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A Survey of Computerization of Selected Community Pharmacies in Southwestern Nigeria

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of article.

Abstract

Background: The use of computers has had impact in all professions including pharmacy. Computers have found lots of application in the management of inventories, electronic prescribing and counting machines for tablets and capsules.

Objective: This research was designed to identify the types of technology devices and programs in use by community pharmacies, capabilities of software in use, as well as to identify the challenges faced by community pharmacists in the use of computerized systems in their premises.

Method: A cross-sectional survey of 217 community pharmacies in 6 Southwestern Nigerian states was done using a set of questionnaires. Data gathered was subjected to statistical analysis using SPSS version 17.

Results: Some community pharmacies in Southwestern Nigeria used inventory management software (47.0%). The reported capabilities of the software packages in use included sales processing (99.0%), account processing (88.2%) and POS link (62.7%). The reasons why some community pharmacies have not computerized their outlets were erratic power supply (56.2%), high cost of the devices (48.4%) and low turnover (35.9%). The major challenges faced by community pharmacists in the use of computer devices in their premises included erratic power supply (90.2%) and high cost of fuel (83.3%).

Conclusion: The level of computerization of community pharmacies in Southwestern Nigeria was observed to be generally low. Erratic power supply and cost of device were major challenges to the computerization of community pharmacies in Southwestern Nigeria.

Keywords: Community Pharmacy, Software, Computerization

INTRODUCTION

The use of computers has had impact in all professions including pharmacy. Computers have found lots of application in the management of inventories, electronic prescribing, tablet and capsule counting machines, Point of Sale (POS) and so on. Adoption of computerized systems in health care, including electronic health record has been intensive especially in the developed world (Kim *et al*., 2017; Plantier *et al*., 2017). Computerized systems are known to support clinical decision making, improve patient's privacy and safety, reduce medication errors increase amount of patient information available to health care team, speed-up service delivery, increase productivity and eventually improve the quality of health care (Anderson and Balas, 2006; Bates and Gawande, 2003; Ferguson *et al*., 2018; Ifinedo, 2017; Peter *et al*., 2008).

Computerization can aid pharmacists both in pharmacy management and in the delivery of pharmaceutical care to their patients. Computers are known to improve effectiveness and efficiency by

increasing speed of processing and storing of data and still be accurate (Afolabi and Oyebisi, 2007; Dikwal *et* al., 2005; Ndukwe, 2011). However, there are limited data on the level of computerization of community pharmacies in Southwestern Nigeria, therefore substantial research needs to be carried out in order to determine the level, functions of software programs in

use and challenges of computerization in community pharmacies.

The aim of this study was to identify the types of technology devices and programs in use by community pharmacies, capabilities of softwares in use, as well as to identify the challenges faced by community pharmacists in the use of computerized systems in their premises.

METHODOLOGY

A cross sectional survey of community pharmacists in the six Southwestern states of Nigeria was carried out using pretested semi-structured questionnaire. The questionnaires were administered to the pharmacists during their respective state meetings of Association of Community Pharmacists of Nigeria (ACPN). The questionnaire was validated by experts in questionnaire design and later pretested among five (5) community pharmacists who were not included in the survey. The pretest led to the modification of an item, which is benefits derived from computer programs they used. The questionnaire contained four (4) main sections – demographic information, pharmacy information, and computerization information.

Ethical approval for this study was obtained from the Ethics and Research Committee of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife. Similarly, the consent of each pharmacist was sought and only those that gave their consents were administered the questionnaire.

Overall, 217 community pharmacists were sampled using convenience method and the distributions were Oyo (74), Lagos (59), Ogun (34), Osun (27), Ondo (12) and Ekiti (11).

Data analysis was carried out using SPSS software version 17.0. Results were presented in frequencies and percentages (descriptive statistics).

RESULTS

One hundred and fifty (69.1%) of the pharmacists were males while 67 (30.9%) were females. Other sociodemographic characteristics of the pharmacists

and the pharmacies surveyed are depicted in Tables 1 and 2 below.

Table 1. Demographic Information

Demography	Frequency	Percentage (%)
Age (years)		
20 – 29	44	20.3
30 - 39	44	20.3
40 - 49	48	22.1
50 - 59	48	22.1
≥ 60	33	15.2
Total	217	100
Country of Study		
Nigeria	211	97.2
Ethiopia	3	1.4
USA	2	0.9
Serbia	1	0.5
Total	217	100
Years post-graduation		
< 5	49	22.6
5 - 9	26	12.0
10 - 14	17	7.8
15 - 19	21	9.7
≥ 20	104	47.9
Total	217	100
Years of Community Pharmacy Practice		
< 5	78	35.9
5 - 9	28	12.9
10 - 14	11	5.1
15 - 19	23	10.6
≥ 20	77	35.5
Total	217	100

Table 2. Community Pharmacy Information

Community Pharmacy Information	Frequency	Percentage (%)
State		
Lagos State	59	27.2
Ogun State	34	15.7
Oyo State	74	34.1
Osun State	27	12.4
Ondo State	12	5.5
Ekiti State	11	5.1
Total	217	100
Type of Ownership		
Pharmacist Owned	169	77.9
Non-Pharmacist Owned	48	22.1
Total	217	100
Year of Establishment		
< 5	54	24.9
5 – 9	31	14.3
10 – 14	23	10.6
15 – 19	19	8.8
≥20	66	30.4
Total	193	88.9
Mode of Operation		
Retail Pharmacy	168	77.4
Wholesale Pharmacy	33	15.2
Both Retail and Wholesale Pharmacy	16	7.4
Total	217	100

Computer devices used by the community pharmacists include inventory management program and telephony Devices as shown in Table 3

Table 3. Technology Devices used by Community Pharmacists

Technology	Frequency (N=217)	Percent (%)
Inventory management program	102	47.0
GSM/telephony device	88	40.6
POS	73	33.6
Bar code scanner	39	18.0
CCTV	32	14.7
web site/web application	31	14.3
Tablet and capsule counting Machine	10	4.6
Electronic prescribing	5	2.3
Prescription Imaging Scanning	4	1.8

Out of 102 community pharmacists that used inventory management program, 55 (53.9%) of them were satisfied with the management program they used while 54 (52.9%) of the community pharmacists had complaints from the salesperson (supporting staff) about the program and 12 (11.8%) of the community pharmacists had complaints from the customers who came to buy medicines.

The capabilities of the programs/ softwares in use are depicted in Table 4.

Table 4. Capabilities of the Programs

Capability	Frequency	Percent (%)
Sales Processing	101	99.0
Account Processing	90	88.2
POS Link	64	62.7
Prescription Processing	19	18.6
Drug Interaction Detection	6	5.9

Some of the benefits the community pharmacists indicated they derived from the programs they used are shown in figure 1 below.
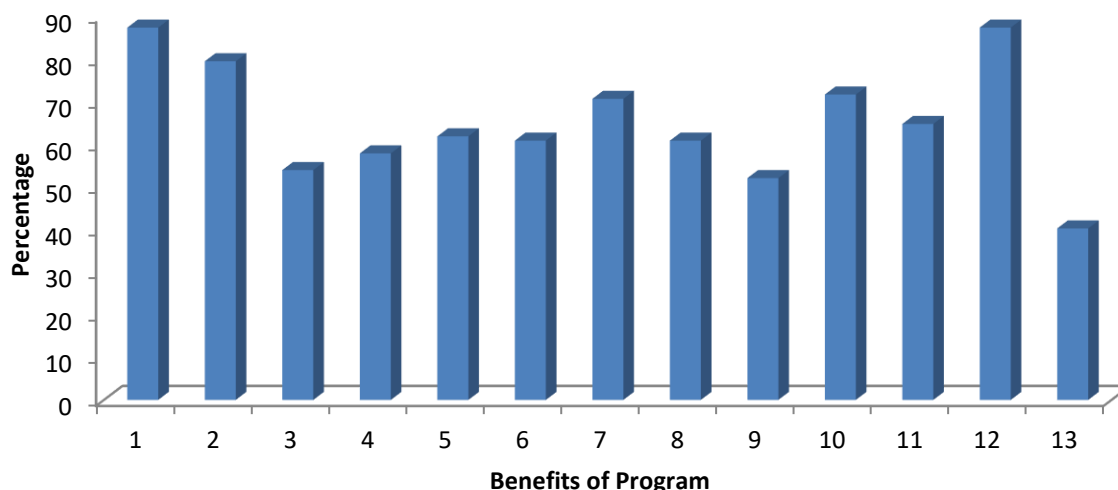
Figure 1. Benefits derived from Computer programs

1. Reduced Risks of Error in Calculation (87.3%)
2. Proper Balancing of Accounts (79.4%)
3. Reduced Customer Waiting Time (53.9%)
4. Reduced Error in Balance/Change Calculation (57.8%)
5. High Amount of Sales Collation (61.8%)
6. High Rate of Sales Processing (60.8%)
7. Proper Organization of Sales (70.6%)
8. Reduced Workload on Salesperson (60.8%)
9. Full Automation of Sales Process (52%)
10. Increased Capacity to Track Transaction (71.6%)
11. Reduced Paperwork and Little/No Notebooks (64.7%)
12. Proper Record Keeping (87.3%)
13. High Turnover Rate due to Increased Sales (40.2%)

The major challenges reported in the use of an inventory management program in a pharmacy outlet include irregular power supply (90.2%), high cost of fuel to power generators (83.3%), software error and breakdown (50%), high cost of maintenance (38.2%), lack of technical knowhow (31.4%) and software ambiguity (12.7%).

DISCUSSION

Most of the community pharmacists sampled used inventory management program, GSM and telephony devices, POS, bar code scanner, CCTV and web site/web application in their pharmacies. This finding is similar to earlier study which reported the use of these devices by community pharmacists (Osemene and Erhun, 2016). However, the percentage of pharmacists that used these devices in this study is smaller than those reported by Osemene and Erhun.

Majority of the software programs used by the community pharmacists were designed to process sales and account and are linked to POS. Few others could process prescription and only very few of them could detect drug-drug interactions. The devices and programs used by community pharmacists in Southwestern Nigeria appear to be directed at the business aspect of community pharmacy practice. Even though the use of the said technologies will afford pharmacists more time to counsel patients, they may however not be able detect some rare but serious drug-drug interactions. This may limit the clinical benefit derived from some of the applications. To remain relevant in the health care system, pharmacists need to keep abreast latest technologies in the sector and be professional pharmacy service provider rather mere dispensers of prescription medications (Aungst, 2015; Volland and Eurich, 2014). Community pharmacists should strive to possess softwares that will be able to store patient information in a structured format and/or provide access to patients' record system (National data), where available as this will enhance their professional decision making which will ultimately improve patient safety (Goundrey-Smith, 2014; Ivanona et al., 2016)

Most community pharmacies in Southwestern Nigeria indicated that irregular power supply was the reason why they had not computerized their pharmacies. It can be inferred that the power supply in the country is a major detriment to computerization of community pharmacies in Southwestern Nigeria. The second commonest reason for not adopting computerization is the cost of devices. Hence, the initial cost and maintenance of these devices were major reasons why community pharmacies were not computerized. Coupled with the issue of low turnover, most community pharmacies are not enriched enough to procure and install these devices. Cost is a major barrier to the implementation of systems or technology even in developed economies (Abramson *et al.*, 2014; Simon *et al.*, 2013). Osemene and Erhun also reported electricity, time, personnel, knowledge and cost as some of the factors community pharmacists indicated influenced the use of technology in Nigeria (Osemene and Erhun, 2016).

Some other reasons for not computerizing the community pharmacy outlet indicated include insufficient space in the pharmacy, indifference/nonchalant attitude of the owner of the pharmacy especially where the pharmacy is not owned by a pharmacist; lack of interest in computer devices by director of the pharmacy and so on. The findings of this study on challenges and obstacles to computerization are similar to those reported by previous studies. In the developing countries, 'epileptic' electric power supply, high cost of fuel, high cost of ICT peripherals, poor telecommunication facilities, low and slow internet connectivity have been reported as barriers to implementation of ICT (Oaks, 2007; Peter *et al.*, 2008). Computer illiteracy and lack of understanding of relevance and use of computer systems is another major barrier to the implementation of computerized Systems (Sobowale *et al.*, 2011).

Non-probability sampling technique employed in this study could introduce some element of Bias into the research findings.

CONCLUSION

From the research carried out, it was observed that the level of computerization was generally low. The main capabilities of the software packages in use include sales processing, account processing and POS link. The major reasons why community pharmacies have not adopted computerized systems were erratic power supply and cost of device. The major challenges encountered by community pharmacists that use computerized systems in their outlets include irregular power supply and high cost of fuel to power generators.

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