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*Full Length Research Paper*

# Technical competence of tutors in pre-service health training institutions on Expanded Programme on Immunization in North Western Nigeria

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**The study was conducted to assess the knowledge and skills of tutors on Expanded Program on Immunization (EPI) in some pre-service health training institutions in Nigeria to identify their training needs. The study was a cross sectional survey using a structured self-administered questionnaire and an observational checklist. A total of 62 tutors from 5 pre-service health training institutions were selected. The level of knowledge was assessed using a scoring system as adequate or in adequate. Overall, 25 (40.3%) of respondents' had adequate knowledge on basic knowledge on immunization concepts, principles and components of Reaching Every Ward approach (REW). The overall mean score was 24.4 ± 2. In all the 5 schools studied, there were no teaching aids (vaccine carriers, ice packs, cold box, AD syringes, safety box, IEC materials and data tools) and no reference materials (REW field guide or immunization in practice) in the school library. In-service training is the only variable that have demonstrated significant statistical association on overall knowledge of respondents' (df = 1; F = 8.62; P<0.0001). There is significant gap in knowledge of the tutors on all components of REW and hence the need for training intervention.**

**Key words:** Tutors, pre-service health training institutions, knowledge, teaching aids, Expanded Programme on Immunization (EPI), Nigeria.

## INTRODUCTION

Immunization is one of the most successful and cost-effective health interventions (Streefland et al., 1999). It has eradicated small-pox, lowered the global incidence of polio and measles by 98 and 60% respectively, and achieved dramatic reductions in illness, disability and death from diphtheria, tetanus, and whooping cough (Ryman 2009; WHO, 2007). Furthermore, immunization services are increasingly used to deliver other important health interventions (such as vitamin A, Anti-helmintic, and anti-malaria), making them strong pillars of health towards the attainment of the Millennium Development Goals by reducing child mortality, improving maternal health and combating diseases, including malaria and HIV/AIDS.

One of the major setbacks of immunization in deve-loping countries is inability of the health worker to carry out appropriate and adequate immunization due to lack of knowledge of current trend in immunization (Simonsen et al., 1999; Ernest, 2002; Musa et al., 2006). Expanded Programme on Immunization (EPI) reviews in many African countries reveal gaps in training, planning and management at district as well as service delivery levels. In particular, it was reported that tutors in pre- and in-service training institutions were not conversant with the current practices, innovations and new technologies in EPI (Lulsged et al., 2003; Mutabaraka 2003, Mutabaraka et al., 2005). This critical situation necessitated the present study to assess the status of implementation of some of the recommendation of these studies to national authorities' which included curriculum review and capa-city building for tutors in pre-service health training

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institutions.

## METHODOLOGY

### Background information on study area

Sokoto and Kebbi States are situated in the North Western corner of Nigeria with a combined estimated total population of about 7 million (NPC/UNFPA 2009). There are a total of 5 pre-service health training institutions (non degree awarding) for nursing, midwifery, community health officers (CHO), community health extension workers (CHEW), senior community health worker (SCHEW), junior community health worker (JCHEW) and laboratory technicians. The annual average number of graduates from these schools is about 600.

### *Study population*

The study population comprises of tutors in all the 5 pre- service health training institutions in Sokoto and Kebbi states of Nigeria.

### *Study design*

The study was a cross sectional survey using a structured self-administered questionnaire which was developed using the reaching every ward (REW) a guide for health management teams at Ward and Local Government levels (FMoH/NPHCDA 2009a). The questionnaire sought information on respondents' bio-data, highest educational qualification, years of service, in-service training received on EPI, and the 5 components of REW namely planning and management of resources, establishing or reactivating fixed post and outreach services, supportive supervision, and community linkage and monitoring for action.

Furthermore, two separate observation checklist were used to collect data by the researchers during lecture sessions given by the tutors on immunization on the content, duration and use of immunization equipments and materials to demonstrate to the students the basic process of planning and conducting sessions including the appropriate arrangements of immunization session lay out, how to arrange frozen ice packs in a vaccine carrier, dosage and route of administration of each routine vaccine, immunization waste disposal during immunization session, and recording of vaccine utilization and children vaccinated as outlined in the REW field guide.

### *Eligibility/inclusion and exclusion criteria*

Teachers in schools of health technology and schools of nursing and midwifery currently engaged in the teaching, field supervision and examination of students in clinical subjects. Tutors who are more engaged in administrative capacity such as directors, principals and vice principals are therefore excluded from the study. Similarly tutors who are not involved in clinical courses such as biology, English, mathematics, physics, anatomy, physiology, environmental health etc. are also excluded from participating in the study. A total of 62 tutors have met the inclusion criteria and participated in the study.

### *Data analysis*

The questionnaires were marked with prototype answers vetted by WHO Office Sokoto. The questionnaires were manually checked for accuracy and completeness. The data was collated and EPI INFO 3.5 Statistical Software Programme and Microsoft Excel in window 2000 were used for data entry and processing. Cross tabulation were made to examine the relationship between variables. Significance of association was tested using $x^2$ test, and Fisher exact test. The level of significance was set at 5%.

The responses of the subjects on basic knowledge of immunization services, planning and management of immunization services and supervision and monitoring were scored with each correct response being scored one mark and no marks for incorrect responses. Respondent level of knowledge was adjudged to be adequate if he/she gave correct/appropriate response to at least half of all questions as similarly described by other studies (Kana, 2007; Umar, 2008).

## RESULTS

Majority of the respondents were males 43 (69.4%), highest qualification was CHEW/CHO accounting for 36 (58.1%) of the study unit and 40 (64.5%) had more than 3 years teaching experience (Table 1).

Only a total of 29 (46.8%) out of 62 respondents' had attended an in-service training programme on EPI. Of this number, only 16 (25.8%) respondents had attended a training programme less than a year ago (Table 1).

Generally respondents had adequate knowledge on the basic concepts and principles of vaccination and immunization. However, in 4 (80%) out of the 5 schools sampled, respondents' had inadequate knowledge (had <50% score) in the areas of planning and management, as well as in monitoring and supervision of EPI programmes (Figure 1).

Overall, 25 (40.3%) of respondents' had adequate knowledge on basic knowledge on immunization concepts and principles, planning and management of immunization resources, service delivery, advocacy and community linkage, vaccine security, cold chain and logistics, surveillance, supportive supervision and monitoring for action. The overall mean score was 24.4 ± 2 (Table 2).

In all the 5 schools studied, there were no teaching aids such as data tools, IEC materials, safety box, hard copies of the REW field guide in the library, no auto disable (AD) syringes, vaccine carriers, ice packs, cold boxes and no functional school clinic. The only aid found in all the schools was baby dolls. There was no demonstration of how to set up an immunization session, how to administer antigens and record immunization data and how to assemble and make use of safety box.

In-service training is the only variable that have demonstrated significant statistical association on overall knowledge of respondents' ($df = 1$; $F = 8.62$; $P<0.0001$).

## DISCUSSION

Majority of the respondents (69.4%) were males. This is not surprising given the fact that the North Western part of Nigeria (region of the study area ) has the highest

**Table 1.** Bio-demographic characteristics of respondents'.

| Characteristics of respondents | Number (%) |
|---|---|
| **Gender** | |
| Female | 19 (30.6) |
| Male | 43 (69.4) |
| | |
| **Highest health related educational qualification** | |
| Degree in nursing | 5 (8.1) |
| Diploma in nursing education | 10 (16.1) |
| Basic nursing | 11 (17.7) |
| C.H.O | 15 (24.2) |
| CHEW | 21(33.9) |
| | |
| **Years of experience as a tutor** | |
| Equal to or less than 3 years | 28 (45.2) |
| Greater than 3 years | 34 (54.8) |
| | |
| **Seminar/workshop on EPI attended by tutors** | |
| Attended seminar/workshop on EPI since graduation | 29 (46.8) |
| Never attended seminar/workshop on EPI since graduation | 33 (53.2) |
| | |
| **Year attended the most recent seminar/workshop on EPI by tutors** | |
| Within the last 1 year | 16 (25.8) |
| More than one 1 year ago | 13 (74.2) |

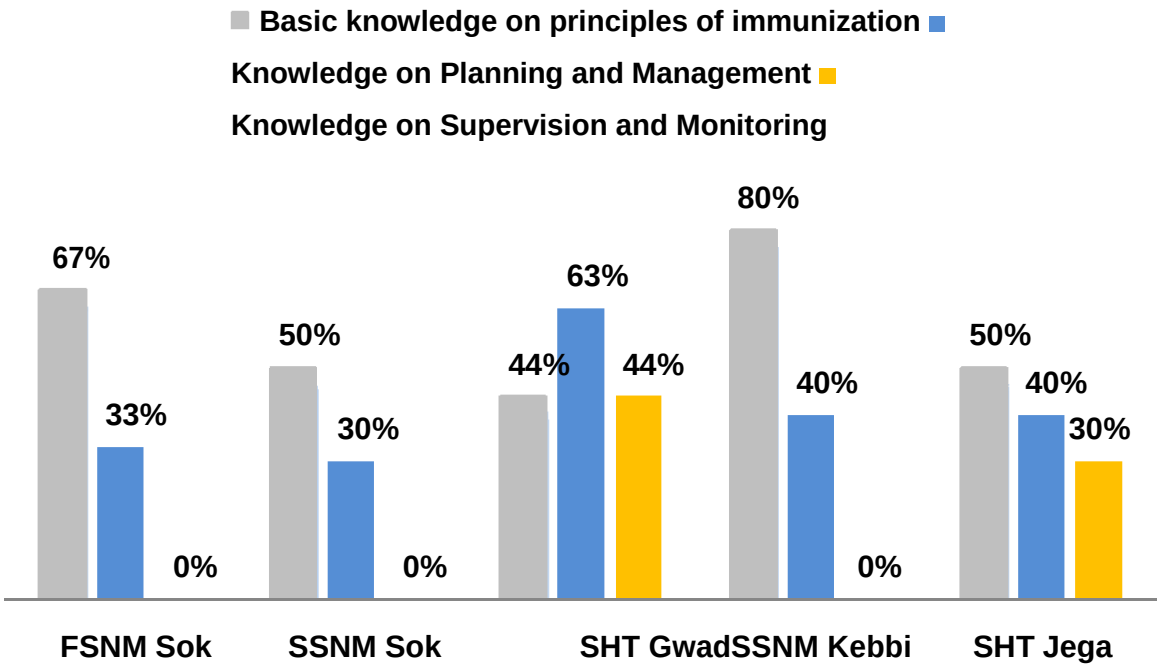


**Figure 1.** Respondents' knowledge on EPI between schools. FSNW Sok = Federal School of Nursing and Midwifery Sokoto, SSNW Sok = State School of Nursing and Midwifery Sokoto, SSNW Kebbi = State School of Nursing and Midwifery Kebbi, SHT Gwad = School of Health Technology Gwadabawa, SHT Jegga = School of Health Technology Jegga.

**Table 2.** Factors influencing level of knowledge of respondents'.

| Variable | Adequate knowledge (%) | Inadequate knowledge (%) | P-value |
|---|---|---|---|
| **Highest health related qualification** | | | |
| Degree in Nursing | 0 | 5 | |
| Diploma in Nursing | 5 | 5 | Df = 4 |
| Basic Nursing | 2 | 9 | $X^2$ = 7.52 |
| C.H.O | 8 | 7 | P > 0.05 |
| C.H.E.W | 10 | 11 | |
| **Years of teaching experience** | | | |
| Less than 3 years | 8 | 20 | Df = 1 |
| Greater than 3 years | 17 | 17 | $X^2$ = 0.78 P > 0.05 |
| **Attended in-service training** | | | df = 1 |
| Yes | 25 | 4 | |
| No | 0 | 33 | F = 8.62 P <0.05 |

**Table 3.** Summary of respondents' scores in key areas of immunization system.

| Scores for each area of the immunization system | Number of respondents' (%) |
|---|---|
| **Principles and concepts of immunization (%)** | |
| 0 - 20 | 0(0) |
| 21 - 40 | 13(21) |
| 41- 60 | 18(29) |
| 61- 80 | 26(42) |
| 81 -100 | 5(8) |
| **Planning and management (%)** | |
| 0 - 20 | 16(26) |
| 21 - 40 | 18(29) |
| 41 - 60 | 15(24) |
| 61 - 80 | 11(18) |
| 81 - 100 | 2(3) |
| **Supervision and monitoring (%)** | |
| 0 - 20 | 15(24) |
| 21 - 40 | 27(44) |
| 41 - 60 | 13(21) |
| 61 - 80 | 7 (11) |
| 81 -100 | 0(0) |

proportion of females (64.6%) with no education (NPC/ UNFPA, 2009). This indicates that males are more likely than females to be engaged in formal public sector as workers. Generally this might be related to the deep seated cultural and religious beliefs in the study area.

CHEW was the highest health qualification of majority of the respondents'. This is as a result that tutors from schools of health and technology constituted 58.1% (36/62) of the study population and therefore is a reflection of the size of man power in all sampled school in relation to student population and differences of the qualification requirements to teach in schools of health and technology compared to that of the schools of nursing and midwifery.

Less than half of the respondents had received an in-service training on EPI after graduation which demonstrated to be the only variable that had significant influence on the level of knowledge of respondents' on current EPI principles and practices as recommended by the WHO. This finding is in line with the findings of (Mutabaruka et al., 2005; Lulsged et al., 2003) in EPI training needs assessment in 12 African countries (2002 to 2004) where more than half of the tutors had no previous in-service training on EPI. It therefore underscores the weakness inherent in dissemination of new policy and guidelines as well as capacity building programme by responsible authority to all relevant stakeholders. Tutors in pre-service training institutions are the link between technical competence of the ever needed health manpower and changing policy environments and should have been accorded priority to make them conversant with new EPI guidelines.

The overall level of knowledge of tutors in the pre-service training institutions on EPI was found to be generally inadequate. Tutors in the schools of health technology have higher knowledge in monitoring and supervision compared to their counterparts in schools of nursing and midwifery where all tutors have basically no knowledge on how to plan, conduct and document supportive supervision and monitoring of EPI programme at district level. Generally respondents' had adequate knowledge on the basic concepts and principles of vaccination and immunology compared to planning and management, supervision and monitoring of and immunization programme can be attributed to the fact that the theory and basic fundamentals of vaccination and immunology remains largely the same in the last few decades.

The overall knowledge in planning and management of immunization was low except for tutors in School of Health Technology, Gwadabawa and this might be attributable to the fact that the tutors regularly participate as State technical facilitators (core trainers) of vaccinators for Polio campaigns, which in Nigeria includes the provision of routine immunization vaccines at fixed immunization post (DPT, Measles, Yellow fever, Hepatitis B vaccine, tetanus toxoid) in order to boost acceptability of the OPV and strengthen utilization of health facilities providing fixed immunization sessions (FMOH/NPHCDA, 2009b). The low level of knowledge on planning and management of EPI resources in these training institutions (except SHT Gwadabawa) might be one of the major impediments to the provision of equitable and quality immunization services. The poor knowledge therefore highlighted the non systematic implementation of various local and international reports/ recommendations. For instance, the WHO/AFRO Task Force on Immunization, 2001 report highlighted that the most important barriers to reaching every child in every district with immunization services are still related to planning and management of human, material and financial resources at district and service delivery levels, rather than just physical barriers to access. However, as demonstrated in this study, tutors that train middle and lower cadre health man power are not conversant with EPI resource planning and management, which will have negative effect on the EPI knowledge and skills of their graduates and ultimately poor access and utilization of immunization service. Studies also carried out on immunization services providers who are direct products of the pre-service health training institution by Musa et al. (2006) at Ilorin, Nigeria reported that 80.4% had inadequate knowledge of safe immunization injection technique and were not aware of any policy on injection safety. Another study in Enugu, South eastern Nigeria by Uzochukwu and Onwujekwe (2004), also found that there is inadequate knowledge of vaccine storage and administration among health workers in primary health care centers. Furthermore, at Nagaur district in Rajasthan only 28.1% of the service providers had adequate knowledge on immunization services (Bairwa et al. 1995). A similar report following an in-dept collaborative study by WHO/UNICEF/USAID (2007b) on reaching every district (RED) approach in nine African countries namely: Benin, Cameroon, Democratic Republic of Congo (DRC), Ethiopia, Ghana, Madagascar, Serria leone, Togo and Uganda on immunization service providers, reported that there was a general lack of knowledge on developing annual immunization plans as reflected by only a half of all health facilities had appropriate plans to cover all EPI areas and special activities to cover hard-to-reach populations. These reports are in line with the findings of this study and all clearly underscored the significant knowledge gaps and call for the need to strengthen the technical competence of tutors in pre-service health training institutions through regular training programme and in particular when there are new shift in guidelines on EPI service delivery.

Referencing materials (Reaching every ward document and basic guide for routine immunization service provider) were not available as a guide on the curriculum in the schools. Similar findings were reported by Mutabaraka et al. (2005) who reported lack of EPI reading and didactic teaching materials in the 12 African countries.

In this study, time allocated for EPI theory range from 2 to 4 h which is inadequate. This finding is similar to the finding of studies in Malawi, DRC, and Cameroon where the time allocated to EPI theory was reported to be between (2 to10 h). Time allocation is every important in the teaching of any subject, and with the current trend of including planning, management, monitoring and supervision, more hours are needed to effectively cover all EPI programme areas (Mutubaraka et al., 2005).

Overall, 25 (40%) of the respondents' who had in-service training within the last one year were adjudged to have adequate knowledge. Furthermore, in-service training is only factor that had significant statistical

influence (P<0.05) on the level of respondents' knowledge of the current principles and practices of EPI as recommended by the WHO. This is in agreement with other studies (WHO, 2001; Mutabakuka et al., 2005; Kana 2007; Umar 2008; WHO 2007b; WHO/WPRO, 2009) that training increases knowledge and shows the importance of in–service training which form the basis of this research. This also shows the need in the retraining of tutors on the current trends in immunization service provision.

## Conclusion

This study reported a significant gap in knowledge of tutors in pre-service health training institutions which might be a reflection of a vast majority of such institutions in the country since they are regulated and monitored by Nursing and Midwifery council of Nigeria and the Nigeria board for Schools of health and technology.

More importantly it highlights how graduates of these schools are ill equipped to provide quality immunization service delivery to improve coverage and achieve the health related MDGs. There is therefore the need to embark on systematic review of EPI curriculum, provision of EPI teaching aids and capacity building programme for tutors in these schools in order to provide up to date knowledge and skills to graduating health manpower that are more largely involved in the provision of immunization services than any other cadre of health manpower in the country.

Finally, the relationship between quality of training and competencies of graduates is a topic worthy of future study.

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