Task Technology Fit in Hemodialysis Care: A Comparative Evaluation of the Renalmu.com Application in Indonesian Hospitals

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Abstract

Hemodialysis services are essential for patients with end-stage renal disease (ESRD), offering routine treatment to sustain health and enhance quality of life. As the prevalence of ESRD continues to rise, hemodialysis units must focus on delivering high-quality care, optimizing resource management, and ensuring patient satisfaction. To support these goals, this study employs a quantitative comparative design with a cross-sectional approach to assess the effectiveness of the Renalmu.com application in hemodialysis services. The study will include 30 respondents from two hospitals, with data analysed using the Mann-Whitney U test to compare key variables. Data collection is scheduled to begin in September 2024 and conclude in March 2025. Preliminary results from the Mann-Whitney U test indicate that while both hospitals reported similar experiences across most dimensions of the Renalmu.com application, a significant difference was observed in the Task Technology Fit (TTF) dimension of data quality. Hospital 1 demonstrated superior data quality, reflected by a U-value of 56.500 and a p-value of 0.013. No significant differences were found in other TTF dimensions, including task characteristics (non-routine, interdependence), site graphic attractiveness, privacy/security, interactivity, data locability, authorization, compatibility, product timeliness, reliability, ease of use, and user relationships. These findings suggest that the primary distinction between the two hospitals lies in the effective utilization of data quality to support clinical decision-making in hemodialysis treatment

Keywords: *Task-Technology Fit, Dialysis, Quality Service Improvement*

INTRODUCTION

Hemodialysis services play a vital role in providing supportive care for patients with End-Stage Renal Disease (ESRD), particularly in the context of end-of-life management. This specialized treatment delivers regular dialysis sessions that are crucial for sustaining the health and quality of life of individuals with severely impaired kidney function. As the global prevalence of ESRD continues to rise, hemodialysis units are increasingly tasked with delivering high-quality healthcare, optimizing resource utilization, and ensuring patient satisfaction. In addition, these units are expected to enhance patients' overall well-being while maximizing the efficiency of medical staff time (Tsakiridis et al., 2023; Yonata et al., 2022; Yuliawati et al., 2023).

One of the primary challenges faced by hemodialysis units is the effective management and utilization of medical data, which is essential for enabling data-driven decision-making

and delivering personalized care. This data encompasses patient demographics, medical history, treatment parameters, and clinical outcomes all of which are critical for providing optimal care, enhancing patients' quality of life, and improving the efficiency of healthcare staff (Canaud et al., 2024; Yuliawati et al., 2023). Traditionally, medical data in hemodialysis units has been managed through paper-based records or fragmented electronic systems, often resulting in operational inefficiencies, increased risk of errors, and suboptimal patient outcomes (Khedekar et al., 2024; Laurier et al., 2025). In Indonesia, medical data is also reported through the Indonesian Renal Registry (IRR). However, the utilization of data submitted to the IRR remains limited, as the system does not provide immediate feedback to the contributing hemodialysis units. Consequently, healthcare providers are unable to fully leverage this information to improve service quality (Nisak et al., 2024).

Renalmu.com , a data integration system implemented in Indonesian hemodialysis units, transforms Indonesian Renal Registry (IRR) data into real-time quality indicators, enabling objective measurement of service quality and supporting data-driven decisions to enhance patient care. The platform automates quality output, streamlines audits and reporting processes, and significantly reduces administrative burden (Reyana, Kautish, & Gupta, 2021; Vasanthakumar et al., 2024). By facilitating performance assessment, benchmarking, and continuous improvement, *Renalmu.com* addresses local healthcare needs while integrating seamlessly with the IRR. The system also identifies key factors influencing patient quality of life, empowering healthcare providers to implement proactive interventions. This fusion of technology and data analytics is transforming the operational landscape of hemodialysis units in Indonesia (Huang, 2019; Shutov, Bolshakov, & Kotlyarova, 2023; Tsakiridis et al., 2023).

In response to the growing need for information systems that enhance efficiency and service quality in hemodialysis units, the Task-Technology Fit (TTF) framework becomes particularly relevant. According to Goodhue and Thompson (1995), an individual's performance in using an information technology system is influenced by how well the technology aligns with the characteristics of the tasks to be performed. The TTF model evaluates whether applications like *Renalmu.com* effectively support hemodialysis-related tasks by considering factors such as task complexity, interdependence, and informational requirements, alongside technological attributes like reliability and ease of use. Individual characteristics, including user knowledge, technological proficiency, and personal preferences, also play a role in refining the TTF model (Chen, 2024; Goodhue & Thompson, 1995). While the TTF framework has been widely applied across various healthcare information systems, most existing research has focused on broad implementations such as electronic health records,

telemedicine platforms, and general hospital information systems. These studies typically emphasize the alignment between technological capabilities and healthcare tasks, often highlighting the influence of TTF on system adoption, clinical efficiency, and user satisfaction (Dishaw & Strong, 1999; Goodhue & Thompson, 1995). However, there remains a notable gap in research exploring TTF within specialized clinical platforms designed for registry-based environments, such as *Renalmu.com,* which is specifically tailored to optimize the use of the Indonesian Renal Registry (IRR) in hemodialysis units.

The perspectives of end-user dialysis unit staff and clinicians regarding the specific alignment between *Renalmu.com*'s features and their day-to-day operational needs remain largely underexplored. Addressing this gap, the present research aims to contribute to the literature by conducting a comparative analysis of the Task-Technology Fit (TTF) of *Renalmu.com* relative to other information systems employed in hemodialysis services. By investigating how *Renalmu.com* responds to the distinct and evolving requirements of dialysis units, this study seeks to provide new insights into the role of specialized digital platforms in advancing clinical excellence, supporting regulatory compliance, and enabling continuous quality improvement within the framework of national health registriesask-Technology Fit (TTF) occurs when there is a strong alignment between the technology employed and the tasks performed, resulting in enhanced performance, productivity, and user satisfaction (Alhendawi, 2022; Chavarnakul et al., 2024). Evaluating the compatibility between technological capabilities, task complexity, and operational demands is essential for the efficient and effective use of technology in clinical settings. A high degree of fit contributes to improved work efficiency, greater data accuracy, and increased user satisfaction, whereas misalignment can impede both individual and organizational performance.

Therefore, applying the TTF framework to assess systems like *Renalmu.com* is vital to ensure that the technology adequately supports the operational and clinical needs of hemodialysis units. Although numerous studies have examined hospital information systems, research specifically utilizing the TTF framework to compare technology applications in hemodialysis services across different hospitals remains limited. This study aims to provide a comprehensive understanding of how *Renalmu.com* is integrated into clinical workflows and to evaluate its impact on the efficiency and quality of hemodialysis services. By applying the TTF model, we seek to determine whether the application's features align with the specific tasks involved in hemodialysis treatment. Additionally, a comparative analysis of two hospitals will help identify best practices and implementation challenges, offering valuable insights for future advancements in digital health solutions.

METHODS

This study employs a quantitative comparative research design using a cross-sectional approach. The sampling method applied is total sampling, in which all individuals who use the *Renalmu.com* application at two Islamic hospitals, Islamic Sidoarjo Hospital (referred to as Hospital 1) and Islamic Bojonegoro Hospital (referred to as Hospital 2), including nurses and IRR administrators, are included as study participants.

Total sampling was chosen due to the limited number of eligible participants within the hemodialysis units, making it necessary to include all available subjects to achieve an adequate sample size. To minimize potential bias, the study ensured that all individuals meeting the inclusion criteria during the study period were enrolled without selective exclusion. Standardized procedures were consistently applied throughout the data collection process to maintain uniformity and reliability across both hospital sitesThe inclusion criteria for this study are as follows: (1) the hemodialysis (HD) unit must have been operational for a minimum of three months, and (2) the individual responsible for managing the Indonesian Renal Registry (IRR) must have at least three months of experience as an IRR operator. These criteria are designed to ensure that participants possess sufficient experience and familiarity with the *Renalmu.com* application to provide reliable and informed responses. The exclusion criteria include HD units that have never completed the IRR entry for variable RU 4, thereby ensuring that only units actively utilizing the application are included in the analysis. This approach enhances the accuracy of the assessment regarding the application's impact on the effectiveness of hemodialysis services.

A total of 30 respondents will be selected from the two hospitals. This study employs a total sampling technique, whereby all accessible members of the defined population are included (N = 30). This method is particularly suitable when the population is relatively small and clearly delineated, allowing for comprehensive representation without introducing sampling bias. Despite the moderate sample size, the use of total sampling, combined with the anticipated effect size, supports the adequacy of the sample for generating meaningful statistical inferences (Cohen, 2013).

Data were collected using a structured questionnaire comprising 47 items, each measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was organized into three main indicator groups: task characteristics, technology characteristics, and task-technology fit. The task characteristics section evaluated aspects such as task complexity, variability, and interdependence as experienced by healthcare workers. The

technology characteristics section assessed elements including site graphics, site attractiveness, and site interactivity.

The task-technology fit section measured eight key indicators: data quality, data locability, authorization, data compatibility, product timeliness, reliability, ease of use, and relationship with users. To assess the normality of the data, the Shapiro–Wilk test was applied to each variable across both hospitals. The results revealed that most variables did not follow a normal distribution, as indicated by p-values less than 0.05. Given the violation of the normality assumption and the relatively small sample size (n = 15 per group), the Mann–Whitney U test was selected to compare the two independent groups. As a nonparametric alternative, the Mann–Whitney U test does not require normally distributed data, making it a suitable choice for this analysisThe data analysis involved comparing variables using the Mann–Whitney U test. This statistical method is appropriate for evaluating differences between two independent groups when the data are not normally distributed or when sample sizes are small (Field, 2013). Group comparisons between the two hospitals were conducted using the Mann–Whitney U test due to the violation of normality assumptions (see Table 1) and the limited sample size ($n \leq 15$ per group). The research will be conducted from September 2024 to March 2025, allowing sufficient time for data collection and analysis.

RESULTS

Normality testing was performed using the Shapiro–Wilk test for each variable across both hospitals. The results showed that the majority of variables had p-values less than 0.05, indicating that the data were not normally distributed in most cases. Consequently, the assumption of normality was deemed unmet for the majority of variables. Based on these findings, the Mann–Whitney U test was selected for subsequent group comparisons, as it is a nonparametric statistical method well-suited for analysing data that do not conform to a normal distribution (White, 2020).

Table 1. Normality test results for TTF variables using the Shapiro-Wilk test

Variable	Hospital	Statistic	df	Sig.
TTF_data localibility	Hospital 1	0.887	15	0.061
	Hospital 2	0.567	15	<.001
TTF_authent	Hospital 1	0.614	15	<.001
	Hospital 2	0.718	15	<.001
TTF_data compatibility	Hospital 1	0.885	15	0.055
	Hospital 2	0.83	15	0.009
TTF_timelines	Hospital 1	0.799	15	0.004
	Hospital 2	0.743	15	<.001
TTF_realibility	Hospital 1	0.879	15	0.047

Variable	Hospital	Statistic	df	Sig.
	Hospital 2	0.885	15	0.057
TTF_EOU	Hospital 1	0.807	15	0.005
	Hospital 2	0.765	15	0.001
TTF_IS	Hospital 1	0.813	15	0.005
	Hospital 2	0.847	15	0.016

The study's findings reveal that descriptive statistics offer a comprehensive overview of the distribution, central tendency, and variability of the variables used to analyze Task-Technology Fit (TTF) and technology characteristics related to the *Renalmu.com* application in two hospital settings. These statistics provide insight into overall data trends, illustrating patterns of alignment between the application's features and the specific tasks associated with hemodialysis care at Hospital 1 and Hospital 2. The following section presents the descriptive results for the key variables assessed in this study (see Table 2)

Table 2. Descriptive Result

Dimension Variable		N	Mean	Std. Deviation	Minimum	Maximum
Task Characteristic	Task Characteristic Non-Routine	30	7.200	1.324	4.00	10.00
	Task characteristic interdependence	30	8.633	1.217	6.00	10.00
Technology Characteristic	Site Graphic Attractiveness	30	12.200	1.627	9.00	15.00
	Site Privacy and Security	30	11.967	1.586	9.00	15.00
	Site Interactivity	30	7.833	0.950	6.00	10.00
Task Technology Fit	TTF Data Quality	30	25.000	3.424	14.00	30.00
	TTF Data Locability	30	15.800	1.690	11.00	20.00
	TTF Authorization	30	6.000	.9097	3.00	8.00
	TTF Data Compatibility	30	8.333	2.564	3.00	15.00
	TTF Product Timelines	30	7.800	1.297	4.00	10.00
	TTF Reliability	30	9.000	2.890	5.00	15.00
	TTF Ease of Use	30	15.900	2.057	11.00	20.00
	TTF Relationship with Users	30	40.200	4.240	33.00	50.00

Based on Table 2, the mean values for Task Characteristic Non-Routine and Task Characteristic Interdependence are 7.20 and 8.63, respectively. The mean scores for Site Graphic Attractiveness and Site Privacy and Security are 12.20 and 11.97, respectively. These results indicate that both hospitals rated the graphic design and privacy/security features of *Renalmu.com* favourably, reflecting a positive perception of the application's visual appeal and data protection capabilities.

The mean score for TTF Data Quality is 25.00, with a standard deviation of 3.42, indicating generally high ratings across both hospitals. The score range (14–30) reflects varying

perceptions of data quality, with some users expressing concerns while others report high satisfaction. Despite this variability, the overall rating suggests that both hospitals consider *Renalmu.com* effective in delivering high-quality data for clinical use, particularly in hemodialysis treatment.

The TTF Data Locability sub-variable has a mean score of 15.80 and a standard deviation of 1.69, indicating positive perceptions of data accessibility within the application. The score range (11–20) suggests that most users find the application's data easily accessible, which is essential for timely and accurate delivery of hemodialysis treatment information. The consistency in ratings further supports the application's strong performance in this area.

For TTF Authorization, the mean score is 6.00 with a standard deviation of 0.91, pointing to concerns regarding authorization features possibly related to user access or permission settings within the system. Although responses are relatively consistent, the lower mean score may reflect challenges or frustrations with access control, potentially limiting full utilization of the application. The mean score for TTF Data Compatibility is 8.33, with a standard deviation of 2.56, indicating moderate ratings and notable variability. The score range (3–15) suggests differences in how well the application integrates with other systems, highlighting potential technical challenges in achieving seamless data exchange across platforms. The TTF Product Timeliness sub-variable (mean = 7.80, SD = 1.30) reflects generally positive feedback, though it suggests room for improvement. Some users reported delays that may impact clinical decision-making. The TTF Reliability score (mean = 9.00, SD = 2.89) indicates overall reliability, but also reveals considerable variation in user experience. While some users find the application dependable, others encounter technical issues that affect performance. The TTF Ease of Use sub-variable (mean = 15.90, SD = 2.06) received high ratings, suggesting that the application is user-friendly and accessible. Although a few users may face operational challenges, the overall feedback indicates that *Renalmu.com* is easy to navigate and operate. The TTF Relationship with Users score (mean = 40.20, SD = 4.24) demonstrates strong user engagement and satisfaction. Scores ranging from 33 to 50 suggest that users perceive the application as effective in supporting hemodialysis care, reflecting positive interactions and overall satisfaction among healthcare professionals. Table 2 shows that a high standard deviation (SD) in several variables reflects substantial variability in participants' responses, rather than errors in statistical testing or inaccuracies in the data. For example, constructs such as TTF Data Quality, Data Compatibility, and System Reliability exhibit high SDs due to wide score ranges, indicating differing user perceptions and experiences. These variations may arise from heterogeneous task requirements, diverse user

backgrounds, or inconsistent system performance across different contexts. Additionally, variables measured on broader scales, such as TTF Relationship with Users, naturally produce greater dispersion. The elevated SDs are therefore a valid reflection of real-world differences, not artifacts of flawed methodology. This underscores the importance of system customization and user segmentation to improve the alignment between technological features and user needs.

Table 3. Wilcoxon Mann-Whitney Statistic Result

Variable	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	*Exact Sig. [2(1-tailed Sig.)]**
Task Characteristic Non Routine	76.00	196.00	-1.56	0.12	0.14
Task characteristic interdependence	71.00	191.00	-1.79	0.07	0.09
Site Graphic Attractiveness	88.50	208.50	-1.10	0.27	0.33
Site Privacy And Security	75.00	195.00	-1.72	0.09	0.13
Site Interactivity	88.50	208.50	-1.13	0.26	0.33
TTF Data Quality	56.50	176.50	-2.50	0.01	0.02
TTF Data Locability	94.50	214.50	-0.82	0.41	0.46
TTF Authorization	105.00	225.00	-0.42	0.68	0.78
TTF Data Compatibility	103.00	223.00	-0.40	0.69	0.71
TTF Product Timelines	96.00	216.00	-0.80	0.43	0.51
TTF Realibility	92.00	212.00	-0.87	0.39	0.41
TTF Ease Of Use	103.50	223.50	-0.40	0.69	0.71
TTF Relationship with Users	88.00	208.00	-1.06	0.29	0.33

The Mann–Whitney U test was used to compare the two hospitals in terms of Task-Technology Fit (TTF) and the technology characteristics of the *Renalmu.com* application. For Task Characteristic Non-Routine, the U-value is 76.000 with a p-value of 0.120. Since the p-value exceeds the 0.05 threshold, there is no statistically significant difference between the two hospitals regarding non-routine task characteristics. This indicates that both hospitals have similar experiences in managing non-routine tasks related to hemodialysis care. For Task Characteristic Interdependence, the U-value is 71.000 with a p-value of 0.073. Although this p-value is relatively close to the significance threshold, it remains above 0.05 and is therefore not statistically significant. This suggests that there is no meaningful difference between the two hospitals in terms of task interdependence within the hemodialysis treatment process.

For Site Graphic Attractiveness, the U-value is 88.500 with a p-value of 0.270. Since the p-value is greater than 0.05, there is no statistically significant difference between the two hospitals in their assessment of the application's visual appeal, indicating that both hospitals perceive the graphic design similarly.

For Site Privacy and Security, the U-value is 75.000 with a p-value of 0.085. Although this p-value is relatively close to the 0.05 threshold, it remains statistically non-significant,

suggesting that both hospitals evaluate the application's privacy and security features in a comparable manner.

For Site Interactivity, the U-value is 88.500 with a p-value of 0.259. As this p-value exceeds 0.05, there is no significant difference between the two hospitals regarding user interaction with the application, indicating similar experiences in engaging with *Renalmu.com*.

The results for TTF Data Quality indicate a statistically significant difference between Hospital 1 and Hospital 2, with a U-value of 56.500 and a p-value of 0.013. Since the p-value is less than 0.05, Hospital 1 rated data quality higher, which likely reflects more effective utilization of the application's data for clinical decision-making in hemodialysis treatment.

In contrast, TTF Data Locability shows no significant difference, with a U-value of 94.500 and a p-value of 0.414. This suggests that both hospitals have similar experiences regarding data accessibility within the application.

Similarly, TTF Authorization yields a U-value of 105.000 and a p-value of 0.675, indicating no significant difference between the two hospitals. This result suggests that both institutions have comparable experiences related to user access and permission settings within *Renalmu.com*.

For TTF Data Compatibility, the U-value is 103.000 and the p-value is 0.689, indicating no statistically significant difference between the hospitals. This suggests that both institutions experience similar levels of data compatibility when integrating the application with other systems. Similarly, TTF Product Timeliness yields a U-value of 96.000 and a p-value of 0.427, showing no significant difference, which implies that both hospitals receive timely data and information from the application.

The results for TTF Reliability also indicate no significant difference, with a U-value of 92.000 and a p-value of 0.386, suggesting comparable experiences in terms of system reliability and stability. For TTF Ease of Use, the U-value is 103.500 and the p-value is 0.689, again showing no significant difference between the hospitals regarding the application's user-friendliness.

Finally, TTF Relationship with Users presents a U-value of 88.000 and a p-value of 0.288, indicating that both hospitals perceive the application as fostering a similar level of user engagement and interaction.

These findings suggest that, aside from the significant difference observed in TTF Data Quality, the remaining Task-Technology Fit dimensions do not differ significantly between the two hospitals. This points to broadly similar user experiences across key functional areas of the *Renalmu.com* application.

DISCUSSION

The descriptive statistics and Mann–Whitney U test results offer valuable insights into how the *Renalmu.com* application aligns with the operational and clinical needs of hemodialysis care in two distinct hospital settings. Descriptively, the data show that both Hospital 1 and Hospital 2 rated key features of the application, such as Site Graphic Attractiveness and Site Privacy and Security, similarly, with mean scores of 12.20 and 11.97, respectively. These scores suggest comparable evaluations of the application's design and security features across both institutions. Additionally, both hospitals reported similar experiences with Site Interactivity, reflected in a mean score of 7.83.

These findings underscore the potential of *Renalmu.com* to support hemodialysis care effectively across diverse hospital environments. This aligns with previous studies indicating that healthcare professionals responded positively to applications designed to support dietary adherence among hemodialysis patients, praising their content and purpose while offering constructive suggestions for improvement (Singh et al., 2019; Yusoff, Ruhaiyem, & Zakaria, 2021).

However, significant differences emerged in the TTF Data Quality dimension. Hospital 1 rated the data quality provided by the application significantly higher, with a mean score of 25.00, compared to the lower rating observed at Hospital 2. The Mann–Whitney U test confirmed this finding, yielding a U-value of 56.500 and a p-value of 0.013, indicating a statistically significant difference in perceived data quality between the two hospitals. This suggests that Hospital 1 may be more effective in utilizing the application's data for clinical decision-making, potentially reflecting differences in how well the application has been integrated into clinical workflows or the level of familiarity with the system.

These findings align with previous research indicating that integrating data into clinical decision-making processes presents a multifaceted challenge, requiring the effective use of electronic health records (EHRs), clinical decision support systems (CDSS), and other health information technologies. The degree to which a hospital successfully incorporates these systems into its clinical workflows can significantly impact the quality of care and decision-making efficiency. This integration is shaped by several factors, including the hospital’s familiarity with the systems, the extent of health IT adoption, and structural and organizational characteristics. In contrast, the other Task-Technology Fit (TTF) dimensions, including Data Locability, Authorization, Data Compatibility, Product Timeliness, Reliability, Ease of Use, and Relationship with Users, showed no statistically significant differences between the two hospitals. The Mann–Whitney U test results for these dimensions yielded p-values greater than

0.05, indicating that Hospital 1 and Hospital 2 share similar experiences with these aspects of the *Renalmu.com* application.

These findings suggest that while both hospitals report comparable satisfaction with the application's usability, timeliness, and integration with other systems, differences remain in their perception and utilization of the system's data quality. This disparity may be attributed to variations in staff training, technological infrastructure, or the rate at which each hospital has adopted the application.

This observation is consistent with previous studies that have identified gaps in the perception and utilization of data quality between hospitals, even when satisfaction with usability, timeliness, and system integration is comparable. Such differences are often influenced by factors including training quality, IT infrastructure, and organizational readiness for technology adoption—all of which shape how hospital staff engage with and leverage the system's data capabilities (Buyantur, Tumurchudur, Ochirbat, & Mashlai, 2023; Guetibi, Hammoumi, & Brito, 2024).

The results underscore the importance of data quality as a critical factor in the success of digital health solutions, particularly in supporting informed decision-making in hemodialysis care. The similarity in experiences across most other Task-Technology Fit dimensions highlights the overall efficacy of the *Renalmu.com* application in facilitating hemodialysis treatment. However, the observed disparities in data quality point to opportunities for targeted improvements, especially in data management and utilization, to enhance the application's performance across both hospital settings.

This finding aligns with previous research emphasizing the need to improve data quality in hospital environments to optimize the performance of healthcare applications. Variations in data quality can significantly affect the reliability and effectiveness of hospital information systems (HIS), which are essential for managing daily operations, conducting statistical analyses, and supporting clinical decision-making. Addressing these disparities through focused enhancements in data governance and utilization can lead to more consistent and effective application performance across diverse hospital contexts. The following sections will explore key strategies for improving data quality in hospital settings (Floroian, 2022; Gehrmann & Beyan, 2024; Varela et al., 2024).

CONCLUSION

The Mann–Whitney U test results indicate that Hospital 1 and Hospital 2 share similar experiences with the *Renalmu.com* application, particularly regarding task and technology characteristics such as site interactivity, graphical appearance, and privacy/security. However, Hospital 1 rated data quality significantly higher than Hospital 2. The remaining Task-Technology Fit sub-variables showed no statistically significant differences between the two hospitals. These findings suggest that, while certain areas, such as data quality, may benefit from targeted improvements, the application generally supports the operational and clinical needs of both hospitals in delivering hemodialysis care.

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REFERENCES

Alhendawi, K. M. (2022). Task-technology fit model: Modelling and assessing the nurses' satisfaction with health information system using AI prediction models. *International Journal of Healthcare Management*, 1–13. doi: 10.1080/20479700.2022.2136881

Buyantur, O., Tumurchudur, S., Ochirbat, M., & Mashlai, Z. (2023). Role of Training in The Successful Implementation of Hospital Information Systems. *Embedded Selforganising Systems*. doi: 10.14464/ess.v10i7.659

Canaud, B., Davenport, A., Leray-Moragues, H., Morena-Carrere, M., Cristol, J. P., Kooman, J., & Kotanko, P. (2024). Digital Health Support: Current Status and Future Development for Enhancing Dialysis Patient Care and Empowering Patients. *Toxins*, *16*(5), 211. doi: 10.3390/toxins16050211

Chavarnakul, T., Lin, Y.-C., Khan, A., & Chen, S.-C. (2024). Exploring the Determinants and Consequences of Task-Technology Fit: A Meta-Analytic Structural Equation Modeling Perspective. *Emerging Science Journal*, *8*(1), 77–94. doi: 10.28991/ESJ-2024-08-01-06

Cohen, J. (2013). *Statistical Power Analysis for the Behavioral Sciences*. Routledge.

Dishaw, M. T., & Strong, D. M. (1999). Extending the technology acceptance model with task–technology fit constructs. *Information & Management*, *36*(1), 9–21. doi: 10.1016/S0378-7206(98)00101-3

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. SAGE Publications. Retrieved from https://books.google.co.id/books?id=srb0a9fmMEoC

Floroian, L. (2022). Aplicație pentru managementul datelor într-un spital intelligent | [Data management application in a smart hospital]. *Jurnal Medical Braşovean*, 59–65. doi: 10.31926/jmb.2021.2.5

Gehrmann, J., & Beyan, O. (2024). Data Quality in Medical Real-World Data—An Oncological Use Case. *Studies in Health Technology and Informatics*, *316*, 9–13. doi: 10.3233/shti240332

Goodhue, D. L., & Thompson, R. L. (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly*, *19*(2), 213–236. doi: 10.2307/249689

Guetibi, S., Hammoumi, M. E., & Brito, A. C. (2024). *Three dimensions' comparison of two hospital centres: Usefulness, ease of use and functional analyses of the information system*. doi: 10.21203/rs.3.rs-3866720/v1

Huang, L. (2019). *Hemodialysis data information monitoring system*.

Khedekar, L., Mohite, A. D., Kamat, A. M., Topugol, A. A., Atale, P. D., & Asniyekar, P. S. (2024, November 15). *Innovating Healthcare: Developing a Comprehensive Patient Record Tracker System for Enhanced Medical Data Management and Patient Care* [SSRN Scholarly Paper]. Rochester, NY: Social Science Research Network. doi: 10.2139/ssrn.5086771

Laurier, N., Robert, J.-T., Tom, A., McKinnon, J., Filteau, N., Horowitz, L., … Trinh, E. (2025). Optimizing use of an electronic medical record system for quality improvement initiatives in hemodialysis: Review of a single center experience. *Hemodialysis International*, *29*(1), 74–82. doi: 10.1111/hdi.13178

Reyana, A., Kautish, S., & Gupta, Y. (2021). Chapter 6—Emergence of decision support systems in healthcare. In P. N, S. Kautish, & S.-L. Peng (Eds.), *Demystifying Big Data, Machine Learning, and Deep Learning for Healthcare Analytics* (pp. 109–128). Academic Press. doi: 10.1016/B978-0-12-821633-0.00004-0

Shutov, E., Bolshakov, S. V., & Kotlyarova, G. (2023). #4747 the application of modern medical information systems with artificial intelligence elements for personalized treatment of patients on hemodialysis. *Nephrology Dialysis Transplantation*, *38*(Supplement_1). doi: 10.1093/ndt/gfad063c_4747

Singh, K. (2021). Mobile Health in Dialysis: The Best Engagement Medium Is the One that's with Patients. *Clinical Journal of the American Society of Nephrology : CJASN*, *16*(1), 12–13. doi: 10.2215/CJN.18051120

Singh, K., Diamantidis, C. J., Ramani, S., Bhavsar, N. A., Mara, P., Warner, J., … Wright-Nunes, J. (2019). Patients' and Nephrologists' Evaluation of Patient-Facing Smartphone Apps for CKD. *Clinical Journal of the American Society of Nephrology*, *14*(4), 523. doi: 10.2215/CJN.10370818

Taj, A., Razzaq, T., Azeem, M. S., Bangash, S. A., Mazhar, T., & Ahmed, N. (2024). *Impact of artificial intelligence on clinical decision support systems in hospital settings*. *2*(2 (Health&Rehab)), 255–259. doi: 10.71000/ijhr202

Tsakiridis, D., Vasiliadis, A., & Tsakiridis, Y. (2023). Implementation of a System for the Real-Time Recording of Patient Medical Data both Within and Outside the Hemodialysis Unit. *2023 14th International Conference on Information, Intelligence, Systems & Applications (IISA)*, 1–6. doi: 10.1109/IISA59645.2023.10345913

Nisak, U. K., Cholifah, & Kautsar, I. A. (2024). Peran Teknologi pada Mutu Pelayanan Kesehatan. Jawa Timur :PT Literasi Nusantara Abadi Grup. https://penerbitlitnus.co.id/portfolio/peran-teknologi-pada-mutu-pelayanan-kesehatan/

Varela, L. O., Sandhu, N., Walker, R. L., Southern, D., Quan, H., & Eastwood, C. (2024). Development of Data Quality Indicators for Improving Hospital International Classification of Diseases–coded Health Data Quality Globally. *Medical Care*. doi: 10.1097/mlr.0000000000002024

Vasanthakumar, G. U., Dankan Gowda, V., Manage, P. S., Prasad, K. D. V., Hariram, V., Vasanthakumar, G. U., … Hariram, V. (2024). Electronic Health Records (EHR) and Clinical Decision Support Systems: Integrating AI Solutions [Chapter]. doi: 10.4018/979-8-3693-0807-3.ch013

White, S. (2020). *Calculating and Reporting Healthcare Statistics*. AHIMA Press.

Xu, J., Guo, S., Yu, X., & Ji, X. (2024, November 26). *Willingness and influencing factors of maintenance hemodialysis patients to use mobile healthcare apps: A cross-sectional study*. Research Square. doi: 10.21203/rs.3.rs-5309337/v1

Yonata, A., Islamy, N., Taruna, A., & Pura, L. (2022). Factors Affecting Quality of Life in Hemodialysis Patients. *International Journal of General Medicine*, *15*, 7173–7178. doi: 10.2147/IJGM.S375994

Yuliawati, A. N., Ratnasari, P. M. D., & Maharani, N. L. P. S. (2023). Quality of Life in End-Stage Renal Disease Patients Undergoing Hemodialysis and Its Affecting Factors in a Hemodialysis Unit of General Hospital Denpasar. *Borneo Journal of Pharmacy*, *6*(3), 320–329. doi: 10.33084/bjop.v6i3.3907

Yusoff, H., Ruhaiyem, N. I. R., & Zakaria, M. H. (2021). SMARTS D4D Application Module for Dietary Adherence Self-monitoring Among Hemodialysis Patients. In F. Saeed, F. Mohammed, & A. Al-Nahari (Eds.), *Innovative Systems for Intelligent Health Informatics* (pp. 52–60). Cham: Springer International Publishing.