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African Institute for Science Policy and Innovation
International Biennial Conference

Conference Proceedings

VOLUME 1

1st AISPI International Biennial Conferenceon Science, Technology and Innovation for Sustainable Development, 2019

Evaluation of Attitude of Community Pharmacists to E-Pharmacy in Osun State of Nigeria

O. J. Ola-Olorun[1*], M. O. Afolabi[1] and E. O. Uwadone[2]

[1]Department of Clinical Pharmacy and Pharmacy Administration, ObafemiAwolowo University, Ile-Ife. Nigeria
[2]Department of Computer Science and Engineering, ObafemiAwolowo University, Ile-Ife, Nigeria
[*]Corresponding author's email address: niyiolaolorun@gmail.com

ABSTRACT

Governments of many nations, including developing countries are striving to achieve better health for all through primary health care with digitalisation of their systems. This provides a platform for involvement of private sector to which community pharmacy belongs. The question remains however, on whether community pharmacists are ready for the changes. Therefore, this study aimed to evaluate the attitude of community pharmacists to e-pharmacy in Osun State of Nigeria. A cross-sectional descriptive survey of eighty-two community pharmacists drawn using simple random sampling method was utilised. The study employed primary data, collected with a set of pre-tested semi-structured questionnaire having one main section. The items sought to elicit information on the attitude of the community pharmacists to e-pharmacy and factors influencing the community pharmacists' attitude on a Likert scales of agreement and importance respectively both with weighting scores of 0 - 4. Weighted averages (WA) and medians (Mdn) were employed in summarising items for attitude and factors respectively. Weighted averages of responses of 0 - 2 and 3 - 4 were taken to connote negative and positive attitudes to e-pharmacy respectively. Overall attitude was computed as mean of the weighted averages (MWA). Collected data were analysed using descriptive and inferential statistics at 5% level of significance. The results show that attitude of the respondents to e-pharmacy was negative (MWA = 2.40, t (81) = 12.56, p = .000) and that organisational factors including business size (Mdn ± IQR = 3±2) and business performance (Mdn ± IQR = 3±1) of community pharmacy were the most and only significant of the set of factors (B (5) = -.204, P = .043) influencing the attitude of the community pharmacists to e-pharmacy. The study concluded that community pharmacists in Osun state of Nigeria possessed a negative attitude to e-pharmacy and may be ill-prepared for implementation of the technology.

Keywords: Evaluation; Attitude; Factors, Community Pharmacist; Community Pharmacy, E-Pharmacy

Selected and peer-reviewed by ASIPI, ObafemiAwolowo University, Ile-Ife, Nigeria.
https://doi.org/10.69798/20898713

INTRODUCTION

There has been an upwardly global trend in the transformation of processes from manual to electronic. The advancement of ICT innovations, including the internet, has enabled virtually all fields of human endeavour including community pharmacies to have websites for marketing themselves globally (Kayne, 2005). Besides, governments of many nations, including developing countries are striving to achieve better health for all through primary health care with digitalisation of their systems. This provides a platform for the involvement of the private sector to which community pharmacy belongs. One of the consequent developments has been electronic health (eHealth) within which are applications such as electronic health records (EHR), and e-pharmacy, among others (Pagliari*et al*., 2005).

E-pharmacy can be described as the use of electronic means to facilitate delivery of pharmaceutical care activities. Sood*et al*. (2008) defines e-pharmacy as an innovative concept associated with electronic transactions, e-prescription systems, decision-support systems, among others, in the delivery of pharmaceutical services. The term appears to have been an offshoot of the older term e-commerce, defined as the use of electronic methods, means and procedures to conduct various forms of businesses over the internet (Cohen and Kalirrori, 2006; Al-Jaghoub, 2007). In e-pharmacy, the pharmacist provides professional services to clients by electronic means, using the internet. Pharmacists the have potential to improve their role in health care through e-pharmacy and are essential to e-health implementation in a health system. It has been reported that in Bangladesh where eHealth, in form of ICT integration, had been implemented to the exclusion of the private sector, including community pharmacies, resulted in a major drawback (Islam and Tabassum, 2015).

The attitude of community pharmacists to e-pharmacy would influence its uptake in their practices which would in turn affect the effectiveness of their services to society. Attitude can be defined as a learned predisposition to respond in a consistently favourable or unfavourable manner to a given object (Fishbein and Ajzen, 1975). Mohamed *et al*. (2010) carried out a cross sectional survey among various health professionals in Malaysia to investigate the level of perception and acceptance of Malaysian health professionals on the concept of telemedicine and use of computers. He found out that nearly half of the respondents felt that computers are important for their profession and that this reflects positive attitude to the use of the technology. It is pertinent to have an idea of the community pharmacists' attitude since they are part of the professionals who would use these technologies. This can assist Governments in formulating policies and legislation towards adopting e-health in general and e-pharmacy in particular.

There are many possible determinants of attitude to an innovation but only some of them are significant. According to Rogers (1995), the attributes of an innovation/technology perceived by individuals would determine its uptake and he identified five which include relative advantage, compatibility, complexity, observability and trialability. Grigsby *et al*. (2007) cited the lack of universal private pay coverage for the limited use of telehealth in the US thereby discouraging capital investment in the technology. Other factors cited include interstate licensure issues; non-uniform engineering standards; confidentiality and liability concerns; a perceived lack of need of the innovation; distance; cost; experience and technical difficulties. In a study in Turkey on factors determining the attitude of pharmacists towards the adoption of e-pharmacy, Sezgin*et al*. (2011) identified six factors influencing the attitude of the community pharmacists to include behavioural intention (BI); perceived ease of use (PEOU); perceived usefulness (PU; perceived behavioural control (PBC; social norms (SN) and System Factors (SYS). Other reports have also identified factors such as beliefs toward the service, perception of usability, perceived usefulness, perceived ease of use, system factors, perceived behavioural control, cost, time, fear, usefulness, complexity as well as secondary barriers such as personnel, physical space, internet access, state law and regulations, cost, availability of ICT infrastructure in the country, government support and business size (Garrett *et al*., 2006; Sezgin and Özkan-Yıldırım, 2015; Irefin *et al*., 2012; Peterson *et al*., 2003). However, there is limited report, if any, in literature of previous investigations on the attitude of community pharmacists to e-pharmacy. Therefore, the objectives of this study were to determine the attitude of community pharmacists towards e-pharmacy and factors determining such attitude in Osun State of Nigeria.

RESEARCH METHODOLOGY

The study was a cross sectional descriptive survey of 82 community pharmacists in Osun State of Nigeria. They were pharmacists in community pharmacies that were registered with the Pharmacists Council of Nigeria (the Council) and licensed for the year 2015 in Apomu, Ede, Ikire, Ikirun, Ile-Ife, Ilesha, Iwo and Oshogbo, which were all towns and villages in Osun State. The list for the year of study (2016) was not employed as some of the pharmacists were known to apply for registration as late as the last quarter of the year while the Council also releases licences as late as October in some years. A set of pre-tested semi-structured questionnaire was employed as a primary source for collecting data. There were 105 community pharmacists in Osun State from which the sample was selected employing simple random sampling method. Sample size was determined using sample size calculator. A list of the community pharmacists was prepared and all the community pharmacists were numbered serially. The targeted respondents were generated using a computer random number generator.

The questionnaire comprised two main sections with Likert scale types of statements. The first section sought to elicit information about attitude of the community pharmacists to e-pharmacy with items made of simple statements having five alternative responses comprising 'Undecided' (U), 'Strongly Disagree' (SD), 'Disagree' (D), 'Agree' (A) and 'Strongly Agree' (SA), with weighting scores of 0 - 4 respectively. The second section sought to elicit information about factors influencing the attitude of the community pharmacists to e-pharmacy with the items having five alternative responses comprising 'Can't say' (CS), 'Not important' (NI), 'Slightly important' (SI), 'Important' (I) and 'Very important' (VI). Weighted averages (WA) with standard deviations (SD) and medians (Mdn) with interquartile ranges (IQR) were employed in summarising items for attitude and factors respectively. Responses to the items with weighted averages (WA) of 0 - 2 and 3 - 4 were taken to connote negative and positive attitudes to e-pharmacy respectively. Overall attitude was computed as the mean of weighted averages (MWA). The instrument was validated based on careful review of literature, consultation with senior faculties and pre-testing.

The instrument was pre-tested for its reliability using test-retest method by administering the questionnaire twice to ten of the community pharmacists, who were not involved in the actual data collection within a two-week interval. Identified errors in the instrument were corrected in the final version used for data collection. Cronbach alpha values were computed to determine the internal consistency of the items of the instrument. Exploratory factor analyses for data reduction were carried out for the items employed to examine the attitude of the respondents to e-pharmacy.

Approval for the study was obtained from the Research and Ethics Committee of West African Post Graduate College of Pharmacists (WAPCP). The study was a non-invasive survey and did not involve any interaction with patients nor was hospital-based. Only community pharmacists were involved after they were informed about the objective of the study and their consent to participate in the study was obtained. Data were collected from the selected community pharmacists during one of their monthly association meetings, and later on, in their practice premises, for those not present. The instrument was handed to them after they had been informed. The instrument took about twenty minutes to fill, on average.

The collected data were analysed using descriptive statistics such as frequencies, percentages, weighted averages (WA) and mean of weighted averages (MWA) while inferential statistics including chi square, t-test, Spearman's rank correlation and logistic regression were employed in determining significant relationships between variables at 5% level of significance. Effects of demographic variables on attitude were determined using chi-square statistics. In analysing attitude, the responses had been recoded into dichotomous variables with responses having WA = 0-2 as negative attitude and those with 3-4 as denoting positive attitude and analysed using t-test. The results are presented as means ± SD for variables used for measuring the attitude construct and median with inter-quartile range (IQR) for ordinal variables employed for measuring factors affecting attitude to e-pharmacy.

RESULTS AND DISCUSSION

The questionnaire gave a test-retest reliability coefficient of 0.87 and Cronbach's alpha values of 0.90 and 0.95 for the main sections on attitude to e-pharmacy and factors influencing the community pharmacists' attitude respectively. The results of exploratory factor analysis for data reduction carried out for attitude items show, from the rotated component matrix, that the thirty-eight items could be reduced to nine principal components that make up the attitude scale for the community pharmacists whereas for factors influencing attitude, the thirty-seven items were resolved into eight principal components which include cost of initial investment, ICT policy in the country, behavioural intention, trialability, competitive strength of the community pharmacy, non-uniform engineering standards leading to interconnectivity challenges, licensure issues, lack of qualified personnel and lack of societal need for e-pharmacy services. These principal components for factors explain 81.6% of the variance existing in all the factor items and less than 20% of information is lost by using them.

The respondents' demographic data are presented in Table 1. The age distribution of the respondents is almost bell shaped with 40-49years being the modal range. Majority, (50, 71.4%) of them were males and 20 (28.6%) were females. Majority of the community pharmacists' premises were located in urban centres with the state capital having the modal value (42, 51.2%). All but one (81, 98.8%) of the respondents possessed a Bachelor degree in Pharmacy and only one (1.2%) held a Doctor of Pharmacy (Pharm. D.) degree. Only 14 (17.1%) of the respondents had secondary degrees and only one (1.2%) held a Ph.D. degree. Sixty-eight (84%) and 56 (69.1%) of the respondents were full time and superintendent pharmacists respectively. Only 45 (60%) of the respondents were proprietors of their community pharmacies. The distribution of the respondents' experience show that they were only fairly experienced with more than half (46, 60.5%) of them having ten or less years in community pharmacy practice. Only 22 (26.8%) of the respondents claimed their community pharmacy possessed a website and most (20, 90.91%) of these claimed they communicated using SMS.

As presented in Figure 1, all of the remaining respondents gave one or more of eight reasons why their community pharmacy did not possess a website with the most prominent three being 'in pipeline' (11, 22%), financial constraints (10, 22%) and lack of knowledge about e-pharmacy (13, 26%).

Table 2 presents the results for items that sought information on the attitude of the respondents to e-pharmacy. The respondents did 'agree' (WA = 3) with two of the positively worded items and did 'disagree' with one of the negatively worded items (WA = 3), indicating in both cases a positive attitude.

The three positively worded items are 'Know how often maintenance will be needed' (WA = 2.23 ± 1.39), 'Ready to sponsor training for staff before starting e-pharmacy' (WA = 2.24 ± 1.48) and 'E-Pharmacy is not difficult to implement' (WA = 2.39 ± 1.53) while the negatively worded items are 'Has concern about legal issues in e-pharmacy' (WA = 1.38 ± 0.97), 'E-pharmacy may likely have a negative impact on community pharmacists' autonomy' (WA = 2.18 ± 1.45) and 'Currently, e-pharmacy is only feasible in developed nations' (WA = 2.05 ± 1.30). The Mean of Weighted Averages (MWA) for the attitude items was computed as 2.4, showing an overall negative attitude (MWA ≈ 2; $t(81) = 12.56$, $p = .000$).

Pearson chi-square tests of association between demographic variables and attitude show that the attitude of the respondents to e-pharmacy was significantly associated with some demographic factors including location ($\chi2\ (399) = 483.07$, $p = .002$); possession of Doctor of Pharmacy degree ($\chi2\ (57) = 82.00$, $p = .017$) and communication with customers via WhatsApp ($\chi2\ (114) = 145.24$, $p = .026$). A set of Spearman's rank correlation tests performed to show the correlation between the demographic variables and attitude of the community pharmacists to e-pharmacy show a weak and negative correlation of experience in community pharmacy practice with attitude to e-pharmacy ($r = -.33$, $p = .003$).

Factors influencing the attitude of community pharmacists to e-pharmacy in Osun State are presented in Table 3. All of the eight factors examined were perceived by the respondents to be important (Median = 3). The output of logistic regression of the factors shows that organisational factors including size and business performance of community pharmacy are the only significant

Table 1: Dmographic Profile of Community Pharmacists about E-pharmacy in Osun State of Nigeria

Item	Values	N	Percentage
Age (years), (N = 78)	20-29	17	21.79
	30-39	20	25.64
	40-49	22	28.21
	50-59	13	16.67
	60 or above	6	7.69
Gender (N = 70)	Male	50	71.43
	Female	20	28.57
Location (N = 82)	Osogbo	42	51.22
	Ile-Ife	23	28.05
	Ilesha	9	10.98
	Iwo	3	3.66
	Ikirun	2	2.44
	Ikire	1	1.22
	Ijebu-Jesha	1	1.22
	IdoOsun	1	1.22
Bachelor Degree (N = 82)	B. Pharm./B.Sc. Pharm.	81	98.78
	Pharm. D.	1	1.22
Other qualification(s), (N = 82)	MBA	5	6.10
	Master of Public Health (MPH)	1	1.22
	Master of Science (M.Sc.)	7	8.54
	Master of Philosophy (M.Phil.)	1	1.22
	Ph.D.	1	1.22
	Other qualifications	9	10.98
Job status (N = 81)	Full-time pharmacist	68	83.95
	Locum pharmacist	13	16.05
Superintendent Pharmacist (N = 81)	Yes	56	69.14
	No	25	30.86
Proprietor (N = 75)	Yes	45	60.00
	No	30	40.00
Experience in Community Pharmacy Practice in years (N = 76)	0-1 year	10	13.16
	2-5 years	23	30.26
	6-10 years	13	17.11
	11-20 years	17	22.37
	21-30years	8	10.53
	Above 30years	5	6.58
Possession of a website by Community Pharmacy (N = 82)	Yes	22	26.83
	No	60	73.17
Use of electronic means to communicate with customers (N = 82)	Yes	22	26.83
	No	60	73.17
Mode of communication of CP with internet customers (N = 22)	Email	13	59.09
	SMS	20	90.91
	WhatsApp	2	9.09

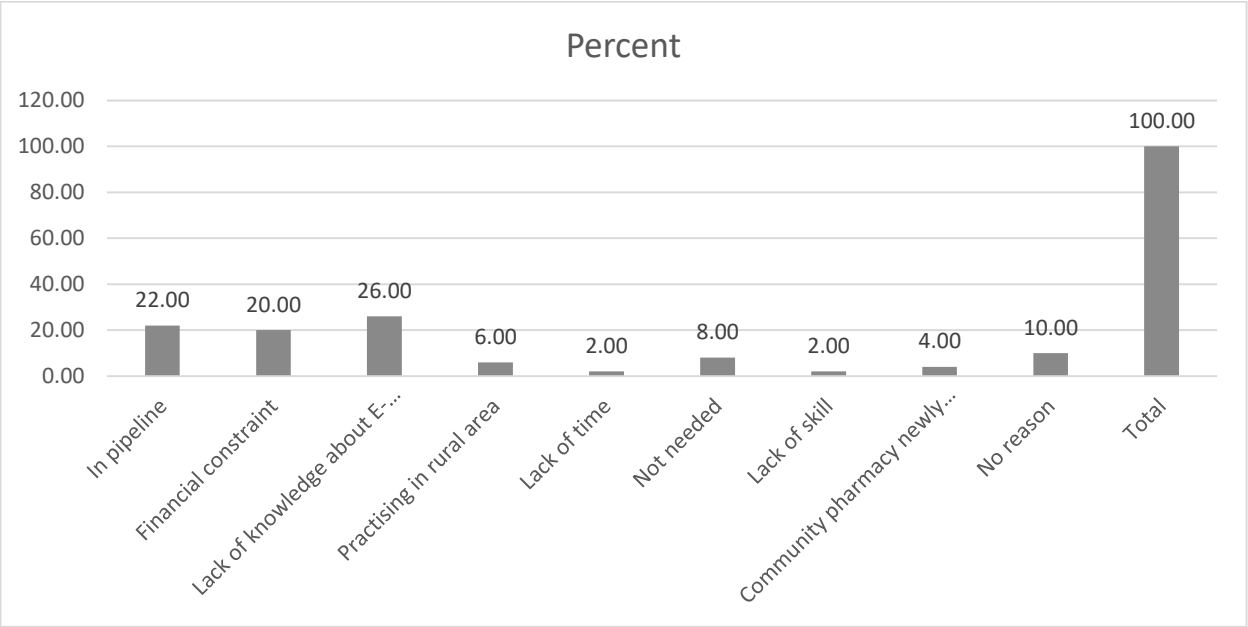

Figure 1: Reasons Provided by Community Pharmacists in Osun State of Nigeria for Lacking Website

RESULTS AND DISCUSSION

This study has aimed to determine the attitude of community pharmacists towards e-pharmacy. Attitude determines uptake of innovations (Rogers, 1995). It is therefore pertinent to have an idea of the attitude of community pharmacists who are part of the professionals that will use e-pharmacy technologies. This will be appropriate as governments globally, especially in developing countries, are striving to digitalise their healthcare delivery. Idea of the community pharmacists' attitude is particularly imperative because many of these governments, including Nigeria, are lacking laws and policies to govern the adoption of e-health. Information gathered from this report can assist such governments in formulating legislation and policy towards adopting e-health in general and e-pharmacy in particular.

Table 2: Attitude of Community Pharmacists to E-pharmacy in Osun State of Nigeria

S/N.	Attitude items	Mean ± SD
1	Need e-pharmacy in practice	3.27 ± 1.20
2	E-pharmacy would improve quality of healthcare	3.12 ± 1.22
3	*E-pharmacy is peculiar to lawless pharmacists	2.77 ± 1.48
4	E-Pharmacy is not difficult to implement	2.39 ± 1.53
5	Ready to sponsor training for staff before starting e-pharmacy	2.24 ± 1.48
6	Know how often maintenance will be needed	2.23 ± 1.39
7	*E-pharmacy may likely have a negative impact on community pharmacists' autonomy	2.18 ± 1.45
8	*Currently, e-pharmacy is only feasible in developed nations	2.05 ± 1.30
9	*Has concern about legal issues in e-pharmacy	1.38 ± 0.97
	Mean of Weighted Averages (MWA)	**2.40**

**Weighting reversed for items indicating negative attitudeof the set of factors determining the attitude of community pharmacists to e-pharmacy (B (5) = -.204, P = .043).*

The fact that majority of the participants in this study were males show that community pharmacy practice in the area of study was male-dominated. That majority of the premises were located in urban centres may have been for economic reasons. With only 1 (1.2%) of the pharmacists possessing Pharm.D. degree, the study population may not have been grounded in the clinical aspect of pharmacy practice and may be ill-prepared for the provision of pharmaceutical care which is the model of pharmacy practice that all practitioners are currently striving after. The fact that a fairly large proportion of the pharmacists were not proprietors of their premises gives the impression that a large proportion of the premises may have been registered as wholesale outlets owned by non-professionals. Pharmacists in such premises are not likely to be favourably disposed to e-pharmacy in their premises as it may further engage them. The fact that 90.9% of those that claimed their premises possessed websites were employing Short Messaging Service (SMS) to communicate with their internet customers may imply that the level of deployment of internet applications among them was low.

Table 3: Factors influencing attitude of community pharmacists to e-pharmacy in Osun State of Nigeria

S/N	Factor items	Median ± IQR
1	Observability	3±2
2	Disruption of workflow if the system malfunctions	3±1
3	Cost of ongoing maintenance	3±1
4	ICT Policy in the country	3±2
5	Lack of qualified personnel	3±2
6	Business size of my community pharmacy	3±2
7	Fear of change	3±2
8	Business performance of my community pharmacy	3±1

With 26% offering lack of knowledge as their reason for not possessing a website and another 20% and 8% offering financial constraint and lack of need respectively, and a further 10% reporting to have no reason, their positive attitude to e-pharmacy appears to be doubtful.

The overall possession of negative attitude (MWA ≈ 2) by the respondents gives the impression that the community pharmacists were not ready for e-pharmacy in their practices. Nonetheless, the agreement of the community pharmacists with the statement that they needed e-pharmacy in their practice expresses their belief in the benefit of the technology to their practice (Rogers, 1995; Sezgin*et al.*, 2011). This is corroborated by their response that e-pharmacy would improve the quality of their healthcare services. Their perception of need is an indication of their belief that the technology would be useful to them and the perception of usefulness is a determining factor in uptake of innovations (Rogers, 1995; Sezgin*et al.*, 2011). Their disagreement with the negatively-worded statement 'E-pharmacy is peculiar to lawless pharmacists' shows they were seeing the technology not as something to be avoided but what lawful pharmacists could be involved in. However, their disagreement with the statement 'e-pharmacy is not difficult to implement' shows that they perceived it as being difficult.

By perceiving e-pharmacy as being not easy to implement may suggest a negative attitude to e-pharmacy (Sezgin and Özkan-Yıldırım, 2015). Also, their negative response to the statement addressing their readiness to sponsor training for staff before starting e-pharmacy suggests a negative attitude. They also disagreed with the statement that they know how often maintenance will be needed', suggesting that they were not conversant with the technology nor prepared for it. Their belief that 'e-pharmacy may likely have a negative impact on community pharmacists' autonomy shows they probably did not have

adequate knowledge of e-pharmacy and may likely not want to adopt the technology and this again portrays a negative attitude. Their response that 'currently, e-pharmacy is only feasible in developed nations' suggests that they were not ready for the technology in their hearts and this is a wrong attitude. Having agreed strongly with the statement that they had 'concern about legal issues in e-pharmacy', it could be inferred that they did not have the boldness to venture into it and this again is a negative attitude. There are legal issues in e-pharmacy but they are for the concern of those who engage in e-pharmacy without following its ethical demands (Ovaskainen, 2003).

The association of attitude with location among the community pharmacists with those at urban areas being more positively disposed to e-pharmacy gives the impression that the urban pharmacists are more receptive to innovations, probably due to better exposure to technology. Whereas the association of positive attitude with possession of Pharm.D. may also be the result of more exposure to use of e-pharmacy in course of their studies than those that passed through the traditional mode of pharmacy education. The weak negative correlation of experience in community pharmacy practice with attitude to e-pharmacy shows that the more experienced practitioners were less positively disposed to e-pharmacy than the younger ones. This appears to suggest that the younger ones are more innovative and therefore receptive to adoption of e-pharmacy.

Out of the eight factors that were identified as being important in influencing the attitude of community pharmacists to e-pharmacy, the two most important are business size and business performance of the pharmacy which are system-related and also related to cost (Sezgin and Özkan-Yıldırım, 2015). ICT in the country has also been identified as an important factor; unfortunately, there is isn't yet a policy on ground for ICT deployment in pharmaceutical sector, particularly, on community pharmacy practice. This leaves operators of community pharmacy confused on how to be involved in e-pharmacy. It becomes imperative, therefore, for Government to formulate policy about e-health and e-pharmacy in particular.

CONCLUSION

From the foregoing results and discussion, the study concluded that the community pharmacists in Osun State possessed a negative attitude to e-pharmacy. In a world that is moving fast towards electronic health care, there is an imperative need for the sensitisation of the community pharmacists to improve their attitude to e-pharmacy. Such sensitisation can be achieved through seminars, workshops and conferences to educate community pharmacists about e-pharmacy.

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