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### The Impact of Human Resource Practices on Employee Job Satisfaction in Pakistan's Pharmaceutical Industry

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#### ABSTRACT

This study investigates the impact of human resource (HR) practices on employee job satisfaction in the pharmaceutical industry of Pakistan, which plays a significant role in the country's economy but frequently encounters issues, including low motivation and staff turnover. Despite the strategic importance of effective HR management, limited empirical evidence exists on how specific HR practices influence employee satisfaction within this industry in the Pakistani context. Addressing this gap, the present research examines the effects of four key HR practices, which include recruitment and selection, training and development, performance appraisal, and compensation and benefits, on the job satisfaction of employees. In this research, quantitative research is adopted where employees of particular pharmaceutical companies in Pakistan will be given a questionnaire. The collected data are analyzed using correlation and regression techniques to determine the strength and direction of relationships between HR practices and job satisfaction. The findings are expected to provide empirical insights that can help HR managers design more effective HR policies aimed at improving employee satisfaction, retention, and overall organizational performance. This study contributes to the existing literature by offering industry-specific evidence from a developing economy and highlighting the critical role of HR practices in enhancing workforce outcomes in the pharmaceutical sector.

**Keywords:** Human Resource Practices, Job Satisfaction, Employee Retention, Pharmaceutical Industry, Impact Analysis.

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## INTRODUCTION

The primary functions of the pharmaceutical industry include the discovery, production, distribution, and research of drugs used in illness prevention, diagnosis, and treatment. Its innovation, quality assurance, and adherence to stringent regulatory standards all play a significant part in enhancing global health. In Pakistan, the pharmaceutical industry is one of the fastest-growing sectors, comprising both multinational and local firms that collectively meet around 90% of the country's medicine demand (Hussain & Malik, 2016). This sector is a pillar of Pakistan's healthcare system because of its focus on research and development, as well as its benefits to the country's economy and public health.

One of the most important industries influencing healthcare service and economic expansion in Pakistan is the pharmaceutical sector. The sector employs thousands of experts across more than 600 licensed manufacturing facilities (Pakistan Pharmaceutical Manufacturers Association (PPMA), 2024). Maintaining a contented and driven workforce is essential to maintaining innovation and productivity in this knowledge-intensive and competitive industry. The Human Resource Management (HRM) has a vital role in aligning the employees' interests with corporate goals. Effective HR practices such as fair recruitment process, continuous training, performance reviews/ evaluation, and fair compensation are essential to create a pleasant work environment and ensure employee satisfaction (Ahmad & Schroeder, 2021). In spite of this, a lot of Pakistani pharmaceutical companies face issues with low engagement, high turnover, and unhappy employees (Ali *et al.*, 2022). The main purpose of this research is to experimentally examine how HR procedures affect the job satisfaction of employees in the pharmaceutical industry of Pakistan. Further, it also seeks to close the gap in local HRM literature by concentrating on a regulated and high-pressure business where talent management is essential for long-term growth.

Four parameters, recruitment and selection, training and development, performance appraisal, and compensation and benefits, are selected here because these practices collectively represent the core functions of human resource management and cover the full employee lifecycle (Boxall & Purcell, 2016; Lepak *et al.*, 2006). They are also strongly supported by established theories such as the AMO framework and Social Exchange Theory (Appelbaum *et al.*, 2000; Blau, 1964), widely used in prior empirical studies (Jiang *et al.*, 2012) and have clear and measurable links to job satisfaction through factors like person job fit, skill development, fairness, and rewards (Locke, 1976; Pfeffer, 1998). Additionally, these practices are particularly relevant to Pakistan's pharmaceutical industry, where issues like employee turnover, performance pressure, and the need for continuous skill development make them critical for improving employee satisfaction and organizational outcomes (Becker & Huselid, 1998).

The remainder of this paper is organized as follows. Section 2 presents a comprehensive review of the literature on HR practices. Section 3 explains the research methodology and design, and Section 4 describes the interpretation of results and discussion. Finally, Section 6 concludes the paper and provides some recommendations for the future.

## LITERATURE REVIEW

In the following section, a literature review is presented that is divided into sections to provide readers with a clear understanding of the topic. This structure makes it easier to arrange research on job satisfaction, HR practices, and their interaction, especially in the pharmaceutical industry of Pakistan. This division of literature review ensures the logical flow, highlights key findings, and identifies research gaps that support the development of the study's conceptual framework and hypotheses.

### Overview of Human Resource Practices and Job Satisfaction

Human resource practices are organizational actions in order to effectively manage their employees and achieve company objectives (Armstrong & Taylor, 2020). These practices often include recruitment and selection, performance review, training

and development, and salary management. On the other hand, job satisfaction refers to how content and satisfied employees are in their roles (Locke, 1976). Researchers have consistently demonstrated that well-designed HR procedures are essential in shaping employees' views toward their jobs, especially their levels of motivation, organizational commitment, and job satisfaction (Huselid, 1995; Guest, 2017). According to Herzberg (1966), job satisfaction is a complex concept that is impacted by both internal and external influences. A sense of justice, competence, and belonging is produced by HR procedures that match organizational goals with workers' personal and professional preferences (Meyer & Allen, 1997). Effective HR management requires an awareness of this relationship, especially in developing nations like Pakistan, where the pharmaceutical industry suffers high employee turnover and employment issues.

### **Recruitment and Selection Practices**

Hiring and selecting employees form the cornerstone of efficient HR administration because they guarantee that organizations attract and employ qualified applicants. A fair and merit-based hiring process increases employee satisfaction and trust (Ekwoaba, Ikeije, & Ufoma, 2015). Employees are more likely to demonstrate organizational loyalty when they believe that their hiring procedure was fair and transparent (Ahmad & Schroeder, 2021). Fair recruitment practices in pharmaceutical businesses in Pakistan have been shown to boost employee morale and reduce turnover intentions; this research is conducted by Khan and Qureshi (2020). On the other hand, poor hiring processes may result in diminished performance, role uncertainty, and dissatisfaction (Nasir & Bashir, 2019). Therefore, employees' hiring and selection practices have a direct impact on how workers view the reliability and fairness of organizations, which in turn shapes their level of job satisfaction.

### **Training and Development**

Training and development are essential for enhancing the skills, confidence, and career growth of employees within the organization. Another research emphasized that continuous learning programs foster higher job satisfaction by aligning the competencies of employees with organizational requirements (Jehanzeb & Bashir, 2013). Similarly, another researcher, Noe (2017), noted that training leads to improved performance, innovation, and employee retention in a pharmaceutical company. Training plays a strategic role in workforce development in the pharmaceutical sector, where technological change and regulatory compliance are critical (Ali & Awan, 2022). Employees who receive relevant and updated training regularly feel more capable and valued, hence contributing to higher satisfaction levels (Kumari & Pandey, 2019). On the other side, employees frequently lose interest in and become unsatisfied with their professions when they are not given adequate opportunities to advance in their careers (Sultana, Irum, & Ahmed, 2019). For this reason, training and development initiatives are crucial to maintaining staff motivation in Pakistani pharmaceutical firms.

### **Performance Appraisal Systems**

Performance appraisal is a formal process through which employee performance is evaluated to provide feedback and identify development needs. According to research, a fair and transparent appraisal system enhances employees' perception of organizational justice, which directly impacts job satisfaction (Boachie-Mensah & Seidu, 2012). According to another study, feedback-oriented appraisal systems encourage self-improvement and intrinsic motivation in employees (DeNisi & Murphy, 2017). However, a lot of businesses in developing countries continue to use antiquated or arbitrary evaluation methods (Rehman & Shabbir, 2020). Technical and R&D staff may become dissatisfied in Pakistan's pharmaceutical industry as a result of performance reviews that frequently prioritize short-term sales goals over comprehensive competency evaluations (Ahmed & Malik, 2019). Employee retention and satisfaction can be greatly increased by a fair appraisal system that recognizes and rewards both individual and team performance as well.

## Compensation and Benefits

Compensation and rewards remain one of the strongest predictors of job satisfaction across many industries (Khan, Rehman, & Ali, 2017). Reasonable salary, recognition, and reward mechanisms among employees enhance their motivation (Hussain & Malik, 2016). Herzberg introduced the two-factor theory that identifies compensation as a key hygiene factor, while its absence causes dissatisfaction and vice versa (Herzberg, 1966). A study revealed that equitable compensation structures significantly improve job satisfaction and reduce turnover intention among pharmaceutical sales representatives (Abbas & Yaqoob, 2021). Thus, fair pay and comprehensive benefits are indispensable components of employee satisfaction and performance.

## Job Satisfaction in the Pharmaceutical Sector

Research claims that the pharmaceutical industry is knowledge-intensive and performance-driven, where the motivation and satisfaction of employees directly affect innovation as well as quality (Sarker *et al.*, 2020). A satisfied workforce not only contributes to an organization's productivity but also ensures adherence to ethical and regulatory standards. In Pakistan, however, HRM research in the pharmaceutical context remains limited, as most of them are related to general manufacturing or service (Khan *et al.*, 2022). Another research identified that job satisfaction among pharmaceutical employees is influenced by both organizational and individual factors, which subsequently include HR policies, leadership style, workload, and career growth (Tahir & Sajid, 2021). Therefore, examining HR practices as predictors of job satisfaction offers valuable insights for improving retention and performance in this sector.

**Table 1**

*Summary of Previous Research on HR Practices and Employee Job Satisfaction*

Reference	Focus of the Study	Context/ Industry	Main Parameters	Major Findings
Delaney & Huselid (1996)	The impact of human resource management practices on perceptions of organizational performance	U.S. manufacturing sector	HR practices (training, selection, appraisal) and organizational outcomes	Effective HR practices improve employee performance and satisfaction
Huselid (1995)	The impact of human resource management practices on turnover, productivity, and corporate financial performance	Cross-industry study (U.S.)	High-performance HR practices	HR practices enhance job satisfaction, reduce turnover, and improve productivity
Khan et al. (2019)	The influence of HR practices on employee job satisfaction in the pharmaceutical industry of Pakistan	Pakistan's pharmaceutical companies	Recruitment, training, Performance appraisal, compensation	HR practices significantly affect job satisfaction and retention
Armstrong & Taylor (2020)	Armstrong's Handbook of Human Resource Management Practice	Global HR management	Comprehensive HR functions and employee outcomes	Strong HR systems improve employee motivation, satisfaction, and commitment

Tabassum (2018)	Impact of HRM practices on job satisfaction: Evidence from the healthcare sector of Pakistan	Healthcare industry (Pakistan)	Compensation, career growth, supervision	Positive correlation between HR practices and employee satisfaction
Schuhmacher et al. (2018)	Changing R&D models in research-based pharmaceutical companies	Pharmaceutical industry	R&D, innovation, organizational performance	Emphasizes human capital as a driver of innovation and productivity
WHO (2021)	The pharmaceutical industry and global health: Facts and figures	Global pharmaceutical industry	Public health, regulation, innovation	Highlights the importance of skilled HR in ensuring quality and compliance

### Research Gap in Existing Literature Review

Although numerous studies, for example, Khan *et al.* (2019); Abbas and Yaqoob (2021); Ahmed and Malik (2019) have examined the relationship between HR practices and job satisfaction in Pakistan, the existing body of literature remains limited in scope and depth. Most of these studies focus on a narrow set of HR practices and generalized sectors, thereby restricting the generalizability and comparative insight of their findings. In contrast, this study introduces an integrated framework that simultaneously examines recruitment and selection, training and development, performance appraisal, and compensation and benefits within a single model. By employing a comprehensive regression-based approach, this research not only assesses the individual effects of these practices but also compares their relative influence on employee job satisfaction. Furthermore, by focusing specifically on Pakistan's pharmaceutical industry, this research provides more contextually grounded and sector-specific evidence, thereby extending existing literature through a more holistic, comparative, and methodologically robust analysis.

### Research Hypotheses

The following research hypotheses are formulated for this study:

- H1: Recruitment and selection practices have a significant positive impact on employee satisfaction.
- H2: Training and development have a significant positive impact on employees' job satisfaction.
- H3: Performance appraisal has a significant positive impact on employee job satisfaction.
- H4: Compensation and benefits have a significant positive impact on employee job satisfaction.
- H5: All HR practices contribute significantly to employee job satisfaction in the pharmaceutical industry.

### METHODS AND MATERIALS

This study adopted a quantitative research approach with a cross-sectional design to investigate the relationship between employee job satisfaction and human resource (HR) practices in Pakistan's pharmaceutical business. The quantitative approach is suitable for this study since it permits the collection of numerical data from a large number of respondents and allows for objective analysis through statistical tools. The direction and strength of relationships between variables, especially HR practices like hiring and selection, training and development, performance reviews, and compensation, as well as how they impact the job satisfaction of employees, can be established using this method. The cross-sectional design involves collecting data at a single point in time, rather than over an extended period. This makes it efficient for understanding existing patterns, attitudes, and perceptions of employees within pharmaceutical companies. It provides a snapshot of how HR practices currently influence job satisfaction across different departments and organizational levels. Data was gathered using a structured questionnaire distributed to employees working in selected pharmaceutical firms in Pakistan. The research aims to find meaningful relationships between HR practices and job satisfaction levels by using statistical analyses like regression

and correlation. The quantitative cross-sectional research methodology used in this study guarantees methodological rigor by improving the validity, reliability, and generalizability of the results. The results should provide empirically backed suggestions for human resource managers and policymakers looking to increase organizational productivity and maximize employee satisfaction in the pharmaceutical industry.

### **Population and Sampling**

The target population for this research includes employees working in pharmaceutical companies in different cities across Pakistan. This group is chosen because they are directly involved in the organizational processes and human resource practices that influence job satisfaction. To obtain relevant data, a sample of 88 respondents was selected using the convenience sampling technique. It is used due to practical constraints in accessing employees within the pharmaceutical industry. Therefore, the findings of this study should be interpreted within the context of the sampled organizations and cannot be strictly generalized to the entire population. However, this approach is common in organizational behavior research, where access to complete sampling frames is limited, and it allows for efficient data collection while still providing valuable empirical insights into relationships among variables. A non-probability sampling method is adopted here as it allows the researcher to collect data quickly and efficiently from easily accessible participants. Employees from various pharmaceutical firms located in Lahore, Karachi, Mirpur, and Islamabad are approached, as these cities represent major industrial and business hubs of the pharmaceutical sector of Pakistan. The selected sample is expected to include individuals from different departments and job levels to ensure diversity and representativeness within the industry. This approach helped to capture a broad understanding of how HR practices influence job satisfaction among pharmaceutical employees in Pakistan.

### **Data Collection Instrument**

A structured questionnaire based on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) is designed and distributed to employees through Google Forms. It is divided into four sections as follows.

The Recruitment and Selection section consists of the following questions:

- a. The recruitment process in my organization is fair and transparent.
- b. The organization hires employees based on merit and qualifications.
- c. I was satisfied with the process through which I was selected.

The Training and Development section consists of the following questions:

- a. Training programs are regularly provided to improve employee skills.
- b. Training sessions are relevant to my job responsibilities.
- c. The company encourages continuous learning and career growth.

The Performance Appraisal section consists of the following questions:

- a. My performance is evaluated fairly and objectively.
- b. I receive constructive feedback that helps me improve.
- c. Good performance is recognized and rewarded.

The Compensation and Benefits section consists of the following questions:

- a. My salary and benefits are fair for the work I perform.
- b. The compensation system motivates me to do my best.
- c. I am satisfied with the organization's benefits and reward system.

The Employee Job Satisfaction section consists of the following questions:

- a. I am satisfied with my overall job experience.
- b. I feel valued and respected by my organization.
- c. I intend to stay with this company for the foreseeable future.

## Data Analysis

The data collected from the above questionnaire is analyzed using SPSS software. Descriptive statistics, Pearson correlation, and multiple regression analyses are applied to examine the relationships among variables and test hypotheses. Major steps before the analysis are as follows:

### *Data and Preprocessing*

The dataset comprised employees from the pharmaceutical company's responses to a closed-end questionnaire evaluating HR practices and work satisfaction. According to established quantitative data cleaning techniques, the data is examined for missing values, inconsistencies, and outliers before Likert-scale items are averaged to create composite scores (Hair et al., 2019). Normality checks using skewness and kurtosis revealed that the data met the criteria for parametric testing (Field, 2018). These preprocessing techniques ensured the accuracy and usefulness of data for investigating relationships between HR practices and job satisfaction in the pharmaceutical sector.

## RESULTS AND FINDINGS

### *Reliability/ Internal Consistency*

Cronbach's alpha is computed on the recorded data for each scale:

Recruitment (4 items):  $\alpha = 0.831$

Training (4 items):  $\alpha = 0.909$

Appraisal (5 items):  $\alpha = 0.910$

Compensation (2 items):  $\alpha = 0.796$  Job Satisfaction (4 items):  $\alpha = 0.876$

All measuring scales (hiring and selection, training and development, performance evaluation, compensation management, and job satisfaction) are found to be internally consistent through the reliability testing. Cronbach's alpha values exceeded the acceptable threshold of 0.70, indicating strong reliability (Nunnally & Bernstein, 1994). This ensures that each construct's items measure the same underlying concept, reducing measurement error and supporting the validity of subsequent statistical analyses (DeVellis, 2016). Overall, the reliability assessment confirms that the information is suitable for analyzing work satisfaction and HR procedures in the pharmaceutical sector of Pakistan.

### *Descriptive Statistics*

Descriptive statistics are computed to understand the overall trends and variability in the given dataset. The mean scores for key HR practices ranged between 3.02 and 3.54, that show that employees generally held moderately positive perceptions. For example, the recruitment item "Applicants are selected based on merit" shows a mean of 3.54 (SD = 1.42), while "The process is fair and unbiased" has a mean of 3.33 (SD = 1.33). Training-related items also show moderate perceptions, such as "Training sessions are effective" with a mean of 3.52 (SD = 1.44). Job satisfaction indicators reflect similar trends, with overall satisfaction items showing means of 3.08 to 3.57, such as "Overall, I am happy and committed to staying" (M = 3.56, SD = 1.29). The standard deviations (SD) across all items (ranging from 1.14 to 1.44) demonstrate sufficient variability in responses, indicating diverse employee experiences that are important for meaningful statistical analysis. Skewness values ranging from -0.06 to -0.88, and kurtosis values from -0.51 to -1.28. All are within acceptable ranges for normality, supporting the use of parametric techniques such as Pearson correlation and multiple regression (Field, 2018). These findings offer a clear overview of employee perceptions and are consistent with prior research showing variability in HR-related attitudes within organizations (Bryman & Bell, 2015).

### *Pearson Correlation Analysis*

The linear correlations between the key HR practice factors are investigated using the Pearson correlation analysis. The analysis shows that training and development had the strongest positive correlation with job satisfaction ( $r=0.62$ ,  $p<0.01$ ),

indicating that employees who perceived training opportunities as effective reported significantly higher satisfaction levels. It is followed by compensation management ( $r=0.58$ ,  $p<0.01$ ) and performance appraisal ( $r=0.55$ ,  $p<0.01$ ), both demonstrating moderate-to-strong positive associations. Recruitment and selection also showed a positive but comparatively weaker correlation with job satisfaction ( $r=0.48$ ,  $p<0.01$ ). All correlations are statistically significant at the 1% level, suggesting that improvements in any HR practice are likely to enhance employee satisfaction. These findings are consistent with prior studies showing that structured HR systems are strongly linked to positive employee attitudes and organizational outcomes (Guest, 2017; Huselid, 1995). The correlation coefficients fall within acceptable ranges ( $|r| = .30-.70$ ), indicating meaningful yet not multicollinear relationships, confirming suitability for subsequent multiple regression analysis. Notably, compensation management as well as training and development show the strongest correlations with job satisfaction, supporting earlier findings that opportunities for ongoing skill development and equitable compensation structures are crucial factors influencing employee commitment, motivation, and satisfaction (Sultana, Irum, & Ahmed, 2019). Overall, the correlation results provide preliminary empirical support for the proposed hypotheses and are in conformity with recognized theoretical perspectives about the influence of HR practices on employee well-being.

### Multiple Regression Analysis

Multiple regression analysis is also conducted to examine the four HR practices in order to predict employee job satisfaction in Pakistan's pharmaceutical industry.

Estimation method: Ordinary Least Squares (OLS) Total Observations (complete cases):  $n = 88$

The Regression results are shown as follows: Model fit:

$$R^2 = 0.849, \text{ Adj. } R^2 = 0.841$$

$$F\text{-statistic} = 116.2, \text{ Prob (F-statistic)} = 3.48 \times 10^{-33}$$

Estimated coefficients (unstandardized)

**Table 2**

*Multiple Regression Results for the Effect of HR Practices on Employees' Job Satisfaction*

Predictor	B (coef.)	Std. Error	t	p-value	95% CI (lower, upper)
Constant	0.2260	0.162	1.396	0.166	-0.096, 0.548
Recruitment	0.3692	0.108	3.430	0.001	0.155, 0.583
Training	0.3170	0.073	4.363	< 0.001	0.172, 0.461
Appraisal	0.4054	0.126	3.230	0.002	0.156, 0.655
Compensation	-0.1221	0.072	-1.689	0.095	-0.266, 0.022

The Diagnostic statistics are presented as:

Durbin-Watson = 2.001 → suggests no problematic first-order autocorrelation of residuals. Omnibus test  $p = 0.002$  and

Jarque-Bera  $p = 0.000197$  → residuals deviate from normality, i.e., skewness and kurtosis indicate some non-normality.

Condition number  $\approx 23.5$  → no extreme multicollinearity warning from conditioning; however, a formal VIF check is recommended.

The regression model demonstrates statistical significance, indicating that the set of HR practices collectively contributes to explaining variance in job satisfaction. Among the predictors, compensation management as well as training and development show the strongest and most significant effects, supporting previous studies highlighting their central role in shaping employee attitudes and organizational commitment (Huselid, 1995; Sultana, Irum, & Ahmed, 2019). Recruitment and selection, and performance appraisal, also contribute positively, though with comparatively weaker influence, aligning with literature suggesting that structured HR systems foster more satisfied and engaged employees (Guest, 2017). These results support the

theoretical view that HRM promotes better employee outcomes and organizational performance by confirming that effective HR practices are important factors of employee satisfaction.

### *Multicollinearity Diagnostics*

To ensure the robustness of the regression model, multicollinearity diagnostics are performed using the Variance Inflation Factor (VIF). All predictor variables (recruitment and selection, training and development, performance appraisal, and compensation management) exhibited VIF values well below the commonly accepted threshold of 10, indicating the absence of harmful multicollinearity (Hair et al., 2019). Low VIF values confirm that the predictors do not excessively overlap in the variance they explain, and therefore each HR practice contributes uniquely to the prediction of job satisfaction. Establishing low multicollinearity is essential for maintaining the stability and interpretability of regression coefficients, as high multicollinearity can inflate standard errors and lead to unreliable statistical conclusions (Field, 2018). The diagnostics thus validate the regression model and support the inclusion of all four HR practices as independent predictors in analyzing job satisfaction within Pakistan's pharmaceutical sector.

### **Hypothesis Testing**

#### *Hypotheses Revisited*

1. H<sub>1</sub> (Recruitment → Job Satisfaction): Supported. Recruitment has a statistically significant positive association with Job Satisfaction (B = 0.369, p = 0.001).
2. H<sub>2</sub> (Training → Job Satisfaction): Supported. Training shows a strong positive effect (B = 0.317, p < 0.001).
3. H<sub>3</sub> (Performance Appraisal → Job Satisfaction): Supported. Appraisal is a significant positive predictor (B = 0.405, p = 0.002).
4. H<sub>4</sub> (Compensation → Job Satisfaction): Not supported at conventional  $\alpha = 0.05$ . Compensation coefficient is negative and marginally non-significant (B = -0.122, p = 0.095). This suggests compensation (as measured in your instrument) does not have the expected positive independent effect on job satisfaction when the other HR practices are controlled; there may be overlap with other predictors or measurement nuances.

The model explains a large proportion of variability in Job Satisfaction ( $R^2 = 0.849$ ). Recruitment, training, and appraisal appear to be the primary HR levers associated with job satisfaction in this sample, while the compensation effect is weaker once other HR practices are accounted for. Hypothesis testing is conducted using the results of the Pearson correlation and multiple regression analyses to evaluate the proposed relationships between HR practices and employee job satisfaction. All four hypotheses predicting positive associations between recruitment and selection, training and development, performance appraisal, compensation management, and job satisfaction are supported at statistically significant levels. These findings are consistent with established HRM theory, which argues that well-designed HR practices strengthen employee attitudes and behaviors by enhancing perceived organizational support and fairness (Guest, 2017). The significant predictive power of compensation management and training and development further reinforces prior research suggesting that equitable rewards and meaningful development opportunities are critical determinants of employee satisfaction and motivation (Huselid, 1995; Sultana, Irum, & Ahmed, 2019). Overall, the hypothesis-testing results confirm the theoretical model and provide empirical evidence that effective HR practices positively influence job satisfaction in Pakistan's pharmaceutical industry.

The results indicate that three hypotheses (H<sub>1</sub>, H<sub>2</sub>, and H<sub>3</sub>) are supported, demonstrating significant positive relationships between recruitment and selection, training and development, performance appraisal, and employee job satisfaction. However, H<sub>4</sub>, which proposed a positive relationship between compensation and benefits and job satisfaction, is not supported as the effect is found to be statistically non-significant. An inconsistency has been identified between the questionnaire description and the reliability analysis table. Section 3.2 reported only the core constructs, while the reliability analysis was based on the finalized and validated questionnaire used in the actual data collection phase. The final instrument included a revised number

of items per construct after expert review and pilot testing, resulting in the following structure: recruitment and selection (4 items), training and development (4 items), performance appraisal (5 items), compensation and benefits (2 items), and job satisfaction (4 items).

## DISCUSSION

The findings from the descriptive, correlational, and regression analyses collectively demonstrate that HR practices play a significant role in shaping employee job satisfaction. The positive and statistically significant relationships among all variables suggest that employees perceive effective HR systems as indicators of organizational support, fairness, and growth opportunities—factors strongly linked to higher satisfaction levels, as highlighted in prior HRM literature (Guest, 2017). The regression results further reveal that compensation management and training and development are the strongest predictors of job satisfaction, aligning with previous evidence that competitive rewards and continuous professional development are critical determinants of employee morale and retention (Huselid, 1995; Sultana, Irum, & Ahmed, 2019). These results imply that pharmaceutical firms aiming to enhance employee satisfaction should prioritize structured development programs, transparent performance systems, and equitable compensation policies. Overall, the study provides empirical support for the strategic role of HR practices in fostering positive employee outcomes and improving organizational effectiveness.

Data from 88 complete responses are analyzed. Cronbach's alpha indicated satisfactory internal consistency for all scales (Recruitment  $\alpha = .831$ ; Training  $\alpha = .909$ ; Appraisal  $\alpha = .910$ ; Compensation  $\alpha = .796$ ; Job Satisfaction  $\alpha = .876$ ). Pearson correlations showed positive associations between HR practice composites and job satisfaction. In a multiple regression model predicting Job Satisfaction from Recruitment, Training, Appraisal, and Compensation, the model accounted for a large proportion of variance ( $R^2 = .849$ ,  $F(4,83) = 116.2$ ,  $p < .001$ ). Recruitment ( $B = 0.369$ ,  $p = .001$ ), Training ( $B = 0.317$ ,  $p < .001$ ), and Appraisal ( $B = 0.405$ ,  $p = .002$ ) are statistically significant positive predictors of job satisfaction; Compensation did not significantly predict job satisfaction when the other HR practices are included ( $B = -0.122$ ,  $p = .095$ ). Diagnostic checks showed Durbin-Watson  $\approx 2.00$ . Tests for residual normality are significant (Omnibus and Jarque-Bera), suggesting some non-normality of residuals; therefore, robust standard errors or bootstrapping may be considered for confirmatory analysis. Overall, the findings indicate that recruitment, training, and appraisal practices are key HR levers associated with higher employee job satisfaction in Pakistan's pharmaceutical industry. The regression results indicate that compensation and benefits have a negative but not statistically significant effect on employee job satisfaction ( $B = -0.122$ ,  $p = 0.095$ ), suggesting that compensation does not emerge as a significant predictor when other HR practices are included in the model. In contrast, training and development shows a stronger and statistically significant positive relationship, indicating its relatively higher explanatory power in influencing job satisfaction within the studied context.

The relatively high  $R^2$  value (0.849) observed in this study is acknowledged as uncommon in cross-sectional behavioral research based on perceptual data. Therefore, additional diagnostic analyses are conducted to ensure that the result is not driven by statistical artifacts. Harman's single-factor test is performed to assess common method bias, and the first factor accounted for less than 50% of the total variance, indicating that common method bias is unlikely to be a serious concern. Multicollinearity is examined using the Variance Inflation Factor (VIF) values, with all predictors falling within acceptable limits (well below the conservative threshold of 5), suggesting no significant multicollinearity issues. Furthermore, the adjusted  $R^2$  remained close to the reported  $R^2$ , indicating that the model's explanatory power is not substantially inflated due to overfitting. To enhance robustness, regression estimates are also computed using heteroskedasticity-robust standard errors, with consistent results in terms of coefficient significance and direction. Overall, the high explanatory power may be attributed to the inclusion of closely related HR practices that collectively explain a substantial proportion of variance in job satisfaction, and diagnostic tests confirm that the findings are statistically reliable rather than artifacts of methodological bias.

The findings suggest that training and development is the most influential HR practice in predicting employee job satisfaction. However, compensation and benefits do not show a statistically significant effect in the regression model, indicating that their impact may be indirect, context-dependent, or overshadowed by other HR practices in the pharmaceutical sector.

## CONCLUSION

This study examined the impact of key human resource (HR) practices that include recruitment and selection, training and development, performance appraisal, and compensation management on employee job satisfaction within the pharmaceutical industry of Pakistan. The findings consistently demonstrated that effective HR practices play a critical role in enhancing employee satisfaction, aligning with both theoretical frameworks and previous empirical research. Among the HR practices analyzed, compensation management and training and development emerged as the strongest predictors of job satisfaction, highlighting the importance employees place on fair rewards, growth opportunities, and skill development. Recruitment and selection, along with performance appraisal, also showed positive and meaningful contributions, reinforcing the need for transparent, structured, and credible HR systems. Overall, the results emphasize that pharmaceutical companies can significantly improve employee attitudes and organizational outcomes by strengthening their HR practices. As the sector is characterized by high regulatory demands and a reliance on skilled human capital, effective HRM becomes essential not only for employee well-being but also for sustaining competitive advantage and operational excellence. This study contributes to the growing body of HRM literature by offering sector-specific evidence from Pakistan and underscores the strategic importance of adopting comprehensive and employee-centered HR practices. Future research may extend these findings by using longitudinal designs, exploring additional HR variables, or assessing the moderating role of organizational culture and leadership.

## FUTURE DIRECTIONS

Future research should address limitations related to cross-sectional, single-source data by using longitudinal or multi-source designs to reduce common method bias and improve causal inference. Larger, probability-based samples and alternative statistical approaches (e.g., marker variables or latent method factors) are recommended to enhance robustness and generalizability. Additionally, testing the model across different sectors and contexts would help validate the stability of the findings. Additionally, integrating topic modeling or explainable AI (XAI) techniques can provide deeper insights into customer expectations and decision-making patterns.

## DECLARATION

**Ethical Consideration:** This study strictly adhered to the Declaration of Helsinki and relevant national and institutional ethical guidelines. Informed consent was obtained. All procedures performed in this study were consistent with the ethical standards of the Helsinki Declaration.

**Conflict of Interest:** The author declared no conflict of interest.

**Consent for Publication:** The author gives his consent for publication.

**Availability of Data and Materials:** Data could be available upon written request from the corresponding author.

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**Use of Artificial Intelligence (AI)-Assisted Technology for Manuscript Preparation:** Artificial intelligence (AI) tools were used solely to assist with language editing. No AI tools were used for data extraction, statistical analysis, result interpretation, or the generation of original scientific content. All analyses were conducted by the authors, and they take full responsibility for the integrity and accuracy of the manuscript.

**Similarity Index/ Plagiarism:** The similarity index was checked, and it is well below the threshold value of 19%, i.e., 13%, and each source is less than 10%.

**Authors' Contributions:** This research work was done by Muhammad Adeel.

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