Quality of Antenatal Care Services at Family Health Units in Alexandria

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ABSTRACT
Background: Quality care encourages health seeking behaviors of clients, motivates health providers, safe guard's client's health and ensures sustainability of the programs, however no adequate data is available on quality of antenatal care in Alexandria. **Objective:** To assess quality of antenatal care through client satisfaction, provider's performance and availability of basic and necessary equipment in seven selected family health units in Alexandria. **Materials and Methods:** A cross sectional study was carried out in seven family health units. One health unit was selected randomly from each of the seven administrative zones in Alexandria. Data were collected from clients of the antenatal care service, health providers and the seven health units. For the exit interview, a total of 427 women were selected by proportion to size of clients in each health unit and a structured pre-tested questionnaire was used. All the seven physicians working in the antenatal clinics were observed using observation check list while examining sampled pregnant women . An Observational checklist was used to assess the availability of instruments and medical equipments necessary for antenatal care**. Results:** Findings indicated poor structure in all the family health units. By observation, 91.3% of pregnant women received poor care while 8.7% received fair care. With concern to interpersonal and technical aspects of antenatal care received, 93.9% and 59.7% respectively had good level of satisfaction. Regarding constellation of services and continuity of care mechanisms, 90.4% and 50.1% of women respectively had fair level of satisfaction, while 54.8% had poor level of satisfaction with information and counseling. **Conclusion:** Overall satisfaction of antenatal care is high, although health providers did not follow proper management of the antenatal care service. **Recommendations:** Family health units should be equipped with essential medical equipments. Regular in-service training of health professionals on use of guidelines for examination and management of women attending antenatal care services is essential.

Key words: Antenatal care, family health units, quality

INTRODUCTION

Antenatal care (ANC) refers to pregnancy related health care provided by a doctor or a health worker in a health facility or at home.[1] ANC is the key entry point of a pregnant woman to receive broad range of health promotion and preventive services which promote the health of the mother and the baby.[2]

Quality of ANC has been designated one of the four Pillars of safe motherhood, along

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with clean and safe delivery, essential obstetric care and family planning which could contribute to reduction of maternal mortality.[3,4] While poor access to basic antenatal care is recognized as a major obstacle to improvement in pregnancy outcomes, there is a growing consensus that access to antenatal care alone is insufficient to alter the present maternal health profile and that the quality of antenatal services may be a key determinant of maternal and perinatal outcomes.[5]

Quality health care means providing health services to individuals and communities to improve health outcomes which should be compatible with the new professional knowledge. Quality antenatal care implies the extent to which antenatal care resources and services correspond with antenatal standards of a particular country.[6] To provide quality ANC, the health care providers need to have adequate infrastructure, clinical skills, necessary equipment and supplies and the referral system should function well enough

that women with complications get treatment as soon as possible. The care provided should be sensitive to women's and their family's needs and should be satisfactory.[7]

Quality of ANC depends on how women attend, initiate antenatal visits at a health facility.[8] Quality requires that pregnant women attend ANC as early as possible to receive the necessary care.[7] According to UICEF/WHO, about 70% of women worldwide had at least one antenatal visit with a skilled provider during pregnancy.[8] In Egypt, during the 5 years prior to the 2008 Egyptian Demographic Health Survey, antenatal care coverage for at least one visit was 74% and antenatal care coverage for at least four visits was 66%.[9]

Quality can be assessed based on the point of view of the users (perceived quality) or by using technical standards (quality defined by professionals).[10,11] Donabedian was one of the first to reflect upon quality, to operationalize the term, and to offer a framework for its definition based on three

major attributes: structure, process, and outcome.[10] "Structure" refers to the attributes of the settings where health care occurs (material, human and financial resources, and organizational structure); "process" denotes what is actually done in giving and receiving care; and "outcome" indicates the effects of care on the health status of patients and populations (morbidity and mortality levels). Most studies assessing quality of care have looked at curative services and at structural aspects and process attributes,[12–14] at client satisfaction,[15,16] or at the relation between curative and preventive services.[17]

Recent studies in Alexandria about the quality of antenatal care services at family health units which represent a primary care level are lacking. This study was designed to assess the quality of antenatal care services provided in the family health units in Alexandria. This can act as a starting point for improvement in the quality of antenatal care at this level of health care delivery by providing useful information to researchers and policy makers in this environment.

Within this context, this study aimed to identify availability of resources required for providing ANC, to assess providers' practice in providing ANC and to explore women's satisfaction with the quality of antenatal services received.

MATERIALS AND METHODS

Study setting:

The study was conducted in 7 family health units in Alexandria; one unit was randomly selected from each of the seven administrative regions in Alexandria (Shark, Gharb, Elmontazah, Elgomrok, Elamreia, Wassat, and Borg- Elarab). Family health units are affiliated to and operated by Ministry of Health and provide health care to insured and non insured patients.

Study design:

Descriptive cross-sectional study

Study population

The study included the following:

1. A sample of family health units to assess the structure of care.

2. All the family health physicians who work in the selected units during the study period to assess the process of care, excluding those who are in sick leave or vacation, the total was 7 physicians.

3. A sample of pregnant women (clients) who have had at least one antenatal visit to one of the selected units to assess their satisfaction with the various aspects of quality of antenatal care received (outcome of care).

Sampling size and process:

1. *A sample of family health units was selected to assess the structure of care.* One unit was randomly selected from each of the seven administrative zones in Alexandria. The total was seven units. The researcher randomly selected one health unit from the seven units, then selected one day from six working days of the week to start visiting each unit. The researcher visited each unit on consecutive days until the estimated sample was reached.

2. All the family health physicians who work in the selected units during the study period were included to assess the process of care with exclusion of those who were in sick leave or vacation, the total was 7 physicians. The researcher observed family health physicians while providing antenatal care for a sample of pregnant women (n=427) before conduction of exit interview with them to assess their satisfaction (the total number of observations was 427). All the physicians accepted to participate in the study.

3. A sample of pregnant women (clients) who have had at least one antenatal visit at the study setting to assess their satisfaction with the various aspects of quality of antenatal care received (outcome of care) was estimated as follows:

The minimum sample size required for the study was estimated to be 384 using the formula $n = p\,(1-p)(Z\_/d)\,2$ where n is the

sample size, Z_ is the standard normal deviate, set at 1.96 (for 95% confidence level), *d* is the desired degree of accuracy (taken as 0.05) and, p is the estimate of the satisfaction rate among our target population (which was assumed to be 50% in the absence of a pre-existing estimate).[15] The sample was raised to 427 to adjust non-responses. To achieve the desired sample size for the study, the available statistics at each unit was used to estimate the average number of pregnant women seen during each antenatal clinic at each unit and the number of pregnant women selected from each unit was determined by a proportional allocation ratio method, i.e. the total number of women sampled from each unit was in accordance with the relative proportion of its weekly antenatal clinic's population. Women at each unit were selected by random sampling method until the estimated sample size for the unit was achieved.

The study was conducted during a period of 3 months starting from March to June 2010.

On each of the days of the study; the researcher enrolled the women as per the number required for that health unit. During the study period, the researcher visited the female waiting area of the antenatal clinics. The purpose of the study was explained to waiting expectant mothers and asked for voluntary participation, and obtained their verbal consent to participate. They were informed about their rights to withdraw at any time. Total confidentiality of any obtained information was assured. The interview was conducted at the time of exit using a structured and pre-tested questionnaire. There were no pregnant women who refused the interview. After finishing observation of physicians while providing the process of care for the pregnant woman, the researcher interviewed the same woman for approximately 15 to 20 minutes in an area with adequate confidentiality and privacy and without any involvement of health care providers. The area is away from the antenatal clinics to avoid influence of

healthcare providers.

Data collection techniques and tools:

The study was based on the conceptual and analytic framework of quality which was developed by Donabedian[10] The framework uses three elements of quality (structure, process and outcome).

Assessment of structure

A checklist was used to assess structural items. Its design was based on literature review.[18,19] Scoring of individual items of structure was done, it was a weighted score and based on literature review.[19] It was based on a professional judgment on what can be considered as a good medical or behavioural standard. The checklist included general infrastructure, basic diagnostic equipment available, maintenance of facility and drugs available.

Level of the structure was classified according to the total maximum score (51 points) into the following grades:

- Good level of structure >80% (score >40.8)

- Fair level of structure from 60% to <80%(30.6 – 40.8)

- Poor level of structure < 60% (score <30.6)

Assessment of process

The process was measured through observation checklist. Scoring of individual items of process was done; it was a weighted score and based on professional judgment and literature review.[19] The researcher observed family health physicians while providing antenatal care to the study sample (427 pregnant women). The checklist (including scores) covered two aspects of care: interpersonal and technical aspects.

Level of the process was classified according to the total maximum score (54 points) into the following grades:

- Good level of process > 80% (>43.2)

- Fair level of process from 60% to < 80% (32.4 – 43.2)

- Poor level of process <60% (<32.4)

Assessment of outcome

Outcome in this study included women's satisfaction with care received at the health

facility. Interviewing was the data collection technique. The tool was a structured questionnaire which is based on literature review.[5,16,20,21] The questionnaire included some characteristics of clients, dimensions of satisfaction as technical quality of care, continuity of care mechanisms and provision of choices, information and counseling, constellation of services, client-provider interpersonal relationships. To assess women's overall satisfaction with the quality of antenatal care, the summary section of the questionnaire contained three indicators employed by WHO to summarize women's overall perception in the antenatal care trial. [22] These indicators included one direct and two indirect summary questions asked against the background of women's responses to previous enquiries on the various aspects of antenatal care quality. It was expected that this "overall satisfaction" variable would reflect women's overall perception of the quality of antenatal care received.[23] This variable was determined by respondents' affirmative

answers to these three questions: "if you were pregnant again, would you come back to this clinic?", "would you recommend this clinic to a relative or a friend for their antenatal checkups?" and "in general, are you satisfied with antenatal care you have received so far in this clinic?" For the purpose of this study, an affirmative answer to all of the three questions by respondent was considered an index of true satisfaction with the quality of antenatal care received. For testing the tool, the questionnaire was pretested among 25 women receiving antenatal care at one of the sampled units of the study area. No modification was required and the results were not used in the study.

Scoring of outcome:

As close-ended questionnaire was prepared to collect responses, each question had five grades of response. The scores were marked using a 5-point Likert scale,[9] in descending order (0,1,2,3,4), as follows: fully satisfied (4 points), somewhat satisfied (3 points), neither satisfied nor dissatisfied

(equivocal) (2 points), somewhat dissatisfied (1 point) and dissatisfied (zero point). The mean score percent for each item was computed by multiplying the number of respondents in fully satisfied level by 4, in somewhat satisfied level by 3 and so on then, adding the resulting three figures and dividing the sum by the total number of respondents. The resulting figure which may range between 0 and 4 was then divided by 4 and multiplied by 100 to convert the score into percentage.

The mean score percent for each dimension was computed as the sum of mean score percent of all items of a specific dimension divided by the numbers of items of that dimension. The dimension score percent ranged from 0.0 to 100%. Level of overall satisfaction was classified according to overall satisfaction mean score percent of the dimension into the following grades:

- Good level of satisfaction from 80 to 100%
- Fair level of satisfaction from 50 to <80%
- Poor level of satisfaction < 50%

Ethical Considerations

The MOH permission was obtained to conduct the survey. The purpose, general content and nature of the investigation were explained to each respondent to obtain verbal consent before inclusion into the study.

Statistical analysis:

The data was computed using EPI Data. The frequency and percentage proportions were calculated using the Statistical Package for Social Studies (SPSS), Version 16.

Study Limitations:

One limitation of this study was lack of literature on quality ANC relevant to Egypt in general and Alexandria in particular. The other limitation was that the study findings cannot be generalized to other organizations. However, the findings have provided strong baseline data for planners and implementers of the reproductive health services in coming up with strategies for improving the quality of antenatal care. Another important limitation of

this study was the lack of qualitative exploration of women's views and expectations, which did not permit one to know which aspect of quality best determines their satisfaction. It should be realized, however, that while qualitative methods allow women to disclose their feelings in greater depth than quantitative research methods, their low external validity limits applicability of the findings to the population from which the study sample was drawn.

RESULTS

Table 1 shows score of the structure of family health units. The total score for structure of the seven family health units was less than 60% of total score, reflecting poor structure in all the family health units. There were deficiencies of the structure items in the units but in a variable degree.

Table 1. Score of the structure of family health unit

Structure items	Family Health Units						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
General infrastructure: (3 points each)							
Toilets with water	0	0	0	0	0	0	0
waiting area	3	3	3	3	3	3	3
privacy of examination room	3	3	3	3	3	3	3
water to wash hands	3	3	3	3	3	3	3
Basic diagnostic equipment available: (3 points each)							
Sphygmomanometer	0	0	0	0	0	3	0
Microscope	3	3	3	3	3	3	3
Gloves	3	3	0	3	3	3	3
Stethoscope	3	3	3	3	3	3	3
Scale	0	0	0	3	0	0	0
Laboratory	3	3	3	3	3	3	3
Haemoglobin measurement	0	0	3	0	0	0	0
Uristix for the detection of glucose	0	0	3	0	0	0	0
Protein in the urine	0	0	3	0	0	0	0
Maintenance of facility: (3 points each)							
Cleanliness of toilets and facility	0	0	0	0	0	0	0
Maintenance of floors and walls	0	0	0	0	0	0	0
Drugs available: (2 points each)							
Iron sulphate	3	0	0	0	0	0	0
Folic acid	3	0	0	0	0	0	0
Tetanus toxoid vaccination	3	0	3	0	0	0	0
Total	30	21	30	24	21	24	21
Mean score percent (total score = 51)	*58.8*	*41.2*	*58.8*	*47.1*	*41.2*	*47.1*	*41.2*

Table 2 demonstrates score of the process of antenatal care in the family health units. Regarding overall degree of care, 91.3% of pregnant women received poor care and 8.7% received fair care. Regarding individual items of process, asking about woman's concerns, privacy (door closed during consultation), explaining procedures to the women before examination, explaining the diagnosis and use of prophylactic drugs, assessing the history of women, checking eyes, urine for infection and legs for oedema were all not done for any woman (100%). Checking weight and fetal heart sound, providing general health education and nutritional education were all done for about ninety percent of women (90.6%). Provision of prophylactic iron sulphate, folic acid and tetanus toxoid were not done for 25.5% of women while blood pressure measurement, checking hemoglobin and urine for albumin were not done for 23.9% of women.

Table 3 demonstrates some characteristics of a sample of pregnant women who were attending family health units. The highest percent of women (41.0%) was below 25 years and mean age was 28.1±6.438. More than half of women (58.3%) had primary education while over ninety percent were unemployed and from inside the family health unit catchment area (95.8% and 93.2 respectively). Nearly fifty percent of the women (48.0%) were pregnant three times before the current pregnancy. Out of those who were pregnant before (287 women), 52.3% had three or more children. The gestation age of 67.2% of women was below 37 weeks and 83.8% of women had at least two antenatal care visits (all the women were in the third trimester i.e. 27-42 week), 62.3% previously used the unit for ANC. The table also reveals that the mean waiting time was 1.4±0.814.

Table 2. Score of the process of antenatal care in family health units

Process of care	Performed		Not Performed	
	No.	%	No.	%
Interpersonal aspects: (Maximum, 16 points):				
Making women comfortable				
Seat offered (2 points)	427	100	0	0
Health worker–woman interaction				
Interest (2 points)	389	91.1	38	8.9
Non-interruption of woman's speech (1 point)	315	73.8	112	26.2
Politeness(2 points)	407	95.3	20	4.7
Asking about woman's concerns (2 points)	0	0	427	100.0
Privacy				
Door closed during consultation (1 point)	362	84.8	65	65
Explaining procedures				
Before examination (2 points)	0	0	427	100.0
Explaining diagnosis(2 points)	0	0	427	100.0
Explaining use of prophylactic drugs (2 points)	0	0	427	100.0
Technical aspect (Maximum, 38 points):				
Assessing the history of				
Any problem (3 points)	0	0	427	100.0
Urinary tract infection (2 points)	40	9.4	387	90.6
Diagnostic approach				
Blood pressure measurement (3 points)	325	76.1	102	23.9
checking haemoglobin (3 points)	325	76.1	102	23.9
checking urine for albumin (2 points)	325	76.1	102	23.9
checking urine for infection (2 points)	0	0	427	100.0
Prophylactic drugs				
Provision of prophylactic drugs Iron(II) sulfate (3 points)	318	74.5	109	25.5
Provision of prophylactic drugs folic acid (3 points)	318	74.5	109	25.5
Vaccination				
Provision of tetanaus toxoid (3 points)	318	74.5	109	25.5
Physical examination				
Checking eyes (2 points)	0	0	427	100.0
Checking Legs For Oedema (3 Points)	0	0	427	100.0
Checking Weight (2 Points)	40	9.4	387	90.6
Checking Foetal Heart Sound (3 Points)	318	74.5	109	25.5
Providing *health education*				
General health education (2 points)	40	9.4	387	90.6
Nutritional education (2 points)	40	9.4	387	90.6
Degree of care (54 points)	(n = 427)		(%)	
Good (≥ 43.2)	0		0	
Fair (32.4 – 43. 2)	37		8.7	
Poor (<32.4)	390		91.3	

Table 3. Some characteristics of a sample of pregnant women attending family health units

Characteristics	(n=427) No. (%)
Age	
< 25	175 (41.0)
25-	91 (21.3)
30-	63 (14.8)
35+	98 (22.9)
Mean ± SD	28.1±6.438
Education	
None	152 (35.6)
Primary	249 (58.3)
Secondary	22 (5.2)
University	4 (0.9)
Occupation	
Unemployed	409 (95.8)
Employed	18 (4.2)
Residence	
Inside unit catchments area	398 (93.2)
Outside unit catchments area	29 (6.8)
Parity	
Nulliparous	140 (32.8)
1-	82 (19.2)
3+	205 (48.0)
Children number (n= 287)	
1	13(4.5)
2	124(43.2)
3+	150(52.3)
Gestational age	
< 37	287(67.2)
37-40	98(23.0)
>40	42(9.8)
Number of ANC visits	
2	358(83.8)
3	37(8.7)
4	24(5.6)
5	8(1.9)
Previously used unit for ANC	
Yes	266(62.3)
No	161(37.7)
Waiting time in minutes	
120-	67(15.7)
150-	58(13.6)
180+	302(70.7)
Mean ± Standard deviation	1.4± 0.814

ANC, antenatal care

Table 4 illustrates level of satisfaction with different items of the five dimensions of antenatal care. Concerning technical aspect of care, the highest percent of women (which is over fifty percent) had good level of satisfaction with all the items of technical care. Regarding continuity of care mechanisms and provision of choices, all the women (100%) had good level of satisfaction with information about the timing of their next visit. On the other hand, all the women (100%) had poor level of satisfaction with gender of provider and availability of reminder system. Regarding continuity of provider, the right to seek another doctor and women's involvement with decision-making with respect to care, 47.3% of women had poor level of satisfaction. Concerning interpersonal aspects of antenatal care received, over eighty percent of women had good level of satisfaction with treatment with respect, protection of their privacy and treating them equally. With respect to information and counseling, the highest percent of women (95.1%) had poor level of satisfaction. From the table, it appears that 97.0 % had good level of satisfaction with frequency and spacing of their antenatal visits belonged to the dimension of constellation of services. In addition, the highest percent of women; 83.1%, 83.5% and 81.8% had poor -level of satisfaction with waiting time, toilet facility and waiting room respectively. On the other hand, 85.0% and 81.7% of women had good level of satisfaction with examination room and working days respectively. About, one fourth of women (25.3%) had poor level of satisfaction with drugs and supply at the units.

Table 4. Level of satisfaction with items of the five dimensions of antenatal care

Dimensions of satisfaction	Level of Satisfaction (n =427)					
	Poor		Fair		Good	
	No.	%	No.	%	No.	%
Technical aspect of the care						
Number of visits	109	25.5	32	7.5	286	67.0
Level of expertise as reported by ANC providers	121	28.3	67	15.7	239	56.0
Visit of the general family medicine physician	130	30.4	51	11.9	246	57.6
Care providers could effectively handle minor obstetric complications	133	31.1	31	7.3	263	61.6
Vaccination against tetanus	52	12.2	0	0.0	375	87.8
Continuity of Care Mechanisms and Provision of Choices						
Continuity of provider	202	47.3	31	7.3	194	45.4
Information about the timing of their next visit	0	0.0	0	0.0	427	100.0
Individual antenatal records	14	3.3	63	14.8	350	82.0
Gender of provider	427	100.0	0	0.0	0	0.0
The right to seek another doctor.	202	47.3	31	7.3	194	45.4
Availability of reminder system	427	100.0	0	0.0	0	0.0
Involvement with decision-making related to care	202	47.3	31	7.3.0	194	45.4
interpersonal aspects of antenatal care received						
Treated you with respect	20	4.7	18	4.2	389	91.1
Protected your privacy	19	4.4	46	10.8	362	84.8
Treated you equally like other clients	34	8.0	24	5.6	369	86.4
Carried out unnecessary procedure/examination	0	0.0	0	0.0	427	100.0
Treated you with empathy	79	18.5	35	8.2	313	73.3
Information and Counseling						
information provided by their caregivers	213	49.9	0	0.0	214	50.1
Health education	406	95.1	0	0.0	21	4.9
Constellation of Services						
Frequency and spacing of their antenatal visits	0	0.0	13	3.0	414	97.0
Spent enough time with you during consultation	213	49.9	0	0.0	214	50.1
Waiting time	355	83.1	62	14.5	10	2.3
Waiting room/area	358	83.8	65	15.2	4	0.9
Examination room	48	11.2	16	3.7	363	85.0
Toilet facility	348	81.5	61	14.3	18	4.2
Drugs and supply at the unit	108	25.3	1	0.2	318	74.5
Costs of services	132	30.9	0	0.0	295	69.1
Service hours	85	19.9	26	6.1	316	74.0
Working days	70	16.4	8	1.9	349	81.7
Distance to clinic	65	15.2	24	5.6	338	79.2

Figure 1 shows level of satisfaction with the five dimensions of antenatal care. Regarding interpersonal aspects of antenatal care received and technical aspect of care, the highest percent of women had good level of satisfaction

(93.9% and 59.7% respectively). Regarding constellation of services and continuity of care mechanisms, the highest percent of women had fair level of satisfaction (90.4% and 50.1% respectively). Regarding information and counseling, the highest percent of women (54.8%) had poor level of satisfaction.
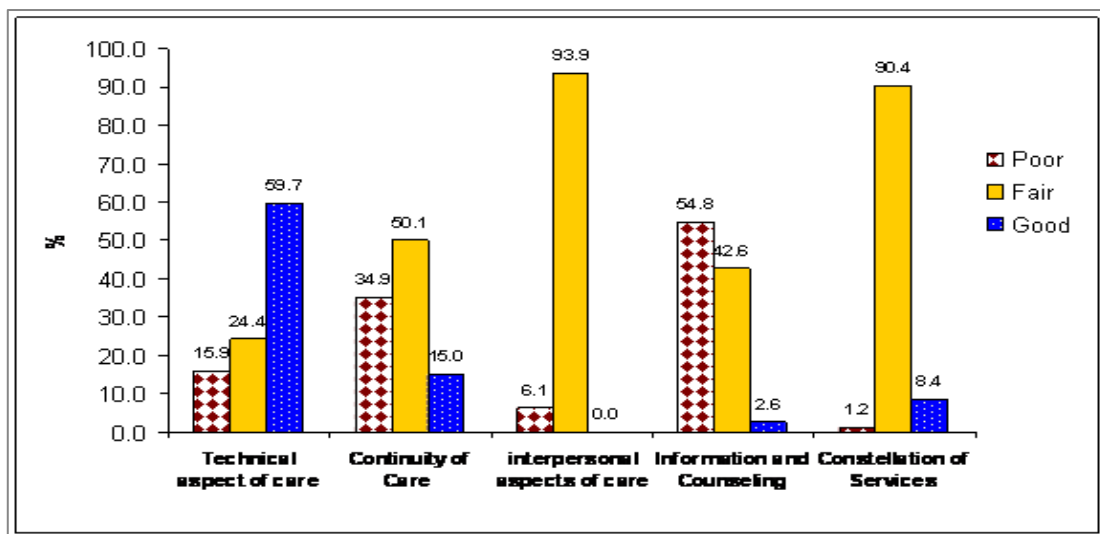

Figure 1. Level of satisfaction with the five dimensions of antenatal care

Table 5 shows relation between mean satisfaction score percent of the different dimensions of antenatal care and selected characteristics of the pregnant women. There is statistically significant relation between the "technical aspect of care" dimension and parity and previously using the unit (p=0.027); the "constellation of service" dimension and occupation, residence, and waiting time in minutes (p=0.000); the "Interpersonal relation" dimension and age and occupation (p=0.017 and 0.040 respectively); the "continuity of care" dimension and age (p=0.003) and the "information given" dimension and education (p=0.018). There is no statistically significant relation between any dimension and children number, gestational age or number of ANC visit

Table 5. Relation between mean satisfaction score percent of the different dimensions of antenatal care with selected characteristics of the pregnant women

Characteristics	Dimensions of satisfaction									
	Technical aspect of care		Continuity of care		Interpersonal relation		Information		Constellation	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Age										
< 25	77.5	22.3	63.2	14.3	91.9	7.9	35.6	19.6	68.4	7.8
25-	75.7	23.1	58.3	14.7	89.9	9.0	36.6	18.5	68.1	6.9
30-	78.1	23.2	62.0	13.9	93.0	6.7	42.2	23.3	69.9	8.1
35+	75.3	23.5	57.0	15.3	89.3	8.4	33.2	19.7	65.9	8.9
X^2 (*p*-value)	0.913 (0.822)		13.9 (0.003*)		10.2 (0.017*)		6.7 (0.083)		6.9 (0.074)	
Education										
None	79.0	22.9	61.9	15.0	91.1	8.6	34.1	18.4	67.7	8.0
Primary	75.0	22.7	59.7	14.6	91.1	7.8	38.6	21.0	68.2	7.9
Secondary	77.1	24.5	59.1	14.0	90.7	8.0	26.4	16.5	69.4	9.6
University	94.0	7.7	72.1	15.7	86.0	16.5	25.0	17.3	62.7	6.2
X^2 (*p*-value)	6.6 (0.087)		5.5 (0.138)		0.31 (0.959)		10.1 (0.018*)		2.5 (0.466)	
Occupation										
Unemployed	76.4	22.8	60.6	14.8	91.2	8.2	36.4	20.3	67.7	7.9
Employed	82.7	22.1	60.2	14.1	88.2	6.6	32.2	15.6	74.9	6.9
Z (*p*-value)	1.3 (0.158)		0.03 (0.980)		2.1 (0.040*)		0.98 (0.325)		3.8 (0.000*)	
Residence										
Inside catchments area	77.1	22.6	60.5	14.9	91.0	8.2	36.0	20.4	67.6	8.0
Outside catchments area	70.9	26.0	61.9	12.6	91.9	7.3	39.0	15.0	73.1	6.3
Z (*p*-value)	1.2 (0.233)		0.43 (0.666)		0.30 (0.673)		0.78 (0.432)		3.7 (0.000*)	
Parity										
Nulliparous	80.3	22.4	61.8	15.1	90.8	8.8	33.0	18.3	67.7	8.0
1-	76.0	22.8	60.9	14.4	91.4	8.1	36.0	19.9	67.8	8.3
3+	74.6	22.9	59.5	14.6	91.1	7.8	38.5	21.0	68.3	7.9
X^2 (*p*-value)	7.2 (0.027*)		2.1 (0.364)		0.23 (0.891)		4.9 (0.086)		0.59 (0.754)	
Children number										
1	71.7	19.8	60.2	13.0	91.1	10.0	43.1	17.0	68.3	7.6
2	76.5	22.9	60.3	14.9	91.6	7.9	36.8	19.3	67.9	8.4
3+	74.0	23.1	59.7	14.5	90.8	7.7	38.2	22.1	68.4	7.8
X^2 (*p*-value)	1.4 (0.505)		0.22 (0.894)		1.4 (0.506)		1.1 (0.584)		0.39 (0.820)	
Gestational age										
< 37	77.3	22.6	60.7	14.8	91.1	7.8	35.2	19.6	68.1	7.7
37-40	78.0	22.5	60.1	15.0	91.3	8.3	38.8	20.8	68.1	8.7
>40	69.8	24.1	60.8	14.3	90.0	10.4	37.1	21.7	67.4	8.7
X^2 (*p*-value)	4.9 (0.058)		0.09 (0.953)		0.18 (0.907)		2.8 (0.242)		0.66 (0.719)	
Number of ANC visits										
2	76.6	22.9	61.0	14.8	91.4	7.8	36.8	20.5	68.3	8.2
3	82.2	19.7	57.5	15.4	91.1	9.5	36.2	18.0	66.6	5.8
4	72.5	25.3	59.9	14.0	85.8	10.3	30.4	17.1	67.1	9.0
5	69.0	26.3	56.8	12.0	90.0	6.4	28.8	18.1	65.9	5.7
X^2 (*p*-value)	2.2 (0.529)		2.8 (0.424)		7.8 (0.050*)		2.9 (40.6)		2.6 (0.453)	

X^2: Kruskal Wallis test   Z: Mann Whitney test   * P < 0.05 (significant)
X^2: Kruskal Wallis test   Z: Mann Whitney test   * P < 0.05 (significant)

 Figure 2 demonstrates pregnant women's overall satisfaction in general and intention to visit the unit again or recommend it to others. Over fifty percent (57.1%) of the sample mentioned that they will visit the unit again and recommend it to others while 70.3% were in general satisfied with the service.
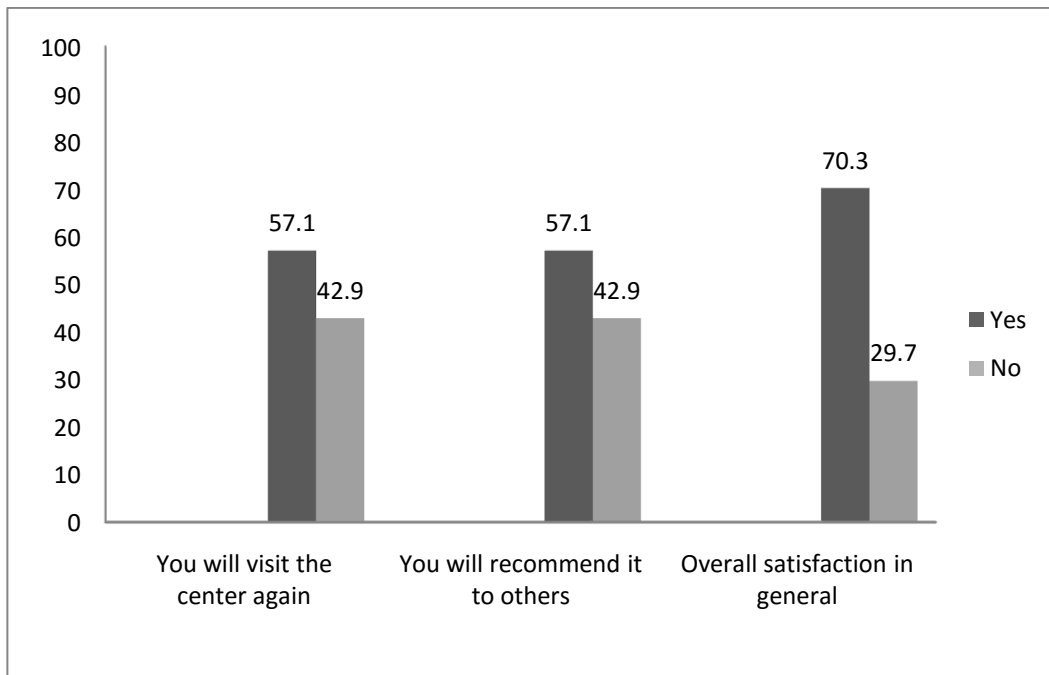

Figure 2. Pregnant women's overall satisfaction in general and intention to visit the unit again or recommend it to others

   Table 6 reveals stepwise linear regression for identifying the factors predicting different satisfaction dimensions and the total satisfaction score of the study sample. The model included all the previously studied patient characteristics

(age, education, occupation, residence, parity and waiting time) as independent factors for assessing satisfaction. As for technical dimension, education was the only significant predicting factor as the patient with higher level of education recorded more satisfaction score by about 1.7, while age was the only predicting factor for patient satisfaction at continuity of care mechanisms where satisfaction score decreased by about 0.14 for each one year advancement in age. Regarding interpersonal aspects of antenatal care received, the non employed persons were less satisfied by about 1.5 points, while information and counseling dimension was inversely related with education and number of visits (B = -0.98 and -0.39, respectively). Waiting time was inversely related with constellation beside the females' residence. Regarding the total satisfaction in general, the main predicting factors were age and waiting time where increased age by one year was accompanied with decreased satisfaction score by 0.26, while the increased waiting time was followed by decreased satisfaction score by 0.07.

Table 6: stepwise linear regression for defining the factors affecting different satisfaction dimensions and the total satisfaction score of the study sample.

Factors	Beta (B)	SE	Standardized B	t	P
Technical					
Constant	15.21	1.71		8.90	0.000*
Education	1.71	0.81	0.12	2.11	0.036*
Continuity					
Constant	25.02	1.39		18.00	0.000*
Age	-0.14	0.05	-0.17	-2.97	0.003*
Inter					
Constant	24.28	0.66		36.82	0.000*
Occupation	-1.44	0.63	-0.13	-2.30	0.022*
Information					
Constant	6.69	0.76		8.81	0.000*
Education	-0.98	0.29	-0.20	-3.39	0.001*
Number of AN visits	-0.39	0.19	-0.12	-2.04	0.043*
Constellation					
Constant	47.92	2.03		23.65	0.000*
Waiting time in minutes	-0.08	0.01	-0.43	-8.16	0.000*
Residence	3.23	1.04	0.16	3.10	0.002*
Grand total satisfaction					
Constant	122.36	5.11		23.93	0.000*
Age	-0.26	0.10	-0.16	-2.71	0.007*
Waiting time in minutes	-0.07	0.03	-0.15	-2.55	0.011*

Beta: regression coefficient
Standardized B: standardized regression co efficient
SE: Standard error
* P < 0.05 (significant)

DISCUSSION

This study was conducted to assess quality of antenatal care services at family health units. Regarding the *structure of care*, poor provision of ANC was identified at all health units. Pregnant women had to wait in a crowded uncomfortable and badly ventilated waiting area due to lack of proper structure. The findings concur with another study in Istanbul.[24] In the present study, some health units had shortage of vital equipments and supplies for providing ANC like sphygmomanometer and reagents for

hemoglobin testing, urine testing, ANC drugs (e.g. iron). In addition, there was inconsistent availability of the supplies, which resulted in dissatisfaction of some women. These findings were identified in other studies.[25,26] In agreement with the findings of the current study, studies in other countries[27,28] revealed that the quality of ANC in most public health facilities is affected by lack of necessary equipments and resources compared to private facilities mainly due to inadequate funding. This finding implied that the women were denied of services requiring materials which were not available.

Regarding the *process of care*, there are two simple preventive interventions that have proven effective in reducing maternal and neonatal deaths.[4] The first intervention is tetanus toxoid, which helps to prevent neonatal and maternal tetanus.[29] The second intervention is iron and folate supplementation which helps to prevent iron deficiency.[29] In the current study provision of prophylactic iron sulphate, folic acid and tetanus toxoid were

not done for 25.5% of women. Moreover, about one fourth of women (25.3%) had poor level of satisfaction with drugs and supplies at different units. So, managers and decision makers should properly manage the resources of the units to guarantee regular supply. In the current study, no woman was examined for oedma, this causes serious concern as oedema is often the only clinical sign of pre-eclampsia.[30] The staff providing ANC did not concentrate on important investigations like urine testing and blood testing, where checking blood haemoglobin and urine for albumin were not done for 23.9% of women. This implies that identification of pre-existing health conditions that may affect outcome of pregnancies such as anemia was not offered. Such missed opportunities should be regarded as indicators of poor quality. The reasons why health workers perform poorly and ways found to improve their performance need to be investigated. It needs to be established whether the problem is lack of knowledge, or failure to translate knowledge

into appropriate practices by health care workers. However, the finding could be due to lack of staff orientation about importance of these investigations, and lack of resources such as lack of reagents. Inadequate staff training or lack of refresher courses to upgrade staff skills on maternal health have also been reported in some studies.[31, 32]

Regarding *outcome of care*, 56.0% of the women had good level of satisfaction with the level of expertise of their care providers and this is similar to a study in Nigeria.[33] Expectations of women as well as their perception of care would largely depend on pregnant women's knowledge about expected care, which may be dependent on previous experience as well as their level of education.[33] This assertion is supported by the finding of other study which was conducted in Nigeria.[33] Similarly in the current study, education was the significant predicting factor for technical dimension as the patients with higher level of education recorded more satisfaction score. Specifically,

56.0% and 61.6% respectively of the women were pleased with the level of expertise of their care providers, and a significant proportion was confident of basic technical competence of their providers and this is similar to other study which was conducted in Nigeria.[33]

In the current study, more than half of the women had poor level of satisfaction with the dimension of information and counseling. One of the main goals of ANC is the provision of adequate information that is essential for maintaining and improving pregnancy outcomes.[33] Moreover information and communication are essential elements of health care provision. Reviews of women's experiences of maternity care highlight their importance.[34, 35] Unfortunately, the current study did not look at providers' views or reasons for perceived deficiency in information provided to some women. Approaches to improving quality of care should be based on regular quality assessments. It is suggested that much attention needs to be given to train

on the concept of counseling, its importance, its requirements and importance of meeting women's information needs during antenatal clinic visits.

Interaction of caregivers with the clients has always been the key to high satisfaction with the service.[36,37] In our study, 93.9% of women had 'Excellent' grade of satisfaction with interpersonal dimension of care and women had positive impression on all aspects of interpersonal relationship. These findings emphasized the fact that in a developing country setting, many women refer to high quality care as "being treated as human beings" without considering the technical aspect of quality.[36] In recent time, the importance of continuity of care in improving the outcome of care is being realized.[38] In the current study 50.1% had fair level of satisfaction with continuity of care dimension.

Waiting time has been reported to influence the satisfaction of clients.[39, 40] In the present study also, waiting time was linked to dissatisfaction with the services where Mean ±

SD was 1.4±0.814. This finding is similar to other studies in Saudi Arabia Cuba, Thailand, Argentina, Oman and Sudan.[40-42] It is important for authorities at these units to find means of reducing the waiting time of pregnant women and this can be achieved by increasing the number of staff in each clinic to decrease workload and thus reduce waiting time.

As regards available facilities, women expressed dissatisfaction with waiting area, drugs and supply and the units toilet facilities. The waiting area and toilet facilities need to be upgraded in these centers to meet expectation of pregnant women. With relatively small-scale investments, many physical infrastructures can be upgraded to meet minimum standards. In accordance with similar studies,[23,24] the questions used to explore women's satisfaction in general showed high level of satisfaction, despite the fact that varying proportion of women expressed concerns about some elements of quality of care. It should be noted, however, that respondents

are often inclined to respond positively to questions on satisfaction with care received, especially when asked within clinical settings, as is systematically noted in research on perceived quality or satisfaction. This implies that caution should be entertained in interpreting our results and may be better considered in a relative rather than an absolute sense. This observation is corroborated by the disparities in the responses to the three questions used for evaluating women's overall perception of antenatal care. The percentages of women who would use the centre again (57.1%) and those who were satisfied (70.3%) indicate that 13.2 percent of the women expressed satisfaction although they were no longer willing to use the centre again. Some studies have blamed women's general uncritical attitude of health care as the reason for the satisfaction they often express and thus suggest that more emphasis should be placed on their expressed preferences than the absolute magnitude of expressed satisfaction.

Regarding relation between satisfaction and selected characteristics of the pregnant women, education was the only significant predicting factor of the technical dimension, while age was the only predictor of patient satisfaction at continuity of care mechanisms. Regarding interpersonal aspects of antenatal care received, the non employed persons were less satisfied; while information and counseling dimension was inversely related with education and number of visits. Waiting time was inversely related with constellation beside the females' residence. Other studies revealed that, socio-demographic factors (age, women education, and women occupation), were not associated with women satisfaction.[42,43]

CONCLUSION

The research provides indications about the areas that should be focused on to promote the quality of antenatal services in family health units, Alexandria. Findings indicated poor structure in all the family health units. By observation, 91.3% of pregnant

women received poor care while 8.7% received fair care. Important areas that deserve consideration (areas of poor level of satisfaction) are gender of provider and availability of reminder system (100%), the right to seek another doctor and women's involvement with decision-making with respect to care (47.3%), information and counseling (95.1%), waiting time (83.1%), waiting room (83.8%), toilet facility (83.5%) and working days (81.7%).

RECOMMENDATIONS

Family health units should be equipped with essential medical equipments including clinical management guidelines. Regular in-service training on management of women coming to health units and on the use of family medicine guidelines for examination and management of health professionals working in antenatal care is essential. This study has certain limitations but quality improvement is never an ending journey therefore further studies are valuable for the improvement of maternal health services.

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