Original Research Article

Readiness and Willingness to Provide Immunization Services: A Survey of Community Pharmacists in Anambra State

Abstract

Background: A significant goal of the World Health Organization is the global control of certain infectious diseases. Immunization is vital in the prevention of infection from vaccine-preventable diseases. Low immunization coverage has led to a low rate of vaccination. Thus, the inclusion of community pharmacists into the immunization scheme is paramount to ensure broader and faster vaccination coverage.

Objective: To assess the community pharmacists' readiness and willingness to provide immunization services with Anambra State as a focus area.

Methods: The study was cross-sectional and conducted among community pharmacists in Anambra state using a self-administered questionnaire to determine the readiness and willingness of the community pharmacists to provide immunization services. Descriptive analysis was used, and the data were analyzed using SPSS software version 23.

Results: The majority of the respondents, 110 (74.3%), expressed their willingness to provide immunization services. Also, out of the 148 participants, 108 (73%) identified multiple limiting factors or barriers to providing immunization services, mainly a lack of training to deliver these services 142 (96.0%) and not having storage facilities in my pharmacy to provide immunization services 106 (71.6%). Lastly, 97 (65.8%) identified solutions to these barriers. Pharmacists who offer immunization services should be well paid 96 (65.2%), and the provision of better storage facilities improve Pharmacists' involvement with immunization 79 (53.4%) were the leading solutions identified.

Conclusion: Findings from the study suggest that community pharmacists are ready and willing to provide immunization services.

Keywords: Immunization, vaccination, Community pharmacists, vaccine, immunity

INTRODUCTION

A primary goal of the World Health Organization is the global control of certain vaccine-preventable infectious diseases, such as chickenpox, diphtheria, tetanus, polio, rotavirus, et cetera(1). The risk of epidemic outbreaks of these diseases is related to many factors, including population mobility, changes in human behavior, social organization, climate, agricultural practices, and medical and public health practices (2).

Immunization and vaccination protect the individual and control the spread of these diseases and are thus recommended throughout the person's lifetime to prevent vaccine-preventable diseases and their sequelae. They are a fundamental part of infectious diseases worldwide (3). Poor vaccination coverage remains a significant public health concern (4). To increase accessibility to immunization services, in the last few years, community pharmacists have been providing immunization services in many developed countries such as the USA, the United Kingdom (UK), Australia, Canada, and New Zealand (5), (6). The use of pharmacists as vaccine administrators in these countries has yielded higher vaccination rates and better clinical outcomes (7)

Like in the majority of countries worldwide, the adult immunization rate in Nigeria falls below the desired targets, urging the need to expand this service nationally(8).
Nigeria is committed to the Global Vaccine Action Plan (GVAP) goals. Immunization coverage in Nigeria is below GVAP goals, putting many children at risk of vaccine-preventable diseases (9). Immunization coverage varies across Nigeria, but improvements are needed in every state. Nigeria conducted a national survey on routine immunization coverage among children 12-23 months of age in 2016/2017, and it was found that All states fall below the global goal of 90% coverage for three doses of pentavalent vaccines. Immunization performance is weakest in North East or northwest zones where every state falls below the 50% penta3 range; children in rural areas are half as likely to be vaccinated as those in urban areas; children of younger and less educated caretakers are at greater risk, Only 1 in 4 children was found to have received all recommended vaccines, and lack of awareness is the main reported reason children are not fully vaccinated(10).
In the literature, many barriers have been identified as factors that may contribute to this low immunization rate, including the lack of patient knowledge and belief about the safety and efficacy of vaccines, inconvenient location and visiting hours for the immunization service, and longer waiting periods (5), (11). Community pharmacists are recognized as highly accessible healthcare professionals, and community pharmacies—because of their convenient location and extended working hours—provide a significant venue to provide an immunization service (12), (13), (14). There is also evidence that pharmacy-led immunization programs can lead to an increase in the uptake compared with usual care (15). Although community pharmacies play an essential role in any healthcare system to overcome some of the barriers, for example, among hard-to-reach groups and those who live in rural areas(16), pharmacists can play a crucial role in facilitating the uptake of immunization services and promoting patient education regarding the importance of immunization. Yet, community pharmacists' readiness and willingness to provide such services have not been explored in Nigeria. Pharmacists in Nigeria are currently not authorized to administer vaccines. Allowing pharmacists to offer vaccination services is a controversial issue. However, recently, the Ministry of Health (MOH) has considered an expansion and authorization in the role of pharmacists in immunization services. Still, it is unclear when this service will be implemented. Pharmacists can be essential in disease prevention by advocating and administering immunizations(17). This is evident from the lower rates of vaccination recorded in regions where participation of community pharmacists in COVID-19 vaccination was low (18). Pharmacists must understand the legal and professional mechanisms by which authorization to administer vaccines is granted, as well as the additional responsibilities and considerations that accompany this expanded role. The feasibility of vaccine administration by pharmacists within a particular practice site or healthcare system can be determined by analyzing the issues of legal authority, training, and program structure.
Thus, the primary purposes of this study were to assess the readiness and willingness of the community pharmacists to provide an immunization service and to identify the barriers involved in implementing such a service in Nigeria.

Objective

General objective:

This study aims to assess the readiness and willingness of pharmacists to provide immunization services.

Specific objective:

- To assess the readiness of pharmacists to provide immunization services.
- To evaluate the willingness of pharmacists to participate in immunization services.
- To identify the barriers to pharmacists' involvement in immunization.
- To identify solutions to these barriers from the pharmacists' perspectives.

METHODS

Study Design

The study was a cross-sectional study of Community pharmacists in Anambra state, Southeast Nigeria, using an adapted, well-structured questionnaire.

Study Setting

The study was carried out amongst Community Pharmacies in Anambra state. Anambra State is a state in the southeastern part of Nigeria.

Study Instrument

A pretested questionnaire was adapted from previous studies on 'Readiness and willingness to provide immunization services: a survey of community pharmacists in Riyadh, Saudi Arabia' by B. Balkhi et al. (11). It was modified and validated to conform with the study's objectives. It included basic demographic details, readiness and willingness assessment, barriers to offering immunization services, and solutions to the obstacles. The scale used for the study was a five-point Likert scale ranging from **1**. strongly disagree, **2**. Disagree, **3**. Undecided, **4**. Agree, **5**. Strongly agree. Those who agreed to the question would tick agreed, those who strongly agreed would do the same on the strongly agreed part, and so on, after which the responses were efficiently collected and well separated. Also, the willingness scale has one item open to elicit any salient information from the respondents. In this part, the respondent has a space to write what they feel, which could only be either positive or negative. Positive responses were scored as 2 for this item, while negative responses were scored as 4.

Instrument validation

The questionnaire was validated by carrying out a pilot test.

Pilot testing:

We used ten community pharmacists in Awka for the pilot study. The community pharmacists were randomly selected; after the first community pharmacy, we maintained a space of three pharmacies, and the subsequent 4th pharmacy was approached, and the data was collected. This way, the weak and unnecessary questions were pointed out and deleted.

Sample size calculation

The population for study (Community Pharmacists) in Anambra State was 236, elicited from the Pharmacists Council of Nigeria (PCN). The method used to determine the sample size is a Simplified formula for Proportions by Yamane (1967:886). The recipe stated thus:

$$n = \frac{N}{1 + N(e)^2}$$

Where: n = sample size, N= Population size (236), e = level of precision (0.05).

Therefore, to substitute the formula, we have:

$n = \frac{236}{1+236(0.05)^2}$ $n = \frac{236}{1+(236 \times 0.0025)}$ $n = \frac{236}{1+0.59}$ = 148

Therefore, n = sample size = 148

Inclusion criteria

All pharmacists practicing in Community Pharmacy outlets in Anambra state gave informed consent.

Exclusion criteria

- Pharmacists not duly registered
- Non-community-based pharmacists
- Pharmacists who refused to participate

Participant recruitment and participation.

The study involves all practicing community pharmacists at different geographical locations in Anambra State. Before the questionnaire was distributed, we first shared the participant recruitment form among all the community pharmacists eligible for the study; after they gave their consent by signing the record, the questionnaire was given to them, and we collected the data. Those who did not sign the consent form were not used for the study.

Data collection

All authors participated in data collection. The initial data collection occurred at Sharon Hall Onitsha, where the Association of Community Pharmacists in Nigeria (ACPN) Anambra State Chapter conducted a general meeting on 27 April 2021. The authors also went to different community pharmacies in urban and rural areas at various intervals to collect the data. Places such as Awka, Onitsha, Nnewi, Agulu, and other places were used for the study, which provided us with enough data.

Sampling: A systematic sampling method was used. After visiting one community pharmacy, a space of 3 pharmacies was given, and the subsequent 4th pharmacy was approached for data collection. In the course of this, it was ensured that those who had responded to the questionnaire on their meeting venue did not partake the second time to avoid bias.

Data analysis

The questionnaire was coded into Microsoft Excel and cleaned of all errors. The cleaned data was then exported into Statistical Product and Service Solution (SPSS) Version-23 for appropriate data analysis. Descriptive statistical analysis (such as mean, mode, frequency, and standard deviation) was used to summarize the study's findings. Chi-squared or Fischer's exact tests (based on the proportion of the variables) were employed in determining the relationship between variables. No further inferential statistical analysis was conducted if there were no statistically significant relationships from the association test. For all comments, statistically significant *p-values* were set at less than 0.05.

RESULTS

Socio-demographic characteristics of the respondents

The number of respondents for the study was 148. While 79 (53.4%) were males, 69(44.6%) were females. The mean age of respondents was approximately 43 years, and 49(33.1%) hold a bachelor's degree in pharmacy. Participants were predominantly from urban-located pharmacies, 71(48.0%), and the respondents had approximately ten years of experience. The superintendent pharmacists had the most respondents, 60(40.5), while the least were the intern pharmacists, 19(12.8).

Table 1. Sociodemographic Characteristics of Participants (n=148)

Variables	**N (%)**
Gender	
Male	79(53.4)
Female	69 (46.6)
Qualifications	

B. Pharm	49(33.1)
Pharm D	25 (16.9)
M. Pharm	32(21.6)
FCPharm	23 (15.5)
PhD	19(12.9)
Role in Pharmacy	
Supritendent	70(47.3)
Locum	36 (24.3)
NYSC	23(15.5)
Intern	19 (12.9)
Pharmacy Location	
Urban	71(48.0)
Semi-urban	51(34.5)
Rural	26 (17.5)
Age	43.24±11.99**
Years of Experience	10.41±7.01**

B.Pharm (Bachelor in Pharmacy); Pharm.D (Doctor of Pharmacy); M Pharm (Master of Pharmacy); **Mean ± SD

Table 2 shows various parameters used to evaluate the readiness and willingness of community pharmacists to provide immunization services. We combined 'strongly agreed and agreed' together to stand for agreement and 'strongly disagreed and disagreed' to stand for disagreement; the key findings are thus: Of the 148 respondents, 100(67.6%) were in agreement that the training they had in pharmacy school has fully equipped them to provide immunization services while 40(21.6%) were in disagreement. Also, 130(87.9%) indicated that they need additional training to carry out immunization services, and just 13(8.8%) showed a clash with needing additional training. The number of respondents that indicated that they were willing and ready to carry out these services were 124(83.8%) and 124(83.8%), while 14(9.5) and 13(8.8) were not, respectively.

Table 2.Evaluation of Community Pharmacists' Readiness and Willingness to provide immunization services.

Parameters	Responses	Levels of arguments					Mean ±SD
	Total n(%)	SD n(%)	D n(%)	UN n(%)	A n(%)	SA n(%)	
The training I had in pharmacy school has fully equipped me to carry out immunization services.	148(100%)	24(16.2)	8(5.4)	16(10.8)	34(23.0)	66(44.6)	2.57
I need additional training to be able to provide immunization services effectively	148(100%)	4(2.7)	9(6.1)	5(3.4)	88(59.5)	42(28.3)	4.05
The facilities I have in my community pharmacy are sufficient to maintain the storage conditions of the	148(100%)	31(20.9	20(1	4(2.7)	51(3	42(2	2.91

vaccines.		)	3.5)		4.5)	8.4)	
I have good knowledge of vaccine and their indication.	148(100%)	20(13.5)	14(9.5)	19(12.8)	40(27.0)	55(37.2)	3.87
As a community-based Pharmacist, I am easily accessible.	148(100%)	3(2.0)	2(1.4)	4(2.7)	54(36.5)	85(57.4)	4.46
Pharmacists' involvement in immunization services would improve vaccination coverage.	148(100%)	6(4.1)	2(1.4)	1(0.7)	41(27.7)	98(66.1)	4.51
Pharmacists will play an essential role in advertising and promoting immunization.	148(100%)	6(4.1)	4(2.6)	1(0.7)	47(31.8)	90(60.8)	4.43
The services I offer in my pharmacy is enough and I will not include immunization services.	148(100%)	65(43.9)	59(39.9)	16(10.7)	6(4.1)	2(1.4)	1.79
I am ready to offer immunization services in my pharmacy	148(100%)	8(5.4)	5(3.4)	11(7.4)	81(54.7)	43(29.1)	3.40
I am willing to offer immunization services in my pharmacy	148(100%)	8(5.4)	6(4.1)	10(6.8)	78(52.7)	46(31.0)	4.00
Pharmacists in the community are better positioned to offer							

immunization services than those in the hospital.	148(100%)	4(2.7)	16(10.8)	12(8.1)	59(39.9)	57(38.5)	4.01
Generally, Community pharmacists in community Pharmacists are in a better position to provide immunization services.	148(100%)	11(7.4)	13(8.8)	11(7.4)	83(56.4)	30(20.3)	3.73

Key: SD = Strongly Disagree; D = Disagree; UN = Undecided; A = Agree; SA = Strongly Agree

Table 3 shows various parameters to evaluate the barriers affecting community pharmacists' readiness and willingness to provide immunization services. Combining 'strongly agreed and agreed' responses to stand for agreement and 'strongly disagreed and disagreed' to stand for disagreement, the key findings are thus: Of the 148 respondents, 106(67.6%) indicated that they do not have enough storage facilities to provide immunization services and 29(19.6%) suggested otherwise. Also, 92(62.2%) showed they would not be paid for these services, and 47(31.8%) indicated otherwise.

Table 3. **Evaluation of the barriers affecting community pharmacists' readiness and willingness to provide.**

Parameters	Responses	Levels of arguments					Mean ±SD
	Total n(%)	SD n(%)	D n(%)	UN n(%)	A n(%)	SA n(%)	
I am not adequately trained to offer immunization services in my pharmacy	148(100%)	14(9.5)	10(6.8)	12(8.1)	52(35.1)	60(40.5)	3.59
I cannot manage any adverse events that may result from immunization.	148(100%)	21(14.2)	7(4.8)	25(16.9)	27(18.2)	68(45.9)	3.41

I do not have space to provide immunization services in my pharmacy	148(100%)	27(18.2)	9(6.1)	10(6.8)	29(19.6)	73(49.3)	3.61
I do not have storage facilities in my pharmacy to provide immunization services	148(100%)	15(10.1)	14(9.5)	12(8.1)	65(43.9)	42(28.4)	3.70
Pharmacists are trusted by patients to provide immunization services.	148(100%)	21(14.2)	5(3.4)	16(10.8)	56(37.8)	50(33.8)	3.86
I will not be paid if I offer immunizations.	148(100%)	17(11.5)	28(18.9)	11(7.4)	33(22.3)	59(39.9)	3.68

Key: SD = Strongly Disagree; D = Disagree; UN = Undecided; A = Agree; SA = Strongly Agree

Table 4 shows various parameters used to evaluate community pharmacists' responses to solutions to the barriers to community pharmacists' readiness and willingness to provide immunization services. Combining 'strongly agreed and agreed' responses to stand for agreement and 'strongly disagreed and disagreed' to stand for disagreement, the key findings are thus: Of the 148 respondents, 95(63.5%) identified community pharmacists being well paid for providing immunization services as one of the solutions while 30(20.2%) were in disagreement to that. Also, 79(53.4%) identified providing better storage facilities as one of the solutions to the barriers, and 38(25.7%) disagreed with that.

Table 4. **Evaluation of suggested solutions to the barriers**

Parameters	Responses	Levels of arguments					Mean ±SD
	Total n(%)	SD n(%)	D n(%)	UN n(%)	A n(%)	SA n(%)	
Pharmacists should be prepared right from the		24(16.2	39(2	23(15.	36(2	26(1	

university to equip them to offer immunization services	148(100%)	)	6.4)	5)	4.3)	7.6)	3.01
Pharmacists in practice should be protected by law to immunize.	148(100%)	20(13.5)	31(20.9)	20(13.5)	40(27.1)	37(25.0)	3.03
Continues update on immunization services will improve pharmacists' involvement with immunization	148(100%)	19(12.8)	39(26.4)	24(16.2)	33(22.3)	33(22.3)	3.15
Provision of better storage facilities improve Pharmacists' involvement with immunization.	148(100%)	14(9.5)	24(16.2)	31(20.9)	47(31.8)	32(21.6)	3.40
The society should be continually informed that pharmacists' can also immunized	148(100%)	14(9.5)	24(16.2)	28(18.3)	43(33.1)	39(22.9)	3.43
Pharmacists who offer immunization services should be well paid	148(100%)	11(7.4)	19(12.8)	23(15.5)	44(29.8)	51(34.5)	3.72

Key: SD = Strongly Disagree; D = Disagree; UN = Undecided; A = Agree; SA = Strongly Agree

Table 5 summarizes the findings of the study. It shows that 110 pharmacists, 74% of the 148 who participated in the study, are willing and ready to offer immunization services. This conclusion was arrived at by taking the average response to each question that evaluated their willingness/readiness and combining strongly agreed and agreed to represent those in agreement and strongly disagree and disagree to represent those that disagreed with the measure. Only 29(19.6%) reported unwilling/ready to provide the services. Whereas approximately 70% of the respondents agreed to the barriers to providing immunization services, about 52% agreed to the suggested solutions to tackle these barriers. However, only 16.2% were still deciding about the answers to the problems.

Table 5. Summary of the study findings

Item	Readiness/Willingness			Barriers			Solutions		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
Average mean	3.64	3.64	3.64	3.64	3.64	3.64	3.29	3.29	3.29
Mean n(%)	110(74.3)	9(6.1)	29(19.6)	103(69.6)	13(8.78)	32(21.6)	77(52.0)	24(16.2)	47(31.8)
Average SD	1.2			1.23			1.33		

SD = Standard deviation

DISCUSSION

This study evaluated the community pharmacists' Readiness and willingness to provide immunization services with Anambra State as the focus area. It also identified the barriers community pharmacists face to providing these services and solutions to these barriers.

With an impressive response rate, most respondents were between 32 and 55 years old, while none were younger than the Nigerian adult age of 18. Despite the accommodation of any year of experience, the respondents showed a good year of experience of 4 to 17 years between them. Also, more than half of the respondents were willing to provide this service. Aside from easy accessibility, community pharmacists believe that they have a vital role in increasing the rate of immunization besides their role in advertising, promoting, and improving the vaccination service through community settings. On the other hand, several limiting factors were also identified in this study - for example, adequate training and not having storage facilities in my pharmacy to provide immunization services were majorly indicated. The community pharmacists also proffered solutions to these barriers, and robust incentives and the provision of better storage facilities were majorly indicated.

The findings from this study can be compared to a similar survey by Wei Chern Ang et al. in Malaysia, who evaluated the Readiness and willingness of Malaysian community pharmacists to provide vaccination services. Of 492 community pharmacies recruited throughout Malaysia, 439 (89.2%) expressed willingness to provide vaccination services to the public (4). This is congruent with the current study since most respondents indicated they would provide the service.

In a similar study conducted in Poland by Piotr Merks, Urszula Religion Kryzyszt of Bilmin et al. on Readiness and Willingness to Provide Immunization Services. One thousand seven hundred and seventy-seven pharmacists participated in the study, comprising 127 (7.1%) pharmacists trained in vaccinations during the Pharmacists Without Borders project and 1650 (92.9%) pharmacists not participating in the workshops. Pharmacists participating in the workshops more often indicated that providing vaccinations in community pharmacies would improve the overall vaccination rate ($p = 0.0001$) and that pharmacists could play an essential role in advertising and promoting vaccinations ($p = 0.0001$). The pharmacists not participating in the workshops indicated, to a much greater extent, possible barriers affecting the Readiness to provide vaccinations in pharmacies (19).
Balkhi, B., Aljadhey, H., Mahmoud, M.A., et al. (11) conducted similar work on the Readiness and willingness of community Pharmacists to provide immunization services. This study was a cross-sectional paper-based survey conducted in the community pharmacy setting in Riyad, Saudi Arabia. Among the 139 respondents, 76 (55%) expressed willingness to administer vaccines and establish an immunization service(11). Our study showed consistency with the three previous studies as both showed that community pharmacists are willing and ready to provide immunization services and identified barriers to carrying out this service and solutions to these barriers.

Conclusion

Community pharmacies offer a unique place to provide a vaccination service. Implementation of an immunization service may increase the number of adults that would be vaccinated and ultimately improve their overall health by reducing vaccine-preventable diseases. The findings of this study indicate that community pharmacists working in Anambra state are willing to provide immunization services. However, overcoming barriers identified in this study is the key to success, which guides future planning and implementation of immunization services. Community pharmacists need to be included in the immunization services scheme to improve immunization coverage in Nigeria.

Recommendation

Pharmacists in this category should be well remunerated as an incentive. Community Pharmacists in practice should be protected by law to carry out immunization services, and the university should train Pharmacists to equip them to offer immunization services. There should be enough provision for space and storage facilities by the Federal Ministry of Health.

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Study Strength

This study has an advantage as the survey has yet to be done anywhere in Nigeria at the time of this research. Also, it will pave the way for pharmacists to participate in immunization services since it is not a regular practice in Nigeria.

STUDY LIMITATIONS

Since the study was cross-sectional, no inferences on a cause-and-effect link can be made. Results cannot be extrapolated to other regions of Nigeria because the survey was only carried out in Anambra State, in Southeastern Nigeria. Self-reporting was used to collect the data for the assessment, which may have resulted in either an under or over-reporting of the use responses.

COMPETING INTERESTS

The authors have declared that no competing interests exist

Author's Contribution

B.E and E. I conceptualized the study design and data analysis. SCO wrote the initial manuscript for publication. All authors participated in data collection.

Ethical Approval

The proposal for the study was sent to Chukwuemeka OdumegwuOjukwu University Teaching Hospital Ethical Committee for review and approval before undertaking the survey. The support was received with the approval reference: COOUTH/CMAC/ETH.C/VOL.1/FN:04/0068. All the Pharmacists were informed about the proposed study. Ethical conduct was also held during data collection and throughout the research process. The confidentiality of the data obtained was assured. The names and addresses of the Pharmacists were omitted from the questionnaire.

Consent:

All pharmacists practicing in Community Pharmacy outlets in Anambra state gave informed consent.

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