; 77 and 70% preferred VB at both antenatal interviews; 23 and 64% had CS planned before admitted	NR	Prospective, but some problems with long-term follow-up	NR

(continued)

Table 1. *Continued*

Study	*Design*	*Sample*	*Numbers*	*Outcome*	*Summary of Main Results*	*% Requesting CS in Absence of Complicating Obstetric Factor*	*Timing of Data Collection*	*Who Collected the Data?*
Hopkins, Brazil, 2000 (20)	Ethnographic: PO; postnatal survey using interviews and attitude scales; in-depth interviews	1 public and 1 private hospital from 4 cities. Survey: stratified random sample. Interviews: purposive subsample	PO: 29 cases. Survey: 321. Interviews: 41	Birth preferences and decision making	PO: OBs perceive women as demanding CS and steer women toward this. Survey: private hospitals 72% primiparas who had a CS had wanted VB and 95% who had VB wanted VB; in public hospital, this was 80 and 88%, respectively. Most women wanted VB but had fears about birth and pain and were not given support	NR	Postnatal	By researcher who is not a health professional or linked to local service
Murray, Chile, 2000 (21)	Survey: semistructured questionnaire and qualitative taped interviews	3 private and public hospitals. Survey: all live births. Interviews: opportunistic maximum variation sampling	Survey: 540 women. Interviews: 21 women and 22 OBs	Rates of CS in different institutions	6–32% of women in private care reported they had wanted CS at some point in their pregnancy; 70% of private care women had a CS but only 18% said they had wanted one	NR	Questionnaire 24–72 hr after birth; interviews not clear	Unclear
Lo, Taiwan, 2003 (22)	Epidemiological: analysis of birth certificate data	All birth certificates in 1998	215,656: 143,781 hospitals, 71,875 clinic	Rates of CS on different days	Women more likely to have CS on auspicious day and less likely on weekend	NR	Retrospective—routine data	Unclear
Lapeyre et al, USA, 2004 (23)	Survey	Convenience sample of pregnant women 2 private clinics	157: 68 *primiparous*, 89 multiparous	Women's hypothetical preferences and reasons	21 (13.4%) would choose CS with no medical need; more likely in women with previous CS; reason for electing for CS: 41.7% sense of control or psychological reasons, 25% perception of reduced risk and/or pain	NR	In pregnancy	Data collected in the authors' obstetric clinic, but unclear who distributed questionnaires

(continued)

Table 1. *Continued*

Study	*Design*	*Sample*	*Numbers*	*Outcome*	*Summary of Main Results*	*% Requesting CS in Absence of Complicating Obstetric Factor*	*Timing of Data Collection*	*Who Collected the Data?*
Walker et al, Australia, 2004 (24)	Postal survey: postnatal, using attitude scales and opinions	Consecutive sample, recruited at 18 wk pregnancy in 2000 Tertiary hospital	148 questionnaires: response 62% (n = 92)	Women's views of public and media attitudes about birth	Agreement with statements: 71% think CS easier way to give birth; 53% CS seen as more convenient way of birthing; 48% CS seen as a routine way of having a baby; 31% CS seen as safer than VB; 25% CS no longer seen as major surgery; 23% thought media portrayed CS as better option	3.3%: 10/68 considered CS in early pregnancy of whom 8/10 had clinical reason	7 wk postnatal	Research team linked to hospital; OB blind to study assessed women for clinical risk
Gamble and Creedy, Australia, 2001 (25)	Survey questionnaire	Public, tertiary referral hospital and private obstetric clinics: 1998–1999	310 recruited and completed questionnaire	Birth preferences and reasons	6.4% preferred CS Main reasons: safety of baby 40%; doctor recommended 25%; pain/tears 20%; easy/ convenient 10%	0.3% with no complications	Prospective—in pregnancy	Researcher not connected to hospital; done while waiting in clinic
Hildingsson et al, Sweden, 2002 (26)	National survey of attitudes and worries	Representative sample, during 3 wk over 1 yr, 600 ANCs	71% (n = 3,283) agreed to take part of whom 94% (n = 3,061) completed it	Rates of preference for CS and associated factors	8.2% preferred CS; associated with previous CS, age >35, previous negative birth experience, worries about birth (log regression)	NR	Mailed shortly after antenatal booking visit	Self-completion; Researchers were from a nursing department
Edwards and Davies, Cardiff, Wales, 2001 (27)	Survey questionnaire	All women, over 5 mo period, attending antenatal booking clinic	344 women; not clear how many given out and to whom	Women's hypothetical birth preferences and reasons for elective CS	"Preferred mode of delivery": 79.1% await spontaneous labor/IOL at 41+ wk; 6.4% IOL at 39 wk; 14.5% elective CS at 39 wk Higher median age preferred CS (32 vs 29) Reasons: vaginal trauma 28%; safer for baby 25%; avoid long labor 21%; timed delivery 18%	NR	Distributed at booking clinic	Not clear who administered

(continued)

Table 1. *Continued*

Study	*Design*	*Sample*	*Numbers*	*Outcome*	*Summary of Main Results*	*% Requesting CS in Absence of Complicating Obstetric Factor*	*Timing of Data Collection*	*Who Collected the Data?*
Chong and Mongelli, Singapore, 2003 (28)	Survey: questionnaire	Women attending public ANC: November 2000 to December 2001	160 responses (65% participation rate) 50% Chinese; 20% Indian; 21% Malay 2% white; 9% other	Birth preferences and reasons; awareness of complications of CS and VB	3.7% preferred CS Main reasons: avoiding labor pain; lowering risk of fetal distress; 2% would recommend CS to friends; 71% women should have right to request CS Awareness of complications for all types of birth generally low	NR	Prospective, hypothetical	Unclear
Donati et al, Italy, 2003 (29)	Survey: questionnaire administered by interview	2,092 eligible 100 consecutive deliveries in 23 university hospitals	Interviews of 1,023 primiparas are reported here, 95% response rate	Retrospective birth preferences	90% of those who had VB and 77% who had CS would have preferred VB	NR	In hospital on afternoon before postnatal discharge	"Trained interviewers"
Tatar et al, Turkey, 2000 (30)	Survey: structured interviews using questionnaire, with closed and open questions	Random sample teaching hospital: January to July 1998	171; 89 (52%) had a CS	Women's perceptions of CS	80% of CS women and 32% VB would not choose it for subsequent pregnancy; women who had CS were more likely to be dissatisfied; socioeconomic factors did not predict mode of birth	NR	In hospital 2–4 days postnatal	Not clear
Johanson et al, UK, 2001 (31)	Survey questionnaire	Women attending ANC and health professionals	117 women; 88 professionals (19 were male, 18 nulliparous, 7 multiparous health professionals)	Hypothetical birth preferences	Preference for CS: 9% nulliparous patients; 5% multiparous patients; 20% nulliparous professionals; 8.5% multiparous professionals	NR	Prospective, hypothetical	Unclear: Researchers were OBs

(continued)

Table 1. *Continued*

Study	*Design*	*Sample*	*Numbers*	*Outcome*	*Summary of Main Results*	*% Requesting CS in Absence of Complicating Obstetric Factor*	*Timing of Data Collection*	*Who Collected the Data?*
Marx et al, Wales, 2001 (32)	Survey and VAS of perceived role of OB/patient in elective CS decision	OBs in 1 hospital: May to July 1999	75 women's bookings for elective CS; no data on the women	Women's role in choosing CS as perceived by OBs	OBs perceived 7% were 100% patient choice; 33% were 100% obstetric reasons Definitions of OB reasons varied across OB and reasons such as breech or 1 previous CS tended to be scored > 50% women's choice	7% of elective CS scored by OBs maternal choice alone	Completed at time of booking any woman for elective CS	Self-administered by OBs; researchers were OBs

CS = cesarean section; VB = vaginal birth; NR = not reported; ANC = antenatal clinic; OB = obstetrician; GP = general practitioner; VAS = visual analog scale; IOL = induction of labor; PO = participant observation.

had a direct focus on women's choice of, or preference for, cesarean section and/or women's role in decision making about mode of birth. However, the studies used different, and sometimes indirect, measures to assess this focus. Apart from the 3 epidemiological studies, which used routine birth cohort data (16,19,22), 13 studies sought women's views (17,19, 23–30), with 3 including women and health professionals (18,21,31). The remaining study (32) asked obstetricians to record their own view of the woman's role in the decision to have an elective cesarean section. Interestingly, this study was entitled "A survey of the influence of patients' choice on the increase in cesarean section rate."

Quantitative Studies with Rate as an Outcome

Only 3 studies (16,23,25) attempted to measure directly the rate of women's preferences for cesarean section without clinical indication, but differences in setting, study approach, or definitions made them difficult to compare. One additional study (24) asked whether women had considered the option of birth by cesarean section in early pregnancy, and distinguished those respondents with and without clinical risks. Rates varied from 0.3 percent of women with no clinical indications in Gamble and Creedy's Australian study (25) to 13.4 percent in Lapeyre et al's (23) United States study. Although Lapeyre et al asked women what they would choose if given the choice of type of delivery, several of those stating this preference had undergone a previous cesarean section, whereas Gamble and Creedy distinguished preferences of women without clinical indications. The remainder of studies looked at other relevant issues, such as maternal factors associated with cesarean section rates or women's views about mode of birth.

In studies that relied on routine records (16,22), it was unclear whether or not women had clinical indications. In Lin and Xirasagar's study (16), for example, 3.5 percent of women were recorded in 2001 in the database as having a cesarean section with no reason given by the obstetrician, a rise from 2 percent in 1997; however, a more detailed analysis of year 2000 data showed that a high proportion of those recorded with no indication had a major obstetric diagnosis, such as breech presentation, distress, or dystocia, and figures included a cohort of women who had previous cesarean sections but were still considered eligible for vaginal birth.

Decisions with respect to defining clinical indications are not absolute, and in compound cases, obstetricians may argue that there is a justification for the woman weighing up the complex and uncertain risks and benefits for herself, and deciding what they mean

for her. Some may define this as "maternal choice." Marx et al focused on obstetricians' perceptions of women's choices and found that most cases were classified as lying somewhere between total maternal choice and medical choice with 5 (of 75) elective cesarean sections defined by the obstetrician to be conducted because of 100 percent maternal choice (32).

Qualitative Studies with Decision Making as an Outcome

Few studies directly addressed women's own perceptions of their role in decision making. One study interviewed 6 women who defined themselves as having chosen a cesarean section without medical indication, although the article does not make clear how this was defined or how the sample was obtained and selected (17). For example, 1 woman had a history of infertility, which may or may not have been seen as an indicator for cesarean section. Although this study stated an aim of exploring Chinese women's perceptions of their autonomy in decision making, the data presented only addressed this aspect briefly, the main focus being on why they had chosen cesarean section. The only study that included direct observation of practice indicated that women's role in decision making was less than that described by professionals in interviews (20). In this study, although many women did not appear to want a cesarean section, obstetricians who perceived they were afraid of birth seemed to be steering them toward this option.

Eight studies (17,18,20,23,25–28) that explored the reasoning and motivation among women for expressing an interest in, or preference for, cesarean section included both qualitative and quantitative studies and showed consistent results. Apart from obstetric or medical factors, key reasons cited were, first, psychological, which related particularly to previous negative birth experiences, poor care, perceived inequalities in care, and specific fears or worries about birth; and second, reasons related to perceptions about safety, particularly believing or being informed that cesarean section was safer for the baby, or would lead to less trauma for their body. Cultural and social factors, such as Chinese views about auspicious birth dates, and more commonly, association between medicalized birth and higher social and economic status, may have influenced the views of women in some countries with high rates of both inequality and medicalized birth, although flaws in these studies, such as ignoring potentially influential background factors, such as a history of infertility (17), or attempting to extrapolate women's actual birth preferences from rates of cesarean section on different days, made this difficult to infer. In addition, several studies from Latin America, which is characterized by very high rates of inequality and medicalized birth, particularly for private patients, challenged the view that women in private facilities with extremely high rates of cesarean section actively chose this mode of birth or were satisfied with it (18,20,21).

Critique of Design and Methods

The designs and methods varied, but all designs were descriptive, including epidemiological studies ($n = 3$) (16,18,22); survey ($n = 11$) (20,21,23–29,31,32); structured interviews ($n = 2$) (19,30); qualitative interviews ($n = 4$) (17,18,20,21); and participant observation ($n = 1$) (20); with 3 studies using more than one of these approaches. Although several studies described using an ethnographic approach (18,20), they were mainly qualitative interview based and only 1 study used direct observation of practices (20). Only 1 study used a longitudinal approach (19). The methods used are summarized in Table 1, and the appraisal is summarized in Table 2.

Several methodological limitations mean that the results of the studies need to be read cautiously, and illustrate the challenge and complexity of trying to identify rates of maternal request for cesarean section or women's roles in decision making.

Sampling

It appeared that only 4 studies excluded some or all high-risk women from their samples (16,17,21,29), and on review, each included some proportion of women with clinical indications for cesarean delivery, illustrating the difficulty of identifying cases where cesarean delivery may be simply the woman's choice. The inclusion of high-risk women in a sample makes it more likely that a greater proportion of women will have a preference for cesarean section. This factor is particularly important in studies using inferential statistics in more general samples, to test for associations of birth preferences with factors, such as maternal age, views of birth, or obstetric history. In such cases, these factors are likely to confound the analysis. For example, older mothers are more likely to be advised that they could have birth complications or to have experienced a previous cesarean section.

Prospective Versus Retrospective Studies

Some studies were retrospective—asking women with vaginal delivery or cesarean delivery what they would have preferred (18,20,29) or would prefer for a future birth (30). These studies, in the context of a high

prevalence of cesarean section, suggested that most women who had a cesarean birth would have preferred a vaginal birth. In Murray's Chilean study, for example, in a private clinic where 70 percent of women had a birth by cesarean section, only 18 percent (regardless of risk) said they had wanted one (21). Of the 7 prospective studies (19,23,25–28,31), only 1 (25) distinguished the preferences of women without obstetric complications from the current pregnancy or previous births. Among those with no complications, only 1 of 137 primigravid women preferred a cesarean section.

It is difficult to be certain of the reliability of data when women are questioned retrospectively about earlier intentions. Although women may recall events well, they may be likely to appraise their cesarean delivery experience positively if they believed that the cesarean section ensured their safety or their baby's health. Gamble and Creedy discussed this issue in depth, referring to the tendency to rationalize their experience as a means of coping with it (5). The phrase, "what is must be best," was coined to explain this phenomenon (33). However, this issue may be a matter of timing: early in the postnatal period such reasons for positive appraisal may come into play strongly, whereas several studies suggest that over time the appraisal becomes less positive (34,35).

No studies sought women's views longer than 1 month after childbirth. At this point, women are still in the early stages of recovering from birth and may feel a great sense of relief at "safe delivery" and a sense of obligation to health professionals. Nonetheless, as we have discussed, the retrospective studies, asking women's views soon after birth, showed that some women were not happy with having had a cesarean delivery.

Only 1 study used a longitudinal approach, with structured interviews in early pregnancy, late pregnancy, and 1 month postnatally, and problems occurred with high dropout rates for follow-up, particularly for those with less education and high parity (19). In addition, the structured nature of the interviews limited the opportunity to explore how women's views might change across the maternity experience.

Data Collection and Reporting by Clinicians and in Hospital

Not all the articles indicated clearly who had been involved in data collection. Of those where this was reported, excluding the 2 studies using only routine data (16,22), 4 were involved in service provision (23,24,31,32), and 5 were independent (18,20,26,27,29). Clearly, data collection by service providers may influence responses, particularly where, as in these studies, the respondents are still using the service, potentially encouraging more compliant responses from women.

A related issue is where data collection occurs. Individuals who are asked to complete questionnaires within the hospital setting may be more likely to feel under pressure to give compliant answers than those who complete questionnaires at home. In the articles that described where data were gathered, most interviews or completion of questionnaires took place in hospital, in antenatal clinics, or in the few days after birth.

A major methodological issue is whether the women's preferences were reported by the women themselves or by professionals. Although more studies from 2000–2005 involved direct reporting of the women's views, several echoed the problems highlighted in Gamble and Creedy's original review (5), where reasons for cesarean section are defined by professionals who have been shown to vary widely in their assessments, and tend to attribute a larger role in decision making to women's choices than the women themselves actually feel. The only study which recorded observation threw interesting light on these issues, since obstetricians described women as pressuring them to agree to a cesarean section, whereas the observation record revealed a more complex situation, where women felt denied good care or support for pain, and professionals interpreted their expressions of distress as "acting out" so as to obtain a cesarean section (20). Apart from these observations, none of the studies directly compared professionals' and patients' perceptions of specific decisions.

One study (31), which sought health professionals own (hypothetical) views, showed relatively high rates of personal preference for cesarean section among health professionals when compared with childbearing women's views—findings that echo those of Cotzias et al (3), although interestingly, this preference for cesarean section was far greater for health professionals who had not given birth (20%) than for those who had (9%). It is possible that health professionals will infer from their personal views that these are likely to be shared by women in general.

The study by Marx et al specifically sought obstetricians' views about the role of women in cesarean section decisions (32). Obstetricians completed a visual analog scale to indicate their perception of the balance between 100 percent maternal request (without clinical indication) and 100 percent clinical decision, each time they booked an elective cesarean section (32). They reported a high level of maternal involvement—with only 25 women (33% of 75) reported as having a cesarean section entirely because of a clinical need. Five women (7%) were indicated as making the choice

Table 2. Summary of Appraisal of Reviewed Studies

Study and Type	*Explicit Theoretical Framework or Literature Review?*	*Appropriate Sample and Recruitment?*	*Methodological and Analytical Quality?*	*Data Presented to Support Conclusions?*	*Steps to Avoid Bias?*	*Attempts to Control for Confounders?*
Lin and Xirasagar, 2005 (16); epidemiology	Assumption that maternal request significant, so aims to explore sociodemographic predictors; literature review limited	Yes; good size sample, covering 5 yr and divided into age bands	Not entirely clear how data accessed or who gave permission	Yes	Main challenge is possible bias and inconsistency in record system; OBs' definition of clinical need used as proxy for maternal request	Regression analysis controlled for age, institution type, and comorbidity, but not for other possible sociodemographic factors
Lee et al, 2001 (17); qualitative interviews	Poorly referenced and weak theoretical framework	Very small, criteria described but not how women recruited	No description of topics/questions included in "interview guide"	Little information given on questions asked or on analysis	Not clear who conducted interviews which were done on a postnatal ward 2 days after elective CS	No; not clear that all had no clinical risks; 1 had history of infertility
Behague et al, 2002 (18); epidemiology and ethnography	Limited references; no clear framework but focuses on inequality and lacks context that would be expected for ethnography	Good size; basis for women's sample clear but not how professionals selected	Brief description of methods used, no plan for data analysis included	Limited; Also, unclear whether the women interviewed requested CS	Public health researchers; interviewer not a health professional	Controls for socioeconomic factors and explores women's feelings about care
Potter et al, 2001 (19); longitudinal interviews	Broad, relevant literature review; no explicit framework but acknowledges a range of perspectives	Good size stratified sample but high and uneven dropout rate	Methods and statistical tests fairly clear, but not clear how sample recruited or who conducted interviews	Yes	No information given	Yes
Hopkins, 2000 (20); ethnographic, mixed method	Good literature review and clear but open theoretical framework	Very clear, appropriate basis for sampling and across range of settings	Methods and data analysis clearly described	Very clear and detailed	By researcher who was not a health professional or linked to local service; triangulation of methods and data sources	N/A
Murray, 2000 (21); survey and interviews	Yes	Clear basis for women's sample; less clear for health professionals; range of settings	Clear description of methods and data analysis; data support conclusions	Yes	Questionnaire 24–72 hr after birth; interviews not clear	N/A
Lo, 2003 (22); epidemiology	Limited selective review; standpoint that already known that maternal request is a major issue	Good size and total data set but unclear about clinical indications	Limited information on data analysis but clear description of methods used	Data to support hypothesis but not the conclusions drawn from this	Routine data completed and collected by OBs	Log regression to control for clinical and nonclinical variables such as type of day

(continued)

Table 2. *Continued*

Study and Type	*Explicit Theoretical Framework or Literature Review?*	*Appropriate Sample and Recruitment?*	*Methodological and Analytical Quality?*	*Data Presented to Support Conclusions?*	*Steps to Avoid Bias?*	*Attempts to Control for Confounders?*
Lapeyre et al, 2004 (23); survey	Selective review mainly about safety of CS and key studies not known; explicit position that CS safe and VB risky	Appropriate size for descriptive study but self-selected convenience sample and no data on setting, rate of response, or obstetric risk	Questionnaire in pilot stage; women asked to complete it in ANC; no information on attempts to establish validity or reliability; descriptive statistics used	N/A as statistics presented with no interpretation	No	All authors are OBs except a statistician; women asked to complete questionnaire while awaiting their visit
Walker et al, 2004 (24); attitude survey	Explores role of community, cultural attitudes or social norms of acceptance toward CS	Appropriate for study type but high number of exclusions and 62% response rate	Clear description of methods used and data collection	Yes, but retrospective recall of consideration of CS in pregnancy and low response to this question	Research team linked to hospital but clinical risk was assessed "blind" to study	Controls to test for differences across sociodemographic factors
Gamble and Creedy, 2001 (25); survey	Yes, broad review with good critique of limitations of previous studies and the need to undertake studies that address those limitations	Good size, representative of state population	Clear description of methods and appropriate analysis with awareness shown of limitations of study	Yes	Researcher not connected to hospital but done while waiting in ANC	Yes
Hildingsson et al, 2002 (26); national survey	Yes, reason for study given as recent rise in CS, seen as partly maternal choice but limited data	Good size, representative sample	Clear description of methods and data analysis	Yes, but no data to show whether women who preferred CS had clinical indications	Questionnaire mailed	Log regression to test associations with factors such as previous birth experience and worries about birth
Edwards and Davies, 2001 (27); survey	Brief, selective review of the literature; no explicit theoretical framework or discussion	Good size but very unclear how recruited, how many women given form or completed it, or characteristics of sample	No clear description of methods used or data analysis; 1 inferential statistic presented, but without explanation	Little correlation between conclusion and data presented	Not clear who administered/gave out or when completed; no information on attempts to established validity or reliability	Descriptive statistics used; 1 p value presented (control for age) but without clear explanation of basis or whether other tests used
Chong and Mongelli, 2003 (28)	Adequate references and theoretical framework	Good size but over-represents better educated women	Clear description of methods and data analysis	Yes	Not clear who administered or gave out questionnaires	Regression analysis to determine whether maternal characteristics predictors of maternal preference

(continued)

Table 2. *Continued*

Study and Type	*Explicit Theoretical Framework or Literature Review?*	*Appropriate Sample and Recruitment?*	*Methodological and Analytical Quality?*	*Data Presented to Support Conclusions?*	*Steps to Avoid Bias?*	*Attempts to Control for Confounders?*
Donati et al, 2003 (29); survey	Yes, broad review of evidence and discussion of relevant issues and debates	Good size and response but over-represents younger, better educated women	Unclear as to whether interviews taped, otherwise methods and data analysis clear	Yes	Retrospective, administered in hospital before postnatal discharge; little on attempts to avoid bias or who administered	Controls for regional and demographic factors
Tatar et al, 2000 (30); interview and survey	Good literature review; theoretical position appears very open	Random 6 mo sample	Clear description of methods but no description of data analysis	Yes	Interviewed in hospital 2–4 days postnatal; not clear who conducted interviews	N/A
Johanson et al, 2001 (31); survey	Only 2 research references; standpoint that vociferous women demanding elective CS may divert resources from others	Basis for sample and how recruited is unclear; unclear if sufficient size for tests used	No clear description of methods used or data analysis	Very unclear presentation of results; no demographic data given on respondents	Insufficient information given	No
Marx et al, 2001 (32); audit/survey using VAS	Poor, limited review; assumes that OBs are able to report women's choices	Consecutive sample, basis for size not clear; not clear how many OBs involved and if any refused	No clear description of methods used or data analysis; good methodological rationale for VAS given	Details of analysis missing	OB providing care reported woman's role in the decision	N/A

CS = cesarean section; VB = vaginal birth; ANC = antenatal clinic; OB = obstetrician; N/A = not applicable; VAS = visual analog scale.

in the absence of any clinical consideration. This study was conducted before publication of Hannah et al's breech trial (36), and although Marx et al's study (32) was published after the term breech trial was published, breech position was cited as maternal choice cesarean section. The clinical reasons listed by the respondents indicated wide differences among obstetricians as to what they regarded as a clinical reason.

Using Routine Data and Determining Reasons for Cesarean Section

In the case of routine birth cohort data, as used in epidemiological studies, the data would normally have been recorded by obstetricians or midwives. In the study by Lin and Xirasagar (16), using the Taiwan National Health Insurance database, obstetricians recorded the indication for cesarean section. They had a financial reason to record any clinical indications, and the detailed analysis of the 2000 data showed that in 2,723 (3.1%) of physician-decided cesarean sections, no record of obstetric complications was made. In contrast, of the 5,906 (6.3% of 93,236) maternal request cesarean sections, significant problems such as breech presentation, fetal distress, and dystocia were recorded in 3.7 percent ($n = 221$) of the cases. In an additional 939 (15.9%) cases, obstetric complications that might necessitate delivery by cesarean section were recorded. This study illustrated the difficulty of interpreting information about reasons for cesarean section when professionals record data on routine records.

Methodological Quality Criteria

The quality criteria applied to the reviews are summarized in Table 2, which demonstrates that the quality of studies was varied highly, with several having both strengths and weaknesses. Other studies had several weaknesses according to widely agreed critical appraisal criteria or were so poorly reported that it was difficult to apply the criteria from reading the published article. Our discussion has also highlighted the methodological and practical challenges that researchers face in attempting to identify women's birth preferences. In addition, although some studies appeared to be of high quality, they raised definitional or conceptual problems, which we will discuss in detail in a subsequent article. For example, a study might be technically of high quality, but failed to measure what the title or discussion suggested, or drew conclusions that did not appear to be supported by the data. This problem partly relates to the complexity of studying issues of choice and decision making, which clinical researchers may underestimate. Lo's study (22), for example, which was well conducted on a good sample, confirmed the hypothesis that cesarean deliveries are more common on auspicious days and less common on weekends. However, the inference drawn that maternal demand for cesarean section is a major issue was not supported by this analysis—which could simply reflect the cultural preference for auspicious days among women who were planning a cesarean section for other, including clinical, reasons.

Discussion and Conclusions

As we have discussed, it was not possible to draw up a simple summary of findings or to conduct a meta-analysis of quantitative studies because of differences in the outcomes and types of measures used, and the ways in which outcomes were defined or conceptualized. The rates of maternal choice of, or preference for, cesarean section remain unclear. However, little good evidence is available to suggest high levels, and indeed, well-conducted studies, which focused directly on the views of women without medical indications, suggest that rates remain low. In addition, those studies that focused on reasons for women's preferences suggest that the minority who do request cesarean section have reasons which they regard as clinically or psychologically important. These studies also show evidence that cultural, institutional, and professional settings of decision making and quality or inequality of care may play an important role, but more work is needed to understand these possible factors better.

Our search generated more opinion articles than it did research articles. The content of the opinion articles and implications of this factor for research and practice will be discussed in a later article. However, this balance of numbers indicates that elective cesarean section is a topic of considerable concern, which may be informed more by professional opinions than by research evidence. It was of note, therefore, that several of the article authors gave as the rationale for their study the existing literature to indicate that maternal choice was a major issue. Opinion articles may influence the research discourse directly or through other means such as media impact.

This review of studies with a range of approaches and in highly varied contexts suggests that maternal choice does not constitute a major driver for rising cesarean section rates. In addition, several studies in settings with high prevalent cesarean section rates challenge the view that women's choices play a major role in decision making. Several studies conversely suggest that professional perceptions of women's

views, and their own personal preferences, may be emerging as an important factor in decision making related to mode of birth.

The quality of the studies identified varied widely, and the presence of definitional and methodological issues created difficulties in drawing clear inferences from some studies. Where processes of decision making are concerned, it is also crucial to consider broader research issues, such as the social, cultural, and political-economic contexts of maternity care, the types and manner of information given to underpin informed consent in health care, and broader sociopolitical issues, such as the status of women and of health care. A wide range of studies of different health care issues have shown these factors to be important in how decisions about health care are made, and how limited health care resources are allocated, including the influence of professional and consumer choice or preferences.

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