BMC Women's Health

Research article

Are women and providers satisfied with antenatal care? Views on a standard and a simplified, evidence-based model of care in four developing countries

Ana Langer *[1], José Villar [2], Mariana Romero [3], Gustavo Nigenda [4], Gilda Piaggio [2], Chusri Kuchaisit[5], Georgina Rojas [6], Muneera Al-Osimi [8], José Miguel Belizán [8], Ubaldo Farnot [9], Yagob Al-Mazrou [10], Guillermo Carroli [3], Hassan Ba'aqeel [13], Pisake Lumbiganon [5], Alain Pinol [2], Per Bergsjö [12], Leiv Bakketeig [13], Jo Garcia[14] and Heinz Berendes [15]

Address: [1]Regional Office for Latin America and the Caribbean, The Population Council, Mexico City, Mexico, [2]Special Programme of Research, Development and Research Training in Human Reproduction, World Health Organization, Geneva, Switzerland, [3]Centro Rosarino de Estudios Perinatales, Rosario, Argentina, [4]Fundación Mexicana para la Salud, Mexico City, Mexico, [5]Khon Kaen University, Khon Kaen, Thailand, [6]Hospital Gineco-Obstétrico "América Arias", Havana, Cuba, [7]National Guard King Khalid Hospital, Jeddah, Saudi Arabia, [8]Latin American Centre for Perinatology and Human Development, Montevideo, Uruguay, [9]Hospital Gineco-Obstétrico "América Arias", Havana, Cuba, [10]Ministry of Health, Riyadh, Saudi Arabia, [11]National Guard King Khalid Hospital, Jeddah, Saudi Arabia, [12]Department of Obstetrics and Gynaecology, University of Bergen, Bergen, Norway, [13]National Institute of Public Health, Oslo, Norway, [14]National Perinatal Epidemiology Unit, Oxford University, Oxford, England and [15]National Institute of Child Health and Human Development. Bethesda, Maryland, USA

E-mail: Ana Langer* - alanger@popcouncil.org.mx; José Villar - villarj@who.ch; Mariana Romero - mromero@cedes.org; Gustavo Nigenda - gnigenda@funsalud.org.mx; Gilda Piaggio - piaggiog@who.ch; Chusri Kuchaisit - chusri-k@medgib.kku.ac.th; Georgina Rojas - rojas@infomed.sld.cu; Muneera Al-Osimi - mun16@hotmail.com; José Miguel Belizán - belizanj@clap.ops-oms.org; Ubaldo Farnot - farnot@infomed.sld.cu; Yagob Al-Mazrou - yalmazrou@hotmail.com; Guillermo Carroli - gcarroli@crep.org.ar; Hassan Ba'aqeel - hassanbaaqeel@hotmail.com; Pisake Lumbiganon - pisake@kk1.kku.ac.th; Alain Pinol - pinola@who.ch; Per Bergsjö - p-bergsj@online.no; Leiv Bakketeig - arosenkrantz@health.sdu.dk; Jo Garcia - jo.garcia@perinat.ox.ac.uk

*Corresponding author

Published: 19 July 2002

BMC Women's Health 2002, **2**:7

Received: 26 April 2002
Accepted: 19 July 2002

This article is available from: http://www.biomedcentral.com/1472-6874/2/7

Abstract

Background: This study assessed women and providers' satisfaction with a new evidence-based antenatal care (ANC) model within the WHO randomized trial conducted in four developing countries. The WHO study was a randomized controlled trial that compared a new ANC model with the standard type offered in each country. The new model of ANC emphasized actions known to be effective in improving maternal or neonatal health, excluded other interventions that have not proved to be beneficial, and improved the information component, especially alerting pregnant women to potential health problems and instructing them on appropriate responses. These activities were distributed within four antenatal care visits for women that did not need any further assessment.

Methods: Satisfaction was measured through a standardized questionnaire administered to a random sample of 1,600 pregnant women and another to all antenatal care providers.

Results: Most women in both arms expressed satisfaction with ANC. More women in the intervention arm were satisfied with information on labor, delivery, family planning, pregnancy complications and emergency procedures. More providers in the experimental clinics were worried about visit spacing, but more satisfied with the time spent and information provided.

Conclusions: Women and providers accepted the new ANC model generally. The safety of fewer visits for women without complications with longer spacing would have to be reinforced, if such a model is to be introduced into routine practice.

Background

In spite of the increasing involvement of technology in routine antenatal care in both developed and developing countries, the clinical encounter between patient and caregiver still represents the core of the current health care paradigm. At least in theory, any care offered should be acceptable for the recipients. However, the importance of allowing for patients' views, alongside medical and economic considerations regarding care assessment during pregnancy and childbirth, wasn't stressed until the late 80's and almost only in developed countries [1].

The importance of caregivers' views has been acknowledged even less frequently, even though it is a crucial component of any attempt to change institutional protocols. [2] In fact, such views about their own clinical work can strongly influence daily performance and acceptance of institutional protocols and norms [3]. For example, physicians' attitudes appear to be the most important factor influencing the rate of Caesarean sections [4].

Undoubtedly, patients and caregivers' perspectives mirror the quality of the care received and provided. However, quality of care has been traditionally a difficult concept to operationalize. As a reflection of the emphasis on the application of advanced technology and specialized training, quality of care has been largely defined in terms of clinical aspects, neglecting social interaction and the subjective dimension of the patient [5]. Only in the last decade and based on Donabedian's work [6] did Bruce's framework highlight the importance of stressing not only the technical but also the interpersonal domain in the field of family planning [7].

Measuring quality of care conceptualized in such a broad manner represents a true challenge. While the technical quality of a health service can be assessed by evaluating the outcomes of the care provided, the subjective dimension of quality of care (interpersonal relationship with the provider and the system's responsiveness to the expectations of the population) can only be assessed through interviews that are strongly influenced by the cultural milieu and the circumstances under which they are conducted. In the field of antenatal care, recent efforts have been made to sort out these various influences [8–13]; however, the knowledge about users' views is still very limited, especially in developing countries [14,15]. This paper describes women and providers' perceptions of the quality of antenatal care (ANC) and their degree of satisfaction with it, alongside a large randomized controlled trial [16–18].

Methods

The project reported here was a special component of a large multicenter randomized controlled trial, to evaluate a new ANC program [18]. The primary hypotheses tested were that a new ANC model, consisting only of actions scientifically proven to improve maternal and newborn outcomes, was as effective as the traditional model with regard to specified maternal and perinatal end-points among singleton pregnancies, was not more expensive, and was accepted by women and providers [16]. Conducted by WHO and collaborating organizations, fifty-three randomly allocated (cluster randomization) ANC clinics in Argentina, Cuba, Saudi Arabia and Thailand participated in the study, providing either the new program or the traditional program in use. There were 12,568 women randomized to the new model and 11,958 to the standard ANC model [18].

The model in the control clinics was the antenatal care currently offered, following guidelines formally recommended by the local health authorities, based on the traditional western model. In general, women made visits once a month during the first six months, one every 2–3 weeks for the next 2 months, and one every week until delivery. Clinical activities, urinary tests, syphilis screening, hemoglobin measurement, and blood group typing were done routinely.

In the intervention clinics, women judged not to need further assessment or special care at the time of the first visit according to predefined risk criteria were assigned to the new ANC model, which required fewer visits (usually four) with longer spacing between them than the standard ANC model recommended. Activities in the new program included: 1) screening for health conditions likely to increase the risk of adverse pregnancy outcomes; 2) providing interventions known to positively impact pregnancy outcomes, and excluding other common interventions that have not proved beneficial to pregnant women (e.g., maternal weight was measured only during the first visit; subsequent measurement was limited to patients with low weight); and 3) alerting pregnant women to potential health problems, especially emergencies, and instructing them on appropriate responses (e.g., recommendations for emergencies were provided in each visit; at the third visit instructions for delivery and suggestions for breastfeeding and contraception were included) [16]. Results of the general effectiveness of the new ANC model (measured by examining low birth weight for the fetal condition and rates of preeclampsia/eclampsia, severe postpartum anemia, and treated urinary tract infection or pyelonephritis for the maternal conditions) have been published elsewhere [18]. The assessment of women and provider satisfaction with the standard model and the new model is described here.

Study Design

The assessment of women and providers' perception of the quality of both models of antenatal care was organ-

ized in two stages. First, we used an ethnographic approach, including focus group discussions and in-depth interviews with women and health personnel to assess the culture-related values in each country. During the qualitative stage we addressed general topics on health care provision and prenatal programs to gain initial understanding of the way health care was perceived in each specific cultural context [17]. The findings of this in-depth study [19] were incorporated in the second stage (quantitative), which used standardized, closed-ended questionnaires that were prepared based on the most relevant categories obtained at the qualitative stage and the aspects of antenatal care that were expected to change as a result of the intervention (i.e., number of visits, spacing, time with provider, and information provision regarding maternal and perinatal health and complications). Both instruments (one for women, one for providers) were developed in English, translated into Spanish and Arabic, and piloted in each country. Changes suggested in each site were incorporated into the final version of the instruments by the investigators responsible of this component of the trial and then reviewed and approved by a WHO special technical review group. These final English versions (see Additional File 1 [Women's questionnaire] and Additional File 2 [Providers' questionnaire]) were again translated into local languages.

The questionnaire for women consisted of 24 questions addressing patients' preferences about the number of antenatal care visits; time spent in the waiting room and with the caregiver; and the amount and appropriateness of the information received during the visits. Women were also asked about their worries concerning their health status and their babies', and the reassurance they received from the provider. Because of the known limited validity of questions that include the word "satisfaction", we decided to include only one direct question ("Are you satisfied with the antenatal care you have received in this clinic so far?"), adapted from a previous antenatal care trial [20] to facilitate their meta-analysis, and two indirect ones ("Would you come back to this clinic?" and "Would you recommend this clinic to a relative or friend?"), which were developed based on information gathered from the focus groups (see Additional File 1 [Women's questionnaire]). We expected the "satisfaction" variable to synthesize women's overall perceptions of the quality of antenatal care [17].

The questionnaire for providers included 15 questions, probing the same issues as the patients': number and spacing of antenatal visits, time spent with the woman, information provided, perception of the quality of antenatal care, and recognition of women's satisfaction. (see Additional File 2 [Providers' questionnaire])

While some questions were worded per the terminology used in each country, their meaning was retained in the four settings. Both questionnaires were piloted in the four participating areas and adjusted accordingly [17].

Sample size and sampling strategy

The sample size was estimated to detect a minimum difference between a dissatisfaction rate of 5% in one arm and 10% in the other, with a two-sided test at a significance level of 5%, and with 80% power. The sample size obtained with standard formulas to compare two proportions for individually randomized design was multiplied by a design effect of 1.7 to account for the decrease in efficiency of the cluster randomized design. A sample of 1600 women (800 per arm of the study, 400 per country) was deemed necessary. A design effect of 1.5 had been previously calculated for the outcome of low birth weight [21]. Since this design effect does not necessarily apply to a different outcome, and there was no information regarding design effects or intraclass correlation coefficients from other studies, we arbitrarily increased it to 1.7. The survey used clinics as strata, and women were sampled proportionally to each clinic's number of women per year.

The interviewers started surveying all eligible women on a randomly selected day and continued during working days until enrolling the estimated sample size. Because women needed to be sufficiently exposed to ANC in order to form their own opinion on the quality of care they had received, we administered the questionnaire only to patients that were at 32 weeks of gestational age and had attended the health care facility for their second or subsequent antenatal visit. The women were surveyed in a private environment, in approximately 15 minutes. We did not request an individual separate informed consent for this component of the trial but we did have special institutional consent. Therefore, the questionnaire was administered to all women that met the inclusion criteria (i.e., 32 weeks of gestational age and two or more antenatal care visits) in both clinics' groups until completion of the sample size.

We asked all 174 ANC providers from both intervention and control clinics to complete a self-administered questionnaire that took approximately 10 minutes. We recruited 92 caregivers from the experimental institutions (57 physicians, 33 nurses, and 2 midwives) and 82 from the routine care arm (54 physicians, 25 nurses, and 3 midwives). No provider refused to fill the instrument.

Outcomes

Regarding the women's survey, affirmative answers to questions about satisfaction measured overall satisfaction (primary outcome). Other satisfaction dichotomous out-

comes were satisfaction with number of visits, spacing between visits, waiting time, and time spent with provider.

Additionally, the following four summary indexes were constructed as outcomes for the women's survey: 1) Information received, defined as the number of 'as much as you wanted' answers provided by a woman to the six questions on information received about looking after own health, tests during pregnancy, any treatment that might be needed during pregnancy, labor, breastfeeding and family planning; 2) Information about how to recognize problems, defined as the number of 'yes' answers provided by a woman to the six questions on: whether she was told how to recognize the following pregnancy-related problems: rupture of membranes, hemorrhage, premature contractions, dizziness and fainting, fever, and other; 3) Information about what to do in the presence of the above-described problems; and 4) Information about how to recognize and handle these problems. For every woman, each index summarized six questions of the survey, thus the numerical value could vary from 0 to 6.

For the providers' questionnaire, information given was measured through an index defined as the number of 'yes' answers to the six questions about health, tests and treatments during pregnancy, labor and delivery, breastfeeding and family planning. This index also ranged from 0 to 6.

Data analysis

Percentages or mean and standard deviations, as appropriate, were computed by group for baseline variables for the women interviewed, by arm, and checked for imbalance between groups. Baseline statistics for the sub-sample of women interviewed were compared with those for all participants to confirm that they were representative of the main trial population.

For the women's survey, the average values of the event rates of satisfaction outcomes were compared between arms, using a rate difference and a t-test at the cluster level, obtaining the standard errors for the difference from a variance analysis adjusted for strata. The indexes were analyzed as numeric outcomes using a random model approach, with clinic and subject as random factors, and arm and strata as fixed factors. Outcomes were adjusted for baseline variables showing a prognostically important imbalance to detect a possible confounding effect.

Since all the clinics' antenatal caregivers were interviewed, and as they constituted a fixed population, the providers' questionnaire was analyzed descriptively by computing percentages or mean and standard deviations, as appropriate.

Ethical review

This component of the study was reviewed and approved as part of the overall ethical review of the WHO trial, which was approved by the Scientific and Ethical Review Group of the UNDP/UNFPA/WHO/World Bank Special Programme on Research, Development and Research Training in Human Reproduction, the WHO Secretariat Committee for Research into Human Subjects, the Institutional Review Boards of the individual participating centres, and corresponding health authorities of the regions where the trial was implemented.

Results

Since this was a randomized controlled trial, the analysis focused on the differences between women and providers in the control clinics as compared to those that offered the new model of ANC.

The comparison between the sub-sample of women recruited for this study and the total trial population showed no significant differences in age, height, weight at first visit, marital status, schooling, proportion of nulliparae and primigravidae, and smoking. However, women in the sub-sample study were slightly better off than women in the main trial regarding prior low birthweight (LBW) (total population: 5.8% *vs.* sub-sample: 4.0%), gestational age at first visit (total population (mean): 16.2 weeks *vs.* sub-sample (mean): 12.7 weeks) and previous hospital admissions (total population: 1.4% *vs.* sub-sample: 0.8%).

Women in both arms of the study had similar characteristics at trial entry (Table 1). There were no differences in prior LBW, stillbirths, neonatal losses and conditions of current pregnancy, but women in the standard ANC model (*i.e.*, control clinics) had a slightly higher proportion of previous abortions (34.2% *vs.* 30.4%). Regarding providers in both trial arms, age and years since graduation were similar.

For women in the new ANC model, the median was five ANC visits (1st quartile: 4; 3rd quartile: 6) while for those in the standard model it was nine (1st quartile: 6; 3rd quartile: 12). The median waiting time to see a doctor or midwife was shorter (Median: 30'; 1st quartile: 20, 3rd quartile: 60) for patients in the new model than for those under the standard model (Median: 45'; 1st quartile: 30, 3rd quartile: 75). There were no differences, however, in time spent with a doctor or nurse for the two arms (median: 15'; 1st quartile: 10, 3rd quartile: 20).

Women under the new ANC model were slightly less satisfied with the number of visits (77.4% *vs.* 85.2%; 95% CI of the difference: -16.0% to 0.2%) and visit spacing (72.7% *vs.* 81.0%; 95% CI of the difference: -16.8% to

Table 1: Baseline characteristics of women enrolled in the satisfaction study, according to ANC model

Women's Characteristics	New ANC (n = 790)		Standard ANC (n = 748)	
	%	Mean (STD)	%	Mean(STD)
Married/stable union	95		93	
Education (less than primary)	16		17	
Smoking during pregnancy	9.5		11	
Substance abuse	0.4		0	
Ratio of persons/room		2.4 (1.3)		2.3 (1.1)
Maternal age (years)		25.5 (5.8)		25.8 (5.6)
Surgery	1.8		0.8	
Any previous LBW (<2500 g)	3.9		4	
Any previous abortions	30		34	
Any previous stillbirths or neonatal losses	3.8		4	
PRESENT PREGNANCY:				
Iso-Immunization Rh (-)	1.3		0.3	
Vaginal bleeding first trimester	2.4		1.7	
LMP unknown	4.3		3.3	
Nulliparae	25		27	
Primigravidae	29		29	
Maternal height (cm)		157 (6.6)		156 (6.4)
Maternal weight at first visit (kg)		59.2 (12.6)		58.9 (11.8)
Gestational age at first ANC visit (weeks)		13 (5.7)		12.4 (5)
Late booking for ANC (>28 weeks at first visit)	2.7		1.7	

Table 2: Women's satisfaction with antenatal care, according to ANC model*

Satisfaction with:	New ANC (%)	Standard ANC (%)	Adjusted mean difference (%)	95%CI	
Number of visits	77.4 (789)	85.2 (744)	-7.9	-16.0	0.2
Spacing between visits	72.7 (782)	81 (744)	-8.3	-16.8	0.3
Waiting time	78.3 (780)	77.6 (743)	0.7	-7.4	8.8
Time spent with provider	85.7 (789)	79.1 (747)	6.6	-0.5	13.7

(Number of women) *Mean differences and 95% CIs adjusted for strata.

0.3%) than their counterparts in the intervention clinics, although these differences were not statistically significant (Table 2). Women in both arms of the trial were equally satisfied with waiting time, but those in the new model were more satisfied with the time spent with their provider, although the difference was not significant (85.7% *vs.* 79.1%; 95% CI of the difference:-0. 5% to13.7%) (Table 2). Adjusting all these outcomes for the baseline abortion rate (which was slightly different among women in the intervention and control groups) did not change the results.

Women in both trial arms were equally satisfied with the information provided by the caregiver about their health, tests during pregnancy and treatment they might need (Table 3) [22]. However, women in the new ANC model were substantially more satisfied with the information received about normal labor and delivery processes, breastfeeding, family planning, and danger signs (Table 3).

During ANC visits, health professionals are usually expected to focus on issues that may worry their patients, a component specially stressed in the new ANC model. Therefore, we asked those women that said they were worried about a specific condition what reassurance they had obtained from their ANC providers (Table 4) [22]. In general, a similar proportion of women in both trial arms

Table 3: Women's satisfaction with information on ANC, labor, delivery, and postpartum care, according to ANC model

Women satisfied with information received about:	New ANC		Standard ANC	
	N	%	N	%
Their own health	789	79.7	744	79.5
Tests during pregnancy	789	86.8	745	83.2
Treatment they might need	788	62.0	744	68.0
Labor and delivery*	785	70.0	745	59.5
Breastfeeding*	789	76.1	743	67.9
Family Planning*	788	65.9	744	51.1
Rupture of membranes*	787	64.3	740	50.5
Hemorrhage*	785	73.0	741	57.4
Premature contractions*	783	73.8	742	59.4
Dizziness and fainting	782	53.3	742	55.9
Fever	779	49.2	741	51.2

* Significant at 5% (adjusted for simultaneous inferences using Bonferroni method) [22]

Table 4: Women who were worried about maternal/perinatal conditions and were reassured by provider

Perinatal/maternal conditions	Women who were worried*				Worried women who were reassured*			
	New ANC		Std ANC		New ANC		Std ANC	
	N	%	N	%	N	%	N	%
Fetal position	788	56.0	788	52.2	436	87.2	395	79.8
Fetal size	788	52.2	740	48.8	406	81.0	355	78.6
Prematurity	787	49.7	740	48.5	384	81.5	354	73.7
Fetal abnormalities	785	60.6	738	59.1	468	76.7	431	68.5
Other complications	762	31.5	720	29.3	328	85.7	402	86.6
Mother's own health	788	42.6	738	55.4	287	88.9	330	87.9
Mother's own weight	787	37.1	737	45.2	188	89.9	166	87.4

* All comparisons non-significant adjusting for simultaneous inferences by Bonferroni method [22]

worried about fetal position, size and possible abnormalities, risk of prematurity, and other complications. Providers reassured a higher number of women in the new ANC model clinics, although these differences were not significant (Table 4).

To assess women's overall satisfaction with the information received during ANC, we compared the composite indexes. Overall, women in the experimental clinics were statistically significantly more satisfied with the general information they received (4.4 *vs.*4.0; 95% CI of the difference: 0.1 to 0.7), with information on how to recognize problems (3.0 *vs*. 2.4; 95% CI of the difference: -0.0 to 1.1) and what to do in an emergency (3.0 *vs*. 2.2: 95% CI of the difference 0.1 to 1.3), and on how to recognize problems and what to do (3.4 *vs*. 2.9: 95% CI of the difference 0.1 to1.3.)

Overall satisfaction was measured in the women's survey by three affirmative answers to the questions "If you were pregnant again, would you come back to this clinic?", "Would you recommend this clinic to a relative or friend for their antenatal checkups?" and "In general, are you satisfied/very satisfied with the ANC you have received in this clinic so far?." Women in both arms of the study showed very high levels of satisfaction, and there were no statistically significant differences between groups. The expressed levels of satisfaction were similarly high when

women were asked direct and indirect questions. The overall satisfaction index showed that more than 90% of women in both ANC models said that they were "very satisfied".

In the case of the providers we did not have a sample; rather it was a census. We distributed the self-administered questionnaire to all health professionals of the clinics where the study was conducted. Providers were slightly more satisfied with the number of visits under the new ANC model (68.5 *vs.* 64.6%); less satisfied with the spacing between visits (60.9 *vs.* 69.5%); and substantially more satisfied with the time spent with each woman (85.9 *vs.* 69.5%). Concerning the information component, providers in general gave themselves higher scores in both ANC models (New ANC: 5.6 STD: 0.9; Standard ANC: 5.2 STD: 1.3) than women did. Finally, most of the health professionals surveyed in the new ANC model qualified the care they provided as "good" or "very good" (82.7%), while a higher proportion in the standard ANC clinics gave themselves that same score (95.1%).

Discussion

Women in the new ANC model clinics were, in general, as satisfied as their counterparts in the standard model. Furthermore, women in both arms were equally satisfied with waiting time and information provided about their health, tests during pregnancy, and treatment they might need. There were also no significant differences regarding what women worried about and whether the caregiver reassured them. Yet, women in the new ANC model were more satisfied with the time spent with the provider and with the information they received. Providers were more satisfied with the new ANC model with regards to number of visits, time spent with the patient, and information provided, but they were less satisfied with the spacing between visits. More providers rated the overall care provided under the standard model as good or very good than under the new ANC model.

Overall, these results show that both ANC models were equally well accepted by women and providers, suggesting that the adoption of the new antenatal care model would not face major obstacles derived from women or providers' perception of ANC and their satisfaction with it.

Within this framework, specific issues deserve special attention. In terms of the number of visits and spacing, the qualitative stage findings of our study [19] and those of several previous trials conducted to evaluate ANC models that reduced the number of visits [15,20,23–26] showed that more women in the intervention groups reported dissatisfaction with a reduced number of visits and longer spacing between them [20,25]. However, our study only demonstrated a trend towards patients' dissatisfaction with the changes introduced by the new ANC model, as no statistically significant differences between the trial arms were found. In another study conducted in a developing country results were similar to ours: there was no change in patients' satisfaction with a smaller number of ANC visits and longer spacing between them [27].

Still, our study findings suggest that number of visits and spacing are potential areas of concern for women. Providers could address these concerns by giving women information on the safety of these protocol changes, as was demonstrated by the results of the large WHO trial [18] and the systematic review of all randomized controlled trials [28]. Other needs that work as incentives for women to attend ANC clinics, such as socialization and social support, should be addressed through other activities that do not necessarily involve formal encounters with medical providers.

Regarding time spent with the provider, women in the new model had a higher level of satisfaction with the time spent with the provider than those in the standard model clinics, although the actual duration of the clinical encounter was similar. This positive impression may have resulted from an improvement in the quality of the patient-provider interaction. It is interesting to highlight that although waiting time was effectively reduced, women's satisfaction did not reflect the difference (Table 2).

One of the main goals of the new model was to strengthen the information component [16]. The fact that a larger proportion of women in these clinics perceived that their information needs were satisfactorily met even if there were only five visits to the clinics reveals that the new model was effective in reinforcing this aspect of care. In the Sikorski *et al* trial conducted in London, which achieved only a small reduction in number of visits, provision of information was also stressed; however, they did not find any difference in satisfaction among women in both arms of the trial [20].

The summary questions used to explore overall women's satisfaction with ANC showed surprisingly high levels among patients in both models, especially considering that women from the same clinics had expressed concerns about the quality of care during the focus groups and personal interviews conducted during the first stage of this study [19]. A hypothesis to explain this difference is that qualitative techniques capture the feelings of few more outspoken women and may provide a biased perception of the group. This could also be due to a "courtesy bias", which usually affects the answers to inquiries about satisfaction with care received, especially when women are asked in clinical settings [29]. In our study, qualitative

techniques allowed to discriminate better among women with different levels of satisfaction than close-ended questions, especially the summary ones. This may be due to the wording of questions meant at exploring overall satisfaction; in fact, those that addressed specific issues (such as number of visits, spacing between them, information provided, etc) received answers with more variability.

There is another interesting hypothesis to consider as well. One study in Scotland found that pregnant women are fairly uncritical of health care, accepting whatever care they receive as appropriate. [30] The authors suggest that it would not be surprising to see high levels of overall satisfaction in a controlled study comparing two ANC models, and that it would be important to examine the differences between the two groups studied in their expressed preferences rather than the absolute magnitude of the expressed satisfaction. This was the case with our study, where we were able to differentiate women's satisfaction between the two models. However, women in the clinics of both models of ANC seemed to be equally uncritical.

Another difficulty in interpreting our findings derives from the variability in views and expectations originated by various cultural and socio-economic settings. In a study conducted in Chile, for instance, low-income urban women defined high quality as "being treated as a human being"; technical quality was not even mentioned [31]. Village women in Thailand identified inequalities of power fundamental to gender, class and ethnic relations as dimensions that crucially affect the client-provider interaction [32]. This was an important challenge in our study. The satisfaction questionnaire we used in each country was standardized with adaptations of terminology only and therefore did not provide any detailed clues about what aspects of ANC women of different cultural backgrounds appreciated more.

Women's satisfaction is a sensitive indicator that responds to changes in quality of care, even before changes in health status are detected, [33] but its measurement remains an important challenge. Qualitative methods allow women to reveal their feelings in greater depth than survey research methods [34]. In fact, most studies aimed at exploring women's views about quality of reproductive health care resort to interviews and focus groups [12]. However, results obtained with these techniques cannot be extrapolated and have low external validity. Yet, although data collected through questionnaires usually offer more superficial insights and do not reflect cultural nuances, when administered to a representative and large sample they can be safely extrapolated to the population from which the sample was obtained. In an attempt to overcome these limitations, we combined both methodologies [34].

Although our study makes important contributions to the area of users' perception on changes introduced into ANC models, it does not address methodological issues involved in the measurement of clients' satisfaction, which other authors have extensively addressed in observational studies [35,36]. In fact, we analyzed the differences between the perspectives of women in the intervention and control clinics, focusing only on those specific aspects that changed as a result of the introduction of the new ANC model (number and spacing of visits, information provided, etc.) Our study did not explore women's satisfaction with any other aspects of ANC such as technical quality, physical environment, access and continuity of the provider [37,38] that were not modified with the intervention, or the differences in users' satisfaction associated with ANC received in different types of facilities (i.e. private or public.) [39]

While users' perspective of quality of care has been assessed relatively often, the perspective of health professionals has been assessed occasionally at best [27,40]. In our study, while some degree of resistance to the new ANC model was expected, doctors and midwives did not have strong views against it. For instance, providers' satisfaction with the number of antenatal visits was similar in clinics of both arms of the trial. The reason for this may be that all providers worked at public health institutions, where the number of visits does not have a serious impact on their workload or income. Similar results were obtained in the study conducted in public hospitals in Harare, where the assessment showed that staff wished women made fewer visits to ANC clinics [27]. In the Sikorski trial [40] doctors were in favor of a reduced number of visits, but the average number under routine circumstances was much higher than in the four countries that participated in the WHO trial.

Regarding the information, our study confirmed an imbalance between women's expectations and providers' responses: providers scored themselves higher than their patients did in relation to the information they provide during antenatal check-ups. There appears to be a mismatch between doctors and nurses' perception of the quality and quantity of the information they provide and the users' needs. Furthermore, providers should be aware of the importance of meeting women's information needs during ANC visits, and thus be prepared to satisfy them.

In matters of overall satisfaction with ANC, although the proportion of providers that said care offered in their clinics was good or very good was high in both arms of the trial, those working in the standard ANC model clinics were

more satisfied. This difference could be interpreted as a sign of discontent with the new ANC model.

Conclusions

Increasing attention is given to patients' views in health care evaluation. Policymakers and program managers should know that women's views are determinant in greater acceptance and sustained use of services. Additionally, health professionals' perspective needs careful evaluation before and during translating new care models into institutional protocols; being a conscious player in the process of change would certainly contribute to improving providers' commitment to their clinical work.

Competing interests

None declared.

Authors' contributions

Author 1 and 4 participated in the design of the study and coordinated it. Author 1 elaborated the different versions of the manuscript. Author 2 was the PI of the WHO randomized trial, coordinated the study's design and implementation, and made essential contributions to the different versions of the manuscript. Author 3, 6, 7 and 8 coordinated project implementation in each country. Author 5 participated in the study design and performed the statistical analysis. The rest of the authors participated in the WHO randomized trial and provided input to this specific component of the study. All authors read and approved the manuscript.

Additional material

Additional file 1

Women's Questionnaire - This file contains the English version of the questionnaire for users that was administered in the four participating countries after translating it into local languages.
Click here for file
[http://www.biomedcentral.com/content/supplementary/1472-6874-2-7-S1.doc]

Additional file 2

Providers' Questionnaire - This file contains the English version of the questionnaire for providers that was administered in the four participating countries after translating it into local languages.
Click here for file
[http://www.biomedcentral.com/content/supplementary/1472-6874-2-7-S2.doc]

Acknowledgements

This trial was supported by the UNDP/UNFPA/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction of WHO. Additional support was provided for the implementation of the study by: Municipal Government, City of Rosario, Argentina; Ministry of Health, Cuba; National Institute of Public Health, Mexico; The Population Council – Regional Office for Latin America and the Caribbean; Ministry of Health, Saudi Arabia; Swedish Agency for Research Cooperation with Developing Countries (SIDA/SAREC); Ministry of Public Health and Faculty of Medicine, Khon Kaen University, Thailand; Department for International Development (DFID) of the United Kingdom; Mother Care – John Snow Inc.; National Institute for Child Health & Human Development (NICHD), National Institutes of Health (NIH), USA; and The World Bank. For the preparatory phase: University of Western Ontario, Department of Epidemiology & Biostatistics, Canada; National Institute of Public Health, Norway; United Nations Development Programme; and the University of Uppsala, Department of Obstetrics & Gynaecology, Sweden.

We would like to thank specially the women and their babies who participated in this trial and the many doctors, nurses, and other staff of the clinics and hospitals that made the implementation of this project possible.

Special thanks are given to Drs G. Lindmark and V. Wong for their active participation as members of the Steering Committee and their continuous support during the trial, to Dr M. Koblinsky for her personal interest and support for this project, to Dr O. Meirik for his continued encouragement and support, to Dr D. Khan for editing the trial's Newsletter and to Ms Carol Peters for her help in the preparation of the manuscript.

References

1. Reid M, García J: **Women's views of care during pregnancy and childbirth.** *In: Effective Care in Pregnancy and Childbirth (Edited by: Chalmers I, Enkin M, Keirse MJNC) Oxford, Oxford University Press* 1989, 131-142
2. Robinson J: **The role of social sciences in evaluating perinatal care.** *In: Effective Care in Pregnancy and Childbirth (Edited by: Chalmers I, Enkin M, Keirse MJNC) Oxford, Oxford University Press* 1989, 81-85
3. Belizán JM, Villar J, Belizán MZ, *et al*: **Attendance of lower class women to prenatal control units in public hospitals in Rosario, Argentina.** *PAHO Bulletin* 1979, **86:**121-130
4. Belizán JM, Quaranta P, Paquez E, Villar J: **Cesarean section and fear of litigation.** *Lancet* 1991, **338:**1462
5. Donabedian A: **The quality of care: How can it be assessed?** *JAMA* 1988, **260:**1743-1748
6. Donabedian A: **Explorations in quality assessment and monitoring. The definition of quality and approaches to its measurement (Vol. 1).** *Ann Arbor (MI), Health Administration Press* 1980
7. Bruce J: **Fundamental elements of quality of care.** *Studies in Family Planning* 1990, **21:**61-91
8. Baldo MH, Al-Mazrou YY, Farag MK, Asís KMS, Khan MU: **Antenatal care, attitudes and practices.** *J Trop Pediatr* 1995, **41(Suppl 1):**21-29
9. Baldo MH, Al-Mazrou YY, Farag MK, Asís KMS, Al-Shehri SN: **Coverage and quality of natal and postnatal care: Women's perceptions, Saudi Arabia** *J Trop Pediatr* 1995, **41(Suppl 1):**30-37
10. Clement S, Sikorski J, Wilson J, Das S, Smeeton N: **Women's satisfaction with traditional and reduced antenatal visit schedules.** *Midwifery* 1996, **12:**120-128
11. Dennis LI, Flynn BC, Martin JB: **Characteristics of pregnant women, utilization, and satisfaction with prenatal services in St. Petersburg, Russia.** *Public Health Nurs* 1995, **12:**374-377
12. Handler A, Raube K, Kelley M, Giachello A: **Women's satisfaction with prenatal care settings: A focus group study.** *Birth* 1996, **23:**31-37
13. Pearce CW: **Seeking a healthy baby: Hispanic women's views of pregnancy and prenatal care.** *Clin Excell Nurse Pract* 1998, **2:**352-361
14. Al Qutob R, Mawajdeh S, Raad FB: **The assessment of reproductive health services: a conceptual framework for prenatal care.** *Health Care Women Int* 1996, **17:**423-434
15. Munjanja SP, Lindmark G, Nystrom L: **Randomised controlled trial of a reduced-visits programme of antenatal care in Harare, Zimbabwe.** *Lancet* 1996, **348:**364-369
16. Villar J, Bakketeig L, Donner A, Al-Mazrou Y, Ba'aqeel H, Belizán JM, *et al*: **The WHO Antenatal Care Randomised Controlled Trial: rationale and study design.** *Paediatr Perinat Epidemiol* 1998, **12(Suppl 2):**27-58
17. Langer A, Nigenda G, Romero M, Rojas G, Kuchaisit C, Al-Osimi M, *et al*: **Conceptual bases and methodology for the evaluation of women's and provider's perception on the quality of antenatal care in the WHO Randomised Controlled Trial.** *Paediatr Perinat Epidemiol* 1998, **12(Suppl 2):**98-115

18. Villar J, Ba'aqeel H, Piaggio G, Lumbiganon P, Belizán JM, Farnot U, *et al*: **WHO antenatal care randomised trial for the evaluation of a new model of routine antenatal care.** *Lancet* 2001, **357:**1551-1564
19. Nigenda G, Langer A, Villar J, *et al*: **Concepts on quality of antenatal care in developing countries: Results of an evaluation in Argentina, Cuba, Saudi Arabia and Thailand.** *Manuscript submitted to Biomedical Central* 2002
20. Sikorski J, Wilson J, Clement S, Das S, Smeeton N: **A randomised controlled trial comparing two schedules of antenatal visits: the antenatal care project.** *Br Med J* 1996, **312:**546-553
21. Donner A, Piaggio G, Villar J, Pinol A, Al-Mazrou Y, Ba'aqeel H, *et al*: **Methodological considerations in the design of the WHO antenatal care randomized controlled trial.** *Paediatr Perinat Epidemiol* 1998, **12(Suppl 2):**59-74
22. Snedecor GW, Cochran WG: **Statistical Methods.** *7th ed. Ames (IA), Iowa State University Press* 1980
23. Binstock MA, Wolde-Tsadik G: **Alternative prenatal care: impact of reduced frequency focused visits and continuity of care.** *J Reprod Med* 1995, **40:**507-512
24. Jewell D, Sharp D, Sanders J, Peters TJ: **A randomised controlled trial of flexibility in routine antenatal care.** *BJOG* 2000, **107:**1241-7
25. McDuffie RS, Beck A, Bischoff K, Cross J, Orleans M: **Effect of frequency of prenatal care visits on perinatal outcomes among low risk women: a randomized trial.** *JAMA* 1996, **270:**847-851
26. Villar J, Carroli G, Khan-Neelofur D, Piaggio G, Gülmezoglu M: **Patterns of routine antenatal care for low-risk pregnancy (Cochrane Review).** *In: The Cochrane Library, Issue 1, Oxford: Update Software* 2002
27. Murira N, Munjanja SP, Zhanda I, Nystrom L, Lindmark G: **Effect of a new antenatal care programme on the attitudes of pregnant women and midwives towards antenatal care in Harare.** *Cent Afr J Med* 1997, **43(5):**131-135
28. Carroli G, Villar J, Piaggio G, *et al*: **WHO systematic review of randomised controlled trials of routine antenatal care.** *Lancet* 2001, **357:**1565-1570
29. Langer A, Farnot U, García C, Barros F, Victora C, Belizan JM, *et al*: **The Latin American Trial of Psychosocial Support During Pregnancy: Effects on Mother's Wellbeing and Satisfaction.** *Soc Sci Med* 1996, **42:**1589-1597
30. Potter M, Macintyre S: **What is, must be best: A research note on conservative or deferential responses to antenatal care provision.** *Soc Sci Med* 1984, **19:**1197-1200
31. Vera H: **The client's views of high-quality care in Santiago, Chile.** *Stud Fam Plann* 1993, **24:**40-49
32. Whittaker A: **Quality of care for women in Northeast Thailand: Intersections of class, gender and ethnicity.** *Health Care Women Int* 1996, **17:**435-447
33. Al-Qutob R, Mawajdeh S, Raad FB: **The assessment of reproductive health services: A conceptual framework for prenatal care.** *Health Care Women Int* 1996, **17:**423-434
34. Simmons R, Elias C: **The study of client-provider interactions: A review of methodological issues.** *Stud Fam Plann* 1994, **25:**1-17
35. Raube K, Handler A, Rosenberg D: **Measuring satisfaction among low-income women: a prenatal care questionnaire.** *Matern Child Health J* 1998, **2:**25-33
36. Omar MA, Shiffman RF, Bingham CR: **Development and testing of the patient expectations and satisfaction with prenatal care instrument.** *Res Nurs Health* 2001, **24:**218-29
37. Handler A, Rosenberg D, Raube K, Kelley MA: **Health care characteristics associated with women's satisfaction with prenatal care.** *Med Care* 1998, **36:**679-94
38. Handler A, Raube K, Kelley MA, Giachello A: **Women's satisfaction with prenatal care settings: a focus group study.** *Birth* 1996, **23:**31-7
39. Brown S, Lumley J: **Antenatal care: a case of the inverse care law?** *Aust J Public Health* 1993, **17:**95-103
40. Sikorski J, Clement S, Wilson J, Das S, Smeeton N: **Health professionals views on possible changes in the provision and organization of antenatal care.** *Midwifery* 1995, **11:**61-68

Pre-publication history

The pre-publication history for this paper can be accessed here:

http://www.biomedcentral.com/1472-6874/2/7/prepub