E-ISSN:2349-4166
P-ISSN:2349-4158
Research Article
Antenatal

Public Health Review - International Journal of Public Health Research

2017 Volume 4 Number 4 July-September

Publisher
MEDRESEARCH
www.medresearch.in

Quality of antenatal care provided through the public health sector in a district in North Kerala

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DOI: https://doi.org/10.17511/ijphr.2017.i4.04

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Introduction: Quality of Care, a key element in provision of health care can be assessed by using technical standards defined by health professionals or from client's perspective. Considering the population in Kerala to have advantage of early and nearly universal antenatal coverage, there is considerable potential for improving the quality of care, based on regular quality assessment. **Objectives:** 1. To evaluate observed quality of process of ante-natal care at various levels in the public health sector of Kozhikode district of Kerala.2. To find out the perception of antenatal women regarding the antenatal care provided. **Methodology:** A cross sectional study was conducted in maternal health care institutions at various levels in the public health sector of Kozhikode district, North Kerala. Arbitrarily, 30% of institutions were selected from each stratum. *Observed quality* of antenatal care was assessed through passive observation of services delivered with help of a checklist. 197 antenatal women were observed. All antenatal women who had come for their re-visit were interviewed for assessing *client perspective* of quality of care. Hence 93 antenatal women were interviewed excluding those who had come for first visit. **Results:** Overall score for attributes of process of antenatal care was observed to be poor. Interpersonal aspects scored better. There was significant difference between different strata ($p < 0.001$), with better scores at Taluk Hospital and Block Primary Health Centre levels and the difference in scores was found to be significant with regards to Diagnostic-techniques, Treatment-aspects, provision-of-Health-Education. An evident disparity was noted between observed and client's perspective. 92.47% were satisfied with overall care. More than three-fourth were satisfied with time spent with health care provider though most spent only 5–15 minutes. **Conclusion:** Quality of antenatal care delivery needs to be improved.

Keywords: Antenatal care, Public sector, Quality of care, Interpersonal aspects and technical aspects

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How to Cite this Article

Mundodan JA, Quality of antenatal care provided through the public health sector in a district in North Kerala. Public Health Rev Int J Public Health Res. 2017;4(4):86-97.
Available From https://publichealth.medresearch.in/index.php/ijphr/article/view/66

To Browse

Manuscript Received	Review Round 1	Review Round 2	Review Round 3	Accepted
2017-09-05	2017-09-15	2017-09-24		2017-09-30

Conflict of Interest	Funding	Ethical Approval	Plagiarism X-checker	Note
No	Nil	Yes	5%	

Introduction

Antenatal care is provided through government run Subcentres (SC), Primary Health Centres (PHC), Community Health Centres (CHC) and Government hospitals as well as private hospitals, clinics and nursing homes [1].

Antenatal care is a potent public health tool in terms of health promotion as *antenatal care* alone could reduce the maternal mortality rate (MMR) by more than 20%, provided that it is regularly utilized by pregnant women and is of good quality [2].

However it isn't coverage but *effective coverage* that matters, which has an impact on the outcome, compliance and continuity of care. For improving the efficiency and effectiveness of primary health care one has to emphasize on quality improvement by finding gaps in the present system and correcting the identified deficiencies.

Poor quality leads to higher morbidity and mortality, higher human resource utilization and higher financial burden. *Quality of Care* is now being increasingly recognized as a key element in the provision of health care. The Working Group on Health of Women and Children for the Government of India has given more stress on Quality of care in the 12th five year plan (2012 -2017) [3].

According to Donabedian, quality of service is based on three major attributes: Structure (including human resources), Process (both technical and interpersonal) and Outcome [4]. Quality can be assessed using technical standards defined by health professionals (observed quality) or from the point of view of the users (perceived quality).

Many view the client's perspective as a meaningful indicator of health service quality as it will strongly influence acceptance, sustained utilization (compliance) and ultimately the outcome of care while others consider it too subjective. According to *Brawley*, for the client, the most important dimensions of quality are technical competence, interpersonal relations, accessibility and amenities [5].

Langer et al placed emphasis on information exchange and interpersonal relations in assessing the level of client's satisfaction with the care received [6]. Satisfaction ratings reflect the personal preferences of the client, the client's expectations and the realities of the received care.

Kerala, a South Indian state known internationally for its health achievements has achieved MMR of 66 (SRS 2010-12) against the MDG target of 109 by 2015 [7]. Considering that the population in Kerala have the advantage of early and nearly universal antenatal coverage (99.8%) [8] the potential for improving the quality of care is considerable.

Approaches to improving quality of care should be based on *regular quality assessment and operational research activities.* There is little evidence on the content and quality of antenatal care in these settings. The only accessible study on quality of antenatal care in Kerala was done in tertiary level maternity hospitals in Thiruvananthapuram [9]. Hence it was decided to conduct a study on the quality of antenatal care provided through the public health sector of Kozhikode district in North Kerala.

Most studies deal with quality either according to technocratic perspective of health care professionals or from the lay perspective of clients. In this study, both client perspective and technocratic perspective were looked into.

Objectives

01. To evaluate the quality of process of antenatal care both interpersonal aspects and technical aspects as observed by the investigator at various levels in the public health sector of Kozhikode district in North Kerala, India.
02. To find out the perception of the antenatal women attending the antenatal clinic regarding the antenatal care provided to them.

Methodology

Study Design: Cross sectional study.

Study setting: Health care institutions providing maternal and child health care functioning at various levels in the public health sector namely Primary Health Centres (PHC), Block Level Primary Health Centres (BPHC), Community Health Centres (CHC) and Taluk Hospitals (TH) of Kozhikode district in North Kerala, India. Subcentres and tertiary level institutions like Medical College and Woman & Child Hospital were excluded due to feasibility issues. A list of PHCs, BPHCs, CHCs and THs was collected from the District Level Statistical Wing Data, District Medical Office, Kozhikode and arbitrarily 30% of institutions [11] were selected from each stratum [10].

Participants: All antenatal women who had come for their re-visit were interviewed for assessing client perspective of quality of care. Hence excluding those antenatal women who had come for their first visit, 93 antenatal women were interviewed.

Data Collection: Observed Quality of process of antenatal care was assessed using standards defined by professionals. After taking necessary consent, all antenatal women who attended the antenatal clinic in the selected institutions on the day of visit were observed while they were being provided care by the health care provider. The institutional visits were scheduled on days when the antenatal clinics were conducted, generally Thursdays in Kerala. Data was collected through passive observation of services delivered with help of a checklist developed using modified WHO checklist [12].

This included 12 attributes relating to *interpersonal aspects* of process of care and 32 attributes related to *technical aspects* of process of care [History taking-5, Diagnostic aspects-7, Physical Examination aspects-11, provision of Health Education-5 and treatment aspects-4]. A pilot study was conducted in two institutions to modify the checklist so as to suit local situation and decide on the method of data collection.

Study Tool: A pretested semi-structured schedule was used to interview the antenatal women to assess perceived quality, after getting their consent. Details regarding the antenatal care provided to them during their earlier visits and their satisfaction regarding the care provided and various factors like waiting time, medications given and instructions given were assessed.

Statistical Analysis: Data analysis was done using exploratory techniques. The attributes relating to the process of care were scored as either present [1] or absent (0). The scores obtained for each attribute under technical and interpersonal aspects were calculated as percentage of maximum total. A standard percentage score of 60 % was established as cut off to distinguish between good quality care and poor-quality care [13]. Mean percentage scores were calculated and using ANOVA variation between different levels of public health sector was analysed. Results of exit interview regarding the care were compared with the findings of observed care. Satisfaction was rated on a 5-point Likert scale. Analysis was performed in Statistical Package for Social Sciences (SPSS) software 16.0 (trial version).

Results

A total of 27 institutions i.e. 30% institutions from each stratum were included in the study that is 20 PHCs, 3 BPHCs, 3 CHCs and 1 TH. Antenatal clinics were conducted on a weekly basis in these selected institutions, majority (81.5%) on Thursdays. Remaining (18.5%) were conducted on Wednesdays along with the immunization clinic which they attributed to the low case load on Thursdays.

Round the clock delivery services were available only in 2 out of the 27 selected institutions, namely one BPHC and one TH, where doctors conducted the antenatal clinics along with the JPHN. The median antenatal attendance in the antenatal clinic in these institutions on the day of observation was 7 (range 1 – 32) with an attendance of 1-21 in PHCs, 5-12 in BPHCs, 8- 15 in CHCs and 32 in the TH studied.

Assessment of Process of care: On the day of assessment by investigator, a total of 199 antenatal women attended the antenatal clinic in these 27 selected institutions. As two antenatal women did not give consent, 197 were observed while they were being provided antenatal care by the health care provider (observed quality). About half (52.8%) were visiting the institutions for antenatal care for the first time. Hence 93 antenatal women were included for exit interview. 72.1% of those exit interviewed had come for their second visit. 39.8% (37) of the antenatal women interviewed were primigravida, 30 (32.2%) were second gravida and 26 (28%) third gravida or above. 61 (65.6%) interviewed were in their second trimester of pregnancy and 16 (17.2%) each in their first and third trimesters of pregnancy.

Results regarding various attributes under interpersonal aspects and technical aspects have been depicted in Table 1. The mean percentage scores for the various attributes under process of care for the different levels of health care facility are given in Table 2. Table 3 depicts the proportion of women who received good quality antenatal care as per the observer.

Client perspective of antenatal care: (Table 1) Overall quality of care from the client's perspective was good except in few aspects. Except for maintaining privacy all aspects of interpersonal relations was reported by 90% or more women. Advice regarding family planning (17.2%) and breast feeding (25.8%) were given to a quarter or less.

Out of 93 interviewed, 66 (70.9 %) were not instructed regarding the time for next visit, 25.8% were advised to come for review the following month and 3.2% were advised to review the following week itself. Less than half were told about Janani Suraksha Yojana, a conditional cash transfer scheme to motivate pregnant women for institutional deliveries.

This may be due to the fact that this scheme is applicable to only those below poverty line and hence only they were explained about this. Examination of eyes for pallor (25.8%), breast examination (12.9%) and abdominal examination (37.6%) was reported by a quarter or less.

All 93 who were exit interviewed reported easy accessibility by road to the health facility. Only half reported home visit by health worker. Only 54 out of the 93 (58.1%) had received a Mother and Child Protection card. One reason noted for this low value was that the women availed services from PHCs in both her mother village as well as her husband's village. The JPHN in one PHC will assume that the card to be issued by JPHN of the other PHC. The JPHN reported that all women will get the card eventually though there is time lag.

Table-1: Process of Care at different levels of health care

Process of Care	Level of Health Care Institution				Total N= 197 n (%)	Exit interview N= 93 n (%)
	PHC N=111 n (%)	BPHC N=27 n (%)	CHC N=27 n (%)	TH N=32 n (%)		
Interpersonal Aspects						
Greeting the woman	106 (95.5)	26 (96.3)	27 (100)	23 (71.9)	182 (92.4)	86 (92.5)
Offering the woman seat	103 (92.8)	27 (100)	26 (96.3)	23 (71.9)	179 (90.9)	91 (97.8)
Interest in interaction with woman	107 (96.4)	26 (96.3)	26 (96.3)	23 (71.9)	182 (92.4)	92 (98.9)
Non-interruption of woman's speech	104 (93.7)	27 (100)	27 (100)	32 (100)	190 (96.4)	92 (98.9)
Politeness	102(91.9)	27 (100)	26 (96.3)	23(71.9)	178(90.4)	92(98.9)
Asking about woman's concerns	61 (55)	24 (88.9)	19 (70.4)	23(71.9)	127(64.5)	83 (89.2)
Door closed/ using screens during consultation	25 (22.5)	6 (22.2)	1 (3.7)	22(68.8)	54 (27.4)	50 (53.8)
Explaining before examination	15 (13.5)	6 (22.2)	0 (0)	26 (81.2)	47 (23.9)	60 (64.5)
Explaining the diagnosis	9 (8.1)	1 (3.7)	1 (3.7)	3 (9.4)	14 (7.1)	53 (57)
Explaining use of prophylactic drugs	46 (41.4)	12 (44.4)	18 (66.7)	2 (6.2)	78 (39.6)	
Explaining about warning signals or complications	5 (4.5)	1 (3.7)	0 (0)	0 (0)	6 (3.05)	31(33.3)
Explaining regarding labour	1 (0.9)	0 (0)	0 (0)	0 (0)	1 (0.5)	12 (12.9)
Assessment on history taking						
History (medical/ obstetric; previous pregnancy; symptoms; etc)	61 (55)	17 (63)	12(44.4)	25 (78.1)	115 (58.4)	75 (80.6)
History of UTI	6 (5.4)	0 (0)	0 (0)	1 (3.1)	7 (3.6)	0 (0)
History of fever with rash	1 (0.9)	0 (0)	0 (0)	0 (0)	1 (0.5)	0 (0)
History of warning signals	1 (0.9)	0 (0)	0 (0)	0 (0)	1 (0.5)	0 (0)
Assessing Health Education provided earlier	1 (0.9)	2 (7.4)	0 (0)	0 (0)	3 (1.5)	0 (0)
Provision of Health Education						
Health education about nutrition	44 (39.6)	19 (70.4)	12(44.4)	1 (3.1)	76 (38.6)	55 (59.1)
Health education about rest, exercise, etc	7 (6.3)	4 (14.8)	1 (3.7)	0 (0)	12 (6.1)	
Health education regarding breast care and breast feeding	0 (0)	1 (3.7)	1 (3.7)	0 (0)	2 (1)	24 (25.8)
Health education regarding HIV / STD	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	19 (20.4)
Health education regarding Family Planning	4 (3.6)	4 (14.8)	0 (0)	0 (0)	8 (4.1)	16 (17.2)

Table-1: Process of Care at different levels of health care (contd)

Process of Care	Level of Health Care Institution				Total N= 197 n (%)	Exit interview N= 93 n (%)
	PHC N=111 n (%)	BPHC N=27 n (%)	CHC N=27 n (%)	TH N=32 n (%)		
Diagnostic Aspects						
Availability of Hemoglobin measurement	40 (36)	22 (81.5)	11 (40.7)	28 (87.5)	101 (51.3)	73 (78.5)
Availability of Blood grouping & Rh typing	58 (52.3)	15 (55.6)	8 (29.6)	28 (87.5)	109 (55.3)	
Blood Examination for HBsAg/ HIV/ VDRL	12 (10.8)	17 (63)	11 (40.7)	28 (87.5)	68 (34.5)	
Availability of Urine for sugar	14 (12.6)	9 (33.3)	0 (0)	28 (87.5)	51 (25.9)	39 (41.9)
Availability of Urine for albumin	14 (12.6)	8 (29.6)	0 (0)	28 (87.5)	50 (25.4)	
Availability of Urine for pus cells	14 (12.6)	8 (29.6)	0 (0)	28 (87.5)	50 (25.4)	
Speculum examination *	0 (0)	1 (0.9)	0 (0)	1 (3.1)	2 (1)	0 (0)
USG	0 (0)	0 (0)	0 (0)	1 (3.1)	1 (3.1)	71 (76.3)
Physical Examination						
Height	99 (10.8)	22 (81.5)	22(81.5)	0 (0)	143(72.6)	0 (0)
Weight	102(91.9)	26 (96.3)	23(85.2)	0 (0)	151(76.6)	81 (87.1)
Blood Pressure	76 (68.5)	22 (81.5)	17 (63)	23 (71.9)	138(70.1)	79 (84.9)
Pulse Rate	1 (0.9)	1 (3.7)	0 (0)	0 (0)	2 (1)	
Checking eyes for pallor	10 (9)	1 (3.7)	3 (11.1)	0 (0)	14 (7.1)	24 (25.8)
Legs for oedema	5 (4.5)	2 (7.4)	1 (3.7)	8 (25)	16 (8.1)	
Examination of breast	0 (0)	0 (0)	0 (0)	1 (3.1)	1 (0.5)	12 (12.9)
Abdominal examination	16 (14.4)	4 (14.8)	1 (3.7)	25 (78.1)	46 (23.4)	35 (37.6)
Fetal heart	13 (11.7)	4 (14.8)	1 (3.7)	9 (28.1)	27 (13.7)	
Auscultation of chest	1 (0.9)	0 (0)	0 (0)	10 (31.2)	11 (5.6)	
Examination of External genitalia / per vaginal *	0 (0)	1 (3.1)	0 (0)	2 (1.8)	3 (1.5)	
Treatment aspects						
Prophylactic IFA	42 (37.8)	15 (55.6)	9 (33.3)	31 (96.9)	97 (49.2)	68 (73.1)
Prophylactic Calcium	11 (9.9)	0 (0)	0 (0)	31 (96.9)	42 (21.3)	
Inj. TT*	90 (81.1)	24 (88.9)	25 (92.6)	21 (65.6)	160(81.2)	92 (98.9)
Other drugs *	5 (4.5)	0 (0)	0 (0)	0 (0)	5 (2.5)	5(5.4)

*As applicable

Table-2: Mean percentage scores at various levels of health care facility

Attributes for Process of Care	Mean percentage score (SD)					Significance
	PHC	BPHC	CHC	TH	Total	
Interpersonal aspects (0-12)	51.5 (15.62)	56.48 (9.05)	52.78 (6.12)	52.08 (20.52)	52.45 (14.9)	0.446
History assessment aspect (0-5)	12.61 (12.63)	14.07 (12.17)	8.89 (10.13)	16.25 (7.93)	12.89 (11.7)	0.176
Diagnostic aspects (0-7)	19.69 (25.76)	41.79 (25.35)	15.87 (9.97)	75.45 (29.08)	31.25 (32.36)	<0.001
Physical Examination aspects (0-11)	26.62 (12.05)	27.61 (13.22)	22.89 (11.38)	21.88 (15.29)	25.47 (12.77)	0.179
Treatment aspects (0-4)	33.33 (20.59)	36.11 (12.66)	31.48 (13.14)	64.84 (16.63)	38.58 (21.49)	<0.001
Provision ofHealth Education aspects (0-5)	9.91 (13.18)	20.74 (16.15)	10.37 (12.85)	62.5 (3.53)	9.9 (13.64)	<0.001
Overall Score	29.42 (11.33)	36.19 (7.24)	27.69 (4.63)	39.49 (8.92)	31.75 (10.59)	<0.001

Table-3: Proportion of women who received good quality antenatal care as per observer

Attributes for Process of Care	Proportion of women who received good quality antenatal care as per observer				
	PHC n=111 (%)	BPHC n=27 (%)	CHC n=27 (%)	TH n=32 (%)	Total N=197 (%)
Interpersonal aspects	26 (23.4)	7 (25.9)	1 (3.7)	17 (53.1)	51 (25.9)
History taking	1 (0.9)	0 (0)	0 (0)	0 (0)	1 (0.5)
Diagnostic aspects	14 (12.6)	7 (25.9)	0 (0)	28 (87.5)	49 (24.9)
Physical Examination	1 (0.9)	1 (3.7)	0 (0)	0 (0)	2 (1)

Provision ofHealth Education	0 (0)	2 (7.4)	0 (0)	0 (0)	2 (1)
Treatment aspects	11(9.9)	0 (0)	0 (0)	21 (65.6)	32 (16.2)

Table 4 depicts **Client–Health care provider interaction time** as observed by the investigator at the different levels versus duration perceived by the interviewed women. The *observed interaction time* was low i.e. between 5-10 minutes for most antenatal women and none spent more than 15 minutes, though the average attendance per day was only 7.

It is unlikely any meaningful information could have been passed within this time. WHO recommends about 20 minutes of consultation per antenatal. In this study, none of the antenatal women observed spent more than 15 minutes with the health care provider.

The time spent by the health care provider for each antenatal woman varied significantly between different levels of health care facility (Chi square 84.132; p value <0.001). More than half (61%) of the antenatal women observed in the PHCs spent less than 5 minutes with the health care provider, though the attendance in the clinics in PHCs ranged between 1 and 21on the day of observation. The situation was better in the BPHCs, CHCs and TH where the health care providers spent between 5 – 15 minutes with the antenatal women.

Waiting to meet the health care provider: In the study, 74.2% antenatal women reported that they had to wait less than 15 minutes to meet health care provider and only 24 (25.8%) had to wait more than 15 minutes.

Table-4: Client–Health care provider interaction time

Client–Health care provider interaction time	Observed duration					Perceived duration N=93
	PHC N=111	BPHC N=27	CHC N=27	TH N=32	N=111	
Less than 5 min	68 (61.3)	0	0	0	68 (34.5)	13(14)
5-10 minutes	43 (38.7)	26(96.3)	26(96.3)	32 (100)	127(64.5)	65 (69.9)
11-15 minutes	0	1(3.7)	1(3.7)	0	2 (1.01)	7 (7.5)
More than 15 min	0	0	0	0	0	8 (8.6)

Satisfaction of Antenatal Women: Table 5 shows the results regarding their satisfaction with respect to various attributes. For convenience of description, those who gave score of 4-5 were grouped as "Satisfied" and those with scores 1-3 were grouped as "Not Satisfied".

When asked about their overall satisfaction in the antenatal care they received from the public health sector 92.47% antenatal women responded they were satisfied and none were dissatisfied. More than three fourth (87.1%) of the antenatal interviewed were satisfied with the health facility and other structural facilities available and none were dissatisfied.

89.25% were satisfied with the waiting area in the health facility; 91.39% were satisfied with cleanliness of the health facility and surrounding and 86% were satisfied with availability of drugs in the health facility.

More than three fourth (88.17%) were satisfied with the time they spent with their health care provider though most spent only 5 – 15 minutes.

A similar proportion (86.02%) was satisfied with the freedom they perceived in discussing their fears and anxiety. One-quarter (25.8%) were dissatisfied with the advice received regarding nutrition as they were not provided this health education.

Half of the women interviewed were dissatisfied with the advice received regarding rest and exercise during pregnancy and warning signals and complications. Less than three quarters were advised about their next visit.

Table- 5: Satisfaction of Antenatal Women (N=93)

Satisfaction Regarding	Very satisfied n (%)	Satisfied n (%)	Neither satisfied nor unsatisfied n (%)	Dis-satisfied n (%)	Very unsatisfied n (%)
Health Facility	17 (18.3)	64 (68.8)	12 (12.9)	0	0
Waiting Area	17 (18.3)	66 (70.9)	8 (8.6)	1 (1.1)	1 (1.1)
Cleanliness Of Health Centre And Surrounding	16 (17.2)	69 (74.2)	7 (7.5)	0	1 (1.1)
Availability Of Drugs	12 (12.9)	68 (73.1)	8 (8.6)	4 (4.3)	2 (2.2)
Time Spent With Health Care Provider	15 (16.1)	67 (72)	8 (8.6)	2 (2.2)	1 (1.1)
Regarding Health Education Regarding Nutrition	17 (18.3)	45 (48.4)	7 (7.5)	0	24 (25.8)
Regarding Health Education Regarding Rest & Exercise	11 (11.8)	28 (30.1)	7 (7.5)	2 (2.2)	45 (48.4)
Health Education Regarding Warning Signals	8 (8.6)	25 (26.9)	9 (9.7)	1 (1.1)	50 (53.8)
Discussing Their Fear And Anxiety	20 (21.5)	60 (64.5)	10 (10.8)	1 (1.1)	2 (2.2)
Overall Satisfaction	18 (19.4)	68 (70.9)	7 (7.5)	0	0

Place from where the IFA tablets were obtained (table 6): Both public sector and private sector were equally utilized for obtaining IFA tablets. Only 5.4% women received IFA tablets from the subcentres. 45% were receiving it from the private sector, either private hospital or medical stores. This was because they were motivated to purchase from the place advised by their gynaecologists and another reason being the perceived poor quality of IFA provided through the government sector.

Place from where the injection TT was administered (table 6): Public sector was utilized by majority (93%) for TT immunization; only 1.1% women received TT immunization from the subcentres. Around 4-5% took vaccination from the private sector, which can be attributed to their gynaecology consultation elsewhere.

Table-6: Place from where the IFA tablets/TT injections were obtained

Place/ Service	SC	PHC	BPHC/ CHC	TH	Private Hospital	Medical Store
IFA tablets	5.4%	34.4%	7.5%	5.4%	17.3%	30.1%
TT injections	4.4%	58.1%	14%	17.2%	5.4%	1.1%

Health care Provider: In the present study, 72.6% of the antenatal women received care from a female health worker (JPHN) alone in the antenatal clinics and only 27.4% women were provided care by a doctor during observation. 83.9% of the antenatal women reported that they were consulting a gynaecologist either in the institution studied or outside. The attributes of process of care like interpersonal aspects and provision of health education were better provided by the JPHN.

Observed conduct of clinic: The ANC clinics officially started at 9am and closed at 1pm. Service delivery usually did not start on time either due to the late arrival of the health worker or due to the fact that they did not expect any pregnant women to come that early. Health workers encouraged pregnant women to arrive early in the morning as the antenatal women generally came towards noon, probably after morning chores at home have settled. There were instances when the JPHN did not attend to women who made her ANC visit on a day not scheduled for antenatal clinic and told her to come back on the correct day.

An informal history taking was usually conducted but not properly structured or complete; usually in the presence of other women. Most of the women had their blood pressure measured, weight checked and tetanus toxoid vaccination.

However, genital examination, abdominal examination including manual palpation of the foetus, measurement of the fundal height, the fundal lie and listening to the foetal heart, foetal heart rate and recording of body temperature, pulse rate and respiration rate were not performed for most of the antenatal women at the primary or secondary level facilities where the antenatal clinic was conducted by the JPHNs.

The JPHNs said that they did not perform most of the examination as per guidelines because of the perceived patients' preferences. Their clients were on regular antenatal check-ups from a gynaecologist and did not want to be examined by them. Moreover, the only expectation from the health facility was the prophylactic tetanus vaccination and IFA tablets.

Individualized birth plans were hardly addressed except in a few indicated cases that too during the physical examination, probably because the women were on regular consultation with a gynaecologist elsewhere.

Apart from perfunctory advice on diet i.e. to eat green leafy vegetables and drink milk, the advice on other aspects of antenatal care was found almost always neglected. *Health education sessions* were supposed to be held either at the beginning or at the end of the antenatal clinic on a topic selected by the JPHN for all women attending the ANC clinic on the day. Though none were observed during the study period, records of having been taken on earlier dates were found in the registers. This would have been probably due to the very low and dispersed attendance.

Details of antenatal women were recorded in the antenatal register in the health facility and on women's ANC cards. An *antenatal clinic register* was maintained in all the institutions visited. There was no uniformity in the details maintained in these registers. Minimum details of the antenatal like age, parity, expected date of confinement, height, weight, whether injection Tetanus Toxoid taken or not were maintained in all institutions. But details like blood pressure, haemoglobin level, foetal heart sound, iron folic acid given, etc. were not mentioned in most of the registers. A probable reason for this may be the duplication of information in MCH register and the ANC register. The former is well maintained and almost complete in all these institutions. Only one out of the 27 institutions had a well maintained Antenatal clinic register.

Planned place for delivery: All the participants were planning to deliver in a health facility. Most (85.6%) were planning to deliver in a tertiary set up and none were planning to deliver in PHCs or SCs. Only 14.4% were planning to utilize a secondary level institution for delivery. 17.8% were planning to deliver in a private hospital. Delivery choices were made on the basis of perceptions of the likely quality of care as well as social factors. Moreover 83.9% were consulting a gynaecologist elsewhere. Out of 93 women interviewed, 88.2% had planned a different institution for delivery, while 3.2% were yet to decide. On enquiring the reason for not planning to deliver in the same institution, 70 out of 82 responded that there were no facilities for delivery in those institutions and 12 (14.6%) felt that the available facilities were not satisfactory.

Discussion

It is seen here that most of the attributes under Interpersonal Aspects were performed better in the primary levels like the PHC, BPHC and CHC than in the TH. This may be due the fact that JPHN conducts the clinic at the primary level and have a better rapport with the antenatal woman. The difference in case load for the JPHN and gynaecologist may be another factor.

With regards to Technical Aspects of process of care, the percentage of speculum examination was low (1%) and this may be due to two factors: one that antenatal women of all trimesters were included in the study, whereas this examination is done in only the third trimester women and the other reason may be that JPHN was the health care provider in 92% institutions.

The same reasons may hold good for the finding that abdominal examination was performed in only 23%. In this study, health education regarding HIV / STD was not provided in any of the observed cases. This was because the JPHN assumed that this information is to be provided by the counsellor in the ICTC when the antenatal goes for screening.

Only 49% of the 197 antenatal women observed were given Iron and Folic acid tablets (IFA). The health workers as well as the antenatal women perceived the available IFA tablets to be of poor quality and hence the JPHNs were reluctant to give. Only 81% were observed being administered Tetanus vaccination; this may be because services delivered by the health care provider only on the day of visit by the investigator were considered; whilst the subject may have received the injection during her previous visits.

Certain aspects like weight measurement during ANC and advice regarding nutrition, rest, sleep and exercise during pregnancy were comparable to the findings in a similar study done in Thiruvananthapuram; but most aspects were found to be poor in our study like blood pressure checking, haemoglobin measurement, blood grouping, urine examinations other than Urine pregnancy testing, blood examination for HIV /HBsAg/ VDRL and health education regarding breast feeding [9].

Blood pressure measurement was received by a greater proportion in Nepal (82.5%) and Pakistan (86.4%) [14,15]. With regards to blood examination lesser proportion received the service in Nepal (45.3%) and Pakistan (60.8%) [14,15].

Urine examination was performed in 55.9% in Pakistan study whereas in 22.6% in Nepal [15,14]. The reason for better performances in the Thiruvananthapuram study may be due to the fact that it was conducted in tertiary hospitals and our study was conducted mainly in primary level hospitals. In few aspects like height measurement and advice on family planning our study, though low, scored better than Thiruvananthapuram study [9].

In the Nepal study, weight was measured in 91.4% but height was measured in only a little more than a quarter (26.5%) [14]. The overall mean percentage score for process of care was found to be poor (31.75%; SD 10.59) indicating that none of the antenatal women received good quality (≥60%) antenatal care.

The overall score was found to be significantly different between the different levels of public health sector ($p< 0.001$), with better scores at TH and BPHC levels. At the PHC level, BPHC level and the CHC level, none of the attributes scored 60% or above. This was dissimilar to the conclusion of Zambia study, were services provided did not vary between facilities [16].

On comparing the scores obtained for various attributes between the different levels of health care, the difference in scores was found to be significant with regards to Diagnostic techniques ($p<0.001$), Treatment aspects ($p<0.001$) and Health education ($p<0.001$). In the Uganda study too availability of diagnostic equipments and drugs were good [17]. The history taking, counselling and treatment was found to be very poor in Pakistan [15].

Overall, better quality of care was received from the TH. The TH studied had scored above 60% for three attributes, namely Diagnostic techniques aspects (75.45%), provision of Health Education (62.5%) and Treatment aspects (64.84%) of process of care. In the Lucknow study, antenatal women perceived PHC as better facility.

Physical examination and diagnostic equipments was poor at CHC level whereas doctors were inadequate at PHC level [18]. Interpersonal aspects (52.45%) scored better than all the other attributes with around 26% of the women observed receiving good quality of care followed by diagnostic aspects (25% women). Only 1% or less received good quality care with regards to history taking, physical examination and provision of health education.

Overall quality of care from the ***client's perspective*** was good in all aspects of interpersonal relations except for few aspects like maintaining privacy.

In the study conducted by Rani M et al in India, poor interpersonal quality was reported by illiterate women and women from southern states reported better interpersonal quality when compared to those from northern states [19]. Less than a quarter (12.9%) were explained about labour and 33.3% regarding warning signals and complications during pregnancy. Greater proportion (81.6%) were explained regarding complications in the study conducted in Pakistan [15].

Observed antenatal care vs. client's perspective: There is an evident disparity between the observed antenatal care process and the care as perceived by the woman as depicted in Table 1. When 98% respondents felt the health care provider was polite to them, it was observed that only 90% were polite.

This may be a subjective difference in what is considered polite. Though in only 27% either a screen was used or door closed during consultation, twice the percentage (54%) responded that either a screen was used or door was closed.

Similar wide disparities between the observations made and client perception were evident in enquiry of previous medical / obstetric conditions (58% vs. 80%); explanation of the procedure or investigation going to be performed (24% vs. 64.5%); explanation regarding present condition and prognosis (7% vs. 57%); explanation regarding diet, rest and exercise (38% vs. 59%); breast feeding and breast care (1% vs. 25.8%); family planning (4% vs. 17%); labour (0.5% vs. 13%); warning signals and complications (3% vs. 21.5%).

The disparity noted in relation to health promotion of HIV (0% vs. 20.4%) may because this information is provided by the ICTC counsellor, so we did not observe but the antenatal received the health education. A similar disparity has been discussed in the study done in Nepal were 54% reported going to ICTC but only 33% were observed [14]. Disparities were also noted in blood pressure measurement (70% vs. 85%) and examination of eyes (7% vs. 25%).

There may be various explanations for this disparity between observed care and client's perspective of care provided.

One may be that as Potter and Macintyre hypothesized, pregnant women generally tend to be uncritical of health care and accept whatever care they receive as appropriate [20]. Another possibility is that the women were biased in answering as they were being exit interviewed inside the institution itself and they feared their negative remarks may affect their subsequent visits.

Another possibility is that we may have interviewed those who got these cares. Other possibilities may be duplication of services from various sectors or may be the difference in the perception with regards to the delivery of services. Yet another explanation for this may be the difference in number of women observed (197) and the number interviewed (93).

Table 4 shows that 8% antenatal women *perceived the* ***time spent with their health care provider*** to be more than 15 minutes in contrast to the observation that none of the antenatal women was observed being provided care for more than 15 minutes. Only 14% antenatal women reported spending less than 5 minutes with the health care provider in contrast to observed 34.5%.

The type of communication that was observed in the secondary level (TH) was that the provider only doled out information and did not encourage clients to ask questions. The communication between the client and health care provider was mostly unidirectional similar to the finding in the Tanzanian study where the health provider spent 10 minutes [11]. The Saudi Arabian study showed mean duration of initial visit was 10.3 minutes (SD 2.3) and 9.1 minutes (SD 1.1) during return visits [21].

80 out of the 93 interviewed were comfortable with the waiting. This was much higher than the 25% who were satisfied with the waiting in the Uganda study [17]. Nearly three fourths (74.6%) in the Uganda study rated services overall satisfactory, compared to 92.47% who responded they were satisfied in our study.

In the Uganda study satisfaction was especially with regards to privacy (83.5%), availability of drugs (32.3%) compared to 86% who were satisfied with availability of drugs in our study [17].

The **limitations** of this study were that the observation of process of care was a one-time assessment and the presence of the observer may have had a short-lived influence on the performance of the health care provider.

Moreover as the perceptions of the antenatal women were assessed through an exit interview in the same institution, some of the perceptions of care delivery may not have been properly expressed.

Conclusion

Process of antenatal care in totality was not satisfactory and needs improvement in all aspects at all levels. None of the studied institutions had a satisfactory score. Only a quarter provided satisfactory care in terms of *interpersonal aspects* and *diagnostic aspects*. The quality was poorest at the CHC level.

History taking needs improvement at all levels as only less than a per cent provided good quality care in this aspect. Only one per cent scored well in *Physical examination* aspect and in *Provision of health education*. There is a need to improve the quality of health education provided at all levels especially at higher levels like CHC, TH. Treatment aspect was adequate at the TH level, but very low at primary levels like PHC, BPHC and CHC.

The *client provider interaction time* was lower than the WHO recommendations though the average attendance was only 7. Most of the antenatal women came for availing only immunization facility. A disparity was noted between the observed and perceived duration of consultation.

Perceived quality was satisfactory though there was wide disparity between observed antenatal care and client perspective of care provided. Only half the women interviewed reported home visit by health worker and a similar percentage reported receiving Mother and Child Protection card.

The government sector was utilized by majority for Tetanus immunization; whereas both government and private sectors were equally utilized for obtaining Iron tablets. The quality of iron tablets in the government sector was perceived to be of poor quality by both the health workers and antenatal women. All antenatal women were planning to deliver in a health facility. Majority were planning to deliver in a tertiary set up and 17% in private sector.

Overall none were dissatisfied with the care they received. More than three fourth were satisfied with the health facility and other structural facilities available; with the time they spent with their health care provider;

The freedom they perceived in discussing their fears and anxiety. One-quarter were dissatisfied with the advice received regarding nutrition.

Half of the women interviewed were dissatisfied with the advice received regarding rest and exercise during pregnancy and warning signals. Less than three quarters were advised about their next visit.

Quality of the antenatal care delivery needs to be improved. The primary level is the first point of contact hence stress has to be given in uplifting this level. Since the average attendance is low, it is possible to improve the quality of the services provided and thus improve the credibility of the public sector. The improvement in this regard is not very easy and requires a lot of inputs.

Recommendations

- Further research should be undertaken to investigate the cause for the existing poor care process in the government sector through *focus group discussions* at various levels and identify which components of antenatal care need more stress through *participatory solution-finding.*
- *Clinical auditing* is a good strategy to improve the quality of process of care**.** The ultimate goal should be 'to create an environment of watchful concern that motivates everybody to perform better'.
- Improve interpersonal aspects especially at higher levels. Train the health workers in *communication skills*.
- Train and retrain health care providers with specific emphasis on technical aspects like history assessment, physical examination, scheduling of visits and developing an Individual Birth Plan (IBP).
- Increase client- provider interaction time.
- Improve quality of counselling during antenatal care, with regards to food intake, activity, danger signs in pregnancy in order to equip pregnant women to make timely decisions for seeking care when a complication arises, postnatal checks and breastfeeding.

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