

## ORIGINAL RESEARCH ARTICLE

# Evaluating Health Workers' Knowledge Following the Introduction of Clinical Mentoring in Jigawa State, Northern Nigeria.

Ekechi Okereke<sup>1</sup>, Jamilu Tukur<sup>2\*</sup>, Ayodeji Babatunde Oginni<sup>3</sup> and Benson Obonyo<sup>1</sup>

Abt Associates Nigeria/Partnership for Transforming Health Systems Phase 2, (PATHS2), Abuja Nigeria<sup>1</sup>; Department of Obstetrics and Gynaecology, Bayero University/Aminu Kano Teaching Hospital, Kano Nigeria<sup>2</sup>; Population Council, Abuja Nigeria<sup>3</sup>

\*For Correspondence: E mail: jtukur@yahoo.com; Phone: 08037042818

## Abstract

Clinical mentoring is work-based training for the capacity building of health care workers. This study determined if there were benefits and increases in knowledge levels for 33 selected health workers across 5 health facilities in Jigawa State following the introduction of clinical mentoring. Questionnaires were used to determine biodata and knowledge scores of mentored health workers and also key departmental activities before and after a 6 months period of introduction of clinical mentoring. Data was analyzed with SPSS version 20. Over 90% of the 33 mentored health workers showed an increase in their knowledge scores. The mean percentage score of the health workers increased significantly from 56.3±2.1 before the start of clinical mentoring to 74.7±1.7 (p<0.001) six months later. Mortality review meetings were also introduced. This study has shown that clinical mentoring is beneficial for improving the clinical knowledge of mentored health workers. (*Afr J Reprod Health* 2015; 19[3]: 118-125).

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**Keywords:** Health workers, clinical mentoring, capacity building, northern Nigeria

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## Résumé

Le mentorat clinique est la formation en milieu de travail pour le renforcement des capacités du personnel de la santé. Cette étude a déterminé s'il y avait des avantages et des augmentations dans les niveaux de connaissances pour les 33 membres du personnel de la santé sélectionnés à travers 5 Centres de santé de l'Etat de Jigawa suite à l'introduction de mentorat clinique. Des questionnaires ont été utilisés pour déterminer un curriculum vitae et des notes de connaissances du personnel de la santé qui sont passés par le mentorat et aussi des activités clés du ministère avant et après une période de six mois de l'introduction du mentorat clinique. Les données ont été analysées avec la version SPSS 20. Plus de 90% des 33 des membres du personnel de la santé qui ont subi le mentorat ont montré une augmentation dans leurs scores de connaissance. Le score moyen de pourcentage du personnel de la santé a augmenté considérablement de 56,3 ± 2,1 avant le début de mentorat clinique à 74,7 ± 1,7 (p <0,001) six mois plus tard. Les réunions pour l'examen de la mortalité ont été également introduites. Cette étude a montré que le mentorat clinique est bénéfique pour améliorer la connaissance clinique du personnel de la santé qui a subi le mentorat. (*Afr J Reprod Health* 2015; 19[3]: 118-125).

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**Mots-clés:** personnel de la santé, mentorat clinique, renforcement des capacités, nord du Nigeria

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## Introduction

The health workforce is one of the key building blocks of the health system and thus increasing its effectiveness is pivotal to improving health systems performance<sup>1</sup>. Skilled health personnel are crucial for the provision of effective healthcare services<sup>2</sup> and thus increasing the number of skilled health-care workers is crucial to attain strategies such as the Millennium Development Goals

(MDGs)<sup>2,3</sup>. There is need for a capacity building process, which ensures that the initial conventional training of health care workers is followed by continuous capacity building within the health system. Capacity building and training of full time health care workers has its challenges in Africa<sup>4</sup>. Bringing health care personnel for centralized trainings tend to disrupt services and diminish the few available staff providing health care services to patients<sup>5</sup>. Clearly, new capacity building and

training approaches are required.

Work-based training has been identified as a modality to effectively transfer knowledge and clinical skills among health care workers<sup>3</sup>. There is considerable evidence that work-based training has been successfully utilized to transfer knowledge and skills in several fields such as management of HIV/AIDS<sup>6</sup>, neonatal care<sup>7</sup> and family planning<sup>8</sup>. Clinical mentoring is an aspect of work-based training, which applies practical tutoring as an approach to capacity building among health care workers. A clinical mentor is typically a clinical practitioner e.g. a doctor or nurse with relevant experience, knowledge and skills that are transferable for the professional development of other less experienced health care workers who provide clinical services<sup>9,10</sup>. To be effective, clinical mentors typically remain practicing clinicians<sup>11</sup>. In addition to mentoring health care workers, clinical mentors usually develop close relationships with health facility management staff and provide assistance to address important problems that may impact on the quality of care at a health facility<sup>12</sup>.

Nigeria has one of the largest numbers of healthcare workers in Africa, but there are significant disparities in the health status as well as access to health services among different population groups across Nigeria<sup>13</sup>. The inadequate numbers and capacity of health care workers at different levels within the Nigerian health system is a major challenge that requires urgent attention and action. In northern Nigeria in particular, human resources for health are inadequate with insufficient numbers of skilled workers to provide basic maternal, newborn and child health (MNCH) services<sup>14</sup>. The World health statistics released by the World Health Organization (WHO) in 2011 estimates the maternal mortality rate (MMR) for Nigeria as 840 deaths per 100,000 live births<sup>15</sup> but evidence indicate that maternal mortality rates are particularly higher in the northern part of the country<sup>16</sup>. Maternal mortality rates for northern Nigeria have been estimated to be as high as 1,271 maternal deaths per 100,000 live births in four States within northern Nigeria i.e. Jigawa, Katsina, Yobe, and Zamfara States<sup>17</sup>. Furthermore a recent study estimates under-5 mortality rates for three

States in northern Nigeria to be 160 deaths per 1,000 live births, which is higher than the national figure of 157 per 1,000 live births<sup>18</sup>. Within this context, it was hypothesized that clinical mentoring could play a part in improving health workers' capacity and thus assist in addressing these prevailing *but critical* health service statistics within northern Nigeria.

In July 2012, clinical mentoring was introduced into the Jigawa State health system in northern Nigeria. The clinical mentoring intervention involves once weekly visits to five selected health facilities by consultant obstetricians and pediatricians who were engaged as clinical mentors. The clinical mentors' visits involved activities such as teaching during ward rounds, carrying out surgeries, as well as conducting outpatient clinics. The clinical mentors also organized meetings such as maternal death review meetings as well as clinical seminars on relevant topics around maternal, newborn and pediatric care. This clinical mentoring intervention involved collaboration between the Jigawa State Ministry of Health through its Gunduma (District) Health Systems Board and the Partnership for Transforming Health Systems Phase 2 (PATHS2). PATHS2 is a health systems strengthening project supported by United Kingdom's Department for International Development (DfID) and implemented by a consortium of partners led by Abt Associates. PATHS2 works in collaboration with the Government of Nigeria (at Federal and State levels) and other stakeholders to improve the planning, financing and delivery of sustainable health services to Nigerians. The objective of this case study was to assess whether clinical mentoring increased the clinical knowledge levels of the mentored health workers and consequently their capacity to provide better quality healthcare services.

### ***Ethical approval***

Ethical clearance for the evaluation was obtained from the Jigawa State Ministry of Health. An informed consent form was included as part of the evaluation. The aims of the study, respondents' right to refuse participation as well as freedom to terminate participation in the study at any time were discussed with each study participant.

**Study setting**

Jigawa State is within the north western part of Nigeria. According to the 2006 census, the State has an approximate total population of 4,348,649 inhabitants<sup>19</sup>. The State has 27 Local Government Councils and the vast majority of the population (~80%) resides in rural settings<sup>20</sup>. The State's health system replicates the WHO-recommended "District Health System" which is a system used by many developing countries to provide quality health services to communities. This approach integrates the health system, bringing both primary and secondary care services under one management structure. In Jigawa State, this district health system is called the 'Gunduma health system'. However Jigawa State suffers from an acute shortage of health manpower. As at July 2008, Jigawa State had 1.5 doctors per 100,000 which are far below the national average of 20 doctors per 100,000. In addition, maternal mortality rates as high as 2284 deaths per 100,000 live births have been reported from a tertiary health center located within rural settings in the State<sup>21</sup>. Table 1 outlines the list of health facilities and cadre of health workers per health facility participating in clinical mentoring as well as each health facility's estimated catchment population.

**Methods**

**Sampling and data collection**

Many potential clinical mentors for clinical mentoring within Jigawa State work as senior medical practitioners in tertiary-level health within and outside Jigawa State.

**Table 1:** List of Health Facilities and Cadre of Health Workers Participating in Clinical Mentoring

S / N	Name of health facility	Classification of health facility	Cadre of health worker	Estimated Catchment Population
1	Hadejia General Hospital	CEOC	Nurse/Midwife Nurse/Midwife Nurse/Midwife Nurse/Midwife CHEW CHEW	104,286

2	Ringim General Hospital	CEOC	CHEW Doctor Nurse/Midwife Nurse/Midwife Nurse/Midwife Nurse/Midwife Nurse/Midwife CHEW	8,609
3	Garki PHC	BEOC	Doctor Nurse/Midwife Nurse/Midwife CHEW CHEW CHEW	21,118
4	Gwaram Cottage Hospital	BEOC	Doctor Nurse/Midwife Nurse/Midwife Nurse/Midwife CHEW CHEW	10,412
5	Basirka PHC	PHC	Doctor Nurse/Midwife Nurse/Midwife CHEW CHEW	7,250

**Key:** CEOC: Comprehensive Emergency Care Centre; BEOC: Basic Emergency Obstetric care Centre; PHC: Primary Health Centre

However for this particular clinical mentoring intervention, purposive sampling technique was used to recruit clinical mentors through the professional network of PATHS2's consultant on clinical mentoring from among consultant obstetricians and consultant pediatricians working in Kano and Bauchi States. The clinical mentors engaged for this clinical mentoring intervention in Jigawa State were three consultant obstetricians and three consultant pediatricians. While the mentees were 33 randomly selected medical officers, nurses/midwives and community health extension workers (CHEWS) working in five selected health facilities in Jigawa State.

During the post-evaluation period i.e. about six months after clinical mentoring commenced, background questions (Table 2) were also applied to the mentored health workers using interviewer-administered questionnaires to elicit crucial information as part of the evaluation. Clinical knowledge tests were developed and administered as 'pretest' and 'posttest' questionnaires. The 'Pretest' questionnaires were administered at the start of the intervention to test the clinical

knowledge levels of the health workers recruited into the clinical mentoring programme. These same questionnaires were also used as a 'posttest' to evaluate the level of change in knowledge of the mentored health workers after a 6 months period. The questionnaires consisted of questions from different areas of maternal, newborn and child health such as the use of magnesium sulphate for eclampsia management, causes of anemia in pregnancy, management of a patient with postpartum hemorrhage, management of normal labour as well as questions around obstetric emergencies, newborn resuscitation and infection prevention. Operational statistics (number of mortality review meetings) were collected from the clinical mentoring health facilities using appropriate data collection tools and assessed 6 months before the start of clinical mentoring as well as reviewed 6 months thereafter.

### Data analysis

Following the completion of data collection, the quantitative data was cleaned, entered into and analyzed using SPSS version 20. Quantitative data analysis explored a two-pronged approach: (1) analysis of key operational statistics from the intervention health facilities and assessment of the responses of the mentored health workers from questions posed by the study evaluators (2) T-test statistical analysis of the pre- & post knowledge test scores of the 33 mentored health workers across the five clinical mentoring health facilities.

## Results

### Background questions posed by the study evaluators to the mentored health workers

Table 2 outlines some key questions posed by the study evaluators to the mentored health workers and the corresponding responses from the thirty-three mentored health workers working in the intervention health facilities. It shows that almost forty percent (~39.4%) and about 42.4% have been

**Table 2:** Background Questions Posed by the Study Evaluators to the Mentored Health Workers

S/ N	Question	Options	N (%)
1	How many years have you been working in this health facility?	1– 2 years	13 (39.4%)
		3– 5 years	6 (18.2%)
		>5 years	14 (42.4%)
2	Did the clinical mentor make an adequate assessment of your level of knowledge at the start of the intervention?	Yes	32 (97%)
		No	1 (3%)
3	How often to you get feedback on your work performance from the clinical mentor in your health facility?	Twice a week	3 (9.1%)
		Once a week	22 (66.7%)
		Once in two weeks	2 (6.1%)
		Once a month	2 (6.1%)
		Twice a month	1 (3.0%)
		Never	3 (9.1%)
4	Does the duration of each clinical mentoring visit to your health facility suit the needs of the facility?	Yes	20 (60.6%)
		No	13 (39.4%)
5	Does the number of visits per week suit the needs of the health facility?	Yes	10 (30.3%)
		No	23 (69.7%)
6	Does clinical mentoring provide adequate opportunities for continuing training and education?	Yes	32 (97%)
		No	1 (3%)
7	Does clinical mentoring provide adequate opportunities to share experiences among health workers?	Yes	31 (93.9%)
		No	2 (6.1%)

**Table 3:** Change in Individual Test Scores of Health Workers within the Five Clinical Mentoring Health Facilities

Health worker category	n	Pre-clinical mentoring period	Clinical mentoring intervention period	Paired samples t-Test	
		Mean ± SEM	Mean ± SEM	t-statistic	p-value
<i>CHEW</i>	11	50.2±2.5	74.9±3.0	7.585	0.000
<i>Doctors</i>	4	67.0±2.8	83.3±2.8	7.133	0.006
<i>Nurse/Midwives</i>	18	57.6±3.0	72.7±2.3	6.089	0.000
Health facility	n	Pre-clinical mentoring period	Clinical mentoring intervention period	t-statistic	p-value
<i>Basirka PHC</i>	5	55.6±5.2	77.6±2.8	5.552	0.005
<i>Garki PHC</i>	6	54.5±3.6	70.5±3.3	7.827	0.001
<i>Gwaram Cottage Hospital</i>	6	67.4±3.7	79.7±1.4	2.756	0.040
<i>Hadejia General Hospital</i>	8	45.1±3.4	72.0±4.5	5.386	0.001
<i>Ringim General Hospital</i>	8	60.9±3.3	75.0±4.3	6.357	0.000
<b>Total</b>	33	56.3±2.1	74.7±1.7	9.767	0.000

n=number of respondents/mentored health workers. Pre-clinical mentoring intervention period: Jan-Jun 2012; Clinical mentoring intervention period: July-Dec 2012

working in their respective health facilities between 1 to 2 years and over 5 years respectively. Ninety-seven percentage (97%) of the mentored health workers reported that the clinical mentors carried out an adequate assessment of their clinical knowledge levels in maternal, newborn and child health prior to the start of the clinical mentoring intervention, while about two-third of the health workers (66.7%) indicated that they received feedback on their work performance on a weekly basis from the clinical mentors. Approximately 6 out of 10 respondents mentioned that the duration of each clinical mentoring visit per day was adequate to suit the needs of their respective health facility while only 3 out of 10 mentored health workers (~30.3%) indicated that the number of clinical mentoring visits per week were suitable

for the needs of the health facility. Over 90% of the mentored health workers indicated that clinical mentoring provides adequate opportunities to share clinical practice experiences among colleagues as well as opportunities for continuing training and education.

#### ***Change in individual test scores of health workers within intervention health facilities***

Table 3 shows the mean test scores (in percentages) before the start of clinical mentoring and then six months after the start of the intervention within the intervention health facilities in Jigawa State. Within the different health worker categories enrolled in clinical mentoring, the test scores increased significantly

among the doctors ( $p < 0.006$ ), nurse/midwives ( $p < 0.001$ ) and community health extension workers (CHEWs) ( $p < 0.001$ ). Across the different health facilities, the mean test scores of the mentored health workers also increased significantly. Overall, the mean percentage scores of the health workers increased significantly from  $56.3 \pm 2.1$  before the start of clinical mentoring to  $74.7 \pm 1.7$  ( $p < 0.001$ ). Over 90% of the 33 mentored health workers showed an increase in their individual clinical knowledge test scores. The test of significance shows that the individual test scores of the health workers differed significantly ( $p < 0.001$ ) during the pre-clinical mentoring period and about six months after clinical mentoring commenced within the intervention health facilities.

### ***Operational statistics/ number of mortality review meetings in clinical mentoring health facilities***

**Table 4:** Number of Mortality Review Meetings in the Clinical Mentoring Health Facilities

Name of health facility		Pre-clinical mentoring intervention period	Clinical mentoring intervention period
		n	N
Hadejia Hospital	General	0	6
Ringim Hospital	General	2	2
Gwaram Hospital	Cottage	0	2
Garki PHC		2	6
Basirka PHC		0	11
Total		4	27

Pre-clinical mentoring intervention period: Jan-Jun 2012; Clinical mentoring intervention period: July-Dec 2012

Table 4 presents information on the number of mortality review meetings held in the clinical mentoring intervention health facilities during the two periods. During the clinical mentoring intervention period, 27 mortality review meetings were conducted; while 4 were conducted during the pre-clinical mentoring intervention period.

## **Discussion**

This study set out to investigate whether a clinical mentoring intervention increased health workers'

clinical knowledge test scores and their capacity to provide better quality clinical health services within selected health facilities in Jigawa State, northern Nigeria. The findings from the study suggest a consensus among mentored health workers that an assessment of clinical knowledge levels and subsequent identification of areas of weaknesses among health workers selected for the intervention facilitated a more focused approach to capacity building. The responses from the mentored health workers point out that clinical mentoring provides adequate opportunities for continuing training and education as well as opportunities for health workers to share clinical practice experiences with colleagues. But only 40% of mentored health workers indicated that the duration of time spent by the clinical mentors providing clinical mentoring services per day was sufficient for the needs of the health facility. Approximately 70% of the mentored health workers indicated that the number of days per week when clinical mentors visit the health facilities was inadequate to suit the need of the health facility. These figures emphasize the need to recruit more clinical mentors to carry out more clinical mentoring visits.

Furthermore the findings of the evaluation show that the test scores of the health workers increased significantly from pre- to post-clinical mentoring periods. This reiterates the point that applying clinical mentoring as a complement to conventional training will significantly improve the work performance of mentored health workers within their work environment<sup>22</sup>. The findings of this evaluation suggest that clinical knowledge can be effectively transferred among health workers even when there is a huge disparity in professional training and cadre e.g. from doctors (i.e. consultant obstetricians/pediatricians) to community health extension workers (CHEWs). The clinical mentoring intervention also illustrates that training is possible with health workers (from different backgrounds and workplaces) transferring clinical knowledge across different levels of the health system. The example are consultants from tertiary hospitals building the capacity of clinical staff of primary health centres and the former also acquiring additional knowledge by practicing within the primary health

care system. These findings illustrate the effectiveness of work based training and reinforce the importance of work-based training approaches for improving human resources for health capacity within the health system as illustrated elsewhere<sup>3,23</sup>. The health workers learnt new skills and acquired new knowledge without leaving their working place. In addition, the learning process took place in workplace settings as well as in groups, rather than a few days of theoretical trainings that usually take place at settings outside of the trainees' work station. Hence the training envisaged by the mentoring was geared to the particular needs of the workplace. However to continue to achieve and maintain high quality performance of health workers, it will be important to understand the context of the study findings such that these findings can be effectively applied to other settings and healthcare service areas as recommended elsewhere<sup>2</sup>. The results of the evaluation also show significant improvements in a key operational statistics of interest within the intervention health facilities. The intervention health facilities report has shown increase in the number of mortality review meetings held as a spin-off from the implementation of clinical mentoring. This increase in the number of mortality review meetings within the intervention health facilities should lead to conscientious efforts to decrease maternal, neonatal and child deaths within these health facilities.

With such clear benefits arising from clinical mentoring, it is recommended that the benefits of the clinical mentoring visits should be extended beyond the health workers in the mentoring centers to other health care workers in other health facilities. There is also need for more mentoring visits and 'mentoring hours'. More clinical mentors could be recruited to provide mentoring services to health workers in other health facilities. This will require engaging more skilled health personnel i.e. consultant obstetricians and pediatricians. There is a large pool of this cadre of health personnel within tertiary health facilities across Nigeria and the management of these tertiary health institutions could be approached to request for the services of consultants that can serve as clinical mentors.

Another source of clinical mentors to expand the current scale of the clinical mentoring intervention is through forging partnership with relevant professional associations such as the Society for Gynecology and Obstetrics of Nigeria (SOGON).

The study has some key limitations: first, this clinical mentoring programme was a pilot intervention, thus the selected health workers and health facilities were few in number. Second, since the health workers were selected (albeit randomly) from among their peers working within the intervention health facilities, there is the possibility of response bias among the mentored health workers when giving answers to questions posed by the study evaluators. Third, it should be noted that the post-tests were done only about six months after the start of clinical mentoring and thus this study doesn't provide evidence about the long-term impact of clinical mentoring on the capacity of health workers. It is recommended that studies to evaluate the long-term retention of clinical knowledge and skills gained as a result of work-based training for health workers should be carried out in Nigeria and within other developing countries.

## Conclusion

This study has shown that clinical mentoring is useful for increasing the number of skilled health workers but it can also be strategic for addressing capacity building challenges among health care workers within developing countries. A better trained health workforce on maternal, newborn and child healthcare is likely to be more effective in providing better quality healthcare services to women and children. Scaling up clinical mentoring should result in better maternal, neonatal and child health outcomes across Jigawa State and within other parts of northern Nigeria. It is thus recommended that clinical mentoring should be introduced as a key HRH quality improvement strategy deployed to attain the Millennium Development Goals across the developing world.

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