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Effectiveness of E-Learning in Improving Electronic Medical Record Policy Literacy Among Healthcare Workers

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ABSTRACT

Objective: *This study aimed to determine the effectiveness of e-learning in improving electronic medical record policy literacy among healthcare workers.* ***Method:*** *This quantitative study used an experimental measurement approach. The study variables consisted of pretest and posttest measurements. The study population comprised all 192 healthcare workers at Ananda General Hospital in Purwokerto. The sample consisted of 130 respondents, determined using the Slovin formula and selected by random sampling. A questionnaire was used as the research instrument. Data analysis used standard deviations, a normality test, a correlation coefficient, and a paired-samples t-test.* ***Results:*** *The results showed a mean pretest literacy score of 7.33 and a mean posttest score of 8.25, with a p-value of 0.001.* ***Novelty:*** *First, this study focuses on electronic medical record policy literacy, rather than only the ability to use EMR applications or acceptance of technology.*

INTRODUCTION

Hospitals use electronic medical records (EMRs) and hospital management information systems to document care and coordinate information. Indonesia's Ministry of Health Regulation No. 24 of 2022 sets requirements for electronic medical records, including their management and the protection of patient information [1]. SATUSEHAT documents FHIR-based exchange at the national platform level [2]. The professional standard for medical record and health information staff also specifies competencies relevant to information management and professional responsibilities [3].

EMR implementation depends on workflow, training, user involvement, and organizational support [4]. Research identifies technical, financial, and organizational barriers to adoption [5]. An Indonesian hospital information system study shows that individual, technological, and organizational factors are relevant to acceptance [6]. The Unified Theory of Acceptance and Use of Technology provides a framework for examining acceptance and use [7]. These issues motivate training that addresses policy comprehension as a specific outcome.

Ananda General Hospital in Purwokerto previously offered in-house EMR instruction. The manuscript reports that the hospital discontinued it at the beginning of 2025 because of budget constraints. E-learning, including online modules, is one delivery option when staff schedules and training resources limit in-person sessions. Research has assessed internet-based instruction in the health professions [8]. A Cochrane review indicates that the relative effects of e-learning depend on the comparison and context [9].

This study focused on EMR policy literacy among health workers. The training covered regulatory requirements, implementation responsibilities, and patient data confidentiality. The study examined changes in knowledge scores before and after participants completed an e-learning module.

RESEARCH METHOD

Design and participants

The study used a quantitative, single-group pretest–posttest design at Ananda General Hospital, Purwokerto. The eligible population comprised 192 healthcare workers. The manuscript reports a sample of 130, determined using the Slovin formula and selected through random sampling. It does not give the sampling procedure beyond that description. All 130 participants in the analysis had scores for both assessments. Within-person change can be measured with this design, although the absence of a comparison group limits causal interpretation [10].

Measurement and training

EMR policy literacy was defined as participants' knowledge and understanding of EMR regulation and implementation. The questionnaire was based on Ministry of Health Regulation No. 24 of 2022 [1]. It covered EMR concepts, legal foundations, governance, data security and confidentiality, and staff responsibilities. The source states that all items exceeded a Pearson item-correlation threshold of 0.361 at the 5% level. It reports Cronbach's alpha of 0.62, indicating modest internal consistency. Alpha depends in part on item characteristics and should be interpreted in the context of the intended use of the score [11].

Participants completed a pretest before studying the e-learning materials on EMR policy and implementation. They completed a posttest with the same instrument after finishing the module. The manuscript does not specify the time between tests or the platform used to deliver the module.

Statistical analysis

The analysis plan specified descriptive statistics, the Shapiro–Wilk test, and a paired-samples t-test when the relevant normality assumption was met. For paired scores, this assumption concerns the within-participant differences [12]. The Wilcoxon signed-rank test was the stated alternative. Tests used a significance threshold of $p < 0.05$. The manuscript reports the paired t-test result. It provides no standard deviations, normality-test results, t statistic, or confidence interval for the mean difference.

RESULTS AND DISCUSSION

Results

The mean baseline score was 7.33 among the 130 participants (Table 1). After the e-learning module, the mean score was 8.25 (Table 2). The difference between the reported means was 0.92 points. The reported paired-samples t-test gave $p = 0.001$ (Table 3).

Table 1. Knowledge scores before reading the e-learning module

Assessment	n	Mean score
Pretest	130	7.33

Table 2. Knowledge scores after reading the e-learning module

Assessment	n	Mean score
Posttest	130	8.25

Table 3. Paired comparison of electronic medical record policy knowledge

Assessment	n	Mean score	Paired p-value
Pretest	130	7.33	0.001
Posttest	130	8.25	—

Discussion

Healthcare workers scored higher on the EMR policy questionnaire after studying the module. The result describes a change in questionnaire performance within this group. It is consistent with evidence that online instruction can support knowledge outcomes in health professions education [8]. A systematic review of online learning in health professions education also examined knowledge, skills, attitudes, and satisfaction as distinct outcomes [13].

The same questionnaire was administered twice, so familiarity with the questions may have contributed to the score increase. A comparison group and delayed assessment would help distinguish improvement associated with the module from retesting and assess retention [10]. The questionnaire's reported reliability and the absence of score dispersion limit interpretation of the size and precision of the change. The study assessed policy knowledge. It did not measure changes in documentation quality, compliance, or patient data handling in practice. Continuing professional education frameworks distinguish knowledge outcomes from changes in performance and practice [14].

The authors propose combining e-learning with face-to-face sessions. Online materials can cover regulatory content at a flexible pace, while in-person sessions can be used to discuss policy scenarios and practice applying procedures. A systematic review in the health professions examined blended learning as one approach to knowledge acquisition [15]. This study did not compare blended and online-only delivery or measure costs, so their relative performance remains a question for evaluation.

CONCLUSION

Fundamental Finding: Analysis of the 130 respondents showed a statistically significant increase in knowledge after the intervention, with the mean rising from 7.33 on the pretest to 8.25 on the posttest. **Implication:** The hospital is advised to build on its existing training by combining face-to-face sessions with e-learning. **Limitation:** The one-group design and reuse of the same questionnaire limit causal interpretation, and the study measured questionnaire scores at the end of training. **Future Research:** Future

studies could compare online-only and blended training using a comparison group and a delayed assessment of knowledge retention.

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