Patients' Satisfaction after Electronic Medical Records Implementation in a Tertiary Hospital in North Central Nigeria

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Abstract

Introduction: The cardinal objective of the services rendered by the pharmaceutical services department is to improve patient compliance to medication, as it is an important factor in the prognosis of numerous diseases. Much attention within the healthcare industry is focused on patients' satisfaction with the quality of healthcare services. Reports has it that Electronic Medical Records (EMR) have the potential to affect healthcare delivery by reducing costs, enhancing patient safety, increasing quality and improving efficiency. Patients' satisfaction after electronic medical records implementation with respect to pharmaceutical services has not been studied in our facility, therefore the need for this work. **Methodology:** Our work is an institutional based cross-sectional descriptive study. The study populations are 300 registered patients that have accessed pharmaceutical services in the study facility. Data on different variables were collected using a pre-tested self-administered questionnaire. The questionnaire was developed and validated by calculating its Cronbach alpha factor in SPSS (version 21) software. The factor was found to be 0.9. **Results:** Most (27.7%) of the respondents, were in the age group of 41-50 years and were mostly Females (52.2%). Most of the respondents (24.7%) had secondary education. Also of interest to note is that 21% of the respondents had a tertiary Education. 31.3% of the respondents have been patients of this Hospital for between 5-9years while 30.3% have been Patients of the Hospital for between 1-4 years, Respondents' satisfaction was assessed base on five pharmacy related characteristics which are Location of Pharmacy, Prescribed Drugs Are Available, Time It Takes To Wait For Service, Pharmacists' Counseling, EMR Has Improved Services Here overall satisfaction status with pharmacy related services shows 139 (46.3%) were satisfied with pharmacy services under EMR platform while 53.7% or 161 Respondents were not satisfied. **Conclusion:** we observed that demographic variables plays vital role in improving Patients' satisfaction. Improving skills of EMR frontline workers, infrastructure, management, and resource allocation are important interventions to improve the EMR system performance in the study area.

Keywords: Keffi; Electronic Medical Records (EMR); Patients' satisfaction; Pharmceutical services; Tertiary hospital

Introduction

The pharmaceutical services Department is an independent functional unit which operates under the Clinical Services Division of our study facility [1-4] whose cardinal objective is to provide pharmaceutical and health care products to optimize effective, safe and quality pharmacotherapy.

The department has about 65 licensed Pharmacists, 71 interns, and 9 Pharmacy Technicians with 13 specialized pharmacy units such as the theater pharmacy, the bulk store, the accident and emergency, the GOPD, the drug information unit etc. And each unit has a Resident pharmacist who supervises and coordinates the activities of the unit.

Patient satisfaction has gained the focal position in modern-day, well-planned healthcare delivery systems. [5] Much attention within the healthcare industry is focused on patients' satisfaction with the quality of healthcare services. [6] Several lines of research have converged on the finding that Healthcare providers' interactions with patients and their families have remarkably strong effects on clinical outcomes, functional status, and even physiologic measures of health. [7]

Measurement of such interactions is used as a key indicator of healthcare quality as it gives useful feedback to clinicians and managers on perceived performance and satisfaction with care that may not be apparent through more traditional audit measures. [6,7]

Our study facility 1 uses a novel technology- The Electronic Medical Record (EMR) to document and managed patient care.

The Electronic Medical Record which is a digital version of the traditional paper chart was designed to collect and maintain individual health history in a particular health provider's domain. [8,9]

It is hypothesized that EMR systems strengthen the health system and clinical care by supporting to have legible and organized medical records and to access clinical information about individual patients. [6-9] Different researches show that the adoption of an EMR system in the healthcare system has the potential to transform healthcare in terms of saving costs, reducing medical errors, improving service quality, increasing patients' safety, decision-making, saving time, data confidentiality, and sharing medical information. [6,10-16] As it is designed to capture ancillary services such as pharmacy, laboratory and radiology with various clinical care components viz.: nursing plans, administration records and provider orders. [10]

While Electronic Medical Record is the cornerstone in the developed countries, full implementation in the developing countries is yet to be achieved. [12,13]

It was observed however that Federal medical Centre Keffi1 introduced the EMR scheme to achieve among other things.

- Increase internally generated revenue.

- Operational cost reduction since there is no need to print cards/stationeries.

- Enhancing patient safety in terms of ensuring that patients obtained their prescribed drugs in the Hospital.

- Ease of patient data management, storage and retrieval.

- Security of patient data as only authorize persons have access to the data.

Patients' satisfaction after electronic medical records implementation with respect to pharmaceutical services has not been studied in our facility or any other facility in Nigeria to the best of our knowledge, therefore the need for this work.

Since the objective of pharmaceutical services are to provide pharmaceutical and health care products to optimize effective, safe and quality pharmacotherapy, we feel that these objectives may not be achievable if Patients are not satisfying with the services rendered to them especially when such services are being rendered with the aid of a novel technology-the EMR system. Our work therefore is set out to assess Patients' satisfaction after electronic medical records implementation with respect to pharmaceutical services.

Methodology

Our work is an institutional based cross-sectional descriptive study. The study area is a 300 bed tertiary healthcare facility, situated in Keffi.1The study population are 300 registered patients that have accessed pharmaceutical services in the study facility. A Sample size of 300 was obtained using the formula:

$$n= z2pq/d2.$$

Respondents were selected using simple random sampling technique in which Registered out patients were the sampling frame. Proportionate allocation technique was used to select respondents from different clinics in the facility.

Data on different variables were collected using a pre-tested self-administered questionnaire. The questionnaire was developed and validated by calculating its Cronbach alpha factor in SPSS (version 21) software. The factor was found to be 0.9. The tool was first prepared in English, translated to Hausa (local language) and then back to English by language experts to check its consistency. Socio-demographic and pharmacy related variables were the major contents of the tool. It was pre-tested in the medical speciality clinics of the same study facility, to check its validity based on feedbacks.

Three assistant scientific officers and one scientific officer were recruited as data collector and supervisor respectively. They were trained for one day on the objective of the study, data confidentiality, data quality assurance, contents of the questionnaire, and the rights of the respondents.

The administered questionnaires were analyzed using Statistical Package for social science (SPSS) statistical software (version 21). The study was reviewed and approved by the Health Research Ethical Committee of Federal Medical Centre, Keffi.

Results

A total of 300 respondents participated in the study. Most (27.7%) of the respondents, were in the age group of 41-50 years and were mostly Females (52.2%). Most of the respondents (24.7%) had secondary education. Also of interest to note is that 21% of the respondents had a tertiary Education. 31.3% of the respondents have been patients of this Hospital for between 5-9years while 30.3% have been Patients of the Hospital for between 1-4 years [Table 1].

In Table 2, respondents' satisfaction was assessed base on five pharmacy related characteristics which are location of

Table 1: Demographic profile of respondents.	
Demographic profile	**Frequency (%)**
Age	
1. 18-24 Years	52 (17.3)
2. 25-30 Years	64 (21.3)
3. 31-34 Years	56 (18.7)
4. 35-40 years	34 (11.3)
5. 41-50 Years	83 (27.7)
6. 51 And Above	11 (3.7)
Gender	
1. Male	142 (47.3)
2. Female	158 (52.7)
Educational level	
1. None At All	55 (18.3)
2. Primary	60 (20)
3. Secondary	74 (24.7)
4. Tertiary	63 (21.0)
5. Others	48 (16)
How long have you been a patient of this facility?	
1. < 1 year	47 (15.7)
2. 1-4 Years	91 (30.3)
3. 5-9 Years	94 (31.3)
4. 10 Years and above	68 (22.7)

pharmacy, where 33.3% were satisfied, 38% were not satisfied and 28.7% were undecided. 38.3% of the respondents said they were satisfied with the Time it takes to wait for service, while 46.7% said they were not satisfied and 25% remained indifferent. 32.7% of the Respondents agreed that EMR has improved services in the pharmacy department while 38% said EMR has not improved services in the pharmacy department while 29.3% were indifferent.

Table 3 explains overall satisfaction status with pharmacy related services shows 139 (46.3%) were satisfied with pharmacy services under EMR platform while 53.7% or 161 Respondents were not satisfied.

Table 4 shows significant relationship between level of Education of the Respondents and location of the Pharmacy, also of interest to note is the significant relationship that exists between EMR has improved services here and Time it takes to wait for services.

Table 2: Pharmacy related characteristics.

Items	Extremely Dissatisfied No. (%)	Very Dissatisfied No. (%)	Undecided No. (%)	Very Satisfied No. (%)	Extremely Satisfied No. (%)
Location of pharmacy	30 (10)	84 (28)	86 (28.7)	78 (26)	22 (7.3)
Prescribed drugs are available	61 (20.3)	86 (28.7)	70 (23.3)	53 (17.7)	30 (10)
Time it takes to wait for service	51 (17)	89 (29.7)	75 (25)	48 (16)	37 (12.3)
Pharmacists' Counselling	90 (30)	92 (30.7)	48 (16)	41 (13.7)	29 (9.7)
EMR has improved services here	29 (9.7)	85 (28.3)	88 (29.3)	66 (22)	32 (10.7)

Table 3: Satisfaction status.

S/N	Satisfaction status	Count	%
1	Satisfied	139	46.3
2	Unsatisfied	161	53.7

Table 4: Correlation coefficient values of some socio demographic characteristics with pharmacy related characteristics respondents.

Variables			Age In Years	Gender	How Long Have Been A Pt of This Hosp	Level of Education	Location of Pharmacy	Time It Takes To Wait For Services	Emr Has Improved Services Here
Spearman's Rh	Age in Years	Correlation Coefficient	1.000	.076	.218**	.151**	.091	.042	-.043
		Sig. (2-Tailed)	.	.189	.000	.009	.114	.468	.454
		N	300	300	300	300	300	300	300
	Gender	Correlation Coefficient	.076	1.000	-.001	.031	.052	-.048	.027
		Sig. (2-Tailed)	.189	.	.992	.597	.373	.407	.642
		N	300	300	300	300	300	300	300
	How long have been a patient of this hospital	Correlation Coefficient	.218**	-.001	1.000	.058	.013	.072	.009
		Sig. (2-Tailed)	.000	.992	.	.318	.822	.211	.873
		N	300	300	300	300	300	300	300
	Level of Education	Correlation Coefficient	.151**	.031	.058	1.000	.185**	.093	.035
		Sig. (2-Tailed)	.009	.597	.318	.	.001	.107	.541
		N	300	300	300	300	300	300	300
	Location of Pharmacy	Correlation Coefficient	.091	.052	.013	.185**	1.000	.131*	.069
		Sig. (2-Tailed)	.114	.373	.822	.001	.	.023	.231
		N	300	300	300	300	300	300	300
	Time it takes to wait for services	Correlation Coefficient	.042	-.048	.072	.093	.131*	1.000	.214**
		Sig. (2-Tailed)	.468	.407	.211	.107	.023	.	.000
		N	300	300	300	300	300	300	300
	EMR has improved services here	Correlation Coefficient	-.043	.027	.009	.035	.069	.214**	1.000
		Sig. (2-Tailed)	.454	.642	.873	.541	.231	.000	.
		N	300	300	300	300	300	300	300
			-.131*	-.037	-.046	-.234**	-.167**	-.002	-.104

Significant Level=0.001 At 95% Confidence Interval

Discussion

Our research work sets out to study patients' satisfaction with pharmaceutical services after electronic medical records implementation in a tertiary hospital in north central Nigeria.

Demographic profile of the respondents reveals that most of them are within the age group of 25-50years, this trend was observed in similar survey in Tanzania, [17] Bayelsa and Delta states, South-South Nigeria. [16] Most of the respondents were female (52.7%), this is not unconnected with the fact that more females seek medical attention than the males, Owonaro A P, et al. [16] observed this trend. On education, our studies reveal that those without education were 18.1%, tertiary were 21% and secondary were 24.7%. These findings were in sharp contrast to similar studies in Delta and Bayelsa states in Nigeria [16], normally people living in the southern part of Nigeria embrace western education that their compatriots of the northern part of the country as reported by Noah. [18] Most respondents 94 (31.3%) had been patients of the hospital for 5-9 Years, measurement for length of being patient to a facility is new in respect to patients' satisfaction with pharmaceutical services after EMR implementation hence our limitation as we cannot compare our findings with similar work.

Pharmacy related characteristics, which are 'location of the pharmacy, prescribed drugs are available, time it takes to wait for service, pharmacists' counseling and EMR has improved services here' were use in terms of measuring patients' satisfaction, in our study we observed that factors that promote patient satisfaction include location of the pharmacy, and availability of medicines. In our case, we consider pharmacists' counseling as provider-patient communication and 60.7% of the respondents were not satisfied, while 16% were undecided and 23% were satisfied this trend is disturbing as it is a well-known fact that patient compliance to medication is an important factor in the prognosis of numerous diseases and Poor patient compliance is a problem worldwide. [16] Thompson, Sunol [8] and El-Kareh et al. [10] reported a similar observation. Sheldon & Ellington, [15] observed that Poor provider–patient communication negatively affects clinical outcomes, including adherence to prescribed medication and treatment regimens, patients' sense of physical and mental health, patients' satisfaction with their treatment and patients' adaption to long-term care. The limited adoption a Satisfaction in terms of availability of prescribed medicines, time it takes to wait for services and EMR has improved services here recorded low level of satisfaction amongst the respondents; this observation is not new in this part of the world due to the fact that EMR system usage is new. [19] Biruk et al. observed that Healthcare infrastructures, health professionals' attitude and awareness level, lack of proper management, resource shortage, skill related issues, users' resistance, policy related issues, poor commitments of staffs, and poor maintenance services are some of the reasons for the limited use of EMR system in developing countries. [20] We believe that this observation is the reason why the overall satisfaction status with pharmacy related services shows 139 (46.3%) were satisfied with pharmacy services under EMR platform while 53.7% or 161 Respondents were not satisfied.

Correlation of satisfaction assessment with demography

There is significant relationship between level of Education of the Respondents and location of the Pharmacy, also of interest to note is the significant relationship that exists between EMR has improved services here and Time it takes to wait for services. The relation between Level of Education of the Respondents and location of the Pharmacy is found to be highly significant, our results corroborate with the Godspower et al. [18] study in some similar settings in southern Nigeria. The implication of this finding is that there is need for proper clients' awareness in terms of placing proper direction within the hospital so as to help them in understanding how they can access services, this especially so whenever a novel programme such as the EMR is introduced.

Conclusion

We observed that demographic variables play vital role in improving Patients' satisfaction. Improving skills of EMR frontline workers, infrastructure, management, and resource allocation are important interventions to improve the EMR system performance in the study area. Skills improvement such as Computer literacy, having regular meetings, and training on EMR system were positive contributors to change the attitude towards and use of EMR system which will definitely in turns improve patients' satisfaction. Study findings from Iran, Norway and Ethiopia [20] support this conclusion. Additionally, management support, presence of EMR manual, proper budget allocation, uninterrupted electric power and standby generator availability were significant variables to determine the utilization of the EMR system. A possible justification to this finding could be that the presence of management support will increase supportive supervision and motivation of the staff. The EMR manual will also serve as guidance for the users and proper budget allocation will improve the refreshment training and timely system maintenance. Different evidences [16,17] from various places also support this justification.

Limitations

It is the first of its kind not only in the study facility but in all recognized internet search engines (using the research topics) which revealed that the work has never been undertaken by any scholar and as such there is paucity of data with which to compare our findings. We compare our findings with few studies on patients' satisfaction with pharmaceutical services but without EMR implementation.

Conflict of Interest

All authors disclose that there was no conflict of interest.

Authors' Contribution

Hassan Abdullahi led in the design and coordination of the study, carried out the field work and data collection, performed statistical analysis of the data collected and drafted the manuscript. Sabiu Adamu and Giyan Johua Ndom participated in the design and coordination of the study and reviewed the manuscript. He also contributed to the discussion section. Yakubu, Amina reviewed the manuscript and contributed to the

discussion segment of the Study and proof read the manuscript. Ezekeil Gwamna a carried out field work and assisted in data analysis.

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Suggestion for Further Studies

We recommend that further research work need to be carried out in areas of knowledge, attitudes and perception of Healthcare workers in relation to EMR operation. We believe that if this work is carried in this study facility, it will improve skills of EMR frontline workers, infrastructure, management, and resource allocation are important interventions to improve the EMR system performance and all these will in turn improve patients' satisfaction in the study area

References

1. Hassan A, Abdullahi GA, Ahmed AA, Sabiu A, John U, Ezekeil G, et al. Assessing prescriber's awareness of essential medicine list, hospital drug formulary and utilization of standard treatment guidelines in a tertiary healthcare facility in North-Central Nigeria. Alexandria Journal of Medicine. 2017.

2. World Health Organization. The role of the pharmacist in the health care system:Preparing the future pharmacist:Curricular development:Report of a third WHO Consultative Group on the Role of the Pharmacist, Vancouver, Canada, 1997.

3. World Health Organization. The role of the pharmacist in the health care system. Good pharmacy practice. Geneva:World Health Organization. 1994.

4. http://www.eahp.eu/press-room/hospital-pharmacists-and-their-role-patient-care

5. Exploring Pharmacists' Role in a Changing Healthcare Environment, 2014.

6. Williams B. Patient satisfaction:A valid concept? Soc Sci Med 1994;38:509-516.

7. Weinberger M, Greene JY, Mamlin JJ. Patient perceptions of health care at a university-based ambulatory care clinic. J Ambul Care Manage. 1981;4:55-64.

8. Thompson AG, Sunol R. Expectations as determinants of patient satisfaction:concepts, theory and evidence. Int J Qual Health Care. 1995;7:127-141.

9. Buntin MB, Jain SH, Blumenthal D. Health information technology:Laying the infrastructure for national health reform. Health Affairs, 2010;29:1214-1219.

10. El-Kareh R, Gandi TK, Poon EG, Newmark LP, Ungar J, Lipsitz S, et al. Trends in primary care clinician perceptions of a new electronic health record. Journal of General Internal Medicine, 2009;24:464-468.

11. Frankel R, Altschuler A, George S, Kinsman J, Jimson H, Robertson NR, Hsu J. Effects of exam room computing on clinician-patient communication:A longitudinal qualitative study. Journal of General InternalMedicine, 2005;20:677-682.

12. Health Information Technology for Economic and Clinical Health Act (HITECH) 2009.

13. Institute of Medicine (IOM). To err is human:Building a safer health system:National Academy Press, Washington, D.C., USA, 1999.

14. Shachak A, Reis S. The impact of electronic medical records on patient-doctor communication during consultation:A narrative literature review. Journal of Evaluation in Clinical Practice, 2009;15:641-649.

15. Sheldon LK, Ellington L. Application of a model of social information processing to nursing theory:How nurses respond to patients. Journal of Advanced Nursing, 2008;64:388-398.

16. Owonaro AP, Eniojukan FJ, Owonaro AD, Ebinyo CN. Assessment of patient satisfaction with pharmaceutical services in a hospital in Bayelsa state south-South of Nigeria. Ortho & Rheum Open Access 2017;6:555-686.

17. Sturgess IK, McElnay JC, Hughes CM, Crealey G. Community pharmacy based provision of pharmaceutical care to older patients. Pharm World Sci. 2003;25:218-226.

18. Godspower O, Owonaro AP, Eniojukan FJ. Patient satisfaction with pharmaceutical care services in selected health facilities in Delta State, South-South of Nigeria. Ortho & Rheum Open Access 2017;8:555-739.

19. An International Multidisciplinary Journal, Ethiopia 2008.

20. Biruk S, Yilma T, Andualem M, Tilahun B. Health professionals' readiness for electronic medical record system in case of three hospitals in Ethiopia:A cross sectional study. BMC Med Inform Decis Mak. 2014;14:115.