

Barriers and Reinforcers as Correlates of Effective and Efficient Capacity Building among HIV/AIDS Supply Chain Workforce in Nigeria

Sunday O. Aguora^{1*}, Azuka C. Oparah², Edith C. Okechukwu¹

¹*School of Public Health, Texila American University, Georgetown, Guyana, South America*

²*Department of Pharmacy and Pharmacy Practice, Faculty of Pharmacy, University of Benin, Benin City, Nigeria*

*Corresponding Author: sunnyaguora@yahoo.com

Abstract

This study on barriers and reinforcers as correlates of effective and efficient capacity building among HIV/AIDS supply chain workforce in Nigeria involved research objectives, questions and hypothesis. A pre-tested self-completed questionnaire (422) was administered to respondents, 396 were completed and returned, with a response rate of (93.8%). Key barriers as correlates of effective and efficient capacity building include emphasis on technical skills at the detriment of leadership and management skills 245 (61.9%), inequitable distribution of workforce due to attrition 379 (95.7%), remuneration differential 310 (78.3%), poor work attitude and placement of personal gains above public good 276 (69.7%), limited funding and opportunities for capacity building 292 (73.8%) and failure of trainees to step-down training 241 (60.9%). Whilst reinforcers include leadership and management trainings for program leaders 379 (95.7%), advocacy to relevant government authorities 379 (95.7%), professional recognition of supply chain personnel and better remuneration 396 (100.0%), institutionalizing and enforcing clear performance benchmarks 276 (69.7%), improved funding and opportunities for capacity development and institutionalizing health supply chain management as a professional postgraduate program 276 (69.7%), and effective follow up to ensure trainees step-down capacity to other colleagues and learning translated into improved work output 327 (82.6%). The study revealed that barriers to capacity building and reinforcers are significant factors of effective and efficient capacity building among HIV/AIDS supply chain workforce in Nigeria ($p < 0.05$). Capacity building with cognizance of the barriers and reinforcers will ensure competent, consistent, competitive, effective and efficient workforce to deliver quality supply chain service.

Keywords: *HIV/AIDS, supply chain, workforce, capacity development, barriers and reinforcers.*

Introduction

HIV/AIDS remains a major cause of death around the world with an estimated 1.7 million AIDS related deaths, out of an estimated 34 million people living with the virus and about 2.5 million new infections in 2011 (UNAIDS, 2012). Granting that HIV affect all regions of the world, the burden is highest on sub-Saharan Africa (UNAIDS, 2012). Approximately 10% of the people living with HIV globally live in Nigeria and constitute huge health, economic and security crisis (Nwandu *et al.*, 2019). The effort to control its spread continues to be a leading global health priority (UNAIDS, 2012; IOM, 2013). There is a critical shortage of trained HIV/AIDS workforce in Nigeria which is a key bottleneck in ensuring

effective provision of service and improved health outcomes (Nwandu *et al.*, 2019).

To address the deficit in human resources, the most recognizable response is to train more. Thus, the key effort to HIV/AIDS supply chain workforce capacity development is to ensure a well-trained, skilled, committed and motivated workforce (Schneider *et al.*, 2011). One of the ways this can be achieved is through formal and informal capacity building programs to increase the knowledge and skills of the workforce to ensure availability of skills to provide quality health services (Frenk, 2010; Matovu *et al.*, 2013). To this end some capacity building strategies have been implemented in Nigeria with certain level of success but not without hurdles. Recognizable approaches for capacity development in HIV/AIDS supply chain

management include; training (pre-service, in-service, residential, onsite, field-based, work-based, on-the-job, and distance learning), e-learning, short courses, task shifting, and outsourcing, logistics management units (LMUs), developing incentives, creating accreditation and strengthening policy (Brossette *et al.*, 2010). Many African countries have reported challenges in funding, employment, capacity building and deployment of the health workforce (Dovlo, 2005). As a result, the continent has continued to experience a fast-progressive health workforce migration to high-income settings in search of better opportunities (Dovlo, 2007). There are growing concerns that Nigeria's human resources for health crisis are linked to the poor states of health governance in the country (WHO, 2016; Adeloje *et al.*, 2017). To achieve the ultimate goals of a health system, all health systems have to develop health workforces and other key resources.

The importance of supply chain management (SCM) has been identified by a number of partners and the need to implement evidence-based plans that help to strengthen the health supply chain as well as to develop, finance and manage the workforce required to effectively run them (Brown and Sankaranarayanan, 2014). However, studies have emphasized the need to give more attention to workforce capacity development in supply chain management (Brown and Sankaranarayanan, 2014). Thus, the need for a well-trained and competent workforce, engaged in health supply chains. To successfully achieve the sustainable development goals (SDGs), it is essential that the right health commodities in the right quantities and condition are made available to the right people (place), by the right people (workforce) at the right time and cost. Workforces are recognized as key factors for sustained progress in health supply chains in low-income contexts and sustainable development (Brown and Sankaranarayanan, 2014).

Therefore, the present study seeks to identify barriers and reinforcers as correlates of effective and efficient capacity building among HIV/AIDS supply chain workforce.

Materials and methods

Selection of the area

The study was carried out in Abuja, Nigeria's Federal Capital Territory (FCT), North-Central geo-political zone. It has 6 Area Councils and have common boundary to the north with Kaduna State, to the west with Niger State, to east and south-east with Nassarawa State and to the south-west with Kogi State (Ebele *et al.*, 2014). Most of the organizations have their offices in Abuja from where they carry out their HIV/AIDS supply chain functions around the country. Abuja is the administrative and political center of Nigeria and also the location (as the capital of Nigeria and seat of power) for policy development, coordination and monitoring of implementation. Abuja is also a conference center and hosts various meetings annually.

Sample size determination

To determine appropriate sample size, Cochran's formula for calculating a representative sample size for infinite population was used (Cochran, 1977). Cochran's formula: $n_0 = z^2 pq / e^2$.

n_0 = sample size

z = 1.96 (selected critical value of desired confidence level)

p = 0.5 (assuming the maximum variability, which is equal to 50%)

q = 1 - p

e = 0.05 ($\pm 5\%$ desired level of precision at 95% confidence level)

$n_0 = (1.96)^2(0.5)(0.5) / (0.05)^2$

$n_0 = 384.16$

We added overage (10%) to the calculated sample size (422) because of drop out, non-response, incomplete response and late response to enable us get that minimum response at the end.

Sampling technique

Respondents (422) from public sector, private sector, non-governmental organization, faith-based organization and donor agency involved in HIV/AIDS supply chain management without gender discrimination were selected using random sampling technique. Those who had not spent up to two years in their respective

organizations and at least bachelor's degree qualification was excluded in the study.

Data collection

Two sources of data (primary and secondary) were used for this study. Secondary data was collected from textbooks, journals, newspapers etc. and was used for literature review and design of the measuring instrument. The primary sources of information are those collected directly from the field (respondents) through a structured self-completed questionnaire. The purpose of the study and questionnaire were explained to each respondent. Consent was obtained from all respondents before their participation in the study. Participation was voluntary and respondents were free to withdraw at any point without consequences. The identity of respondents was kept confidential and anonymous. The questionnaire had 20 questions with which relevant information were obtained in the area of demographic characteristics, area of training and experience, barriers and reinforcers of effective and efficient capacity building. The questionnaire required about 15 minutes to complete. Construct validity was ensured by fashioning the questionnaire based on review of relevant literatures and empirical studies. To ensure content validity, the questionnaire was reviewed by the supervisor and pre-tested and changes made accordingly. The survey (field work) was conducted between September and December 2019.

Data analysis

Returned questionnaires were checked for completeness, accuracy and consistency. Analysis of data was carried out with Statistical Package for Social Sciences (SPSS version 20.0). Statistical comparison and hypothesis testing were made using chi-square statistic to determine the level of significance of association at 5% level of significance ($p \leq 0.05$).

Results and Discussion

We administered 422 questionnaires, however only 396 questionnaires were returned giving a response rate of 93.8%. Respondents' areas of training and experience in the HIV/AIDS supply chain management (Table 1) were procurement, inventory strategy and logistics management information system 258 (65.2%), warehousing and distribution 241 (60.9%), serving customers,

product selection, quantification, monitoring and evaluation 207 (52.3%) and risk management 155 (39.1%). In the present study, the respondents had received substantial training with experience on the key supply chain functions. This means that the respondents used in this study were experienced and knowledgeable on the Nigeria HIV/AIDS supply chain workforce capacity. They have basic background and knowledge required for their position.

In the present study (Table 2), the key barrier to effective and efficient capacity building is attrition or transfer of trained skilled staff 379 (95.7%). Low staff retention has been attributed mainly to lower compensation rates for staff in public health facilities compared to colleagues in the private sector (Serumaga *et al.*, 2014). High workforce attrition is part of almost all organization and understanding what is driving it and addressing it will lessen the turnover rate. Some of the reasons within the control of the organization are work stress, insufficient pay, poor working conditions, inadequate training, lack of advancement possibilities, and lack of support or reward on the job (Waako *et al.*, 2009; Itiola and Agu, 2018). Patel and Phillips (2009) reported workforce depletion in many public health programs in low- and middle-income countries by internal and external migration, resulting in overworked, stressed, and poorly motivated and supported workforce within the system. An extreme imbalance exists in the distribution of credentialed health professionals among regions and countries, and workforce migration possess additional stress on health care systems in Africa (IOM, 2011). The workforce mobility further stresses already weak and fragile systems and includes within countries (rural to urban locations), between countries (weaker to stronger economies), public sector to donor organizations and non-governmental organizations, and globally to high-income countries (Awases *et al.*, 2004; Hagopian *et al.*, 2004). Lack of opportunity and career progression results in low morale, with little incentive to work in the public sector, or even to stay in the country (IOM, 2009). Therefore, human resources in HIV/AIDS supply chain management remain a significant concern and multiple actions are needed to address systemic problems of workforce production, retention, and allocation (Philips *et al.*, 2008).

Furthermore, the study revealed that remuneration differential is a contributory factor to attrition resulting to inequitable distribution of human resource 310 (78.3%). This finding is consistent with report of previous studies such as; frozen recruitment and salaries, depleting work environments of basic supplies, drugs, and facilities (JLI, 2004), overburdened and underpaid staff of universities in low-income countries as challenge faced in meeting the need to educate and train the health workforces (Dovlo, 2003; Tettey, 2006), lack of funds, weak infrastructure, outdated or misaligned training programs, and overcrowded classrooms (Dovlo, 2003; Tettey, 2006), insufficient compensation of health workers and working under harsh conditions with few supplies and little support (IOM, 2011) and 100-150% higher wages in the private sector as compared to the public sector (Cometto *et al.*, 2014).

Also noted is poor work attitude and placement of personal gains above public good 276 (69.7%) which have negative impact on service delivery and important human resource challenge (Itiola and Agu, 2018). Likewise, sustained underinvestment in the health care workforces have negative impact on staff morale and the attitude of care (IOM, 2011).

Another barrier reported is that capacity buildings are conducted with emphasis on technical skills at the detriment of leadership and management skills required to strengthen health systems 245 (61.9%). This finding is supported by previous studies by Sherk *et al.* (2009) and partly explain the inability of program managers to address performance factors such as work environment, organizational support, clear expectations, feedback and motivation. Oleribe *et al.* (2016 and 2018) reported that poor healthcare leadership and management is common in Nigeria. Often decision-making are shifted to persons without prior management experience (McEwan *et al.*, 2001; Perry, 2008). In furtherance, IOM (2011) noted the need to provide resources to strengthen the entire health system, not just clinical services. Management training is fundamental to developing human resources for health and management skills are rarely prioritized in health training, and sustained capacity building in this area is limited (Rowe *et al.*, 2010). Frenk (2010) reported that the most complex challenge in health systems is to nurture persons who can develop the strategic vision,

technical knowledge, political skills, and ethical orientation to lead the complex processes of policy formulation and implementation. Without leaders, even the best designed systems may fail.

Similarly, limited funding and opportunities for capacity building 292 (73.8%) is another barrier mentioned. This result is consistent with the report of Waako *et al.* (2009) that training opportunities and resources for capacity development were limited mainly in remote facilities in East African countries. Fenton *et al.* (2014) also reported that limited professional development funding for national staff is often wasted, as there is no accepted system to measure competencies or training effectiveness. More so, many African countries have reported challenges in funding, employment, capacity building and efficient deployment of the health workforce (Dovlo, 2005). As a result, the continent has continued to experience health workforce migration to high-income settings in search of better opportunities (Dovlo, 2007). Itiola and Agu (2018), reported inadequate domestic financing in Nigeria that often impacts negatively on employment of skilled workforce and funding of Logistics Management Coordinating Unit (LMCU) activities. On the other hand, IOM (2011) reported restricted public budgets among the major forces that challenge the health workforce capacity development in Africa. Another barrier acknowledged is that trainees often fail to step-down training and not able to translate learning from training into improved work output 241 (60.9%).

On the reinforcers (Table 3), the respondents 379 (95.7%) indicated that HIV/AIDS supply chain leaders and managers should receive leadership and management trainings. This result is consistent with previous study, Matovu *et al.* (2013) that program leaders and managers receive the necessary training in order to provide effective and efficient interventions. Strong leadership and effective management are critical skills needed to direct large-scale sustainable change (Rowe *et al.*, 2010). Some strategies that have been implemented elsewhere to address gaps in public health leadership and management include, a leadership development program in Egypt (Mansour *et al.*, 2010), a 6-month health systems management course in Liberia (Rowe *et al.*, 2010), and a program aimed at increasing leadership capacity for HIV/AIDS programs in Zimbabwe (Jones *et al.*, 2009). Thus, competent

health supply chain leaders are needed to enable successful implementation of improvement plans for effective running of health supply chains (Brown *et al.*, 2014).

Similarly, respondents agreed that advocacy to relevant government authorities will reduce transfer of trained staff to health facilities where their skills may not be needed and recruitment, training and motivation of workers through regular payment of salaries and absorption of ad hoc staff under appropriate terms of service will help overcome attrition 379 (95.7%). Attrition is a key human resource challenge at all levels of Nigeria HIV/AIDS supply chain system and improving retention of trained or skilled staff will ensure provision of quality services. More so, Africans need to plan their health workforce based on anticipated needs and establish, strengthen, and maintain health workforce information systems that collect, analyze, and translate data into effective health workforce policies and planning (IOM, 2011).

All respondents 396 (100.0%) agreed that leadership effectiveness and professional recognition of HIV/AIDS supply chain personnel and better remuneration package will improve retention of skilled personnel and best brains. Some professional associations such as Health Logistics Association (HLA), International Association of Public Health Logisticians (IAPHL), and People that Deliver (PtD) have been committed to professionalizing the supply chain workforce and HLA's experience in humanitarian logistics indicates that it requires more advocacy, buy-in, recognition and endorsement for certification (Fenton *et al.*, 2014). It is imperative to define a recognised career pathway within the sector with clear routes for progression. IAPHL was created in 2007 to strengthen the professionalization of supply chain management and the results showed that IAPHL has brought recognition and made contribution towards professionalization of health supply chain management in the public sector (Teclerian and Wright, 2014). The IAPHL discussion platform has proved to be an effective forum to engage a variety of country-based stakeholders concerning issues around supply chain workforce (Brown *et al.*, 2014).

Conversely, Indonesia Ministry of Health in 2011 collaborated with people that deliver (PtD) initiative, world health organization (WHO) and USAID|DELIVER PROJECT and developed

provincial supply chain management (SCM) Network to professionalize and strengthen the capacity of supply chain workforce, a strategy that was adjudged successful (Mas'ud *et al.*, 2014). On the other hand, Brown *et al.* (2014) identified professionalization of the supply chain management workforce as the most significant challenge for the effective, efficient, and sustainable management of health supply chains and noted that improving the professionalization of health supply chain cadres should be seen as a priority by countries with appropriate combinations of pre-service foundation training and competency based in-service training. However, Sankaranarayanan *et al.* (2014) acknowledged that more evidence needs to be generated to support the professionalization of health supply chain while Machagge *et al.* (2014) stated that right strategies, policies and plans are needed for the recruitment and retention of supply chain workforce and professionalization of supply chain management.

Also institutionalizing and enforcing clear performance benchmarks will attract best brains from the private sector to improve public sector performance to address attitudinal challenges 276 (69.7%). In a previous study, IOM (2011) noted that public-private partnerships enhances the skills and capacities of local organizations, increases the public sector's access to the expertise and core competencies of the private sector, facilitates the scale-up of proven, cost-effective interventions through private-sector networks and associations, expands the reach of interventions and sharing costs and promoting synergy among programs.

In furtherance, 276 (69.7%) respondents agreed that improved funding and opportunities for human resources capacity development and institutionalizing health SCM as a professional postgraduate programme is a positive reinforcer. In particular, partnerships and regional collaborations involving universities and other academic training programs in developing countries can be used to exchange technical assistance in HIV/AIDS prevention, treatment, and care through visits, training, and ongoing communication (IOM, 2011). In a previous study, IOM (2011) noted that the shortage of human resources has replaced funding as the major obstacle to implementing national prevention, care, and treatment programs of the 396 respondents, 327 (82.6%) agreed that there

should always be a follow-up to ensure trainees step-down capacity to other colleagues and learning from training translated into improved work output. Trainings with regular follow-up have been reported to be effective (Omar *et al.*, 2007). Effective supervision after training and post-training follow-up support will prove highly

successful, as the approach will facilitate team work to develop and implement follow-on and corrective action plans.

The relationship between barriers, reinforcers and effective and efficient capacity building among HIV/AIDS supply chain workforce (Table 4 and 5), was statistically significant ($p < 0.05$).

Table 1. Area of training and experience of respondents

| Areas of Training and Experience | Frequency | Percentage (%) |
|---|----------------------------------|-----------------------|
| Serving Customers | 207 | 52.3% |
| Product Selection | 207 | 52.3% |
| Quantification | 207 | 52.3% |
| Procurement | 258 | 65.2% |
| Inventory Strategy | 258 | 65.2% |
| Warehousing and Distribution | 241 | 60.9% |
| LMIS | 258 | 65.2% |
| Monitoring and Evaluation | 207 | 52.3% |
| Risk Management | 155 | 39.1% |
| | *Multiple answers allowed | |

Table 2. Barriers to Effective and Efficient Capacity Building among HIV/AIDS Supply Chain Workforce

| Barriers | Grading Scale n (%) | | | | |
|--|----------------------------|--------------|-----------------|-----------------|--------------------------|
| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
| Capacity building are conducted with emphasis on technical skills at the detriment of leadership and management skills required to strengthen health systems | 100 (25.3%) | 145 (36.6%) | 34 (8.6%) | 117 (29.5%) | 0 (0.0%) |
| Attrition/ transfer of trained/skilled staff is a key human resource challenge at all levels of Nigeria HIV/AIDS supply chain system | 259 (65.4%) | 120 (30.3%) | 0 (0.0%) | 17 (4.3%) | 0 (0.0%) |
| Remuneration differential is a contributory factor to attrition resulting to inequitable distribution of human resource | 224 (56.6%) | 86 (21.7%) | 52 (13.1%) | 34 (8.6%) | 0 (0.0%) |
| Poor work attitude and placement of personal gains above public good at the state and national levels | 86 (21.7%) | 190 (48.0%) | 69 (17.4%) | 34 (8.6%) | 17 (4.3%) |
| Limited funding and opportunities for capacity building | 68 (17.2%) | 224 (56.6%) | 52 (13.1%) | 52 (13.1%) | 0 (0.0%) |
| Trainees often fail to step-down training and not able to translate learning from training into improved work output | 34 (8.6%) | 207 (52.3%) | 86 (21.7%) | 69 (17.4%) | 0 (0.0%) |

Table 3. Reinforcers of Effective and Efficient Capacity Building among HIV/AIDS Supply Chain Workforce

| Reinforcers | Grading Scale n (%) | | | | |
|---|---------------------|-------------|------------|-----------|-------------------|
| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
| HIV/AIDS supply chain leaders and managers should receive leadership and management trainings and experience to deliver effective and efficient interventions | 293 (74.0%) | 86 (21.7%) | 0 (0.0%) | 17 (4.3%) | 0 (0.0%) |
| Advocacy to relevant Government authorities to reduce transfer of trained staff to sites where their skills may not be needed and recruitment, training and motivation of workers through regular payment of salaries and absorption of ad hoc staff under appropriate terms of service | 276 (69.7%) | 103 (26.0%) | 0 (0.0%) | 17 (4.3%) | 0 (0.0%) |
| Leadership effectiveness and professional recognition of HIV/AIDS supply chain personnel and better remuneration package will improve retention of skilled personnel/best brains | 189 (47.7%) | 207 (52.3%) | 0 (0.0%) | 0 (0.0%) | 0 (0.0%) |
| Institutionalizing and enforcing clear performance benchmarks and attracting best brains from the private sector to improve public sector performance to address attitudinal challenges | 173 (43.7%) | 103 (26.0%) | 69 (17.4%) | 34 (8.6%) | 17 (4.3%) |
| Improved funding and opportunities for human resource capacity development and institutionalizing health SCM as a professional postgraduate programme | 155 (39.1%) | 121 (30.6%) | 52 (13.1%) | 34 (8.6%) | 34 (8.6%) |
| There should always be a follow up to ensure trainees step-down capacity to other colleagues and learning from training translated into improved work output | 258 (65.2%) | 69 (17.4%) | 69 (17.4%) | 0 (0.0%) | 0 (0.0%) |

Table 4. Relationship between the Barriers to Capacity Building and Effective and Efficient Capacity Building among HIV/AIDS Supply Chain Workforce

| Barriers to Capacity Building | Factors of Effective and Efficient Capacity Building | | Total | χ^2 | p-value |
|-------------------------------|--|-----------------------|-------------|----------|---------|
| | High Level Factors (%) | Low Level Factors (%) | | | |
| High Level of Barrier | 30 (22.7) | 102 (77.3) | 132 (100.0) | 90.8 | 0.001 |
| Low Level of Barrier | 193 (73.1) | 71 (26.9) | 264 (100.0) | | |

Decision

The chi-square (χ^2) test revealed a relationship between barriers to capacity building and effective and efficient capacity building among HIV/AIDS supply chain workforce, p-value (<

0.05). We accepted the alternate hypothesis (H_a), therefore barriers to capacity building is a significant factor of effective and efficient capacity building among HIV/AIDS supply chain workforce.

Table 5. Relationship between the Reinforcers of Capacity Building and Effective and Efficient Capacity Building among HIV/AIDS Supply Chain Workforce

| Reinforcers of Capacity Building | Factors of Effective and Efficient Capacity Building | | Total | χ^2 | p-value |
|----------------------------------|--|-----------------------|-------------|----------|---------|
| | High Level Factors (%) | Low Level Factors (%) | | | |
| Positive Reinforcers | 175 (88.3) | 35 (16.7) | 210 (100.0) | 52.36 | 0.001 |
| Negative Reinforcers | 88 (48.9) | 92 (51.1) | 180 (100.0) | | |

Decision

The chi-square (χ^2) test revealed a relationship between reinforcers of capacity building and effective and efficient capacity building among HIV/AIDS supply chain workforce, p-value (< 0.05). We accepted the alternate hypothesis (H_a), therefore reinforcers of capacity building are a significant factor of effective and efficient capacity building among HIV/AIDS supply chain workforce.

Conclusion

Effective and efficient capacity building programs are central to the improvement and responsiveness of HIV/AIDS supply chain system. Continual capacity building and support while taking cognizance of the various barriers and reinforcers will ensure development of competent, consistent, competitive, effective and efficient workforce to deliver quality HIV/AIDS supply chain service.

Recommendations

Capacity building should be integrated with strengthening organizational structures, policies and processes that guide and drive supply chain services and essential research including funding, national and international partnerships. Given the huge investments in HIV/AIDS commodity procurement, there is need to invest substantially in capacity building of supply chain workforce to ensure sustainable workforce for service delivery.

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