Electronic Incidence reporting impact on Quality and Patient Safety: Results of Quality Improvement Project at Yarmouk Health Care Center, Kuwait

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Abstract

At Yarmouk Primary Health Care Center (PHCC), a continuous quality improvement and patient safety system is in place. \

Health care delivery was explored and paper-based incident reporting was found to compromise patient safety and quality. Induction of electronic reporting of incidents was started and its favorable outcome demonstrated. This was followed by establishing a continuous quality improvement process at the facility.
Ethical principles were followed during data collection and analysis.

Electronic Incidence reporting was started in January 2022. A substantial increase (16 in paper-based versus 53 in electronic reporting) in Incidence reporting, following introduction of electronic reporting at Yarmouk PHCC was demonstrated.

A reduction of time consumption from 35 minutes in paper-based Incidence reporting to 10 minutes in electronic reporting was demonstrated. An improvement in accuracy while using electronic Incidence report (94%) in comparison to that while using Paper based Incidence reporting (85%) was documented.

Maximum Incidence reporting was by Pharmacy followed by doctors, administration staff and laboratory. Maximum Incidences were product related followed by investigation related. No sentinel event reporting was found. The majority of reported incidences were in “no harm” and “near miss” categories. Employee satisfaction improved with electronic Incidence reporting.

Due to advancement of technology today, it is imperative and strongly recommended to use principles of quality improvement process to improve patient safety and quality of care. Electronic Incidence reporting is found to improve quality and patient safety. Further studies into impact of better utilization of electronic Incidence reporting on health care outcomes is strongly recommended.

Key words: Patient safety; Quality Improvement; Electronic Incidence reporting; Paper-based Incidence reporting

Introduction

Kuwait has one of the most modern health care infrastructures, well equipped and manned by high quality human resources, distributed among primary health care centers, general hospitals and specialized hospitals and clinics(1). Primary care delivery provision is an important strategy for service delivery at public health facilities. The primary health care centers provide high quality, comprehensive and package-based services. The records and data in primary health care centers are computerized(2).

Primary health care center (PHCC) strategies in Kuwait involve expanding PHCC facilities and strengthening co-ordination between primary, secondary and tertiary health care services. PHCCs are staffed by health teams comprising physicians, nurses, pharmacists, laboratory technicians, radiology services and administrative workers(3).

Yarmouk Primary Health Care Center is an important primary care service delivery outpost, and has been regarded nationally and regionally by the WHO as an exemplary model for primary health care service provision, in the Middle East North African (MENA) zone (4).

Statistics in Yarmouk PHCC showed a decrease in number of incidence report documentation across all departments by approximately 50%. This issue was studied by the leadership team, in conjunction with the safety and risk management committee, and it was noted to have such a decline due to fear of punitive action, wavering safety culture within the organization, lack of understanding and awareness among clinicians about what should be reported and how such incidents are analyzed. Furthermore, clinicians' doubts on how such reports would ultimately lead to improvements was identiýed as an obstacle to clinical engagement, especially lack of systematic analysis and feedback to the staff.

In healthcare delivery services, reporting practices by healthcare workers and staff should promote a culture that helps address patient safety concerns with fairness and without fear of blame(5). It is important to ensure conýdentiality of reports submitted by the employee and the sole purpose of the practice is quality improvement and patient safety. Incident reporting should ensure an organized approach to report near misses or adverse events for quality improvement and patient safety (6).
In order to serve its purpose, incident reporting practice should be voluntary, anonymous, and conýdential, preferably based on an efýcient electronic system. It should freely allow the reporting of incidents and adverse events for analysis, for quality improvement and patient safety(7, 8, 9). Incidence reporting has its own limitations. Reports can be subjective and therefore unfair, are not comparable between hospitals, and may be biased. Such limitations should always be considered while dealing with such reporting (10,11).

Incidence reporting electronically has been shown to be convenient for busy health care providers and staff and improves incidence rates in health care delivery service(12). It has been shown that electronic approaches to streamlining the use of adverse event reports can be used to improve patient safety(13).

At Yarmouk PHCC, it was considered that improving incidence reporting by making the transition from paper to paperless documentation, could play a major role in improving patient safety; allowing frontline clinicians to have a facilitated access for reporting incidents, which are to be handled in a non-punitive manner. Data was collected to study the impact of electronic incidence reporting on quality improvement and patient safety.

Methodology

Design: Descriptive analytical study of incidents reported from 1st of January to 15th of December, 2022 at Yarmouk PHCC, using incidence report registration application.

Quality improvement tools, such as PSDA, ýshbone and root-cause analysis were used to implement electronic reporting. It encourages the staff to register all the incidence reports easily and efýciently, and decreases staff time and efforts due to automatic analysis. It allowed description of the epidemiology of patient safety (PS) incidents registered in an electronic notiýcation system, at Yarmouk primary care (PC) health center. It assisted in deýning a risk map to identify the critical areas where intervention is required.

Setting:
• **Creating a process-workþow map:** Information was recorded and noted as soon as the staff entered data regarding the incidence report. It was crucial to map the entirety of the incidence report registration, in order to clearly outline and predict how much paperwork was used. This is so that the entire task could be subsequently automated.
• **Procuring the required hardware and software:** All existing records were scanned in order to build a paperless system for incidence report documentation. Such records include data from various healthcare domains (general practice clinic, walk-in clinics, family practice clinics, appointment clinics). Data from departments like diagnostic labs, pharmacy, vaccinations, imaging unit, and administration was collected.
• **Implementing the EMR** (Electronic Medical Records) **System:** To automate the entire workþow and transition into a paperless environment, software for creating the EMR were obtained and operationalized.
• **Giving Staff Training:** To avoid a vicious cycle of lack of incident report documentation, staff training is of peak importance. This training involved the use of the new system for both, entering and retrieving, patient information, and abiding by the principles and high standards of the center to complete such tasks with the utmost accuracy and correctness. Training was provided on a periodic basis for existing staff, to update the staff on any technological

advancements and new practices, as well as induction training for newcomers on a more regular basis.

Participants: All employees across all departments working in Yarmouk Health Center from January to December, 2022.
Data recorded: Data was obtained from records voluntarily submitted to an electronic, standardized, and anonymized form. (Healthcare unit, notiýer, type of incident, risk matrix, causal and contributing factors, preventability, level of resolution and improvement actions.)
Measurements:
• To measure the increase in incident reporting in all departments in Yarmouk Health Center
• To measure real-time completion of all patient and practice management-related information
• To measure the ease of access and accuracy by the staff for documenting Incidence Report
Å Cost saving and improved work efýciency for better root cause analysis and quality improvement project implementation, Ministry of Health Quality and Accreditation Directorate Form-1 was used

Quality Improvement (QI) Plan
1. Formation of Quality Improvement team
2. Baseline data collection
3. Finalizing goals and work plan
5. Make training schedule for staff
6. Implement training based on the operational plan
7. Report training results
8. Implementation of the operational plan in all departments
9. Print and distribute posters
10. Safety culture promotional event every three months
11. “Safety responsibility” award every month
12. Include the operational plan in new staff orientation booklet
13. Audit and Data collection
14. Data analysis
15. Discussion of results and taking corrective actions
16. Regular reporting of data analysis and corrective actions

Results

A total 16 Incidence reports were generated through manual method, between January to July, 2022, at Yarmouk Primary Health Care Center. Electronic reporting of adverse events started in June, 2022 at the Center and a total of 53 adverse events were recorded till ýrst week of December, 2022. (Figure 1)

Time consumed in generating Paper based Incidence report was 35 minutes in comparison to 10 minutes with electronic reporting, a saving of 25 minutes per report. Reporting accuracy was 85% with paper-based reporting in comparison to 94% with electronic reporting. (Figure:2)

Department wise reporting showed 14 reports through paper-based system in comparison to 55 reports generated electronically. Maximum reports were generated by Pharmacy followed by Doctors, Administration staff and laboratory. Substantially more reports were electronically generated in comparison to paper-based. (Table1)

Maximum reports generated were related to products (25) followed by investigation related (10), medical record related (8), Clinical/Surgical (8) and device related (8). No sentinel events were reported. Events reported fell in No harm, adverse event, near miss and unsafe categories among 25, 16, 14, and 14 incidents. (Table 2)

A much higher employee satisfaction was reported with electronic incidence reporting system. (Figure 3)

Figure 1: Monthly incidence reports documented

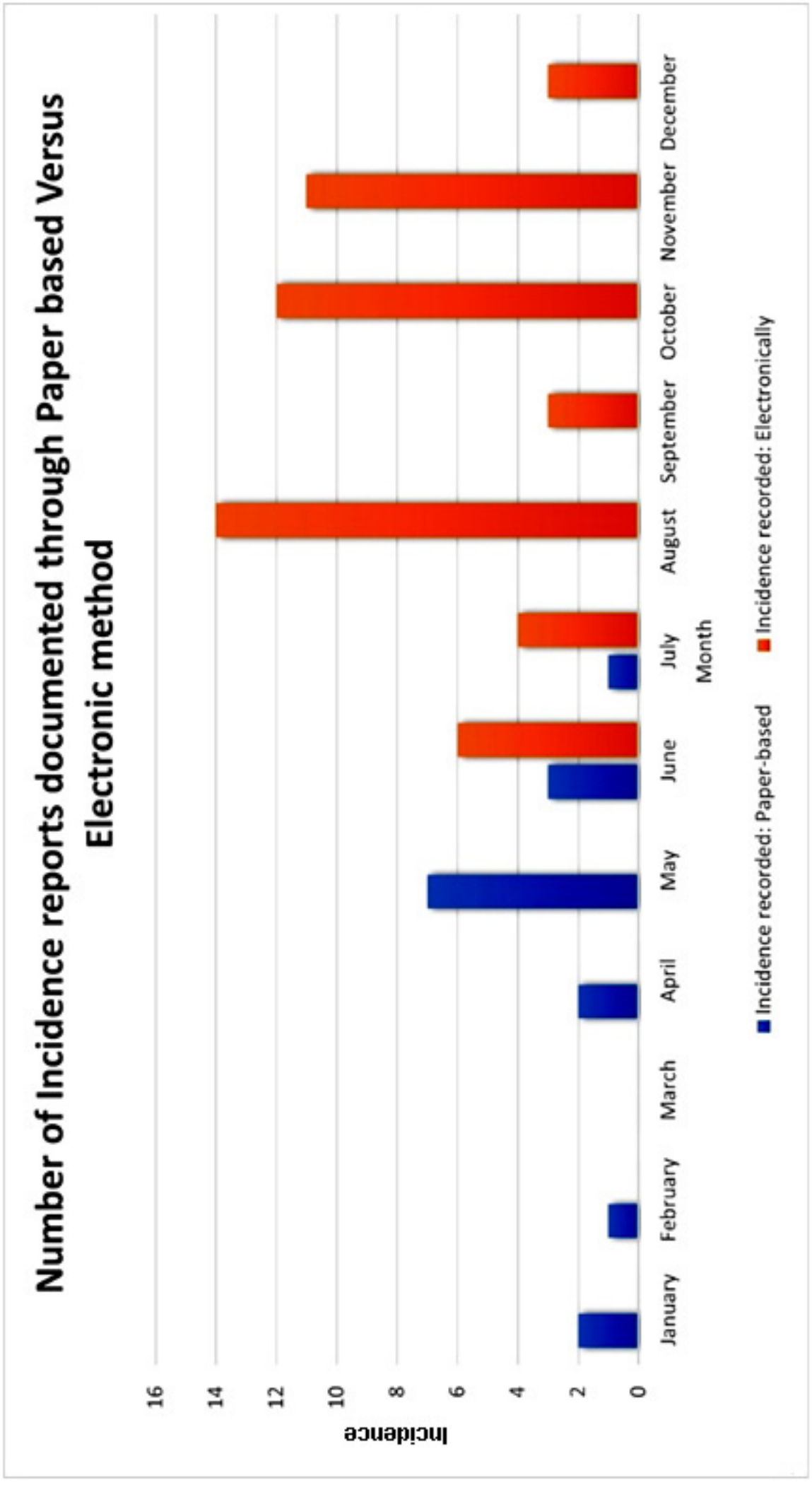

Figure 2: Accuracy vs Recording time

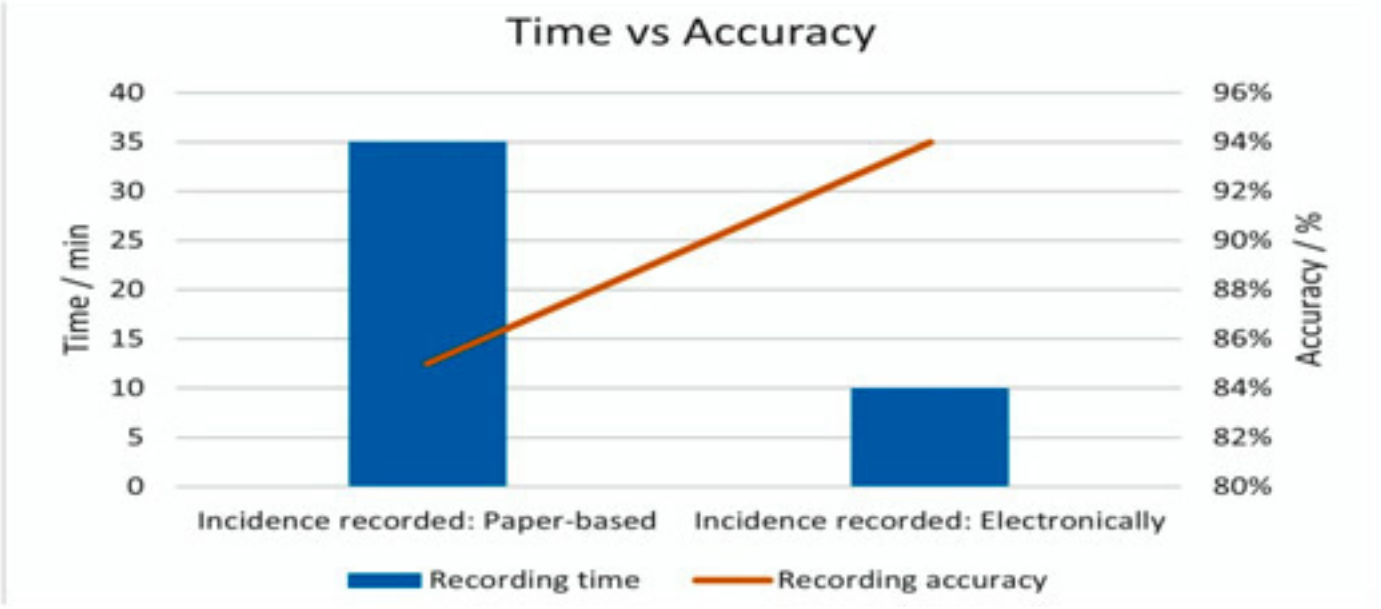

Table 1: Number of Incidence reports documented in each department

Recording Category	Incidence recorded: Paper-based	Incidence recorded: Electronically	Total	%
Doctors	4	10	14	20
Dentist	0	5	5	7.2
Nurse/Preventive medicine	1	3	4	5.8
Laboratory	2	8	10	15
Pharmacy	6	19	25	36
Administration staff	1	10	11	16.9
Total	14	55	69	100

Table 2: Nature and Type of Event related to Incidence reporting

Nature/Type of Event	Number
Administration related	4
Medical record related	8
Clinical/Surgical	8
Decubitus Ulcer	0
Investigation related	10
Product related	25
Device related	8
Patient behavior related	2
Environment related	4
Sentinel event	0
Adverse event	16
No harm	25
Near Miss	14
Unsafe condition	14