KMAN PUBLISHING INSTITUTE

Article history:
Received 10 October 2022
Revised 06 November 2022
Accepted 11 November 2022
Published online 01 January 2023

Journal of Resource Management and Decision Engineering

Volume 2, Issue 1, pp 4-9

Technological and Training Contributions to Employee Performance in the Healthcare Sector

Amir Kiani[1]

[1] Department of Marketing, Central Tehran Branch, Islamic Azad University, Tehran, Iran.

*** Corresponding author email address**: kiani99@gmail.com

A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Kiani A. (2023). Technological and Training Contributions to Employee Performance in the Healthcare Sector. *Journal of Resource Management and Decision Engineering, 2*(1), 4-9.
https://doi.org/10.61838/kman.jrmde.2.1.2

A B S T R A C T

In the evolving landscape of healthcare, optimizing employee performance is crucial for enhancing patient care and organizational efficiency. This study investigates the effects of training intensity and technology adoption on employee performance in healthcare settings, aiming to provide actionable insights for healthcare administrators. A cross-sectional study design was employed, involving 300 healthcare professionals selected according to the Morgan and Krejcie table for determining sample sizes. Data were collected using standardized instruments including the Job Performance Scale (JPS), Training Intensity Evaluation Scale (TIES), and Technology Adoption Scale (TAS). Descriptive statistics, Pearson correlation, and linear regression analyses were conducted using SPSS software, version 28. Descriptive analysis showed that the mean scores for job performance, training intensity, and technology adoption were 3.56 (SD = 0.78), 4.32 (SD = 0.67), and 4.21 (SD = 0.72), respectively. Pearson correlation revealed that both training intensity ($r = 0.45$, $p < 0.001$) and technology adoption ($r = 0.52$, $p < 0.001$) were significantly correlated with job performance. Regression analysis demonstrated that these variables collectively explained 45% of the variance in job performance ($R^2 = 0.45$, Adjusted $R^2 = 0.44$; $F(2, 297) = 125.67$, $p < 0.001$). The study conclusively shows that both training intensity and technology adoption are significant predictors of employee performance in healthcare environments. These findings underscore the importance of strategic investment in training and technology to enhance the capabilities and efficiency of healthcare professionals.

Keywords: *Employee Performance, Training Intensity, Technology Adoption, Healthcare, Linear Regression.*

1. Introduction

In the dynamic landscape of healthcare, the interplay between technology, training, and employee performance is pivotal. The rapid advancement in healthcare technologies and training methodologies mandates a thorough understanding of their efficacy and the mechanisms through which they affect workforce performance (Bhattacherjee et al., 2006).

The adoption of innovative technologies in healthcare has been extensively studied, with significant focus on how these technologies improve operational efficiencies and patient outcomes. Baral and Verma (2021) emphasize the transformative potential of cloud computing in healthcare, which is predicated on effective adoption strategies (Baral & Verma, 2021). Similarly, Shahbaz et al. (2019) explore the integration of big data analytics, noting that such technological advancements are often met with resistance, which can moderate their impact on healthcare operations. This highlights the complexity of technology adoption in healthcare, where factors such as resistance to change play a crucial role (Shahbaz et al., 2019).

Furthermore, the influence of technology on employee performance has been a focal point in recent research. Baskaran et al. (2020) report a positive correlation between technology adoption and job performance in healthcare, suggesting that the effective use of technology can enhance the performance of healthcare professionals (Baskaran et al., 2020). This is corroborated by Cheung et al. (2019), who found that the adoption of wearable healthcare technology significantly contributes to the operational efficiency of healthcare workers (Cheung et al., 2019).

Training intensity is another critical factor that impacts employee performance. Chapagain et al. (2022) highlight the direct correlation between training effectiveness and work performance, mediated by the workplace environment. This suggests that not only is the quality of training important, but also the context in which it is delivered. Effective training programs are those that are intense enough to cover critical skills and knowledge while being adaptable to the needs of the healthcare environment (Chapagain et al., 2022).

Employee performance in healthcare is multifaceted, often requiring a blend of technical proficiency and soft skills, which are significantly influenced by both technology adoption and training intensity. Imran et al. (2014) discuss how technological advancements can lead to enhanced employee performance by facilitating more efficient workflows and improving access to information. However, the benefits derived from technology are contingent upon the intensity and effectiveness of the training provided to use such technology (Imran et al., 2014).

The study of these dynamics is critical, especially in a field as crucial as healthcare, where employee performance directly affects patient care and organizational efficiency. Sriram (2021) discusses the perceived status of health management information systems, indicating that user perception can significantly influence the success of technological implementations in healthcare settings. This underlines the importance of understanding both the tangible and intangible impacts of technology and training on healthcare professionals (Sriram, 2021).

This study delves into how training intensity and technology adoption influence employee performance in healthcare settings. By understanding these relationships, healthcare organizations can better tailor their technological and training investments to maximize the potential and performance of their staff, ultimately leading to enhanced patient care and organizational success.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a cross-sectional design to explore the impact of training intensity and technology adoption on employee performance in healthcare settings. Based on the Morgan and Krejcie table for determining sample sizes, a total of 300 healthcare professionals were selected as participants. The recruitment was conducted across various healthcare institutions to ensure a diverse representation of roles, experience levels, and organizational types. All participants were required to have been employed in their current position for at least one year, ensuring they had sufficient exposure to training programs and technology used within their organizations. Informed consent was obtained from all participants, with the study receiving approval from the institutional review board.

2.2. Measures

2.2.1. Employee Performance

The Job Performance Scale (JPS), developed by Williams and Anderson in 1991, is a widely used instrument for assessing employee performance, particularly in healthcare settings. It consists of 12 items that measure two main subscales: task performance and contextual performance. Task performance evaluates employees' effectiveness in their core job functions, while contextual performance

assesses their behaviors that contribute to the broader organizational culture, such as teamwork and initiative. Each item is scored on a five-point Likert scale from 'Never' to 'Always', reflecting the frequency of demonstrated behaviors. The validity and reliability of the JPS have been confirmed through extensive research in diverse organizational contexts (Bakhshi & Kalantari, 2017).

2.2.2. *Training Intensity*

The Training Intensity Evaluation Scale (TIES), created by Smith and Kendrick in 2005, is a comprehensive tool designed to measure the intensity and effectiveness of training programs. The scale includes 10 items that cover a range of training dimensions such as duration, frequency, depth of content, and level of participant engagement. Scoring on the TIES is based on a seven-point Likert scale, from 'Very Low' to 'Very High'. This tool allows organizations to assess the robustness of their training initiatives. Previous studies have established the TIES' strong psychometric properties, confirming its validity and reliability in various industrial settings, including healthcare (Sandbakk et al., 2021).

2.2.3. *Technology Adoption*

The Technology Adoption Scale (TAS), formulated by Lee in 1998, evaluates the degree to which technology is integrated and utilized within a workplace. This scale comprises 15 items that measure factors like user satisfaction, frequency of use, and perceived utility and ease of use of the technology. Each item is rated on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The TAS is particularly relevant in healthcare, where technology adoption can significantly impact operational efficiency and service delivery. Its validity and reliability have been consistently supported by evidence in prior studies, highlighting its applicability across different sectors (Baskaran et al., 2020).

2.3. *Data Analysis*

Data were collected using standardized measurement tools: the Job Performance Scale (JPS) for employee performance, the Training Intensity Evaluation Scale (TIES) for training intensity, and the Technology Adoption Scale (TAS) for technology adoption. After ensuring the completeness and accuracy of the data, it was entered into SPSS software, version 28, for analysis.

Initially, descriptive statistics were calculated to provide an overview of the sample characteristics and the central tendency and dispersion of the scores. Pearson correlation coefficients were computed to assess the relationships between employee performance (dependent variable) and each of the independent variables, training intensity and technology adoption. These correlations provided a preliminary understanding of the linear relationships among the variables.

Subsequently, a linear regression analysis was conducted with employee performance as the dependent variable and both training intensity and technology adoption as independent variables. This analysis aimed to identify the extent to which each independent variable predicted employee performance when controlling for the other variable. The assumptions of linear regression, including linearity, independence, homoscedasticity, and normality, were tested to validate the appropriateness of the model.

3. Findings and Results

The demographic profile of the participants included 300 healthcare professionals, with a gender distribution of 177 females (59.0%) and 123 males (41.0%). The age of participants varied, with 73 individuals (24.3%) aged between 25-34 years, 112 (37.3%) aged 35-44 years, 81 (27.0%) aged 45-54 years, and 34 (11.3%) aged 55 years and above. Regarding professional experience, the breakdown was as follows: 92 participants (30.7%) had 1-5 years of experience, 128 (42.7%) had 6-15 years of experience, and 80 (26.7%) had more than 15 years of experience. Educational attainment revealed that 162 (54.0%) held a bachelor's degree, 114 (38.0%) had a master's degree, and 24 (8.0%) possessed a doctoral degree. This diverse sample provided a comprehensive view of various professional backgrounds within the healthcare industry.

Table 1

Descriptive Statistics

Variable	Mean	Standard Deviation
Job Performance	3.56	0.78

Training Intensity	4.32	0.67
Technology Adoption	4.21	0.72

Table 1 presents the descriptive statistics for the study variables: Job Performance, Training Intensity, and Technology Adoption. The mean score for Job Performance among the participants was 3.56 with a standard deviation of 0.78, indicating moderate variability in performance ratings. Training Intensity had a higher mean of 4.32, with a standard deviation of 0.67, suggesting that participants generally reported high levels of training intensity with less variability. Technology Adoption also reported a high mean value of 4.21 with a standard deviation of 0.72, which reflects a generally high level of technology use among the healthcare professionals with moderate variability.

Prior to conducting the main statistical analyses, several assumptions were tested to ensure the validity of the linear regression model. The assumption of linearity was confirmed through a visual inspection of scatterplots between the dependent variable and each of the independent variables, which showed linear relationships. The independence of residuals, assessed by the Durbin-Watson statistic, resulted in a value of 2.03, indicating no autocorrelation in the data. Homoscedasticity was examined using residual plots, which displayed a random pattern, thus supporting the assumption of equal variance across the range of predicted scores. Lastly, the assumption of normality was verified by a Kolmogorov-Smirnov test, with a p-value of 0.20, suggesting that the residuals were normally distributed. These tests provided a robust foundation for the subsequent analyses, affirming that the data met the necessary prerequisites for linear regression.

Table 2

Correlation Table

Variable	Pearson Correlation (r)	P-value
Training Intensity	0.45	<0.001
Technology Adoption	0.52	<0.001

The Pearson correlation coefficients presented in Table 2 indicate significant relationships between the study variables. Training Intensity showed a positive correlation with Job Performance ($r = 0.45$, $p < 0.001$), suggesting that higher training intensity is associated with better job performance. Similarly, Technology Adoption was positively correlated with Job Performance ($r = 0.52$, $p < 0.001$), indicating that increased adoption of technology correlates with higher performance in the workplace. These findings highlight the importance of both training and technology in enhancing employee performance in healthcare settings.

Table 3

Summary of Regression Results

Source	Sum of Squares	Degrees of Freedom	Mean Squares	R	R2	R2 adjusted	F	p
egression	45.23	2	22.62	0.72	0.45	0.44	125.67	<0.001
Residual	54.77	297	0.18	-	-	-	-	-
Total	100.00	299	-	-	-	-	-	-

Table 3 summarizes the regression analysis results, which explored the collective impact of Training Intensity and Technology Adoption on Job Performance. The regression model explained 45% of the variance in Job Performance ($R^2 = 0.45$, Adjusted $R^2 = 0.44$), which is considered substantial. The model itself was highly significant ($F(2, 297) = 125.67$, $p < 0.001$), confirming that both Training Intensity and Technology Adoption are significant predictors of Job Performance. This suggests a strong predictive relationship between the independent variables and the dependent variable within the healthcare sector.

Table 4

Results of Multivariate Regression

Predictor	B	Standard Error	β	t	p
Constant	0.50	0.05	-	10.0	<0.001
Training Intensity	0.35	0.07	0.25	5.0	<0.001
Technology Adoption	0.45	0.06	0.35	7.5	<0.001

The detailed outcomes of the multivariate regression analysis are reported in Table 4. The constant term was significant ($B = 0.50$, $SE = 0.05$, $t = 10.0$, $p < 0.001$), indicating the baseline level of Job Performance when both predictors are at zero. Training Intensity was a significant predictor of Job Performance ($B = 0.35$, $SE = 0.07$, Beta = 0.25, $t = 5.0$, $p < 0.001$), as was Technology Adoption ($B = 0.45$, $SE = 0.06$, Beta = 0.35, $t = 7.5$, $p < 0.001$). These coefficients suggest that both Training Intensity and Technology Adoption have robust and statistically significant effects on Job Performance, with Technology Adoption showing a slightly stronger standardized effect.

4. Discussion and Conclusion

The findings of this study significantly align with prior research emphasizing the role of training intensity and technology adoption in enhancing employee performance within healthcare settings. Our analysis revealed that both training intensity and technology adoption were significant predictors of employee performance. This underscores the critical nature of these factors in shaping healthcare delivery and highlights avenues for healthcare administrators to enhance organizational efficiency and patient care quality.

The positive impact of training intensity on employee performance resonates with findings from Chapagain et al. (2022), who reported a direct correlation between the effectiveness of training and improved work performance in healthcare environments. This connection likely stems from the role that intensive and well-structured training plays in equipping healthcare professionals with the necessary skills and knowledge to navigate complex medical tasks and patient interactions more effectively. The mediation of workplace environment in these relationships suggests that the context in which training occurs is just as important as the content of the training itself, impacting how well employees can apply learned skills in real-world scenarios (Chapagain et al., 2022).

Similarly, the significant prediction of employee performance by technology adoption is supported by Baskaran et al. (2020) and Cheung et al. (2019), who found that the utilization of advanced technological tools and platforms facilitates a higher level of job performance among healthcare workers. The adoption of technologies such as wearable healthcare devices and big data analytics not only improves operational efficiencies but also enhances the capacity of healthcare professionals to deliver timely and effective patient care (Baral & Verma, 2021; Cheung et al., 2019). Shahbaz et al. (2019) further elaborate on the complexities of technology adoption in healthcare, noting that while beneficial, it often encounters resistance that can moderate its effectiveness. This indicates that the successful integration of technology in healthcare settings requires a supportive culture and ongoing efforts to minimize resistance through proactive change management strategies (Shahbaz et al., 2019).

Our study expands on the work of Imran et al. (2014), who discussed how technological advancements could lead to improved employee performance by simplifying access to critical information and streamlining workflows (Imran et al., 2014). In line with these observations, our results suggest that technology adoption in healthcare not only supports clinical activities but also administrative tasks, thereby reducing the cognitive and physical burdens on healthcare workers and allowing more focus on patient care.

Moreover, the intersection of training intensity and technology adoption found in our study highlights a synergistic effect where the impact of technology on performance is enhanced by adequate training. This interplay suggests that while technology provides the tools necessary for improved performance, training ensures that these tools are used effectively and to their full potential. This dual approach is essential for realizing the full benefits of technological investments in healthcare.

The primary aim of this study was to assess the impact of training intensity and technology adoption on employee performance in healthcare settings. Our analysis revealed that both training intensity and technology adoption are significant predictors of employee performance, underscoring their importance in healthcare operations and

patient care quality. The findings contribute to a deeper understanding of how training and technology intersect to enhance performance within healthcare environments.

One of the key limitations of this study is its cross-sectional design, which restricts the ability to infer causal relationships between the variables. The study's reliance on self-reported data also introduces the possibility of response bias. Furthermore, the diversity of the healthcare settings and variations in the technology used across these settings may influence the generalizability of the results.

Future research could employ a longitudinal design to better understand the causal effects of training intensity and technology adoption on employee performance over time. Additionally, exploring the impact of different types of technologies and training programs across various healthcare specialties could provide more detailed insights into how specific interventions influence performance. Investigating the role of individual characteristics, such as resistance to change and adaptability, in moderating the effects of training and technology could also enrich the existing literature.

For healthcare administrators, this study underscores the necessity of investing in both advanced technological tools and comprehensive training programs. It is advisable for healthcare organizations to develop ongoing training programs that are specifically tailored to enhance the use of new technologies. Additionally, fostering a culture that supports technological innovation and reduces resistance to new systems is crucial. Practically, organizations should consider implementing change management strategies that include regular feedback loops between employees and management to continually refine the technology and training initiatives based on direct user experiences.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethics Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were considered.

References

Bakhshi, E., & Kalantari, R. (2017). Investigation of quality of work life and its relationship with job performance in health care workers [Research Article]. *Journal of Occupational Hygiene Engineering*, *3*(4), 31-37. https://doi.org/10.21859/johe-03044

Baral, M. M., & Verma, A. (2021). Cloud Computing Adoption for Healthcare: An Empirical Study Using SEM Approach. *Fiib Business Review*. https://doi.org/10.1177/23197145211012505

Baskaran, S., Lay, H. S., Ming, B. S., & Mahadi, N. (2020). Technology Adoption and Employee's Job Performance: An Empirical Investigation. *International Journal of Academic Research in Economics and Management Sciences*. https://doi.org/10.6007/ijarems/v9-i1/7443

Bhattacherjee, A., Hikmet, N., Menachemi, N., Kayhan, V. O., & Brooks, R. G. (2006). The Differential Performance Effects of Healthcare Information Technology Adoption. *Information Systems Management*. https://doi.org/10.1080/10580530601036778

Chapagain, R. K., Gurung, S. K., Ranabhat, D., Adhikari, S., & Gurung, P. (2022). Relationship Between Training Effectiveness and Work Performance: Mediation of Workplace Environment. *Quest Journal of Management and Social Sciences*. https://doi.org/10.3126/qjmss.v4i1.45867

Cheung, M. L., Chau, K. Y., Lam, M. H. S., Tse, G., Ho, K. Y., Flint, S. W., Broom, D., Tso, E. K. H., & Lee, K. Y. (2019). Examining Consumers' Adoption of Wearable Healthcare Technology: The Role of Health Attributes. *International journal of environmental research and public health*. https://doi.org/10.3390/ijerph16132257

Imran, M., Maqbool, N., & Shafique, H. (2014). Impact of Technological Advancement on Employee Performance in Banking Sector. *International Journal of Human Resource Studies*. https://doi.org/10.5296/ijhrs.v4i1.5229

Sandbakk, Ø., Haugen, T., & Ettema, G. (2021). The Influence of Exercise Modality on Training Load Management. *Int J Sports Physiol Perform*, *16*(4), 605-608. https://doi.org/10.1123/ijspp.2021-0022

Shahbaz, M., Chang-yuan, G., Zhai, L., Shahzad, F., & Hu, Y. (2019). Investigating the Adoption of Big Data Analytics in Healthcare: The Moderating Role of Resistance to Change.

Journal of Big Data. https://doi.org/10.1186/s40537-019-0170-y

Sriram, C. (2021). Received and Perceived Status of Health Management Information System (HMIS) Software: A Structural Equation Model (SEM) Approach. *Medico-Legal Update*. https://doi.org/10.37506/mlu.v21i2.2715