

Virtual Classroom Training, Electronic Medical Records and Medical Service Delivery: Case of Resident Psychiatrists at the Federal Neuropsychiatric Hospital, Yaba, Nigeria

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ABSTRACT

Introduction: This study evaluated the influence of residency virtual classroom training and Electronic Medical Records (EMRs) on medical service delivery among psychiatry doctors in Lagos State, Nigeria. The research assessed the individual and combined effects of virtual training and EMR usage on clinical skills, patient care, and overall workflow efficiency in psychiatric practice.

Methods: A cross-sectional design was adopted for the study. The population of the study comprised sixty-six (66) psychiatry resident doctors at the Federal Neuropsychiatric Hospital, Yaba, who participated by completing standardized questionnaires: the Virtual Learning Effectiveness Scale (VLES) and the Professionals' Satisfaction Questionnaire with EMRs (PSQ-EMR). The collected data were analysed using descriptive and inferential statistics.

Results: The findings revealed that virtual classroom training significantly improved clinical knowledge and decision-making ($t = -15.30$, $p < .001$). Similarly, EMRs were perceived to enhance efficiency and documentation quality in patient care ($t = -4.76$, $p < .001$). However, the combined use of both tools was perceived as significantly less than satisfactory in improving service delivery ($t = -7.036$, $p < .001$). Despite the noted benefits of each tool independently, integration challenges may account for the mixed perceptions of their joint impact.

Conclusion: Based on the findings of the study, it was concluded that virtual classroom training and EMRs independently contribute positively to psychiatric service delivery. It is recommended that the hospital administrator should enhance the integration of virtual classroom training with EMR use through structured simulations, targeted user training, and improved technical support to fully optimize their benefits for psychiatric service delivery.

Keywords: Virtual classroom, electronic medical records, psychiatry residency, service delivery, Nigeria

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Introduction

Healthcare systems globally are transitioning from manual processes to digital formats, such as electronic health records, online prescriptions, AI-assisted consultations, and telemedicine (Alolayyan et al., 2020). This shift is often referred to as Digital Health Technology (DHT). This transformation describes how the adoption and implementation of digital technologies reshape care delivery (Stoumpos et al., 2023). Digital Health Technology (DHT) encompasses tools that streamline patient care through digital platforms. These include electronic records, telemonitoring tools, e-prescribing systems, and clinical decision aids. It also includes internet-based tools, digital devices, social media, and innovative treatments that enhance medical efficiency. The benefits of DHT include improved access to patient data, faster diagnostics, and broader care access, especially for patients in remote areas. DHTs have also enhanced the training of healthcare providers through digital learning and virtual classrooms. Because of these benefits, DHT has been widely adopted across various levels of healthcare (Babatunde et al., 2021; Edo et al., 2023).

Unfortunately, adoption is hindered by challenges in both implementation and user acceptance in many developing countries (Moshhood et al., 2022). Virtual classrooms have emerged as key tools in medical education, using platforms like Zoom, Google Meet, and Microsoft Teams to facilitate teaching and learning (Singh & Meena, 2022). While online environments reduce face-to-face cues critical for communication and interactivity (Song et al., 2019), they offer flexible scheduling and improved access to learning materials

(Greenan, 2021; Boatin et al., 2015; Larocque et al., 2021). For example, the COVID-19 pandemic disrupted conventional training, with public health measures necessitating physical distancing. Hence, medical institutions, including psychiatry residency programs that were traditionally rooted in face-to-face instruction, have transitioned to virtual platforms for academic sessions. Components like seminars, case reviews, and psychotherapy classes shifted online, while clinical exposure remained in person (Amparore et al., 2020).

Residency training in Nigeria is a structured postgraduate medical program for doctors who have completed their MBBS degree and mandatory national service. It provides supervised specialist instruction, typically lasting four to six years, under the oversight of the Medical and Dental Council of Nigeria (Nwachukwu, 2019). During the COVID-19 pandemic, restrictions on physical gatherings required medical institutions to migrate much of this training to virtual platforms. In psychiatry residency programs, virtual classrooms became essential for maintaining academic continuity through seminars, case conferences, and journal clubs, while clinical training remained in person (Amparore et al., 2020; Larocque et al., 2021). This adaptation demonstrates the increasing integration of digital learning into postgraduate medical education in Nigeria and aligns with the broader digital transformation occurring through Electronic Medical Record (EMR) adoption. While virtual classrooms have enhanced access to theoretical learning, they provide limited exposure to hands-on clinical practice, an essential component of medical education. This challenge is particularly evident in psychiatry, where observation and interaction are critical learning tools (Amparore et al., 2020; Larocque et al., 2021).

Simultaneously, the adoption and implementation of EMRs have revolutionized how patient records are documented, accessed, and utilized, impacting clinical efficiency, communication, and patient continuity of care. There is no doubt that Electronic Medical Records (EMRs) offer digital storage of clinical information, including patient histories, medications, and treatment plans (Adio & Oladipo, 2022). Unlike traditional paper records, EMRs are

accessed and updated using electronic systems, which allows for more efficient, accurate, and secure management of patient information (Sufyan et al., 2021).

The use of EMRs in psychiatry has both its benefits and challenges, as the nature of psychiatric care requires detailed documentation of patient histories, treatment plans, and progress notes. EMRs can help psychiatrists by providing organized access to patient data. When well-implemented, EMRs streamline documentation, support multidisciplinary coordination, and facilitate continuity of care (Sufyan et al., 2021). For example, in cases of patients taking medications and also supportive therapies, the psychiatrist can access the patient's progress with the psychologists or occupational therapists as the case may be. Also, in co-morbidities and physical conditions, psychiatrists can access comprehensive health data to make better-informed decisions (Moshhood et al., 2022; Salju et al., 2023). For psychiatry, EMRs allow clinicians to track therapy, co-morbid conditions, and collaborative care inputs. Yet, technical issues, user resistance, and system costs remain significant barriers (Fraillon et al., 2013; Iyanna et al., 2022).

Literature Review

Digital transformation in healthcare refers to the beneficial use of digital technologies to improve healthcare delivery (Stoumpos et al., 2023). These changes include the use of the internet, computers, social media, and novel therapies for better medical service delivery. Digital Health Technology (DHT) encompasses communication and technological devices that enable patient care management in computerized formats. It includes record management systems, health monitoring tools, prescribing systems, and other software that support and improve the management of patient care processes.

DHT offers numerous benefits to both patients and healthcare providers, including faster and more accurate access to patient records, improved access to care, reliable diagnostics, and the facilitation of remote consultations for patients who might otherwise struggle to receive adequate medical care (Babatunde et al., 2021; Edo et al., 2023).

However, challenges associated with digital health technologies in the healthcare industry can be categorized into two domains: development, which refers to the process of bringing new technology to market, and acceptance, which relates to users' willingness to adopt and use the technology (Edo et al., 2023; Moshhood et al., 2022).

A virtual classroom is an online mode of teaching conducted through digital platforms such as Zoom, Skype, Google Meet, Microsoft Teams, Google Classroom, and YouTube (Singh & Meena, 2022). According to Song et al. (2019), the classroom setting is a social environment where individuals interact, but relationship building may be difficult in online learning due to limited social cues and nonverbal communication. Virtual classrooms eliminate much of the verbal and non-verbal interaction typical of traditional environments, which may weaken opportunities for cultural exchange and connection (Greenan, 2021). Developing a culture that allows learners to engage with each other before, during, and after virtual sessions is therefore important for maintaining interactivity and collaboration (Greenan, 2021).

Although virtual classrooms enable the continuity of medical training, they also pose several challenges that can affect overall effectiveness and learner experience. One of the most common difficulties faced by residents and educators during virtual classroom training is technical problems, such as unstable internet connections or bandwidth limitations, which interrupt live sessions and reduce engagement (Olufemi et al., 2020; Strojny & Dużmańska-Misiarczyk, 2023). Using multiple learning platforms (Zoom, Microsoft Teams, WebEx, etc.) can also lead to compatibility issues or system downtimes, while poor audio or video quality can hinder comprehension. Furthermore, virtual environments often fail to replicate the spontaneous engagement typical of face-to-face residency training, where residents can ask questions and participate freely (Croce & Salter, 2022; Tsyrulnik et al., 2021). In online settings, motivation and participation can decline, particularly in large virtual groups with limited opportunities for active interaction.

Electronic Medical Records (EMRs) are digital versions of patients' health records that store socio-demographic data, medical histories, medications, test results, and other clinical information (Adio & Oladipo, 2022). EMRs are designed for use by clinicians and healthcare staff within an organization and can enhance providers' performance when properly implemented and supported by positive user attitudes. Unlike traditional paper records, EMRs allow efficient, accurate, and secure management of patient information (Sufyan et al., 2021).

The use of EMRs in psychiatry presents its benefits. Psychiatry requires detailed documentation of histories, treatment plans, and progress notes, and EMRs support this by providing structured access to patient data, improving communication among care teams, and ensuring continuity of care. For example, psychiatrists can track progress made by psychologists or occupational therapists, and access information on co-morbid physical conditions, allowing for more holistic treatment decisions (Moshhood et al., 2022; Salju et al., 2023).

Despite these advantages, EMR adoption is not without obstacles (Fraillon et al., 2013; Iyanna et al., 2022; Strojny & Dużmańska-Misiarczyk, 2023). Technical challenges such as system crashes, slow load times, and data loss can disrupt workflow and frustrate users. Inadequate training and lack of support further contribute to user resistance, especially among clinicians accustomed to paper-based systems. Financial barriers also exist, as implementing EMR systems requires significant investment in hardware, software, and ongoing maintenance, which may be prohibitive for smaller or resource-limited institutions. Additionally, cybersecurity threats continue to raise concerns about the safety of digital health data (Iyanna et al., 2022; Strojny & Dużmańska-Misiarczyk, 2023).

In summary, EMRs have transformed healthcare delivery by improving the accuracy, accessibility, and security of patient information. However, to maximize their benefits, healthcare institutions must address the technical, financial, and user-related challenges that hinder effective implementation. In psychiatry, EMRs present both

opportunities and hurdles—offering streamlined documentation and interdisciplinary coordination while demanding careful attention to confidentiality, usability, and clinician engagement to ensure ethical and effective use.

The intersection of virtual learning and EMR usage offers opportunities for better training and service delivery, especially in psychiatry, where communication and detail are key. However, integration is complex and often affected by contextual factors such as training gaps, infrastructure, and user experience (Greenhalgh et al., 2017). Despite the growing global literature on EMRs and virtual learning, little is known about their combined influence on psychiatric residency training and service delivery in low- and middle-income countries such as Nigeria. This study contributes by providing empirical evidence on how psychiatry residents perceive the individual and joint effects of virtual classroom training and EMR use, addressing a critical gap in the digital transformation of mental health care in resource-limited settings. It is against this background that this study assesses the perceived impact of virtual classroom training and EMRs on the service delivery experiences of psychiatry trainees.

Research Hypotheses

The study sought to provide answers to the following research hypotheses:

H1: Virtual classroom training positively influences the clinical decision-making and knowledge of psychiatry doctors.

H2: The use of EMRs improves the efficiency and quality of medical service delivery.

H3: The combined use of virtual training and electronic medical records (EMRs) significantly enhances psychiatric service delivery.

Methods

The study was carried out at the Federal Neuropsychiatric Hospital, Yaba, Lagos (FNPHY), a mono-specialist psychiatric facility that trains

medical doctors in psychiatry residency programs. It is a tertiary psychiatric hospital established on 31st October 1907 under British colonial rule. Over the years, it has evolved into a leading centre for mental health services, research, and residency training in Nigeria. The hospital provides care to individuals from Lagos State (with a population of over 20 million) and the entire southwest geopolitical region of Nigeria.

The respondents of the study were resident doctors currently undergoing training at the Federal Neuropsychiatric Hospital, Yaba, Lagos. Medical residency in Nigeria is a postgraduate pathway following an MBBS, typically lasting 4–6 years depending on the specialty. Initiated formally in the 1970s, it includes supervised clinical care, structured learning, and research projects (Nwachukwu, 2019). Residency involves didactic sessions, patient interaction, mentorship, and assessments by postgraduate medical colleges. The residency training is conducted through a combination of virtual classroom sessions, in-person teachings, and consultant-led ward rounds. Patient care is facilitated through the Electronic Medical Records (EMR) system. Given that FNPHY is the only psychiatry residency training centre in Lagos utilizing both virtual classroom training and EMR at the time of the study, it was selected as the study site for this research. The study adopted a cross-sectional survey design.

Using the purposive sampling technique, all resident doctors at FNPHY actively enrolled in the psychiatry residency program who have participated in virtual classroom training and/or used the Electronic Medical Records (EMR) system and gave informed consent to participate were included in the study. Resident doctors on long-term leave or unavailable during the period of the study were excluded. At the time of the study, 75 resident doctors were enrolled in the psychiatry residency program at the Federal Neuropsychiatric Hospital, Yaba. Of these, 9 residents were either on leave or unavailable during the study period and were therefore excluded. The final sample comprised 66 resident doctors who met the inclusion criteria and consented to participate. Data

were collected through self-administered structured questionnaires over a 3-week period in April 2025.

The Virtual Learning Effectiveness Scale (VLES), developed by Hamutoglu et al. (2018), was used to assess the effectiveness of virtual classroom training in improving clinical skills and knowledge among psychiatrists (Hamutoglu et al., 2018). The Virtual Learning Experience Scale consists of 12 items organized into three domains: perceived learning outcomes, learner satisfaction, and engagement and interactivity on a 5-point Likert scale with responses ranging from Strongly agree to Strongly disagree. The VLES has demonstrated high internal consistency (Cronbach's Alpha = 0.85) and good construct validity in previous studies on digital learning in medical education.

The Professionals' Satisfaction Questionnaire with Electronic Medical Records (PSQ-EMR) by Boyer et al. (2011) was used to evaluate healthcare professionals' satisfaction with electronic medical records structured into ease of use, efficiency and impact on clinical workflow, and quality of documentation and patient care (Boyer et al., 2011). It is a 17-item 5-point Likert scale (Strongly Agree to Strongly Disagree) questionnaire. The PSQ-EMR has been validated in psychiatric settings with a Cronbach's Alpha of 0.88, indicating high reliability.

The questionnaires were distributed in person during scheduled academic sessions and clinical meetings. Respondents were given time to complete the questionnaires and returned them immediately. To ensure confidentiality and anonymity, questionnaires were assigned unique identification codes without any personally identifiable information. Informed consent forms were signed before participation, and residents were informed that participation was voluntary and they could withdraw from the study at any time without consequences.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics, including frequency counts, percentages, mean, median, and standard deviation, were used

to summarize demographic characteristics and respondents' responses to survey items. Inferential statistics were applied to test the study's hypotheses. Specifically, one-sample t-tests were conducted to determine whether mean scores on virtual classroom training, EMR use, and their combined effect significantly differed from the neutral midpoint value of 3.0 on the 5-point Likert scale. In addition, simple linear regression analysis was employed to examine the predictive relationship between the combined use of virtual training and EMRs and perceived service delivery. Statistical significance was set at $p < 0.05$.

Ethical approval for this study was obtained from the Research and Ethics Committee of the Federal Neuropsychiatric Hospital, Yaba, Lagos. Informed consent was obtained from all participants, and confidentiality was strictly maintained throughout the study

Results

A total of 66 psychiatry trainees participated in the study. The majority were female (60.6%), while males accounted for 39.4% of respondents. Respondents' ages ranged predominantly between 25 and 34 years, with half (50.0%) aged 30–34, 25.8% aged 25–29, 15.1% aged 18–24, and 9.1% aged 35–39. In terms of religious affiliation, most respondents identified as Christians (78.8%), while 21.2% were Muslims. Regarding professional experience, 28.8% of respondents had been in residency for less than one year, 36.4% for 1–3 years, and 34.8% for 4–6 years. In terms of residency year, 28.8% were in their first year, followed by 19.7% in the second year, 16.7% in the third year, and 15.1% in the fourth year. The remaining respondents were in their fifth (12.1%) and sixth (7.6%) years of training.

Table 1: Demographic characteristics of respondents

Variable	Frequency	% (N=66)
Gender		
Male	26	39.4
Female	40	60.6
Age		
18-24	10	15.1
25-29	17	25.8
30-34	33	50
35-39	6	9.1
Religion		
Christianity	52	78.8
Islam	14	21.2
Others		
Years in residency		
Less than 1 year	19	28.8
1-3 years	24	36.4
4-6 years	23	34.8
Year of residency		
1	19	28.8
2	13	19.7
3	11	16.7
4	10	15.1
5	8	12.1
6	5	7.6

Respondents' experiences of virtual classroom training

As presented in Table 2, respondents reported generally positive experiences with virtual classroom training. The overall mean score on the Virtual Learning Effectiveness Scale was 1.98 ± 0.70 on a five-point Likert scale, where lower scores indicate stronger agreement with positive statements. These findings suggest that residents perceived virtual classroom training as effective for achieving learning objectives, maintaining satisfaction, and promoting active engagement during academic sessions.

Respondent's experience with the electronic medical records

As shown in Table 3, respondents expressed moderate satisfaction with the use of Electronic Medical Records (EMRs). The overall mean score on the Professionals' Satisfaction Questionnaire with EMRs was 2.53 ± 0.71 on a five-point Likert scale, where lower scores reflect higher satisfaction levels. High satisfaction was defined as a mean score of ≤ 2.5 , while low satisfaction was defined as > 2.5 . Based on this classification, 32 respondents (48.5%) reported high satisfaction, and 34 respondents (51.5%) reported low satisfaction with EMR use

Respondent's combined experience of virtual classroom training and electronic medical records

As presented in Table 4, the combined experience of virtual classroom training and EMR use among respondents yielded a mean score of 2.53 ± 0.71 on a five-point Likert scale, where lower scores denote higher satisfaction. Using a cut-off of ≤ 2.5 to indicate high satisfaction and > 2.5 to indicate low satisfaction, 32 respondents (48.5%) reported high satisfaction with both digital tools, while 34 respondents (51.5%) reported low satisfaction. These findings suggest that, overall, psychiatry residents expressed moderate satisfaction with the integration of virtual classroom training and EMR systems in their residency program.

Table 2: Respondents' experiences of virtual classroom training

Domain	No of items	Scale range	Mean	SD
Perceived learning outcomes	5	1–5 (Strongly Agree–Strongly Disagree)	1.98	0.72
Learner satisfaction	4	1–5 (Strongly Agree–Strongly Disagree)	2.05	0.68
Engagement and interactivity	3	1–5 (Strongly Agree–Strongly Disagree)	1.91	0.70
Overall Virtual Classroom Experience	12	1–5 (Strongly Agree–Strongly Disagree)	1.98	0.70

Table 3: Respondent's experience with the electronic medical records

Domain	No of items	Scale range	Mean	SD
Ease of use	5	1–5 (Strongly Agree – Strongly Disagree)	2.42	0.74
Efficiency & workflow impact	6	1–5 (Strongly Agree – Strongly Disagree)	2.61	0.70
Quality of documentation & patient care	6	1–5 (Strongly Agree – Strongly Disagree)	2.56	0.68
Overall EMR Satisfaction	17	1–5 (Strongly Agree – Strongly Disagree)	2.53	0.71

Table 4: Respondent's combined experience of virtual classroom training and electronic medical records

Variable	Scale range	Mean	SD	High satisfaction (%)	Low satisfaction (%)
Combined Virtual Classroom and EMR Experience	1–5 (Strongly Agree – Strongly Disagree)	2.53	0.71	32 (48.5%)	34 (51.5)

One-sample t-test assessing the hypothesis that virtual classroom training influences clinical decision-making and knowledge among psychiatry residents (H_1)

To assess the influence of virtual classroom training on the clinical decision-making and knowledge of psychiatry residents, a one-sample t-test was conducted. The mean score for the composite variable clinical knowledge, derived from questionnaire items assessing clinical improvement due to virtual training, was compared to a neutral reference value of 3.00 (representing a neutral perception on a 5-point Likert scale).

The analysis revealed a statistically significant difference, $t(65) = -15.30$, $p < .001$, with a mean score of 1.66. The 95% confidence interval for the difference was [-1.52, -1.17], suggesting that respondents perceived the virtual classroom training as substantially beneficial to their clinical knowledge and decision-making skills. These findings support the hypothesis that virtual classroom training during psychiatric residency positively influences clinical competence among trainees.

Table 5: One-sample t-test assessing the hypothesis that virtual classroom training influences clinical decision-making and knowledge among psychiatry residents (H_1)

Variable	Test value	N	Mean	SD	t	df	p-value	95% CI
VT and Clinical knowledge	3.00	66	1.66	0.712	-15.30	65	<0.001	-1.5159- -1.1659

One-sample t-test assessing the hypothesis that Electronic Medical Record (EMR) use improves efficiency and quality of psychiatric service delivery (H_2)

A one-sample t-test was conducted to determine whether psychiatry doctors perceived that electronic medical records (EMRs) positively influence the efficiency and quality of medical

service delivery, particularly in terms of patient management and treatment continuity.

The mean score of perceived EMR impact ($M = 2.46$, $SD = 0.91$) was significantly lower than the neutral test value of 3.00, $t (65) = -4.76$, $p < 0.001$. This indicates that respondents generally agree that EMRs improve clinical efficiency, accuracy, and continuity of care in psychiatric practice.

Table 6: One-sample t-test assessing the hypothesis that Electronic Medical Record (EMR) use improves efficiency and quality of psychiatric service delivery (H_2)

Variable	Test value	N	Mean	SD	t	df	p-value	95%CI
EMR impact on service delivery	3.00	66	2.46	0.913	-4.760	65	<0.001	-0.7600- -0.3107

One-sample t-test assessing the hypothesis that combined virtual training and EMR use enhance psychiatric service delivery (H_3)

To assess the perceived impact of combining virtual classroom training and electronic medical records (EMRs) on service delivery in psychiatric practice, a one-sample t-test was conducted comparing the mean of the combined effect variable to a neutral test value of 3.00. The results indicated a

statistically significant difference between the mean score ($M = 2.26$, $SD = 0.85$) and the test value, $t(65) = -7.036$, $p < .001$. The negative mean difference (-0.737) suggests that respondents, on average, did not perceive the combined use of virtual training and EMRs as significantly improving service delivery to a satisfactory level. The 95% confidence interval for the mean difference ranged from -0.95 to -0.53, reinforcing the conclusion that the actual mean is significantly lower than neutral.

Table 7. One-sample t-test assessing the hypothesis that combined virtual training and EMR use enhances psychiatric service delivery (H_3)

Variable	Test value	N	Mean	t	df	p-value	95% CI
Combined EMR and VT effect	3.00	66	2.26	-7.036	65	<0.001	-0.95- -0.53

Linear regression predicting service delivery from the combined effect of virtual training and EMR use

A simple linear regression was conducted to examine whether the combined effect of virtual classroom training and EMR use significantly predicted overall service delivery in psychiatric practice. The results indicated that the model was statistically significant, $F(1, 64) = 23.35$, $p < .001$,

and accounted for approximately 71% of the variance in service delivery scores, $R^2 = .71$, Adjusted $R^2 = .71$. The combined effect significantly predicted service delivery ($B = 0.58$, $SE = 0.12$, $\beta = .54$, $t = 4.83$, $p < .001$), suggesting that higher perceived synergy between virtual training and EMR use is associated with improved psychiatric service delivery.

Table 8: Linear regression predicting service delivery from combined effect of virtual training and EMR use

Variable	B	Standard error	β	t	p-value	R^2	F(df)
Combined Virtual Training & EMR Use	0.58	0.12	0.54	4.83	<0.001	0.71	23.35

Discussion of Findings

This study examined how virtual classroom training and the use of Electronic Medical Records (EMRs) influence psychiatric service delivery among resident doctors. Findings revealed that the first two hypotheses were supported, while the third hypothesis showed a statistically significant but negative perception of the combined effect of virtual training and EMR use. The first hypothesis assessed the positive influence of virtual classroom training on clinical decision making and knowledge of psychiatry trainees. The residents strongly agreed that virtual classroom training improved their clinical skills, diagnostic reasoning, and confidence in applying knowledge to real-world cases. Most residents also reported that incorporating various aspects of training into the virtual platform was positive, as it gave them the flexibility to schedule their other activities with ease. This aligns with prior research that showed satisfaction with and effectiveness of virtual training platforms (Larocque et al., 2021). Similarly, our respondents' perception that virtual training improved their clinical reasoning and confidence is consistent with literature showing that virtual classrooms enhance knowledge retention, engagement, and competence (Kolcun et al., 2023). Evidence from systematic reviews further supports this, demonstrating that many students, particularly low-achieving learners, find virtual

training more effective than traditional classrooms (Jong, 2015; Strojny & Dużmańska-Misiarczyk, 2023). Together, these findings suggest that virtual classroom training not only supplements traditional teaching but may be especially valuable in psychiatry, where sensitive clinical judgment is critical.

The second hypothesis assessed the improvement in quality of service delivery from the use of EMRs. In this study, respondents generally agreed that EMRs enhance documentation speed, reduce errors, and improve communication with other professionals. However, this was a moderate rather than a strong agreement. This moderate agreement reflects the challenges reported by the respondents with the use of the EMR, such as system downtime or errors, and insufficient technical support. EMRs have been found to improve service delivery by enhancing accessibility to patient information such as medical history, medications, and lab results, leading to more informed decision-making and improved care coordination (Adeniyi et al., 2024). Clinicians have reported that frequently used EMR functions are useful for improving work efficiency. They have found EMR useful in time-consuming tasks related to paper-based processes through the quick retrieval of information, reduction in documentation time by, for example, using EMR templates (Tsai et al., 2020). However, issues such as system downtime and poor technical support

can temper enthusiasm and limit efficiency gains. Our moderate mean likely reflects this mixed experience—clinicians appreciate the potential of EMRs but remain cautious due to usability and support challenges. Studies have shown that EMR can be found to be challenging in terms of resource constraints, poor/ insufficient training and poor technical/ educational support for users and individual poor technology skills (Adeniyi et al., 2024; Tsai et al., 2020).

The third hypothesis assessed the combined use of virtual training and electronic medical records (EMRs) significantly enhances psychiatric service delivery, particularly in terms of patient care quality, treatment outcomes, and workflow efficiency. The results of this study suggest that the combined implementation of virtual training and electronic medical records (EMRs) in psychiatric settings is not perceived by respondents as sufficiently enhancing service delivery to a satisfactory level. A simple linear regression confirmed the strong predictive relationship between virtual training and EMR on overall service delivery. In other words, trainees who reported greater integration of virtual classroom training and EMR tools also perceived substantially better efficiency, care quality, and patient outcomes.

The direction and magnitude of the result indicate that clinicians perceived the combined technological intervention as underperforming relative to expectations of neutral or satisfactory service enhancement. These findings contrast the perception of the respondents on the influence of virtual training and EMRs separately on their service delivery as psychiatrists. This discrepancy between these potential benefits and the perceptions captured in this study may reflect how significant the challenges of these systems are for the residents. The contextual limitations, such as insufficient training, poor user interface design, poor technical support or limited integration between systems, may affect how residents perceive the combined effect of these systems on their service delivery. Greenhalgh et al. (2017) have argued that digital tools in healthcare often fail to deliver value when adoption is fragmented or when

clinicians face high administrative and cognitive burdens. This helps explain why residents who were comfortable with virtual training or EMRs individually still expressed dissatisfaction with their combined effect. Similarly, Stoumpos et al. (2023) emphasize that digital transformation requires systems that are user-friendly and context-sensitive; otherwise, rigid or poorly tailored platforms risk disrupting workflow. In psychiatry, where rapport, nuanced communication, and emotional insight are central, such disruptions may reduce efficiency and compromise perceived care quality. Thus, our findings align with broader literature showing that the integration of digital tools must be deliberate, well-supported, and clinician-centered to achieve meaningful improvements in service delivery.

Moreover, while virtual training and EMRs each offer distinct advantages, their combined use may require more deliberate coordination and support than currently provided. If virtual training focuses solely on clinical knowledge without addressing the practical use of EMRs during patient interactions, the full benefit may not be realized. As Mohan et al. (2017) suggest, coupling EMR-based data simulation into training can significantly improve usability and practical skill translation (Mohan et al., 2016).

This study examined the perceived impact of virtual classroom training, electronic medical records (EMRs), and their combined implementation on psychiatric service delivery. Findings showed that virtual classroom training enhanced residents' clinical knowledge, diagnostic ability, and confidence, while EMR use improved documentation, reduced errors, and facilitated communication. However, the combined use of both technologies fell short of expectations, mainly due to integration challenges, insufficient training, and limited system support.

To maximize the benefits of digital innovations in psychiatry, virtual classroom training should be expanded to include hands-on simulation with EMR systems to promote familiarity and real-world application. Addressing EMR system downtimes, improving interface usability, and ensuring

responsive technical support are essential to enhance user acceptance. Developers and administrators should involve clinicians in EMR and virtual training design to ensure relevance and reduce cognitive load. Continuous and peer-supported refresher training should be encouraged, while institutional and governmental stakeholders must allocate sufficient technical, financial, and human resources to sustain digital transformation in psychiatric care.

This study has some limitations that should be considered when interpreting the findings. First, its cross-sectional design limits causal inferences; the observed relationships between virtual classroom training, EMR use, and perceived service delivery reflect associations rather than direct causal relationships. Second, the study relied on self-reported data, which may be subject to response bias, including social desirability and acceptance. Third, the study was conducted at a single tertiary psychiatric hospital, which may limit the generalizability of the results to other institutions or regions with different levels of digital health infrastructure. Nevertheless, the use of validated instruments, the Virtual Learning Effectiveness Scale (VLES) and the Professionals' Satisfaction Questionnaire with Electronic Medical Records (PSQ-EMR), enhances the reliability and comparability of findings. Conducting the study among psychiatry residents actively using both virtual classroom platforms and EMR systems provides a focused understanding of digital health adoption within a real-world clinical training environment.

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Conflict of interest

None declared.

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