

Original Article

LOGISTICS AND SUPPLY CHAIN MANAGEMENT: HUMAN RESOURCE CAPACITY AND TRAINING NEEDS ASSESSMENT OF PHARMACISTS IN NIGERIA

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ABSTRACT

Objective: Logistics and supply chain management have received global attention since the early 1980s, but this concept is thought to still be unpopular in Nigeria as very little literature exists on it, especially in the pharmaceutical sector. This paper, therefore set out to investigate the human resource capacity and the needs assessment of pharmacists in Nigeria as regards logistics and supply chain management.

Methods: This cross-sectional study was conducted among pharmacists in Nigeria. A total of 873 pharmacists participated in the study. A well-structured questionnaire was produced, validated, and administered to the registered pharmacists.

Results: Out of the 873 retrieved questionnaires, 21 copies were not completely filled and were therefore discarded; hence the 852 completely filled questionnaires were taken as the number of participants in the study. The survey shows that out of the 51.76% pharmacists who have acquired trainings, 18.2% were exposed to supply chain management by virtue of their workplace, while 30.9% were self-trained through conferences and workshops. Also, 98.8% of the respondents were ready to be trained in this emerging field in Nigeria, with only 1.2% declining any interest in supply chain management training.

Conclusion: These findings show that there is a low provision for proactive education on supply chain management for pharmacists. However, there is a promising opportunity to introduce such training as the majority of the respondents were receptive to such an innovation. This study may, therefore be useful for policymakers and health professionals to chart the path for the future to ensure adequate and proper delivery of medicines and other health commodities.

Keywords: Supply chain, Capacity, Training needs, Assessment

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INTRODUCTION

Logistics and supply chain management have received global attention since the early 1980s, but this concept seems to be unpopular in Nigeria, especially in the pharmaceutical sector. Amidst Nigeria's poor drug distribution system, the concept of logistics and supply chain management is made worse with an attendant risk to the populace. Unfortunately, this is not particularly well understood, and to worsen matters, pertinent policies are webbed in misconstrued dynamics [1, 2].

Logistics and Supply Chain are erroneously interchanged to mean the same thing. While logistics focuses on the product flow, supply chain, on the other hand, refers to all actors in the provision of a particular product to its end user, including the manufacturer, distributor, logistics team, and even the end users [3]. Looking further at Supply Chain Management, Kathawala and Abdou [4] referred to the concept as the flow of goods and products from their state in the raw form to their consumption, as well as associated information flows.

In reality, the supply chain network can be very complex, requiring a number of steps that must be taken to ensure that medications are available and accessible to patients [6]. To this end, competent and well-trained health workers are essential for the delivery of quality health services and there are stakeholders involved in ensuring that patients get the right medicines at the right time. These include manufacturers, distributors, wholesalers, retail/community pharmacists, and other aspects of the supply chain.

The National Drug Policy stated that only duly licensed pharmacists shall have the authority to supply, sell, and dispense medicines to

the public while permitting certain over-the-counter medicines to be sold in patent medicine shops operated by licensed pharmacy technicians [7]. A consideration of this policy makes the importance of a pharmacist in drug supply chain management apparent. Yet, prior to 2021, logistics and supply chain management courses were not adequately captured in the undergraduate pharmacy curriculum. Also, several studies have reported health supply chain knowledge and skills gaps among pharmacists in Nigeria. To this end, this study was conducted to ascertain the level of supply chain knowledge and skills of Nigerian pharmacists and assess their training needs.

MATERIALS AND METHODS

Study type

Cross-sectional study

Study population and settings

The research was carried out among pharmacists in Nigeria. The minimum sample size was calculated to be 389 and the majority of the respondents were recruited during the annual national conference of the Pharmaceutical Society of Nigeria, while the others were recruited via the respective state coordinators of the Pharmacy Council of Nigeria (PCN).

Study period

Eligibility criteria

Participants were included if they were pharmacists residing in Nigeria

Exclusion criteria

Potential participants were excluded if they were intern pharmacists, pharmacists undergoing the mandatory national 12-month youth service scheme, and pharmacists who refused to give their consent or withdrew their consent at any point.

Ethical consideration

The study was approved by the Pharmacy Council of Nigeria Research Committee, Ref. No: PCN/PRS/305/T 11. There was no conduction of review protocols as the research did not involve the acquisition of personal or contact details of respondents and also did not involve any institution.

Data collection

A well-structured questionnaire was produced and administered to the registered pharmacists who were lucidly informed about the background and objectives of the study, after which their consent to partake in the study was obtained individually. Respondents were informed that they were free to withdraw for any reason and that every piece of information provided would be treated with anonymity and confidentiality. The questionnaires were divided into socio-demographic characteristics, knowledge and experience of logistics and supply chain management, respondents' practice field and training needs.

Statistical analysis

The analysis of study data employed primarily univariate and multivariate regression methods. Also, $*P < 0.05$ was considered as the indicator of statistical significance, having conducted all inferential analysis at a confidence interval of 95%.

RESULTS

Out of the 873 retrieved questionnaires, 21 copies were not completely filled and were therefore discarded; hence the 852 completely filled questionnaires were taken as the number of participants in the study. The demographic characteristics of the participants are provided in table 1; males (62.91%), females (37.09%). A total of 459(53.87%) pharmacists had B. Pharm as their highest academic qualifications, while others were PharmD (35; 4.11%), MSc (205; 24.06%), PhD (37; 4.34%), and professional fellowship or FPC Pharm (116; 13.62%).

The highest number of pharmacists that participated were from Lagos, Abuja, Rivers, Kaduna and Taraba, respectively. The survey showed that among the pharmacists who participated more in the survey, 87% were in the downstream part (community and hospital) of the pharmaceutical supply chain, while about 6% were from the upstream (research, manufacturing and importation) part of the supply chain.

Table 2 shows the frequency distribution of the answers provided by the participants on the assessment of their interest, knowledge, and experience in supply chain. About 91.19% of the pharmacists reported being familiar with supply chain and logistics management.

The survey shows that 98.8% indicated an interest in receiving training, with only 1.2% declining any interest in supply chain management training. About 70% of the pharmacists indicated particular interest in receiving trainings in Supply Chain Management, Health Informatics, Procurement and Inventory Management, Supply Chain Management in Disasters, Emergencies and Humanitarian Services and Logistics and Operations Management. Only about 30% indicated an interest in Transport Techniques and Management and Managing Multi-Project Environments.

A total of 441(51.76%) have acquired trainings, 404(47.42%) have not, while 7(0.82%) were unclear if they have acquired trainings or not. Among the 441(51.76%) participants that have acquired trainings, 136(30.87%) knew about logistics and supply chain management from attendance at conferences and workshops, with 120(27.21%) getting information on the subject during their undergraduate trainings, 45(10.20%) during their postgraduate trainings, 80(18.20%) from their place of work, and 60(13.60%) from other sources.

Among the participants who have acquired trainings, about 126(28.57%) had received certificates in supply chain or logistics management, 27(6.12%) obtained diplomas, while 17(3.85%) had degrees in supply chain or logistics management. About 67(15.22%) had undertaken the training between 1-2 d, 128(29.02%) between 3-7 d, while 89(20.18%) reported that their training lasted for a duration of 1-3 mo, implying that some participants might have been engaged in more than one type of training.

A total of 244(28.64%) of the participants considered themselves as working in the supply chain, 605(71.01%) were not, and 3(0.35%) were not clear if they were working in the supply chain or not.

Table 1: Demographics of participants (n=852)

Characteristics	Category	Frequency
Gender	Male	536(62.91%)
	Female	316(37.09%)
Age	21-30	137(16.08%)
	31-40	332(38.97%)
	41-50	193(22.65%)
	51 and above	190(22.30%)
Highest Academic Qualification	B. Pharm	459(53.87%)
	Pharm D	35(4.11%)
	M. Sc.	205(24.06%)
	PhD	37(4.34%)
	FPCPharm	137(13.62%)

Table 2: Interest, knowledge, and experience of participants in supply chain (n=852)

Item	Category	Frequency
Familiarity with supply chain	Yes	777(91.19%)
	No	67(7.86%)
	No response	8(0.94%)
Interest in supply chain management training	Yes	842(98.8%)
	No	10(1.2%)
Have you acquired any supply chain and logistics management training?	Yes	441(51.76%)
	No	404(47.42%)
	Unclear	7(0.82%)
Source of supply chain management training	Conference/Workshop	136(30.87%)
	Undergraduate curriculum	120(27.21%)
	Post-Graduate Curriculum	45(10.20%)

Item	Category	Frequency
Type of supply chain management training	Place of Work	80(18.20%)
	Others	60(13.61%)
	Certificate	126(28.57%)
	Diploma	27(6.12%)
	Degree	17(3.8%)
	1-2 d training	67(15.2%)
	3-7 d training	128(29.02%)
Currently working in supply chain	1-3 mo training	89(20.18%)
	Yes	244(28.64%)
	No	605(71.01%)
	Unclear	3(0.35%)

DISCUSSION

Logistics and Supply chain management is an emerging field in Nigeria that is very crucial to the profession of pharmacy. As custodians of drugs and other health commodities, the essential roles of pharmacists, as actors and champions in logistics and Supply Chain management, cannot be overemphasized. In light of this, this study investigated the human resource capacity for the health supply chain and training needs assessment of pharmacists in order to provide information to enhance the development of human resources in the pharmaceutical supply chain and public health sector, in general.

The significant level of awareness about logistics and supply chain management in the pharmaceutical sector shown in this study does not necessarily translate to practicing or having sufficient skills to operate an effective supply chain system. This is in agreement with the report of a similar study on the assessment of knowledge of essential supply chain functions among HIV/AIDS supply chain workforce (all pharmacists) in Nigeria, which revealed knowledge and skill gaps in some essential supply chain functions among the HIV/AIDS supply chain workforce [8]. The findings of this study also aligns with those of a similar study carried out to evaluate the extent of knowledge and implementation of supply chain management practices among community pharmacists in Anambra State, Nigeria, which revealed a poor implementation of Supply Chain Management practices despite the high level of knowledge exhibited by the community pharmacists [9].

The high interest in the subject as seen in the results of this study is another enabler of any training that may be innovated or developed in response to the situation of low skill and implementation of the logistics and supply chain practices. A study conducted in Katsina State Nigeria explored the evolution of the availability of public health commodities across all the supported health facilities in Katsina State, Northwestern Nigeria; one of the identified limitations was the lack of assessment of optimal product availability of pharmaceutical outlets and other private organizations; implying that appropriately trained pharmacists are needed in order to strengthen the supply chain workforce and improve performance [10]. The study also revealed that Pharmacists are aware of the knowledge gap required to optimize the pharmaceutical supply chain practice and are willing to undertake further training/education in order to ensure they are well-equipped to operate the various processes in logistics and supply chain management. However, the disharmony observed between acquired knowledge and practice suggests other factors affecting this implementation. A scoping review by Oluotase *et al.* (2022) suggests that the implementation of these practices by pharmacists would be encouraged by the strengthening of the Nigerian healthcare system and its drug policy, as pharmacists are still, in the real sense, restricted from being the sole professionals responsible for carrying out these duties [11]. A survey on Nigerian pharmacists showed that enforcement of existing laws was rated as the most important aspect from where this challenge can be mitigated [11]. Hence, stricter measures taken by public policy enforcement agencies would be of immense benefit to pharmacists in this light. Inadequate enforcement of drug policies is a long-standing issue and affects access to medicines [12].

The study is, however, not without limitations. Despite the fact that the sample size was far exceeded, the nationwide spread of the respondents was limited due to the fact that some potential

respondents were located in conflict and/or hard-to-reach areas of the country.

CONCLUSION

This study shows a significant level of awareness of logistics and supply chain management among pharmacists in Nigeria. However, awareness does not necessarily translate to having sufficient skills to operate an effective supply chain system. Majority of the pharmacists are aware of the knowledge gap required to optimize the pharmaceutical supply chain practice and are willing to undertake further training. Therefore, there is an urgent need to institutionalize training in logistics and supply chain management at pharmacy undergraduate, graduate, continuing professional education and practice levels, in order to ensure the standard and ethical practice of Logistics and Supply Chain Management by pharmacists.

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AUTHORS CONTRIBUTIONS

All liabilities relating to the content of this study were borne by the authors. Mohammed NAE, Falabi OA, and Okafor UG designed the research, were involved in the process of data collection, and co-wrote the manuscript. Ahmed IB, Bala MU, Muonemeh F, and Anukwu IK collaboratively wrote the discussion of the study and partook in the research design and data collection. Okeke AN and Wannang ANN designed the data collection tool, carried out the data analysis, and co-wrote the manuscript.

All authors edited and collectively reviewed the final draft during group meetings prior to the submission.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

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