Knowledge and attitude of health care professionals towards electronic prescribing system in a public sector hospital of Lahore, Pakistan

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Abstract

Objectives: To assess the knowledge and attitude of healthcare professionals towards electronic prescribing system.

Methods: The cross-sectional study was conducted at the Services Institute of Medical Sciences, Lahore, Pakistan, from July to August, 2018, and comprised physicians, pharmacists and nurses working at the public-sector facility. Data was collected through structured interviews and the parameters were assessed by using a pre-validated questionnaire. Data was analysed using SPSS 22.

Results: Of the 303 healthcare professionals, 101(33.3%) each were physicians, pharmacists and nurses. The overall age range was 30-50 years. Physicians had the highest mean knowledge level 20.57±7.87 ($p<0.05$), while pharmacists had the highest mean attitude score 14.18±3.4 ($p>0.05$).

Conclusion: Physicians, pharmacists and nurses had appropriate knowledge of and attitude towards electronic prescribing system, but physicians had significantly more knowledge compared to the other HCPs.

Keywords: Knowledge, Attitude, Healthcare professionals, Electronic prescribing, Prescription. (JPMA 70: 376; 2020)
https://doi.org/10.5455/JPMA.18218

Introduction

During the past 120 years there has been an uprising in therapeutics. Medicines have been discovered to cure diseases as well as to relieve pain. With these new medicines, there is an increase in the misuse and abuse of some of them.[1] Prescription medicines can be just as dangerous when misused as street drugs. For instance, heroin was first introduced in 1898 and was at first thought to be non-addictive, but later it was recalled due to its addictive nature.[2] In 1900, drugs like opium, morphine and cocaine were used as over-the-counter (OTC) products but their results as an OTC product were devastating. Due to the adverse effects and addictive nature, it was found necessary that these medications should be used but for a limited period of time.[3,4]

Hence, a prescription was used to ensure that the right drug is used by the right patient at the right time and the right dose is taken through the right route of administration. A prescription is defined as a written order by an authorised person, a medical doctor, to an authorised person, a pharmacist, to dispense or compound a medication, device or therapy to a specific patient.[5,6] The symbol of prescription is 'Rx' which originated from a Latin word 'recipere' meaning 'recipe' and in medical terms it meant 'take thou' or 'to take'.[7]

With the passage of time and due to entering into an era of full-scale technology, hand-written prescriptions are gradually being replaced by electronic (E) prescriptions. E-prescribing has been defined as the computer-based electronic generation, transmission and filling of a prescription, replacing the paper and faxed prescriptions.[8] Most prescribing occurs in the outpatient care setting, where paper-based prescribing is most profoundly used.[9-11] Electronical sending and receiving of prescriptions has rationalised the clinical practice workflow, while the patient agreement and compliance have increased.[12] Additionally, connecting physicians and pharmacy systems has reduced paperwork and the allied mistakes that may occur from dependence on manual prescriptions.[13]

With time, patients and patient organisations have appreciated the potential of E-prescribing systems which they believe can improve speed, efficiency, responsibility, simplicity of information and help in decision making.[14]

E-prescribing, however, is an emerging challenge for healthcare system in a developing country like Pakistan. The poor literacy rate of the patients and the reluctance of the healthcare professionals (HCPs) have already pushed the e-prescribing system far behind. There is a basic need to evaluate what the HCPs think about adopting a totally new system of prescribing and what parameters could be

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made favourable to give up on the conventional prescribing system. Over time, there has been an increase in non-compliance, medication errors and poor provision of care which has resulted in poor clinical outcomes, including increased morbidity, increased resistance towards medicines and associated factors which have only contributed to worsen the situation. Hence, the HCPs should have a clear concept of e-prescribing as well its benefits, limitations and the need to adopt it to contribute to the provision of optimal healthcare.[15,16]

The current study was planned to assess the knowledge and attitude of HCPs towards e-prescribing in a public-sector setting.

Subjects and Methods

The cross-sectional, observational, questionnaire-based study was conducted at the Services Institute of Medical Sciences (SIMS), Lahore, Pakistan, from July to August, 2018, and comprised physicians, pharmacists and nurses working at the public-sector facility which has a bed strength of 2000 having e-prescribing system, and is affiliated with the Pakistan Medical and Dental Council (PMDC).

After approval from the institutional review board, the sample size was calculated using Raosoft calculator.[17] The sample was raised using cluster sampling technique in which subgroups of the population were used as the sampling unit, rather than individuals. HCPs other than physicians, pharmacists and nurses as well as the patients and the laypersons were excluded. A pilot study was done on 30 HCPs; 10(33.3%) from each category. A data collection form comprising demographic, knowledge and attitude sections was designed and scored using 5-point Likert scale whose reliability was checked through Cronbach alpha which was 0.756.

The same data collection forms were used in the main study and they were filled through structured interviews with the subjects who filled the forms themselves. Data was analysed using SPSS 22. One-way analysis of variance (ANOVA) and post-hoc tests were used to make multiple comparisons regarding knowledge and attitude values among the physicians, pharmacists and nurses. $P \leq 0.05$ was considered significant.

Results

Of the 303 healthcare professionals, 101 (33.3%) each were physicians, pharmacists and nurses. From the demographics, it was found that there were 65 (64.3%) male and 36 (35.6%) female physicians, 45 (44.5%) male and 56 (55.4%) female pharmacist and 101(100%) female nurses. The lower age range was 20-30 years which included 22 (21.7%) physicians 56 (55.4%) pharmacists and 18 (17.8%) nurses, The upper age range was 40-50 years which had 24 (23.7%) physicians and 48 (47.5%) nurses. There was no pharmacist within this age limit. Forty (39.6%) physicians had an experience of 10-15 years, 42 (41.5%) of the pharmacists and 37 (36.6%) nurses had an experience of 5-10 years.

All the HCPs were well aware of the e-prescribing system and its significance (Table-1A-B).

Table-1A: Knowledge of physicians regarding electronic (E.) Prescribing.

Health Care Professionals Variables	Physicians Frequency (N) Percentage (%)	Pharmacist Frequency (N) Percentage (%)	Nurses Frequency (N) Percentage (%)
Are you well aware of E. prescribing system?			
Strongly Agree	16 (16.0)	21 (20.0)	8 (8.0)
Agree	46 (46.0)	80 (80.0)	48 (48.0)
Neutral	28 (28.0)	0 (0.0)	32 (32.0)
Disagree	5 (5.0)	0 (0.0)	18 (18.0)
Strongly Disagree	6 (6.0)	0 (0.0)	0 (0.0)
E. prescribing is clinically appropriate as compared to Manual prescribing.			
Strongly Agree	0 (0)	20 (20.0)	16 (16.0)
Agree	28 (28)	81 (81.0)	59 (59.0)
Neutral	51 (51.0)	0 (0.0)	14 (14.0)
Disagree	10 (10)	0 (0.0)	8 (8.0)
Strongly Disagree	12 (12)	0 (0.0)	4 (4.0)
E. prescribing provides an easy flow of information among the patient, physician and the pharmacist.			
Strongly Agree	10 (10.0)	20 (20.0)	22 (22.0)
Agree	36 (36.0)	80 (80.0)	56 (56.0)
Neutral	28 (28.0)	1 (0.0)	9 (9.0)
Disagree	5 (5.0)	0 (0.0)	14 (14.0)
Strongly Disagree	22 (22)	0 (0.0)	0 (0.0)

Table-1B: Knowledge of physicians regarding E. Prescribing.

Health Care Professionals Variables	Physicians Frequency (N) Percentage (%)	Pharmacist Frequency (N) Percentage (%)	Nurses Frequency (N) Percentage (%)
E. prescribing influences the patient's medication- taking behaviours.			
Strongly Agree	4 (4.0)	0 (0)	10 (10.0)
Agree	40 (40.0)	67 (67.0)	48 (48.0)
Neutral	30 (30.0)	0 (0.0)	38 (38.0)
Disagree	11 (11.0)	34 (34.0)	5 (5.0)
Strongly Disagree	16 (16.0)	0 (0.0)	0 (0.0)
E. prescribing has improved the extent of care you provide to the patient.			
Strongly Agree	4 (4.0)	0 (0.0)	26 (26.0)
Agree	46 (46.0)	66 (66.0)	40 (40.0)
Neutral	22 (22.0)	0 (0.0)	24 (24.0)
Disagree	16 (16.0)	35 (35.0)	11 (11.0)
Strongly Disagree	13 (13.0)	0 (0.0)	0 (0.0)
E. prescribing has improved to be helpful in avoiding medication errors.			
Strongly Agree	6 (6.0)	21 (21.0)	24 (24.0)
Agree	28 (28.0)	80 (80.0)	60 (60.0)
Neutral	18 (18.0)	0 (0.0)	10 (10.0)
Disagree	34 (34.0)	0 (0.0)	7 (7.0)
Strongly Disagree	15 (15.0)	0 (0.0)	0 (0.0)
Drug-Drug Interactions can be easily eliminated using E. prescribing.			
Strongly Agree	4 (4)	20 (20.0)	6 (6.0)
Agree	54 (54)	81 (81.0)	66 (66.0)
Neutral	17 (17.0)	0 (0.0)	17 (17.0)
Disagree	20 (20.0)	0 (0.0)	12 (12.0)
Strongly Disagree	6 (6.0)	0 (0.0)	0 (0.0)
Patients have Privacy concerns regarding their Information by using E. prescribing.			
Strongly Agree	4 (4.0)	1 (1.0)	25 (25.0)
Agree	18 (18.0)	80 (80.0)	60 (60.0)
Neutral	62 (62.0)	20 (20.0)	10 (10.0)
Disagree	10 (10.0)	0 (0.0)	6 (6.0)
Strongly Disagree	7 (7.0)	0 (0.0)	0 (0.0)

The HCPs had a positive attitude towards the significance of e-prescribing but a sense of reluctance was also present (Table-2).

Physicians had the highest mean knowledge level 20.57±7.87 ($p<0.05$), while pharmacists had the highest mean attitude score 14.18±3.4 ($p>0.05$). At 95% level of confidence, physicians' knowledge exceeded by 0.73973 from pharmacist and 0.59928 from nurses (Table-3).

Discussion

Majority of the HCPs in the study knew about the e-prescribing system. They not only knew it, but also had an understanding about its uses, benefits and limitations. They agreed to the fact that e-prescribing encourages an easy flow of information between the pyramids of the healthcare system. It has not only improved patient compliance, but has made communication among the HCPs and patients better and has also allowed a close check on controlled used substances. By minimising drug or disease interactions, e-prescribing has improved the extent of care provided. A previous study has shown to increase the patient adherence by 53% which is the ultimate goal of any healthcare system.[15,16] Most of the HCPs agreed that e-prescribing is clinically appropriate to use which suggests that e-prescribing should be used more often to provide better healthcare provision to patients which is in accordance with earlier results.[18-20]

In terms of attitude, all the HCPs had positive or somewhat neutral attitude towards e-prescribing. The HCPs agreed to the fact that although e-prescribing is a bit time-consuming but it has promising benefits for the future because once a patient gets registered with the system, it is easy to fetch all the relevant information. Another important aspect was the patients' involvement in the prescribing process as the prescription is actively communicated with the patients and they are free to communicate their queries which in the long run avoids errors in medication-taking behaviours. This finding was

Table-2: Attitude of physicians regarding Electronic (E.) Prescribing.

Health Care Professionals Variables	Physician Frequency (N) Percentage (%)	Pharmacist Frequency (N) Percentage (%)	Nurse Frequency (N) Percentage (%)
E. prescribing is difficult to perform than manual prescribing.			
Strongly Agree	8 (8.0)	0 (0.0)	8 (8.0)
Agree	60 (60.0)	10(10.0)	36 (36.0)
Neutral	20 (20.0)	21 (21.0)	17 (17.0)
Disagree	5 (5.0)	70 (70.0)	40 (40.0)
Strongly Disagree	8 (8.0)	0 (0.0)	0 (0.0)
E. prescribing is helpful to get patient's data when needed.			
Strongly Agree	18 (18.0)	0 (0.0)	26 (26.0)
Agree	58 (58.0)	101 (101.0)	72 (72.0)
Neutral	25 (25.0)	0 (0.0)	3 (3.0)
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Strongly Disagree	0 (0.0)	0 (0.0)	0 (0.0)
E. prescribing system responses faster than manual prescribing.			
Strongly Agree	10 (10.0)	20 (20.0)	28 (28.0)
Agree	26 (26.0)	50 (50.0)	42 (42.0)
Neutral	42 (42.0)	0 (0.0)	27 (27.0)
Disagree	5 (5.0)	31 (31.0)	4 (4.0)
Strongly Disagree	18 (18.0)	0 (0.0)	0 (0.0)
E. prescribing is more time consuming than manual prescribing.			
Strongly Agree	12 (12.0)	0 (0.0)	8 (8.0)
Agree	48 (48.0)	90 (90.0)	42 (43.0)
Neutral	18 (18.0)	11 (11.0)	18 (18.0)
Disagree	11 (11.0)	0 (0.0)	15 (15.0)
Strongly Disagree	12 (12.0)	0 (0.0)	18 (18.0)
E. prescription is actively communicated with the patient.			
Strongly Agree	4 (4.0)	0 (0.0)	6 (6.0)
Agree	42 (42.0)	60 (60.0)	66 (66.0)
Neutral	18 (18.0)	0 (0.0)	15 (15.0)
Disagree	14 (14.0)	41 (41.0)	10 (10.0)
Strongly Disagree	23(23.0)	0 (0.0)	4 (4.0)
E. prescribing has a culture of open and honest communication.			
Strongly Agree	0 (0.0)	0 (0.0)	12 (12.0)
Agree	53 (53.0)	90 (90.0)	55 (55.0)
Neutral	30 (30.0)	11 (11.0)	20 (20.0)
Disagree	4 (4.0)	0 (0.0)	8 (8.0)
Strongly Disagree	14 (14.0)	0 (0.0)	6 (6.0)

n=101

Table-3: MEAN score (Knowledge & Attitude).

	Mean	SD	P Value
MEAN score (Knowledge)			
Physicians	20.57	7.87	0.00
Pharmacists	15.31	5.06	0.00
Nurses	16.815	7.49	0.00
MEAN score (Attitude)			
Physician	13.73	9.14	0.00
Pharmacists	14.18	3.4	0.00
Nurses	12.85	5.45	0.00

SD: Standard deviation.

also in line with literature.[21-23]

There was a significant level of difference among the knowledge of physicians, pharmacists and nurses. The physicians had more vivid concept of the system than the other HCPs. Taking attitude into account, the individual difference was non-significant. There was little reluctance observed in some HCPs but on the whole, all agreed to the promising future for e-prescribing.

Conclusion

The findings are expected to be helpful for all HCPs to get a better insight about e-prescribing system in a

developing country to improve the clinical outcomes and healthcare provision to patients.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

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