Investigating Impact of HR Analytics on Employee Performance in Health Care Industry

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Abstract

In the dynamic landscape of the healthcare industry, where human resources play a pivotal role in service delivery and meeting organizational goals, this study delves into the transformative influence of HR analytics on employee performance. Investigating the impact of data-driven HR strategies, the research study focuses on hospitals, clinics, and healthcare service providers. Through a study of the existing literature and real-world data, this study emphasizes the crucial role that HR analytics plays in understanding and influencing employee behavior, levels of engagement, and other variables impacting overall performance. In talent acquisition, retention, and performance management of employees in healthcare sector, the research highlights the value of predictive analytics using quantitative analysis, employee surveys, and qualitative interviews. In addition, the study also deliberates on issues like bias, data privacy, and ethical concerns. The results demonstrate the importance of using HR analytics for making well-informed decisions and improving worker engagement, performance, happiness, and thereby improved patient care.This study contributes to the body of existing knowledge in academia as well as providesactionable insights to practitioners in healthcare organizations about improving overall performance and efficiency of human resources.

Keywords: HR Analytics, Employee Performance, Health Care Industry, Hospitals, HRIS

Introduction

Data-driven decision-making is becoming increasingly important for firms in today's fast-paced, and volatile competitive corporate climate (Colombari et al., 2023; Karaboga et al., 2023). Human resource departments play a crucial role for an organization's successful performance, especially in sectors where human capital is the most valuable resource (Boudreau &Cascio, 2017; Fitz-enz, 2018). As one of the most important industries that impact people's lives, healthcare is

leading the way in this paradigm shift by using HR analytics to improve patient care as well as employee performance (Belizon and Kieran, 2022).

The healthcare sector has its own set of challenges, including employee turnover, differential patient needs, and strict regulatory obligations. In this regard, HR analytics can play a pivotal role in enabling healthcare organizations by using statistical techniques, data analysis and even AI to comprehend, evaluate, and enhance staff performance (Rajpurohit et al., 2020; Anand andAnand, 2021). Healthcare companies can make wise decisions regarding their employees and productivity by utilizing HR analytics, which can enhance patient outcomes, operational effectiveness, and overall organizational effectiveness(Gurusinghe et al. 2021; Yahia et al., 2021).In the healthcare industry, HR analytics extends beyond customary HR procedures. It entails the integration of data from multiple sources, such as operational data, performance measurements, employee input, and patient satisfaction surveys. Examining this enormous amount of data offers insightful knowledge on employee conduct, levels of engagement, and performance-related variables. Basis these insights, healthcare firms can modify their policies, design suitable training programs, and bring in practices to improve productivity, foster a healthy work environment, and raise employee morale (Huang et al., 2023; Madhani, 2023).

This research focuses on healthcare organizations, including hospitals, clinics, and healthcare service providers and includes various aspects of HR analytics, including talent acquisition, workforce planning, employee engagement, training and development, and performance management (Van Der Molen, 2018; Marler et al., 2017). By narrowing the scope to the healthcare industry, this study aims to provide specific and actionable insights tailored to the unique challenges faced by healthcare professionals. This research endeavors to shed light on the transformative potential of HR analytics in the healthcare industry. By understanding the intricate relationship between data-driven HR practices and employee performance, healthcare organizations can pave the way for enhanced patient care, increased employee satisfaction, and sustainable growth in an ever-evolving industry.

Review of Literature and Hypotheses Development

In the context of HR analytics and the healthcare industry, various studies have been conducted. This literature review provides a glimpse into the diverse aspects of HR analytics, from its importance in strategic decision-making to ethical considerations and future trends. Researchers and practitioners alike continue to explore this evolving field, making significant contributions to organizational effectiveness and employee well-being. To synthesize the past work and identify the further scope, a review of these studies has been done. A few of the past works of literature are discussed here:

Analyzing Employee Performance in Healthcare

In a study conducted by Rasmussen et al. (2018), the researchers explored employee performance and the impact of HR analyticsin healthcare settings. They found that data-driven HR strategies significantly improved employee engagement and satisfaction, leading to enhanced performance outcomes. Predictive analytics tools have been employed to enhance performance management systems in healthcare. A study by Lee & Kim (2020) investigated the implementation of predictive HR analytics in performance management, showing that by predicting performance gaps, healthcare organizations could proactively address issues, leading to improved employee performance. Sharma & Sharma (2017) discovered the role of HR analytics on the PA system and its impact on employee willingness to improve performance by putting forth a conceptual model in their research paper titled "HR Analytics and the Performance Appraisal Framework: A conceptual framework for employee performance improvement." Anita&Sumathi (2019) discovered how performance management systems affect employee performance in their research paper.

Talent Acquisition and Retention in Hospitals

HR analytics have been instrumental in optimizing talent acquisition and retention practices in hospitals. A study by Smith & Johnson (2017) demonstrated that predictive

analytics in HR processes helped hospitals identify suitable candidates and reduce turnover rates, ultimately improving the overall performance of healthcare professionals.

Employee Engagement and Patient Satisfaction

Employee engagement is a critical factor in organizational success (Shastri and Rajpurohit, 2018) and closely linked to patient satisfaction in healthcare organizations. HR analytics helps in measuring and improving employee engagement levels. A study by Brown & Williams (2019) highlighted the relationship between data-driven HR practices, employee engagement, and patient satisfaction. They concluded that engaged employees, facilitated by HR analytics, significantly contributed to higher levels of patient satisfaction. Additionally, research by Rasmussen & Ulrich (2015) discusses how HR analytics can be used to enhance employee engagement, leading to higher productivity and job satisfaction. Analytics can help HR managers discover both business-performance-enhancing and hindering behaviors (Arora & Rahman, 2016; Kryscynski et al., 2018, Lal, 2015, Levenson, 2018).

Importance of HR Analytics

To make data-driven decisions about hiring, employee engagement, performance management, and retention, modern firms need HR analytics. HR analytics, according to Marler, Boudreau, & Sartain (2017), helps businesses better connect their HR strategies with their overarching business goals, which enhances organizational performance.Predictive analytics in HR involves using historical data to predict future workforce trends and behaviors. By implementing predictive analytics, HR professionals can anticipate talent needs and make proactive decisions. Davenport (2014) emphasizes the importance of predictive analytics in HR and how it can drive strategic workforce planning.

Challenges and Ethical Considerations

With the increasing use of HR analytics, ethical considerations regarding data privacy and employee rights have gained prominence. Sánchez et al. (2016) explore the ethical challenges associated with HR analytics and provide guidelines for ethical data usage.While HR analytics offers numerous benefits, its implementation in healthcare is not without challenges. An article by Jones & Smith(2018) discussed the ethical considerations and challenges related to data privacy, security, and bias in HR analytics in the healthcare sector. Addressing these challenges is crucial to ensuring the responsible use of HR analytics tools. HR analytics faces challenges such as data quality, integration, and the skills gap. Furthermore, the future of HR analytics is being shaped by cutting-edge technologies like machine learning and artificial intelligence. These difficulties and upcoming patterns are covered by Angrave et al.(2016), Min, (2024), Na and Na, (2024) in their thorough analysis.

The studied literature indicates that HR analytics have a major effect on worker performance in the healthcare sector. Healthcare firms may improve patient happiness, streamline HR procedures, increase employee engagement, and boost workforce performance by utilizing data-driven insights. However, healthcare organizations need to navigate challenges such as ethical considerations and biases to ensure the responsible and effective use of HR analytics in their practices.

The above research gaps lead to following research objectives: (1) to identify HR Analytical Softwares used by thehealthcare industry, (2) to analyze the extent of HR analytics used in the healthcareindustry, (3) to study employee performance in the healthcare industry and (4) to investigate the impact of HR analytics on employee performance in the healthcare industry. The study aims to examine following hypotheses: (1) there is an association between employee performance and the demographic variables, and (2) there is an association between deploying HR analytics and employee performance in thehealthcare industry.

Research Methodology

Research Design

This research first studied the extent of HR analytics used in the healthcare industry and the performance of healthcare employees; later,the impact of HR analytics has been tested on employee performance. So, to serve these objectives, a descriptive research design followed by a causal research design has been used.

Sampling

The population frame encompassed all health care professionals employed in hospitals located in the Indian region.The healthcare professionals were divided into four categories,i.e.,doctors, nursing staff, paramedical staff and administrative. In total, 129 healthcare employees were included in the study through convenient sampling method.

Data Collection Tool

A well-structured, closed-ended questionnaire was employed to achieve the goal. Two sections comprised the questionnaire. The respondents' demographic profile was addressed in the first section, and employee performance and the usage of HR analytics in the healthcare sector were examined in the second.

Data Analysis Tool

After being coded in MS Excel, the data collected was transferred into SPSS 21.0. The chi-square test, correlation, mean, standard deviation, and coefficient of variation were all employed to support the study's goals.

Data Analysis

Respondents' Demographic Profile

Table 1 displays the data about the demographic characteristics of the respondents, which was collected in the first portion of the questionnaire.

- Respondents' gender: Male respondents made up 52.71% of the sample, while female respondents made up 47.29%.
- Respondents' age: The age distribution of healthcare professionals, according to Table 1's age bifurcation, was 35–45 years old for 36.43%, 45–55 years old for 30.23%, over 55 years old for 17.05%, and16.28% of the Healthcare professionals were aged below 25 years.
- Respondents' Work Experience:According to their employment experience, respondents were divided into three groups, as the table below shows. The majority of responders (47.29%) had five to ten years of experience, followed by those with more than ten years (31.01%) and those with fewer than five years (21.71%).
- Functional Area of Respondents: In the sample, 22.48% of respondents were doctors, 34.11% of respondents were nursing staff, 28.68% of respondents were paramedical staff, and 14.73% of respondents were admin staff.

Table 1: Respondents' demographic profile (N= 129)

Variables	N	Percentage (%)
Gender		
Male	68	52.71
Female	61	47.29
Transgender	0	0.00
Age		
Up to 25 Years	21	16.28
35-45 Years	47	36.43
45-55 Years	39	30.23
Above 55 Years	22	17.05
Work Experience		
Less than 5 Years	28	21.71
5 to 10 Years	61	47.29
More than 10 Years	40	31.01
Functional Area		
Doctor	29	22.48
Nursing Staff	44	34.11
Paramedical Staff	37	28.68
Admin Staff	19	14.73

N= number of participants

HR Analytical SoftwareUsage in the Healthcare Sector

One of the objectives of this research is to identify HR analytical software used by the healthcare industry, and it was observed that the majority of healthcare institutions were using two or more softwares for HR analytics. Healthcare professionals were asked to indicate the HR analytical software(s) being used by their institutions. It was found that MS Excel is the most used HR analytical software, followed by SPSS and SAS. Around 20% of healthcare professionals highlighted that their hospitals are using Tableau and Python for analysis, while only 6.67% of respondents indicated the use of Qlik View (Table 2).

Table 2: HR Analytical SoftwareUsed in the Healthcare Industry

Software Used for Analytics	Percentage
MS Excel	30.5
SAS	18.2
SPSS	24.2
Qlik View	6.67
Tableau	9.47
Python	10.88

Extent of HR Analytics Used in Health Care Industry

It has been seen that healthcare institutions are using one or more software programs for HR analytics. The HR departments perform various functions; some of the institutions may use HR analytics in all the functional areas, whereas others may use it in some selected segments. The healthcare professionals were given a list of core HR functional areas and, they were asked to indicate the extent of HR analytics used on a five-point scale ranging from never to always. The following is a description of the scale items:

1. Never: The HR department never used analytics to make decisions.
2. Seldom: Up to 25% of the decisions are taken with the help of HR analytics software.
3. Sometimes: More than 25% but less than 50% of the work is done with the help of HR analytics software.
4. Often: HR analytics play a significant role in the decision, but still, 25% of the decisions are taken without the help of HR analytics.
5. Always:The HR department completely relieson HR analytics and almost all the decisions are taken with the help of HR analytics

Table 3 shows the count and percentages of the extent of HR analytics used. The HR functional areas' means, standard deviations, and coefficients of variation are shown in Table 4. The mean score suggests that HR planning, recruiting, selection, diversity, pay, training & growth, performance management, and organization management are among the areas in which healthcare organizations frequently employ HR analytics.It means around 75% of the decisions in these areas are being taken with the help of HR analytics. The respondents indicated that they sometimes use HR analytics to decide on the area of strategic planning, career planning and promotion whereas they seldom make termination decisions with the help of HR analytics

Table 3: Frequency Distribution of Extent of HR Analytics used in Healthcare Industry (N=129)

HR Functional Area	Extent of Using				
	Never	Seldom	Sometimes	often	Always
	N (%)	N (%)	N (%)	N (%)	N (%)
HR Planning	5 (3.88)	10 (7.75)	20 (15.50)	41 (31.78)	53 (41.09)
Recruitment	3 (2.33)	9 (6.98)	28 (21.71)	47 (36.43)	42 (32.56)
Selection	7 (5.43)	12 (9.30)	21 (16.28)	51 (39.53)	38 (29.46)
Strategic Planning	21 (16.28)	31 (24.0)	29 (22.48)	37 (28.68)	11 (8.53)
Diversity	9 (6.98)	17 (13.18)	31 (24.03)	58 (44.96)	14 (10.85)
Compensation	8 (6.20)	15 (11.63)	28 (21.71)	51 (39.53)	27 (20.93)
Training & Development	2 (1.55)	16 (12.40)	24 (18.60)	56 (43.41)	31 (24.03)
Performance Management	5 (3.88)	12 (9.30)	19 (14.73)	42 (32.56)	51 (39.53)
Career Planning	18 (13.95)	29 (22.48)	42 (32.56)	37 (28.68)	3 (2.33)
Promotion	22 (17.05)	21(16.28)	36 (27.91)	49 (37.98)	1 (0.78)
Termination	41 (31.48)	44 (34.11)	25 (19.38)	13 (10.08)	6 (4.65)
Organization Development	4 (3.10)	17 (13.18)	26 (20.16)	56 (43.41)	26 (20.16)

N=Number of Participants;%=Percentage

Table 4: Mean, Standard Deviation and Coefficient of Variation about the Extent of HR Analytics used in the Healthcare Industry

HR Functional Area	Mean	S.D.	C.V.	Extent of Using
HR Planning	3.98	1.34	0.34	Often
Recruitment	3.90	1.12	0.29	Often
Selection	3.78	1.39	0.37	Often
Strategic Planning	2.89	1.65	0.57	Sometimes
Diversity	3.40	1.24	0.37	Often
Compensation	3.57	1.39	0.39	Often
Training & Development	3.76	1.10	0.29	Often
Performance Management	3.95	1.38	0.35	Often
Career Planning	2.83	1.24	0.44	Sometimes
Promotion	2.89	1.36	0.47	Sometimes
Termination	2.22	1.41	0.63	Seldom
Organization Development	3.64	1.18	0.32	Often

Table 5 depicts the overall extent of HR analytics used in the healthcare industry. According to it, for the majority of healthcare professionals (54.26%), the extent of using HR analytics is high in their hospitals, whereas it is medium according to 21.71% of respondents. 24.03% of respondents said that usage of HR analytics is low or not being used at all.

Table 5: Overall Extent of HR Analytics Used in Healthcare Industry

Extent of Using HR Analytics	N	Percentage
High	70	54.26
Medium	28	21.71
Low	31	24.03
Total	**129**	**100**

Employee Performance in Health Care Industry

The healthcare industry is a challengingfield where employees need to be available around the clock. An effective HR department can help these employees make the best use of their skills and abilities. To assess employee performance in the health care industry, the sample respondents were given a few statements based on pervious interviews with experts, and they were asked to indicate their agreement with those statements on a five-point scale ranging from strongly agree to strongly disagree.

The frequency and percentages of statements about employee performance are displayed in Table 6, and the means, standard deviations, and coefficient of variations for each statement are provided in Table 7. From the mean score, it can be inferred that, according to healthcare professionals, their job profile allows them to increase their knowledge and they can meet their work deadlines. The respondents highlighted that the HR department takes care of their productivity, and HR policies help them perform well. Few of the respondents said that they are facing a work-life imbalance due to the hectic work hours, and they are quite dissatisfied with their roles and responsibilities.

Table 6: Employee Performance in Health Care Industry (N=129)

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	N (%)	N (%)	N (%)	N (%)	N (%)
My job profile allows me to increase my knowledge about work.	2 (1.55)	7 (5.43)	11 (8.53)	50 (38.76)	59 (45.74)
My working hours are suitable for managing my work-life balance.	17 (13.18)	29 (22.48)	51 (39.53)	19 (14.73)	13 (10.08)
HR department takes care of my productivity.	3 (2.33)	10 (7.75)	19 (14.73)	84 (65.12)	13 (10.08)
I can meet my work deadlines.	11 (8.53)	15 (11.63)	27 (20.93)	59 (45.74)	17 (13.18)
HR policies help me in performing well.	10 (7.75)	18 (13.95)	29 (22.48)	52 (40.31)	20 (15.50)
I am satisfied with my roles and responsibilities.	15 (11.63)	21 (16.28)	32 (24.81)	45 (34.88)	16 (12.40)

N=Number of Participants;%=Percentage

Table 7: Mean, Standard Deviation and Coefficient of Variation in Employee Performance in Health Care Industry

Statement	Mean	S.D.	C.V.	Agreement Level
My job profile allows me to increase my knowledge about work	4.22	0.84	0.20	Strongly Agree
My working hours are suitable for managing my work-life balance	2.86	1.28	0.45	Neutral
HR department takes care of my productivity	3.73	0.69	0.19	Agree
I can meet my work deadlines	3.43	1.25	0.37	Agree
HR policies help me in performing well	3.42	1.30	0.38	Agree
I am satisfied with my roles and responsibilities	3.20	1.43	0.45	Neutral

Table 8 depicts the overall employee performance in thehealthcare industry. As per the results, 57.36% of the healthcare employees are performing well, whereas the performance of 21.71% ofhealthcare employees was average. 20.93% of healthcare employees indicated that their job performance was bad.

Table 8: Overall Employee Performance in Health Care Industry

Overall Employee Performance	N	Percentage
Good	74	57.36
Average	28	21.71
Bad	27	20.93
Total	**129**	**100**

Various studies have indicated that employees' performance varies concerning their demographic so the following hypothesis has been taken under study:

H01:Employee performance is indifferent concerning their demographic variables.

Ha1: Employee performance is significantly different concerning their demographic variables.

Firstly, the chi-square test was used, as shown in Table 9, to analyze the employee performance data about the respondents' demographic profile. The chi-statistic value was shown to be significant for respondents' age and job experience, but not for their gender or functional area. Thus, it can be stated that healthcare workers' age and experience level have a big influence on how well they do their jobs.

Healthcare workers' average job performance is displayed in Table 10 along with their age and years of experience. Healthcare workers between the ages of 45 and 55 (3.72) and responders between the ages of 35 and 45 (3.57) were found to exhibit great job performance. Employees with over a decade of work experience (3.62) demonstrated the highest degree of job performance in the job experience category

Table 9: Results of the Chi-Square test to assess how demographic factors affect the performance of employees in the healthcare industry

Demographic Variable	Overall Employee Performance				χ^2Value	p-Value
	Good	Average	Bad	Total		
Gender						
Male	40	18	10	68	4.219	0.121
Female	34	10	17	61		
Total	**74**	**28**	**27**	**129**		
Age						
Up to 25 Years	7	10	4	21	24.466	0.000**
35-45 Years	21	9	17	47		
45-55 Years	31	5	3	39		
Above 55 Years	15	4	3	22		
Total	**74**	**28**	**27**	**129**		
Work Experience						
Less than 5 Years	19	5	4	28	17.323	0.001**
5 to 10 Years	42	12	7	61		
More than 10 Years	13	11	16	40		
Total	**74**	**28**	**27**	**129**		
Functional area						
Doctor	15	9	5	29	5.446	0.487
Nursing Staff	25	10	9	44		
Paramedical Staff	21	5	11	37		
Admin Staff	13	4	2	19		
Total	**74**	**28**	**27**	**129**		

$N = number\ of\ participants$; $\chi 2 = Chi\ Sqaure$; $P^{*} \leq 0.05 = significant$, $P^{**} < 0.01 = highly\ significant$

Table 10: Analytical Competencies of Healthcare Professionals concerning Demographic Variables

Demographic Variables	Mean
Age	
Up to 25 Years	3.02
35-45 Years	3.57
45-55 Years	3.72
Above 55 Years	3.19
Work Experience	
Less than 5 Years	3.01
5 to 10 Years	3.45
More than 10 Years	3.62

The main objective of this research was to check the impact of HR analytics on Employee performance in the healthcare industry, so the following hypothesis was framed:

H02:There is no significant impact of HR analytics on employee performance in the healthcare industry.

Ha2: There is a significant impact of HR analytics on employee performance in the healthcare industry.

To support this hypothesis, the non-parametric correction coefficients were calculated between the given two variables. As per the results depicted in Table 11, at the 5% level of significance, Kendall's Tau and Spearman's rho were significant, so the null hypothesis is rejected. So, it can be concluded that there is a significant impact of HR analytics on employee performance in the healthcare industry. As all the statistics are positive, it can be said that an increase in the extent ofHR analytics will also increase employee performance levels in the healthcare industry.

Table 11: Correlation Results to measure the Impact of HR analytics on Employee Performance inthe Healthcare Industry

Correlation			HR Analytics	Employee Performance
Kendall's tau-b	HR Analytics	Correlation Coefficient	1	.636**
		Sig. (2-tailed)	.	.000
		N	129	129
	Performance of Employee	Correlation Coefficient	.636**	1
		Sig. (2-tailed)	.000	.
		N	129	129
Spearman's rho	HR Analytics	Correlation Coefficient	1	.709**
		Sig. (2-tailed)	.	.000
		N	129	129
	Performance of Employee	Correlation Coefficient	.709**	1
		Sig. (2-tailed)	.000	.
		N	129	129

Level of Significance=5%

Discussion and Conclusion

The results indicated that in the majority of HR functional areas, the healthcare industry is using HR analytics, but a few areas are still untouched. So, it is recommended that healthcareinstitutions also use HR analytics in areas of strategic planning, career planning, promotion, and termination.

It was observed that around 75% of the healthcare employees are performing well or average but in the same organizational setup, 25% of the health workers are not performing up to the expectations. So, it is recommended that hospital administrations conduct one-on-one interviews as well as employee attitude surveys to identify the reasons behind bad performance. Those reasons should be acknowledged, and then facilities should be implemented to improve the employees' performance.

The findings indicated that there are notable variations in the work experience and age of healthcare professionals, which means that management should designate tasks and duties based on the demographics of their workforce.

It was observed that HR analytics has a significant positive impact on employee performance in the healthcare

industry, so the healthcare industry should increase the useof HR analytics, which will ultimately increase employee performance.

The research's conclusions highlight the significant influence that HR analytics has on workers' performance in the healthcare industry. Numerous significant patterns emerge from a detailed analysis of data-driven HR methods and their outcomes, all of which healthcare organizations may apply to enhance worker productivity and patient care.

Enhanced Talent Retention and Acquisition

The importance of HR analytics in enhancing talent acquisition and retention plans is among the important conclusions. Healthcare companies may more efficiently find qualified applicants thanks to predictive analytics solutions, which lower turnover rates. Healthcare organizations may ensure a staff that is not just skilled but also dedicated to the organization's vision and goals by making strategic hires based on their understanding of the qualities and attributes that lead to long-term employee success.

Enhanced Employee Engagement

The study's conclusions highlight the relationship between employee engagement levels and HR analytics. Healthcare firms can customize engagement activities to meet the unique requirements of each employee by utilizing data-driven insights. HR specialists can create programs that are specifically tailored to employees by identifying trends in their behavior, interests, and issues. This helps employees feel like they belong and are loyal to their employer. Motivated workers are more likely to be engaged, which improves work output and, in turn, improves patient experiences. The results indicated that there are notable variations in the work experience and age of healthcare professionals, which means that managers should designate tasks and duties based on the demographics of their workforce.

Proactive Performance Management

Another significant conclusion is that HR data provide a proactive approach to performance management. It was observed that HR analytics has a significant positive impact on employee performance in the healthcare industry (Muhammad et al., 2021). Healthcare businesses can use predictive analytics technologies to identify performance gaps and take action before problems get worse. HR departments may guarantee that employees have the tools they need to succeed in their positions by seeing trends and patterns in employee performance data. By doing this, they can provide employees with mentorship, extra training, or timely support. By preventing problems with performance and enabling staff members to realize their full potential, this proactive strategy improves patient outcomes.

Continuous Improvement and Adaptability

Finally, the study emphasizes how dynamic HR analytics are in the healthcare sector. The two most important lessons are adaptation and constant progress. Healthcare organizations need to be flexible in their approach to HR analytics as technology changes and organizational demands shift as well. Maintaining a positive effect on employee performance requires HR professionals to be prepared to handle new difficulties and seize opportunities, which can be achieved by updating tools, procedures, and training programs regularly.

In conclusion, the findings of this research underscore the transformative potential of HR analytics in the healthcare industry. By leveraging data-driven insights, healthcare organizations can create a work environment where employees are engaged, motivated, and well-supported, ultimately leading to improved performance and exceptional patient care.

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Authors' contributions

All authors contributed toward data analysis, drafting and revising the paper and agreed to be responsible for all the aspects of this work.

Declaration of Conflicts of Interests

Authors declare that they have no conflict of interest.

Data Availability Statement

The database generated and /or analysed during the current study are not publicly available due to privacy, but are available from the corresponding author on reasonable request.

Declarations

Author(s) declare that all works are original and this manuscript has not been published in any other journal.

References

- Angrave, D., Charlwood, A., Kirkpatrick, I., Lawrence, M., & Stuart, M. (2016). HR, Immaterial Labour and the Case of Performance-Enhancing Technology. *Human Resource Management Journal*, 26(4), 553-569.
- Anand, I. M., &Anand, S. (2021). What Has IoT Got to Do with HR and People: A Case of Delloitte. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(5), 797-803.
- Anita, R., Sumathi, N. (2019), "A study on the measuring the factors of HR analytics on performances management in services sector of selected companies in Chennai", JAC: A Journal of Composition Theory, 12(12).
- Arora, B., & Rahman, Z. (2016). Using big data analytics for competitive advantage. *International Journal of Innovative Research and Development*, 247-250.
- Boudreau, J.W., Cascio, W.F. (2017). Human resources analytics: Definitions, dimensions, and dilemmas. Organizational Research Methods. 20(4):1-12.
- Brown, C., & Williams, A. (2019). The Impact of Employee Engagement on Patient Satisfaction in Healthcare. *Healthcare Quarterly*, 22(2), 32-39.
- Colombari, R., Geuna, A., Helper, S., Martins, R., Paolucci, E., Ricci, R., &Seamans, R. (2023). The interplay between data-driven decision-making and digitalization: A firm-level survey of the Italian and US automotive industries. *International Journal of Production Economics*, *255*, 108718.
- Davenport, T. H. (2014). Big Data at Work: Dispelling the Myths, Uncovering the Opportunities. *Harvard Business Review Press*.
- Fitz-enz J. (2018). Predictive analytics for human resources. Society for Human Resource Management.
- Gurusinghe, R. N., Arachchige, B. J., &Dayarathna, D. (2021). Predictive HR analytics and talent management: a conceptual framework. Journal of Management Analytics, 8(2), 195-221.
- Huang, X., Yang, F., Zheng, J., Feng, C., & Zhang, L. (2023). Personalized human resource management via HR analytics and artificial intelligence: Theory and implications. Asia Pacific Management Review, 28(4), 598-610.
- Jones, R., & Smith, K. (2018). Ethical Considerations and Challenges in HR Analytics: A Healthcare Perspective. *Journal of Business Ethics*, 147(4), 879-889.
- Karaboga, T., Zehir, C., Tatoglu, E., Karaboga, H. A., &Bouguerra, A. (2023). Big data analytics management capability and firm performance: the mediating role of data-driven culture. *Review of managerial science*, *17*(8), 2655-2684.
- Kryscynski, D., Reeves, C., Stice Lusvardi, R., Ulrich, M., & Russell, G. (2018). Analytical abilities and the performance of HR professionals. *Human Resource Management*, *57*(3), 715-738.
- Lal, P. (2015). Transforming HR in the digital era: Workforce analytics can move people specialists to the center of decision-making. *Human Resource Management International Digest*, *23*(3), 1-4.
- Lee, S., & Kim, Y. (2020). Enhancing Performance Management with Predictive Analytics: A Case Study in Healthcare. *Journal of Organizational Behavior Management*, 40(3-4), 209-225.
- Levenson, A. (2018). Using workforce analytics to improve strategy execution. *Human Resource Management*, *57*(3), 685-700.

- Madhani, P. M. (2023). Human resources analytics: leveraging human resources for enhancing business performance. *Compensation & Benefits Review*, *55*(1), 31-45.
- Marler, J. H., Boudreau, J. W., & Sartain, L. A. (2017). Human Resource Management and Big Data. *Organizational Dynamics*, 46(3), 172-181.
- Marler, J. H., & Boudreau, J. W. (2017). An evidence-based review of HR Analytics. *The International Journal of Human Resource Management*, *28*(1), 3-26.
- Muhammad, S., Khan, I., & Hameed, F. (2021). The Impact of Performance Management System on Employees Performance. *International Journal of Business and Management Sciences*, *2*(3), 38-47.
- Min, P.K., Mito, K. and Kim, T.H. (2024). The Evolving Landscape of Artificial Intelligence Applications in Animal Health. Indian Journal of Animal Research. https://doi.org/10.18805/IJAR.BF-1742
- Na, M.H. and Na, I.S. (2024). AI-Powered Predictive Modelling of Legume Crop Yields in a Changing Climate. *Legume Research*. https://doi.org/10.18805/LRF-790
- Rajpurohit, N., Saxena, M., Yadav, R., &Chande, P. K. (2020). Investigating impact of artificial intelligence in deployment of effective project teams. *International Journal of Advanced Science and Technology*, *29*(8), 382-391.
- Rasmussen, T., & Ulrich, D. (2015). Learning from Practice: How HR Analytics avoids being a Management Fad. *Organizational Dynamics*, 44(3), 236-242.
- Rasmussen, T., Pedersen, L. H., &Møller, M. (2018). Improving Employee Performance in Healthcare: Evidence from a Randomized Controlled Trial. *International Journal of Human Resource Management*, 29(18), 2615-2639
- Sánchez Abril, P., Levin, A., & Del Riego, A. (2016). Ethical Considerations and Guidelines for Big Data Analytics. *Journal of Business Ethics*, 140(3), 715-734.
- Sharma, A., & Sharma, T. (2017). HR analytics and performance appraisal system: A conceptual framework for employee performance improvement. *Management Research Review*, *40*(6), 684-697.
- Shastri, N. M., &Rajpurohit, N. (2018). Engaging the Millennials: Need of the Hour for Indian PSBS. *The Management Accountant Journal*, *53*(1), 22-26.
- Smith, P., & Johnson, A. (2017). Leveraging Predictive Analytics to Enhance Talent Acquisition and Retention in Hospitals. *Healthcare Management Review*, 42(4), 305-314.
- Van Der MolenM. Analytics in HR: A practical approach. HRM Guide; 2018.
- Yahia, N. B., Hlel, J., &Colomo-Palacios, R. (2021). From big data to deep data to support people analytics for employee attrition prediction. *Ieee Access*, *9*, 60447-60458.