

## Research Article

# Effects of a Clinical Audit Training Model on the Quality of Reproductive Health Services in Primary Health Care

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## Abstract

Audit and feedback is used as a quality improvement strategy to enhance professional practice. This operational research was conducted in two Family Health Units (FHU) of Primary Health Care (PHC), in Giza Governorate-Egypt. A pre/post comparison was done in a test unit and results compared with findings of a control unit. The study aims at evaluating the effects of implementing clinical audit on the performance of Reproductive Health (RH) services in the selected FHU and assesses client satisfaction among clients attending for reproductive health services of antenatal care and family planning, before and after implementing clinical audit training. Following implementation of the clinical audit training model the mean audit scores for the intervention unit significantly improved in all FP and ANC tasks while the control unit did not show any statistical difference between pre and post assessment scores that remained almost unaffected. It is recommended that the Ministry of Health and Population should adopt auditing as an important intervention for improvement of RH services.

**Keywords:** Family planning; Antenatal care; Reproductive health; Clinical audit; Primary health care

## Introduction

Availability, accessibility, acceptability and high quality care are fundamental for provision of effective Primary Health Care (PHC) services [1]. In Egypt, there are 5,164 units providing PHC services nationwide [2]. Reproductive Health (RH) includes several components of which the most important are maternal health services in the form of Antenatal Care (ANC) and Family Planning (FP). RH is a key component of the Basic Benefits Package (BBP) implemented through all Family Health Units (FHU). These services are available and accessible [3]. However, the quality of services provided is crucial to ensure acceptability and thus utilization of service and most important its' effectiveness.

The Health Sector Reform Program (HSRP) established a system for accreditation where FHU are assessed according to pre-set criteria. The accreditation system has been established since 1998 as part of the HSRP and managed by the Ministry of Health and Population (MOHP)-General Department for Quality (GDQ). Its aim is to garner a minimum threshold level of care across Egypt [4]. Accreditation is a formal organized process to evaluate the health care facilities according to set quality standards with defined activities and structures that directly contribute to improvement of health care outcomes [5]. PHC facilities get accredited for a maximum of two years after which they need to be re-assessed. As a result, the

accreditation process stimulates the service providers to improve their performance and ensures continuous quality improvement [4].

Clinical audit is a quality improvement process through systematic review of care against explicit criteria to identify deficiencies and implement change. Aspects of the structure, processes and outcomes of care are selected and systematically evaluated against explicit criteria. Where indicated, changes are implemented at an individual, team or service level and further monitoring is used to confirm improvement in health care delivery. This definition is endorsed by the National Institute for Clinical Excellence [6]. Unlike accreditation, clinical audit is not only periodic. Clinical audit entails making and sustaining improvements [7]. It is widely believed that healthcare professionals are prompted to modify their practice when given performance feedback showing that their clinical practice is inconsistent with a desirable target [8].

The present study was conducted to assess FP and ANC services provided by FHUs and to evaluate the effect of implementing clinical audit on performance of reproductive health services.

## Methods

### Study design

This study is an operational research, conducted in two Family Health Units (FHU) of Primary Health Care (PHC), in Giza governorate. Pre and post assessment of reproductive health services, of Family Planning (FP) and Antenatal Care (ANC), were conducted before and after introduction of a clinical audit training model in an experimental unit and compared with findings of a control unit.

### Study setting and participants

Two PHC units, in Giza Governorate were selected after consultation with the health directorate. The units were selected based on the fact that both units scored above 85% on the accreditation standards of MOHP. One of the units was randomly selected for implementing the clinical audit training model (intervention FHU). The study included health care providers and clients. All physicians and nurses working in ANC and FP clinics in either unit were included. Client satisfaction was assessed by an exit interview for a

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quota sample of 50 clients attending ANC and 50 attending FP clinics in each unit, before and after the intervention. On average 10 clients per day in the waiting area were approached. The interview took about 15 minutes to be completed.

### Implementation

The first phase of the study included a situation analysis in the two PHC units. This included observation of clinical resources available for the FP and ANC services, using developed checklists and observation of health care team members' performance using clinical audit checklists. The performance of the health teams was observed during the process of providing the required health services for 50 clients in each of the ANC and FP clinics in both units i.e. total number=100 observation from each unit. Exit interviews assessed client's satisfaction with the provided services after the women had received the required services at the ANC and FP clinics. Administration of exit interviews was conducted after obtaining voluntary verbal consents from the participants and completed in an anonymous manner. A total of 100 participants (equally divided between the two clinics i.e., 50 clients each) were included from each unit. Situation analysis was done in the two FHU simultaneously over a period of six months. The clinical audit training model was implemented in one of the units (intervention FHU) as the second phase of the study. Then a post-assessment of activities was conducted after one month duration in both units and extended for a period of four months.

### Study intervention

The content of the clinical audit training model was based on the MOHP-Practice Guidelines for Family Physicians, 2007 for quality FP and ANC services [9]. Four clinical audit training sessions, as well as two feedback sessions were administered. The training aimed at introducing a structured approach to clinical performance in FP and ANC, as well as assist the medical team to identify areas and activities in need for quality improvement based on initial baseline assessment. Each session was conducted on two separate days. The duration of each session ranged between 60-90 minutes. A total of six sessions were conducted at the intervention FHU. The training was administered to 9 trainees (5 from ANC and 4 from FP). The gained team skills were assessed after four weeks.

### Items of clinical audit training

The training model was divided into two main sections which covered ANC and FP. Items of ANC addressed elements of quality ANC in two subsections that included communication and examination (27 items) and Counseling (12 items). Items of FP included three subsections covering quality FP services that consist of communication and general examination (20 items), pelvic examination (10 items) and IUD insertion (14 items). All items included in the training model were assessed at baseline using specific observation checklists.

### Evaluation

After completion of the training sessions the following activities were conducted after one month pre-assessment of FHU medical team practices, using the clinical audit observation checklists. The researcher observed the performance of the health team during the process of providing the required health services for another 50 clients in each of the ANC and FP clinics in both units. Re-assessment of client satisfaction with provided services, using the exit interviews. The exit interviews were administered to another group of women (50 from ANC and 50 from FP clinics) from each unit.

### Statistical analysis

All collected questionnaires were revised for completeness, and logical consistency. Statistical analysis was performed using the Statistical Package of Social Science, version 15 (SPSS *vs.* 15).

Simple frequencies were used for data checking. Comparison between pre-and post-intervention nominal data findings was done using the McNemar's test while comparison of proportions between the intervention and control FHU was done using the Chi Square test. A total score was calculated for each of the audit checklists where if the item was done the score given was one and if not done then this was given a score of zero. This was followed by summation of all scores of the items on each checklist. Independent t-tests of the differences in average scores was performed to test whether there was a difference between the intervention FHU as compared to the control FHU at baseline and after implementation of the clinical audit intervention. The Paired t-test was used to test for significant improvements in mean scores before and after the intervention within the same centre. The significance level was set at P-value  $\leq$  0.05.

### Ethical considerations

The study protocol was discussed by staff members of the Public Health Department, Faculty of Medicine, Cairo University, and was approved by its council. Selected members of this department constituted the internal review board to guarantee the ethical conformity of the study. Verbal consents were obtained from all participants before recruitment in the study, after explaining the objectives of the work. Confidentiality was guaranteed on handling the database and questionnaire forms according to the revised Helsinki declarations of biomedical ethics [10].

### Results

The Ministry of Health and Population (MOHP) had previously accredited the two selected units with a total score of 85% for both. The total score was 86.7% for the intervention FHU and 88.5% for the control FHU. Both units are located in a densely populated area serving a low/middle income class population. Each unit works from 9:00 am till 3:00 pm. They provide integrated reproductive health services within the family health basic benefits package. An observation checklist for clinical resources was used to assess the FP and ANC clinics of both units. FP methods display was available in the control unit only. Contraceptive pills, condom and injectable leaflets were available in adequate number and Intra Uterine Device (IUD), injectable, subcutaneous implants and pills stock were available for 2-3 months in both units. However, condom stock was deficient in the intervention unit and IUD leaflets were deficient in the control unit. There was monthly comparison of achievements between previous and current years in both units. As for the ANC clinic, all examination forms were complete and there was comparison of achievements between current and previous year and these items were fulfilled at the control unit only. On the other hand, a weight scale was present in the intervention unit but not at the control unit. No monthly comparison of achievements between previous and current years was done in both units (Table 1).

An equal number of nurses were found in both units representing 22% and 25% of the health team in the intervention and the control FHU respectively. On the other hand, doctors were slightly more at the control than the intervention FHU (34% and 26% of health teams respectively). Pharmacists, laboratory technicians and community/outreach workers were slightly more at the intervention than the

control FHU (Table 2). Three physicians are allocated for FP services in either unit two of which are seniors with more than 5 years experience in the intervention unit, while in the control unit only one senior physician is available. Only one junior nurse is allocated for FP in the intervention unit and two senior nurses at the control unit. ANC is provided by 4 physicians in the intervention FHU three of which are seniors and only three junior physicians in the control unit. Only one junior nurse works in ANC clinic in either unit. All the physicians and nurses were females.

During assessment of services provided for 50 patients in the FP clinic of the intervention FHU, it was found that the nurse prepares the examination space and get supplies needed for examination for only 6% of clients (n=3 for each) at baseline assessment compared to 94% (n=47) and 98% (n=49) respectively in the post-assessment phase. None of the FP providers examined the face, breast, neck teaches breast self-examination, examined the abdomen or legs for varicose veins, measured clients' blood pressure or weighed the clients while during the post-assessment these were done to more than 80% of the FP clients (n>41 clients) with high statistical significance (P<0.001). During the pelvic examination of FP clients in the intervention unit, providers washed their hands in the post assessment phase in all observed clients (100% - n=50) compared to only 6% of the time in the pre-assessment (n=3 clients) and this was statistically significant (P<0.001). Explaining speculum insertion procedure was done for only 4% of clients in the pre-assessment phase (n=2) compared to 100% in post assessment (n=50) and this finding was highly significant (P<0.001). The intervention unit's providers re-confirmed client's method choice for 6% of FP clients

(n=3) in the pre-assessment phase and this reached 100% (n=50) in post-assessment which was highly significant (P<0.001). None of the FP clients were asked to wait and rest for 15 minutes after the IUD insertion in the pre-assessment compared to 100% (n=50) during post-assessment (P<0.001).

The mean audit scores for FP general examination at the intervention unit significantly improved after the intervention (P<0.001). No difference was found between both units at baseline before the intervention (P<sub>1</sub>=0.06). Comparing the intervention unit with the control unit in the post-assessment phase showed a significantly higher mean score for general examination of FP (P<sub>2</sub><0.001). The mean audit scores for IUD insertion at the intervention unit significantly improved after the intervention in comparison to baseline scores (P<0.001) and IUD insertion score was significantly reduced at the control unit. Additionally, a significant difference was detected between both units after intervention with the intervention unit showing the significantly higher mean score with P<sub>2</sub><0.001 (Table 3).

Items observed during ANC examination at the intervention FHU showed that the nurse prepares the examination space for 96% of the observed ANC clients (n=48) in the post-assessment while this was not done in at baseline with high statistical significance (P<0.001). There was a significant improvement in hand washing procedures which was done for 74% of clients (n=37) post-intervention compared to not at all at baseline with (P<0.001). Measuring client's blood pressure in the pre and post-assessment was 46% (n=23) and 100% (n=50) respectively with (P<0.001). Summarizing findings for the client upon completion of examination increased to 54% (n=27) while this was not done at baseline. Similarly, cleaning tabletops with a disinfectant was done after finishing examination of 50% of observed clients (n=20) in the post-assessment phase compared to not at all and these findings were statistically significant (P<0.001). In addition, ANC counseling improved significantly after the intervention. All clients received counseling about personal hygiene in the post assessment phase (n=50), which was not done to any of the observed clients at baseline. Counseling regarding adequate nutrition improved from 78% (n=39) at baseline to 100% (n=50) post-assessment. Furthermore, Counseling on danger signs of pregnancy improved from 20% (n=10) at baseline to 100% (n=50) in the post-assessment phase with all findings showing high statistical significance (P<0.001).

The mean audit examination scores for ANC showed no difference between the intervention and control units at baseline (P<sub>1</sub>=0.3). However, the intervention unit showed a highly significant improvement in mean ANC examination score after intervention from 17.01 ± 0.4 to 25.21 ± 0.5 (P<0.001). Additionally the intervention unit was significantly better (P<sub>2</sub><0.001) than the control unit that remained almost unaffected. Similar findings were found for ANC mean counseling scores (Table 4).

The majority of clients were satisfied with FP services in both units, and although the proportions decreased after intervention, no statistical difference was detected within each unit or between units. On the other hand, there was a marked significant difference between the intervention and control units regarding satisfaction with ANC services in the post-assessment phase (P<sub>2</sub>=0.007). However, no difference was detected within each unit (Table 5).

**Table 1:** Comparison of clinical resources in both units.

Items	Intervention unit	Control unit
Family planning services		
Availability of family planning methods	×	√
Condom stock (3 months)	×	√
IUD leaflets	√	×
Antenatal care services		
Antenatal care examination forms	×	√
Weight scale	√	×
Monthly comparison of achievements	×	×
Annual comparison of achievements	×	√

**Table 2:** Distribution of health care team in the intervention and control family health units.

Health Care team members	Intervention FHU		Control FHU	
	Frequency	Percent (%)	Frequency	Percent (%)
Manager	1	1.5	1	1.7
Physicians	18	26.1	20	33.9
Pharmacists	8	11.6	5	8.5
Lab. Technicians	3	4.3	2	3.4
Nurses	15	21.7	15	25.4
Community/Outreach Workers	7	10.1	4	6.8
Others <sup>†</sup>	17	24.6	12	20.3
Total	69	100	59	100

<sup>†</sup>Others include: Dentists, sanitarians, and clerks

**Table 3:** Comparison of mean audit scores for family planning services in both units.

Mean Family Planning Audit Scores	Intervention FHU		Control FHU		P <sub>1</sub>	P <sub>2</sub>
	Pre	Post	Pre	Post		
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD		
General Examination	11.36 ± 1.4	12.70 ± 0.6	10.67 ± 2.2	10.08 ± 0.4	0.06	<0.001
P-value	<0.001		0.06			
Pelvic examination	9.79 ± 0.7	9.96 ± 0.2	9.75 ± 0.2	9.89 ± 0.1	0.54	0.02
P-value	0.1		0.05			
IUD insertion	12.76 ± 0.6	13.68 ± 0.5	13.06 ± 0.2	12.00 ± 0.1	0.01	<0.001
P-value	<0.001		<0.001			

P<sub>1</sub>: Pre-intervention comparison of mean scores between both units  
P<sub>2</sub>: Post-intervention comparison of mean scores between both units

**Table 4:** Comparison of mean audit scores for antenatal care services in both units.

Mean Antenatal Care Audit Scores	Intervention FHU		Control FHU		P <sub>1</sub>	P <sub>2</sub>
	Pre	Post	Pre	Post		
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD		
Examination	17.01 ± 0.4	25.21 ± 0.5	16.79 ± 1.3	17.21 ± 0.9	0.3	<0.001
P-value	<0.001		0.06			
Counseling	5.21 ± 1.1	11.63 ± 0.7	5.36 ± 0.3	5.22 ± 1.6	0.4	<0.001
P-value	<0.001		0.54			

P<sub>1</sub>: Pre-intervention comparison of mean scores between both units  
P<sub>2</sub>: Post-intervention comparison of mean scores between both units

**Table 5:** Comparison of client satisfaction for reproductive health services in both units before and after intervention.

Reproductive Health Services Satisfaction		Intervention FHU				Control FHU				P <sub>1</sub>	P <sub>2</sub>
		Pre-intervention		Post-intervention		Pre-intervention		Post-intervention			
		N	%	N	%	N	%	N	%		
Family Planning	Satisfied	48	96	45	90	46	92	43	86	0.4	0.5
	Unsatisfied	2	4	5	10	4	8	7	14		
P-value		0.2				0.3					
Antenatal Care	Satisfied	47	94	49	98	44	88	41	82	0.3	0.007
	Unsatisfied	3	6	1	2	6	12	9	18		
P-value		0.3				0.4					

P<sub>1</sub>: Pre-intervention comparison  
P<sub>2</sub>: Post-intervention comparison

## Discussion

This study was implemented in two FHUs of PHC, in Giza Governorate. A pre/post assessment in an experimental unit was compared to findings in a control unit. Both units were previously accredited by MOHP and so fulfilled the standard requirements for FP and ANC services. This indicates that inputs in the form of clinic layout, equipment and education material generally satisfy the need for implementing quality services. However, resource assessment of both FP and ANC clinics in both units showed presence of some deficiencies.

Human resources are the core of any health service. The health care team can transform inputs into outputs reflected as outcomes. The MOHP Central Office for Technical Support and Projects suggests 6 physicians, 14 nurses and one pharmacist as the minimum standard for practice [4]. The total number of staff working in the both units is thus considered to be high. Yet, despite the large total number of providers, the number allocated for FP and ANC is not enough, especially the nurses, where only one junior nurse is allocated to FP services in the intervention unit. An increase in the number of physicians and nurses is suggested however, the solution can come from within the unit through re-allocation of staff.

Clinical audit is identified as “the most effective method used by organizations to understand and improve quality of services” [11]. In the present study, the effect of auditing on improved quality of services is very clear. Pre-intervention assessment revealed that examination of FP clients is greatly deficient in both units. In particular, clients were neither weighed nor had their blood pressure measured at the intervention unit. Furthermore, hand washing procedures were lacking. Similarly, pre-intervention auditing of ANC services showed incomplete counseling and lacking examination items. Blood pressure, which should be routinely checked in each visit according to Family Practice Guidelines, 2006, was not done for all observed clients. Even though providers were aware they are being observed they did not comply with the guidelines. The Egyptian demographic and health survey reported that 88% and 93% of the females receiving ANC had their weight and blood pressure measured respectively [12]. On the other hand, findings from another study conducted in Upper Egypt showed that blood pressure, and body weight measurements in addition to medical examinations were not done routinely [13]. Such findings show the marked discrepancy of offered services that may vary due to geographic location or skills of service providers.

Post-intervention auditing revealed great improvement. Several components reached 100%. Hand washing became 74% only in ANC

though this task became 100% with the FP service. Providers may not appreciate the importance of hand washing during ANC as they may consider it for infection control during pelvic manipulations of FP services. However, tabletops cleaning with a disinfectant solution between ANC patients became 100%.

A study conducted in the Department of Emergency Obstetric Care at Cairo University Teaching Hospitals reported hand washing behaviors at 0% before and 10% after training and re-auditing [14]. Similar results were found in a prospective study conducted in four health care settings in England (before and after a six hours training sessions of hand hygiene) where significant improvement of the hand hygiene compliance after the training was achieved (39% vs. 19%) [15], such achievements concur with results of present study and indicate the positive effect of training. Another study conducted in the university hospital in Turkey to evaluate the nurses' hand washing behavior and knowledge before and after training program that involved 200 nurses who participated in hand washing training at that hospital. Nurses received 40 minutes of training on hand washing and handbook prepared by researchers. The hand washing behaviors were assessed before training then one month later and found significant increase in the frequency of hand washing of the nurses [16]. A simple measure like hand washing could be easily implemented even if included within a short training program like the one implemented in our study and the Turkish study. When health care providers are being observed they usually conduct the correct procedures if they have the skills. However, this does not guarantee the same when not observed.

According to the WHO "it is desirable to have blood pressure measurements taken before initiation of all contraceptives used". However, in some settings blood pressure measurements are unavailable. In many of these settings pregnancy morbidity and mortality risks are high. Hence, women should not be denied the use of contraceptives simply because their blood pressure cannot be measured" [17]. However, this is not the situation in our setting; resources are available to measure blood pressure but actual measurement was not conducted at baseline assessment. This was improved by simple instructions during training.

Involving mothers in the auditing process is presented by client satisfaction. Client satisfaction, at baseline, was expressed by 96% of FP clients attending the intervention unit and 92% of control unit. ANC satisfaction was expressed by 94% and 88% of intervention and control units respectively. In a study carried in seven Family Health facilities in Qaliubiya governorate half of the clients were satisfied by ANC services and all were satisfied by the FP services [18]. The high satisfaction rate expressed by the clients may reflect a bias due to the presence of the interviewer in the premises of the health unit. Women may feel obliged to respond in favor of the health facility in fear of indicting the personnel at the unit [19]. Contrary to expectations, the percentage of unsatisfied clients increased after the intervention, except for ANC in the test unit. It is worth mentioning that the study done at the Department of Emergency Obstetric Care at Cairo University Teaching Hospitals reported the same increase in dissatisfied clients after intervention [14]. One explanation for this phenomenon may be due to increased expectations associated with improved service. Additionally, the study period coincides with the Egyptian revolution therefore increased expectations of better quality of care. The use of exit interviews as a source of client satisfaction has its' limitations. Exit interviews by definition involve a sample of

clients who have already made a choice to utilize a specific facility and are therefore less likely to believe that the facility will be minimally satisfactory [20].

Following implementation of the clinical audit training model the mean audit scores for the intervention unit significantly improved in all FP and ANC tasks while the control unit did not show any statistical difference between pre- and post- assessment scores except for IUD mean audit scores that unexpectedly became significantly worse. Additionally, post-intervention mean audit scores were significantly better for the intervention unit compared to the control unit.

These results observed in our study could be attributed to several factors; Supervision is a key component of PHC system and physicians are accustomed to comply with standards specially if being observed.

Where the baseline of adherence to recommended practices is low there is a greater likelihood of success with audit and feedback, which is often the case in under-resourced settings. Variable results have shown that when effective, the effects of audit and feedback on practice are generally small to moderate [21]. This stands true for results of our study. Our results point to the role of auditing as a potentially effective approach to improve the quality of service. Although the training was not long, yet it resulted in significant changes. Auditing of providers performance using a checklist designed according to expected standards, revealed statistically significant improvement in almost all post-intervention observations with many tasks becoming 100% even though many were not done at baseline.

There is a need to monitor, evaluate and continuously improve healthcare. Yet, some concerns exist about the limited impact of clinical audit on patient care and professional practice. Audit feedback occurs at governance level for the services audited, in addition to clinician feedback. Feedback may also include evidence-based recommendations for clinical practice or service provision where appropriate. In order to close the audit loop, a response from the service is required to confirm that recommendations have been transformed into actions [11].

## Conclusion

Accreditation though important, did not guarantee proper implementation of all aspects of FP or ANC services. Pre-intervention audit revealed several deficient aspects in service provision. Clinical Audit Training has reflected on improved performance as elicited by the post-intervention audit findings. The MOHP should adopt auditing as an important intervention for improvement of RH services. The concerned MOHP Sectors/Directorates should revise existing systems and protocols, design and test an audit system and train supervisors at governorate and district level to implement the system. Clinical and managerial audit should go hand in hand with a system for supportive supervision to detect deficiencies and correct them. Each service unit is an organization in itself. Providing the staff with needed clinical and managerial skills to ensure good performance and continuous quality improvement is essential.

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