

Appraisal of Nature of Capacity Building Programs of HIV/AIDS Supply Chain Workforce in Nigeria

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Abstract

This study on appraisal of nature of capacity building programs of HIV/AIDS supply chain workforce in Nigeria involved cross-sectional observational design. A pre-tested self-completion structured questionnaire was administered to 422 participants drawn from HIV/AIDS supply chain workforce. The survey had a response rate of 396(93.8%). The reliability statistics showed the questionnaire is reliable for nature of capacity building programs, Cronbach alpha ($\alpha = 0.886$). On-the-job training was the most predominant capacity building approach, while task shifting and fellowship program were the least used. The study revealed nature of capacity building of HIV/AIDS supply chain workforce comprised of on-the-job training, short courses, residential training, field-based, work-based, in-service, pre-service and e-learning trainings as leading strategies and excellent in strengthening HIV/AIDS supply chain workforce capacity, mean \pm standard deviation score (3.774 ± 0.9882) on a Likert scale of 1-5 (5-point scale). Others included collaboration, university-based model, mentorship, task shifting and fellowship program. Inferential statistics revealed that Managers and Directors with postgraduate qualification have more benefit from the capacity building programs ($p < 0.05$). Whilst age, sex and years of experience have no effect on the capacity building programs of HIV/AIDS supply chain workforce ($p > 0.05$). Chi-square statistic revealed that nature of capacity building program is a significant factor of HIV/AIDS supply chain workforce capacity ($p < 0.05$). Effective capacity building programs are central to the improvement of HIV/AIDS supply chain systems and responsiveness.

Keywords: Capacity building, HIV/AIDS, supply chain, workforce.

Introduction

The importance of building the capacity of workforce as part of strengthening health systems and ensuring sustainability cannot be overemphasized [1]. Workforce capacity can be developed through formal and informal programs to ensure availability of skills to provide quality health services [2]. Recognizable approaches for capacity development in supply chain management to ensure availability of skilled workforce include; pre-service, in-service, residential, onsite, field-based, work-based, on-the-job, distance learning, e-learning, mentorship, short courses, task shifting, face-to-face learning, blended learning, fellowship program, outsourcing, establishing logistics management units (LMUs), developing incentives, creating

accreditation and strengthening policy [3, 4, 5, 6, 7, 8, 9].

Some of the vital impacts of capacity building programs in Nigeria and other countries include; long-term availability of skills in-country crucial for success and sustainability of HIV/AIDS program in Nigeria [5]; improved access to safe, effective and quality-assured medicines for the treatment of HIV/AIDS, Tuberculosis and Malaria in the East African region [10]; enhanced workforce skills, health system performance and evidence-base for policies, programs and practice resulting in better control of communicable diseases in Australia [3]; boosted leadership and management capacity for HIV/AIDS program in Zimbabwe, Ethiopia, Iran, Egypt, Liberia and Uganda [2, 11, 12, 13, 14, 15, 16, 17]; better skills in pharmaceutical supply

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management in East Africa [18]; health facility management skills essential for long-term health systems strengthening in Liberia [17] and advanced institutional and workforce capacity to provide quality health services [2].

Nigeria's health sector has particularly experienced a number of other lingering crises in recent times [19, 20]. It has been reported that lack of adequate health workforce in Nigeria to potentially meet increased demand have also contributed to non-implementation of National Health Insurance Scheme (NHIS) at the state and local government levels [21]. Other actions that might be required to strengthen the supply chain workforce may be implemented as part of broader health workforce policies and include improving public sector pay and incentives [22]; creating rural pipelines to education and training to ease education and deployment in under-served areas [23]; improving education strategies to adapt content and modalities of training to current and emerging health system needs [24] and more delegation of tasks to cadres with shorter training [25].

While capacity building has been well developed in the private or for-profit business sector, it remains less well-defined in the public, non-profit and social sectors in low- and middle-income countries [1]. Often capacity building has resulted in disempowerment of local organizations rather than promoting local ownership and sustainability [1]. This study unlike others will strengthen existing literature on workforce capacity development and reduce the gap in knowledge applying to HIV/AIDS supply chain workforce. It will help the Federal and State Ministries of Health to determine a procedure for strengthening human resources in health supply chains.

In spite of the huge expenditure of millions of dollars, there have not been rigorous evaluations of capacity building efforts [1]. It is important that a firm evidence-base should be established concerning strategies that work and what doesn't work to build capacity before additional investments are made [1]. This will ensure that each country is better equipped to adopt and adapt the lessons learned from every other nation and shared learning would be greatly assisted by a global repository of evidence on health system performance [26]. This type of evidence is a global public good.

Therefore, it is important to first conduct health system assessments, analyze challenges to health system strengthening success, prioritize addressing challenges, and implement appropriate activities to build new capacity in overcoming challenges.

Therefore, the present study seeks to assess nature of capacity building programs of HIV/AIDS supply chain workforce in Nigeria.

Methods

Selection of the Area

This study was conducted in Abuja, the administrative centre of Nigeria. Abuja has six Area Councils and 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 [27]. Abuja is a city ("Centre of Unity") and became the capital of Nigeria on December 12, 1991. Most of the HIV/AIDS organizations have their offices in Abuja from where they carry out their supply chain functions around the country.

Sample Size Determination

The representative sample size for the infinite population was calculated using Cochran's formula ($n_0 = z^2 pq / e^2$) [28].

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)

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

$n_0 = 384.16$

To the calculated sample size, 10% overage was added to provide for drop out, non-response, incomplete response and late response. This ensured minimum response rate for the study.

Sampling Technique

HIV/AIDS supply chain workforce (422) from public sector, private sector, non-governmental organization, faith-based organization and donor agency, minimum of bachelor's degree qualification and two (2) years in their organization, signed consent form and not a participant in the pilot without gender

discrimination were selected using random sampling technique. The study excluded other supply chain workforce, HIV/AIDS supply chain workforce less than two (2) years in their organization, without at least bachelor's degree qualification, those that participated in pilot and declined to sign consent form.

Data Collection

Cross-sectional observational design was employed and comprised of two sources of data, namely primary and secondary sources of data. The primary sources of data were those collected from the field through a self-completion structured questionnaire. Secondary data were from published literature sources. The purpose of the study and questionnaire were explained to the participants. Participants read and signed the consent form before joining the study. Participants were informed they could withdraw at any point from the study without consequences. Identity of participants was kept anonymous and confidential by excluding all identifiers. The questionnaire had twenty (20) questions with which relevant information in the area of socio-demographic characteristics and nature of capacity building programs of HIV/AIDS supply chain workforce were obtained. The questionnaire was pre-tested with volunteers similar to expected participants to ascertain its effectiveness and suitability. Pre-testing of the questionnaire was done with 38 participants (10% of the calculated sample size). After the pretest, amendments were made in the light of lessons learned.

The questionnaire required about fifteen (15) minutes to complete. Construct validity was ensured by fashioning the questionnaire based on relevant literatures and empirical studies. Content validity was ensured by modifying the questionnaire based on the results of the supervisor's review and pre-test. Social response bias was safeguarded as participants were allowed to complete and return the questionnaire on a later date, and not necessarily in the presence of the researcher. Ethical approval to carry out the study was granted by National Health Research Ethics Committee of Nigeria (NHREC).

Data Analysis

Data obtained were coded and analyzed using Statistical Package for Social Sciences (SPSS) version 22 (SPSS Inc., Chicago, Illinois, USA) for descriptive statistics. Items within each domain were summarized using descriptive statistics such as mean and standard deviation. Two-sided independent student's t-test and one-way analysis of variance (ANOVA) were used to compare means across groups with the aid of GraphPad Instant version 3 for inferential statistics, P-values set at $p < 0.05$. The negative response was < 2.5 while positive response was > 2.5 . Chi-square statistic was used to determine the level of relationship at 5% level of significance ($p \leq 0.05$).

Results and Discussion

The survey had a response rate of 396 (93.8%). Table (1) socio-demographic characteristics, with most of the participants 328 (82.9%) between the age 30 and 49 years. More of male participants 275 (69.4%) and participant's years of experience in HIV/AIDS supply chain 345 (87.1%) between 4 and 15 years. Majority 294 (74.2%) in the rank of manager, supervisor, specialist, advisor and officer. More than half 221 (55.8%) had a master's degree. Table (2) percentage frequency of nature of capacity building programs, Table (3) reliability analysis of nature of capacity building programs, Table (4) effect of socio-demographic characteristics on nature of capacity building programs and Table (5) Chi-square tests.

The participants have substantial experience with good understanding of capacity building strategies of HIV/AIDS supply chain workforce, and their opinion can be trusted for quality research outcomes. The respondents have an attained ample level of skill with over half of them with master's degree qualification and played key roles in strengthening capacity of HIV/AIDS supply chain workforce. They have practical knowledge of effective capacity building strategies and basic background required for supply chain functions.

The study revealed that on-the-job training is the predominant strategy in HIV/AIDS supply

chain workforce capacity building programs. This is followed by short courses and jointly residential, field-based, work-based, in-service, pre-service and e-learning trainings. Collaboration among stakeholders, university-based model and mentorship on real work situation and task shifting are in less use while fellowship training program seemed the least used strategy. The outcome of the present study suggests that the various capacity building strategies can be a useful model for strengthening human resources in HIV/AIDS supply chain for improved health service delivery and agrees with previously reported approaches for capacity development in supply chain management [4]. This is in addition to outsourcing, establishing logistics management units (LMUs), developing incentives, creating accreditation and strengthening policy [4]. Similar approaches have been used to strengthen health workforce capacity in other countries including The Gambia, Nicaragua and Liberia [2]. It is worth noting that some capacity building strategies have been implemented to ensure long-term availability of skills in different countries with positive results such as, on-site and off-site training in South Africa [29], collaboration among stakeholders in Uganda, Kenya, Tanzania and Rwanda [18], on-the-job training and short courses in Uganda, Kenya, Tanzania and Rwanda [10], mentorship on real work situation in Uganda [30], field-based training in Australia [3], skills transfer in Liberia [17], fellowship training program in Uganda [2], work-based/ hands-on training in Uganda [2], in-service, pre-service and e-learning training in Nigeria [5]. Furthermore, it has been reported that fellowship program does not yield quick returns but are critical in building longer-term capacities needed to address HIV/AIDS in coming generations [31].

The study further agreed with previous studies [10, 14] that skill building approaches/activities that do not take workers away from their places of work for long periods such as on-the-job training and short courses/in-country workshops with regular follow-up were effective and preferred modes of capacity building in Iran and East African countries,

respectively. Effective capacity building program will guarantee improved capacity of workforces to ensure a reliable supply chain for HIV/AIDS program [32]. Workforces plays a vital role in supply chain management, thus improving their capacities would result in improved quality of HIV/AIDS services. It can be assumed that appropriate capacity building strategy equips workforce with skills that make them more efficient and productive. Well-trained supply chain workforce often has higher motivation and morale leading to lower turnover rates, more confident as well as aware of the expectations and work better than teams, more likely to accept change and take initiatives [33]. Skilled workforce is equipped to train other employees, thus reduces pressure on the management team. Similarly, it has been suggested that training is not a panacea and lack of frequent training is not necessarily the cause of under-performance, as the problem may not be the type solved by training [34].

The mean \pm standard deviation score (3.774 \pm 0.9882) for the nature of capacity building programs indicates that existing methods are excellent in strengthening workforce capacity. Factor loading (0.674-0.968) is good and entails all mean components are added to the summation. Cronbach's alpha, $\alpha = 0.886$ showed the questionnaire is reliable.

Inferential statistics revealed that socio-demographic characteristics such as educational qualification and job title/rank have an effect on the nature of capacity building programs ($P < 0.05$). Those in the rank of Managers and Directors with postgraduate qualification have more benefit from the capacity building programs. However, age, sex and years of experience have no effect on the capacity building programs of HIV/AIDS supply chain workforce.

Chi-square statistic was carried out to determine the level of relationship at 5% level of significance ($P < 0.05$) and there is a relationship between nature of capacity building programs and HIV/AIDS supply chain workforce capacity. It revealed that nature of capacity building programs is a significant factor of HIV/AIDS supply chain workforce capacity.

Table 1. Socio-demographic Characteristics of HIV/AIDS Supply Chain Workforce (N=396)

Socio-demographic Characteristics	Categorization	Number (%)
Age (Years)	30-39	121 (30.6)
	40-49	207 (52.3)
	50-59	52 (13.1)
	≥60	16 (4.0)
	Total	396 (100.0)
Gender	Female	121 (30.6)
	Male	275 (69.4)
	Total	396 (100.0)
Years of Experience (years)	0-3	34 (8.6)
	4-7	104 (26.3)
	8-11	138 (34.8)
	12-15	103 (26.0)
	≥16	17 (4.3)
	Total	396 (100.0)
Job Title	Director	68 (17.2)
	Associate/Assistant Director	34 (8.6)
	Manager/Supervisor	156 (39.4)
	Specialist/Advisor/Officer	138 (34.8)
	Total	396 (100.0)
Highest Educational Qualification	Bachelor's Degree	119 (30.1)
	Postgraduate Diploma	14 (3.5)
	Fellowship	35 (8.8)
	Master's Degree	221 (55.8)
	Doctorate	7 (1.8)
	Total	396 (100.0)

Table 2. Percentage Frequency of Nature of Capacity Building Programs of HIV/AIDS Supply Chain Workforce (N=396)

Items	Positive Responses
	Frequency N (%)
Capacity building strategies being used in Nigeria HIV/AIDS supply chain to ensure availability of skilled workforce to provide quality health services	
Residential training	327 (82.6)
Fellowship training	190 (48.0)
Mentorship on real work situation	276 (69.7)
Field-based training	327 (82.6)
Work-based training	327 (82.6)
On-the-job training	396 (100.0)
Short courses	362 (91.4)
University-based model	293 (74.0)
In-service training	327 (82.6)
Pre-service training	327 (82.6)
E-learning training	328 (82.8)
Task shifting	258 (65.2)
Collaboration among stakeholders	310 (78.3)

Positive responses = Agree/ Strongly Agree

Table 3. Reliability Analysis of Nature of Capacity Building Programs of HIV/AIDS Supply Chain Workforce (N=396)

Items	Mean	SD	Factor Loading	Cronbach's Alpha
Capacity building strategies being used in Nigeria HIV/AIDS supply chain to ensure availability of skilled workforce to provide quality health services				
Residential training	3.833	0.9613	0.674	0.886
Fellowship training	3.104	1.2855	0.783	
Mentorship on real work situation	3.793	1.2478	0.865	
Field-based training	3.747	1.0296	0.922	
Work-based training	3.747	1.0296	0.922	
On-the-job training	4.306	0.4612	0.837	
Short courses	4.003	0.7204	0.911	
University-based model	3.576	1.0963	0.878	
In-service training	3.833	0.9154	0.968	
Pre-service training	3.879	0.9469	0.965	
E-learning training	3.967	0.9995	0.933	
Task shifting	3.487	1.1351	0.848	
Collaboration among stakeholders	3.790	1.0183	0.888	
Mean of mean \pm SD	3.774	0.9882		

Table 4. Effect of Socio-demographic Characteristics on Nature of Capacity Building Programs of HIV/AIDS Supply Chain Workforce (N=396)

Variables	N	Nature of Capacity Building
Age		
Below 40	121	3.704 \pm 0.9816
Above 40	275	3.778 \pm 0.9561
P-value		0.4861
Sex		
Male	275	3.768 \pm 0.9560
Female	121	3.728 \pm 0.9865
P-value		0.7043
Years of experience		
Below 8	138	3.683 \pm 0.9846
Above 8	258	3.795 \pm 0.9517
P-value		0.2709
Highest Education		
Bachelor's Degree	119	3.671 \pm 0.6700
Postgraduate	277	3.792 \pm 0.6301
P-value		0.0448
Job Titles		
Managers/Directors	258	3.774 \pm 0.9556
Specialists/Advisors	138	3.522 \pm 0.9829
P-value		0.0179

Table 5. Relationship between Nature of Capacity Building Programs and HIV/AIDS Supply Chain Workforce Capacity (N= 396)

Nature of Capacity Building Programs	Factors of Supply Chain Workforce Capacity		Total	χ^2	p-value
	High Level Factors (%)	Low Level Factors (%)			
Good Capacity Building	199 (92.1)	17 (7.9)	216 (100.0)	206	0.001
Poor Capacity Building	38 (21.1)	142 (78.9)	180 (100.0)		

Null Hypothesis (Ho)

Nature of capacity building programs is not a significant factor of HIV/AIDS supply chain workforce capacity.

Alternative Hypothesis (Ha)

Nature of capacity building programs is a significant factor of HIV/AIDS supply chain workforce capacity.

Conclusion

The study revealed that nature of capacity building programs to improve capacity of HIV/AIDS supply chain workforce include on-the-job training, short courses, residential training, field-based, work-based, in-service, pre-service and e-learning trainings as leading strategies. Other strategies include

collaboration, university-based model, mentorship, task shifting and fellowship program. The strategies are believed to be cost effective, with minimal disruption, and can lead to practice change.

Recommendations

Federal and State Ministries of Health should ensure implementation of effective capacity building programs as they are central to the improvement of HIV/AIDS supply chain systems and responsiveness. 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.

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