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Advanced Statistical Analysis of Judicial Delays: A Multivariate Exploration of Protracted Justice in the Courts of Peshawar and Charsadda

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ABSTRACT

This study conducts a statistical investigation into the causes of delayed justice within the judiciary courts of Peshawar and Charsadda, employing multivariate techniques such as multiple linear regression and logistic regression. A sample size of 384 respondents was selected using cluster sampling, and data was analyzed to explore the relationship between case duration and factors such as political interference, corruption, judge transfers, lawyer qualifications, and frequent appeals. The results show that political interference significantly prolongs case duration (p-value = 0.007), while frequent transfers of judges further contribute to delays. Lawyer qualifications are also a key factor, with higher educational attainment (LLM) being associated with faster case resolutions. Additionally, frequent appeals by clients are found to considerably delay the justice process (p-value = 0.021). The study finds that the Rayleigh distribution provides the best fit for case duration data, reflecting the variability of judicial delays. The research highlights the need for judicial reforms targeting political interference, enhanced legal education, reduced corruption, and improved case management processes. These findings provide empirical evidence for policy interventions aimed at improving judicial efficiency and ensuring timely access to justice in Pakistan.

Keywords: Delayed Justice, Multiple Linear Regression, Logistic Regression, Judicial Delays, Political Interference, Rayleigh Distribution, Case Duration.

1. INTRODUCTION

The concept of delayed justice is a significant concern in judicial systems worldwide, often encapsulated in the adage, “Justice delayed is justice denied” (Bhardwaj, S. 2018). Delayed justice refers to the undue postponement in the adjudication of cases, resulting in prolonged litigations and delays in delivering legal remedies. This phenomenon undermines the efficacy of the judicial system, erodes public trust, and exacerbates societal inequalities (Barton, A. H.

2019). The causes of delayed justice are multifaceted, encompassing various structural, procedural, and socio-political factors that interact in complex ways. A multivariate analysis offers a comprehensive approach to understanding the key contributing factors in judiciary courts, allowing for an empirical evaluation of the problem and guiding potential reforms (Verma, K**.** 2020). The delay in delivering justice not only impacts the parties directly involved in litigation but also affects the overall perception of fairness in the judicial system. Prolonged litigation can lead to increased financial burdens on litigants, psychological stress, and even miscarriages of justice (Sen, S. 2019). In developing countries, this problem is particularly acute, where backlogs of cases often extend for years, and in some cases, decades. These delays can exacerbate inequality, as wealthier individuals or entities may afford to prolong litigation, while disadvantaged parties suffer from lack of timely redress (Kapoor, A**.** 2021). Numerous studies have highlighted a variety of factors contributing to delayed justice. These factors can broadly be categorized into institutional, procedural, and socio-economic variables, each playing a significant role in exacerbating delays within judiciary systems (Llanos, M., & Schedler, A. (2020). A multivariate analysis allows for the examination of these different factors simultaneously, providing a nuanced understanding of their interrelationships (Garcia, L. P. 2021). Institutional factors play a pivotal role in delayed justice, with many researchers identifying systemic inefficiencies within courts as major contributors to prolonged litigation. These inefficiencies include understaffing, inadequate infrastructure, and a lack of modern technology, which collectively hinder the effective functioning of courts. For instance, Bhardwaj (2018) highlights the shortage of judges and judicial officers in India, where the number of cases far exceeds the capacity of the judiciary to resolve them promptly. Similar trends are observed in other developing countries, where judicial systems are often overburdened due to insufficient resources (Verma, 2020). In developed countries, while infrastructure and staffing are less critical issues, there are still concerns about inefficiencies within judicial institutions. According to Barton (2019), delays in European courts can often be attributed to bureaucratic procedures and the slow pace of administrative reforms. He further suggests that institutional reforms, such as the introduction of digital case management systems and procedural automation, could significantly reduce delays. However, these solutions are not universally applicable, especially in low-resource settings where institutional weaknesses are deeply entrenched. Socio-economic factors are increasingly recognized as significant contributors to delayed justice, particularly in developing countries. Socio-economic inequalities can influence access to justice, with disadvantaged groups often facing greater challenges in navigating the legal system. According to Pathak and Gupta (2018), economically disadvantaged litigants are more likely to experience delays due to their inability to afford legal representation or pay court fees. These inequalities are exacerbated in cases where wealthier parties can exploit procedural loopholes to prolong litigation, further disadvantaging those with fewer resources. For instance, Sharma (2017) conducted a multivariate analysis of delays in Indian courts, examining the role of case volume, institutional resources, and procedural formalism. His findings suggest that delays are often the result of the interaction between institutional inefficiencies and procedural complexity, with socio-economic factors further exacerbating the problem. Similarly, Pathak and Gupta (2018) utilized multivariate regression analysis to assess the impact of socio-economic disparities on access to timely justice, highlighting the importance of addressing inequality in judicial reforms. Garcia (2021) also employed a multivariate framework to examine judicial delays in global contexts, identifying key institutional, procedural, and socio-economic variables that contribute

to delays across different regions. His study underscores the need for context-specific reforms that address the unique challenges faced by individual judicial systems. While the issue of delayed justice is prevalent globally, the nature and extent of delays vary across different regions and legal systems. In a comparative study of judicial systems in Latin America, Llanos and Schedler (2020) found that institutional inefficiencies and corruption are key drivers of delays in countries like Brazil and Argentina. In contrast, delays in European courts are more often associated with procedural inefficiencies and bureaucratic inertia (Dimitrova, 2019). For instance, Burnett (2015) applied a Cox Proportional Hazard Model to examine the duration of judicial cases in India and found that variables such as the number of hearings, type of case (criminal vs. civil), and court jurisdiction significantly impact delay times. Similar methodologies could be applied to the courts of Peshawar and Charsadda, given their shared structural characteristics with other South Asian judicial systems. Multivariate statistical techniques are particularly useful in isolating the effect of specific variables on the duration of court cases. According to Tajik and Hamid (2020), using logistic regression models in a study of Pakistan's judicial system revealed that urban courts, such as those in Peshawar, tend to experience shorter delays due to better resource allocation and access to technological tools, compared to rural courts like those in Charsadda. The literature on judicial delays reveals that these delays result from a complex interplay of procedural, institutional, and resource-related factors, particularly in developing countries like Pakistan. The courts of Peshawar and Charsadda offer a microcosm through which broader issues related to judicial delays can be examined. Advanced statistical methods, particularly multivariate analysis, offer valuable tools for disentangling these factors and identifying areas for reform. By addressing the causes of judicial delays, policymakers and legal institutions can work toward ensuring that justice is delivered more efficiently and equitably.

2. METHODS AND MATERIAL

2.1 STUDY POPULATION

The target population for the study was Khyber Pakhtunkhwa. Study was based on primary data to be obtained from various law chambers of Peshawar high court and Charsadda judiciary complex. The study was conducted among the clients attending the selected courts of Peshawar high court and Charsadda judiciary complex located in the District Peshawar and District Charsadda, Khyber Pakhtunkhwa, Pakistan. These districts were selected because Peshawar is the capital of Khyber Pakhtunkhwa whereas Charsadda is less developed or rural area. The majority of clients were treated in these courts for various issues. The data was collected from the clients attending the following courts:

i. Lower court / Session court
ii. High court
iii. Supreme court

2.2 SAMPLE SIZE

The numbers of clients attending the selected courts were sampled. The sample size was determined using the formula:

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$$n = \left(\frac{z}{E}\right)^2 pq$$

For 95 % confidence level, 5% margin of error and a population proportion of p = 0.5, the given formula provides a minimum sample size of n = 384.

2.3 SAMPLING TECHNIQUE

Cluster sampling was used for collection of data. First, courts were selected from the two districts of Khyber Pakhtunkhwa. After words, various cases were selected from each courts and data was collected from clients of the selected courts after took a proper approval from all selected courts.

2.4 MEASUREMENT TOOL

A questionnaire was plan to accumulate data for the study as given in **Annexure**. The benefits of studies techniques are that there is an awesome response rate, and the respondent's instant reaction to their courts experience can be easily assessed. The questionnaire consisted of closed structured questions. The questionnaire consist of forty-eight questions divided into unmatched portion namely: Behaviours role of lawyers, ignorance of clients, frequent transfers of judges, Political involvement and corruption. The section (b) of questionnaire linked to the delayed justices, section (c) of questionnaire linked to corruption, section (d) of questionnaire linked to the transfer of judgers, section (e) of questionnaire linked to political involvement and section (f) of questionnaire linked to ignorance of law. Respondents had the chance at the bottom of the questionnaire to create any remarks or suggestions. The records became analysed the usage of SPSS and R software. Frequency tables have been generated, and cross tabulations were carry out to calculate the connection between demographic characteristics and the factors. The Chi-square test check was implemented to discover significantly related variables. An odds ratio (OR) is a statistic which express the relative power of association among qualitative variables, A and B. It is defined by

$$OR = \frac{ad}{bc} \quad (1)$$

Where a is odds of A in the presence of B, and b the odds of A in the absence of B, c the ratio of the odds of B in the presence of B, and d the odds of B in the absence of B.

2.4 MULTIPLE LINEAR REGRESSION

Multiple linear regression was statistical model that makes use of quite number independent variables to look at the effect on dependent variable. The purpose of multiple linear regression model is the relation between the independent variables and dependent variable. A multiple regression model spreads to respective independent variables. Multiple regression model can be defined as:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_p x_p + \varepsilon \quad (3)$$

y is dependent variable and x is explanatory variables, β·s are the parameter of the regression model variable and Ɛ is the model's error term [20].

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2.5 LOGISTIC REGRESSION

To assess / measure the effect of independent variables upon dummy dependent variable, logistic regression model is usually taken into consideration. The dependent variable (Delayed justices) in this study is binary having two categories. That is,

$$Y = \begin{cases} 1, & delayed\ justice \\ 0, & \text{Other wise} \end{cases} \quad (4)$$

Logistic regression model can be defined as:

$$\text{Log}\left(\frac{\pi(x)}{1-\pi(x)}\right) = \alpha + \sum_{i=1}^{k} \beta_i \boldsymbol{X}_i \quad (5)$$

Where α and $\beta's$ are the parameters of the model, X_i are independent variables.
Probability distributions play important role in statistical analysis. They are widely used to model uncertainty in phenomena. Since delayed time varies from case to case, therefore, it is a random variable and can be modelled by some appropriate distributions and the objective of the study is to fit various probability distributions to the response variable in order to describe it and to determine the best fit.

3. RESULTS AND DISCUSSION

3.1 FITTING OF PROBABILITY DISTRIBUTION

Table: 3.1 Probability distributions

	Mle	AIC	CAIC	BIC	HQIC	p-value
Exponential Distribution	0.1353563	2305.892	2305.903	2309.843	2307.459	3.053e-14
Weibull Distribution	0.7955702	2285.846	2285.878	2293.748	2288.98	1.532e-07
Rayleigh Distribution	0.01232211	2277.318	2277.328	2281.269	2278.885	6.65e-14

Our dependent variable is duration of cases. Dependent variable varies from time to time. Three distributions were fitted to the data and it was found that Rayleigh distribution provided better fit to the data as compared to exponential and Weibull distribution.

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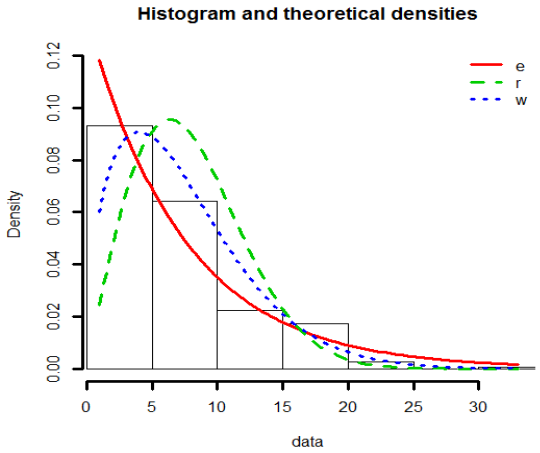

Fig: 3.1 Histogram and theoretical densities

3.1.1 GOODNESS OF FITTNESS

This Table shows the goodness of fit on the duration of cases of respondents. The results showed that Rayleigh Distribution provides better fit to the duration of cases as compared to Weibull Distribution and Exponential Distribution.

3.2 REGRESSION MODELING

Table: 4.2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.137[a]	.019	.016	61.44787

Table 4.8 shows that the value of R^2 =0.019. This mean that 1.9% of the variation in predicted variable (Y) was describe by regressors included in our model (Delayed Justice, Corruption, Transfer of Judge, Political Involvement and Ignorance of Law**)** and the rest of the variation is due to other factors.

Table: 4.3 ANOVA

Model	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
Regression	27336.194	1	27336.194	7.240	.007
Residual	1438595.086	381	3775.840		
Total	1465931.279	382			

Table 4.9 express that the significant p-value=.007 which is less than 0.05. Consequently, the hypothesis of no effect is rejected. In addition. It is decided that there is strongly statistical significant effect of regressors (Delayed Justice, Corruption, Transfer of Judge, Political Involvement and Ignorance of Law**)** on duration of delay cases. It mean that there was a statistical significant effect of the political interference in judiciary system on the duration of delay cases

Table: 4.4 Model

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	132.047	16.368		8.068	.000
	POLITICAL	-33.057	12.286	-.137	-2.691	.007

Table: 4.5 Excluded Variables

Model	Beta In	T	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
DELAY	-.070[b]	-1.332	.184	-.068	.928
CORRUPTION	-.070[b]	-1.332	.184	-.068	.928
TRANSFER	-.045[b]	-.801	.423	-.041	.832
IGNORANCE	-.049[b]	-.939	.349	-.048	.941

The estimated model is given below

$$Y = 132.047 - 33.057(political) - 0.07(Delay) - 0.07(Corruption) - 0.045(Transfer) - 0.049(Ignorance)$$

The individual effects of each regressor on dependent variable (Y), the effect of (X_1) on duration of cases was p-value 0.007. Which was significant. Because they are less than 0.05. As a result, the political interference in judicial system had significant effects on the duration of delay in cases. The p-value for the regressor (X_2) is greater than 0.05 i.e. 0.184>0.05, is insignificant regressor (X_3) for which p-value was concluded as 0.184 >0.05. The p-value for the regressor (X_4) was greater than 0.05 i.e. 0.423>0.05. Insignificant regressor (X_5) for which p-value was 0.349 >0.05.

It is there deduced from these finding that If one unit increase in political interference in judiciary system may lead to be -33.057 decrease on the average in duration of delay in justice. If there were one unit increase in delay in cases, then there would be -0.07 time decrease in the duration of cases. Duration of cases was decrease -0.07 time if there were one value increase in

corruption. Furthermore, if there were one unit increase in transfer of judge in judiciary system there would be -0.045 time decrease in duration of cases. , and if there was one unit increase in Ignorance of law in judiciary system, then there would be -0.049 time decrease on the duration of cases. If the coefficient of all the variables including in the model was equal to zero and there was no effect of the regressors on the duration of cases, and the duration of cases would stand at 132.047.

3.3.1 FITTING OF LOGISTIC REGRESSION MODEL

The questionnaire consists a question i.e. what is the ideal period of getting the decision. Among the 384 respondent, majority of them are in favor of the opinion that less than equal to 3 years is an ideal/ best period of getting the decision.so based on the results; the response variable is constructed as binary having two outcomes namely 3 years or less than 3 years and more than 3 years.

Best-suited model outcomes is used for nominated important threat causes of duration of cases were designated further down. Table 4.11 is the first stage called as null model or ‘O, model, which includes for only discontinue. Whereas table 4.12 contains of independent cause as well as interrupt. The perfect result of response variable in the design of percentage in identify by step ’O, that was 53.8% while in step 14 prove the value of response variable which be dependent on directly full logistic regression model. The full model percentage is 96.3%, which designate that the model was finest-fitted model. additional it point out that out of 177 predictor, there are 171 predictors are accurate in best model and 6 predictors or incorrect in best model, and there accurate percentage was 96.6%.Similarly, out of 206 observed variable, 8 are incorrect observed and 198 are properly observed in best model, and there observed correctly variable percentage is 96.1%.

Table: 3.6 Classification table with no predictors

	Observed		Predicted		
			Response Variable		Percentage Correct
			> 3 years	<=3 years	
Step 0	Response Variable	> 3 years	0	177	.0
		<=3 years	0	206	100.0
	Overall Percentage				53.8

Table: 3.7 Classification table with predictors

	Observed		Predicted		
			Response Variable		Percentage Correct
			> 3 years	<=3 years	
Step 1	Response Variable	> 3 years	171	6	96.6
		<=3 years	8	198	96.1
	Overall Percentage				96.3

3.3.2 LOG LIKELIHOOD RATIO AND DIFFERENT R-SQUARE

Table 4.13 display the value of log likelihood variation in separate stages and given information concerning the best model. In the first step the likelihood value was 121.831 .the value of log-likelihood is increasing stages by stage and.at stage 14 log likelihood value will be 128.314.The log-likelihood higher value point out that this model be composed of some more parameters and designated the suitable model. Whereas the value Cox and Snell R-square and Nagelkerke R-square contribute information about the quantity of variation in dependent described by model.

Table: 3.8 Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	121.831	.654	.874
2	121.836	.654	.874
3	121.838	.654	.874
4	121.880	.654	.874
5	122.005	.654	.874
6	122.113	.654	.874
7	122.241	.654	.874
8	122.389	.654	.874
9	122.739	.654	.873
10	123.435	.653	.872
11	124.076	.652	.871
12	125.189	.651	.870
13	126.489	.650	.869
14	128.314	.648	.866

3.3.3 VARIABLES IN THE EQUATION

Ratio which was (LR=0.641). Delay 2 is detached from due to minimal change in -2log-likelihood ratio (LR=123).The factor Delay 1 is take out at stage 8 due to smallest amount change in 2log likelihood ratio which is (LR=0.35). At seven stage short change in 2log-likelihood ratio which was (LT=0.148) that is way the factor Corruption 2 is rejected. Due to smallest amount change in 2log likelihood ratio at stage 6 which is (LR=.128) the factor corruption 9 is cancelled. At five stage due to tiny change in 2log-likelihood ratio which was (LR=0.108) the factor Ignorance 2 is reduce. Corruption 3 is terminated due to little change in -2log-likelihood ratio which is (LR=0.125). At stage three the factor delay 4 is scratch due to infrequent change in -2log-likelihood which was (LR=0.042). At stage second due to smallest amount change in 2log likelihood ratio which was (LR=0.035) the factor Political 4 is revoke. Due to least possible change in 2log-likelihood ratio at last stage which was (LT=0.004) the factor Political 5 is reject

3.3.4 RISK FACTOR MODEL PARAMETERS OF ESTIMATION

Table 4.14 the best model point out the risk factors , which be composed of p-value, Wald-statistics, Standard error of estimation, degree of freedom, regression coefficients, odds ratio.

The table as well designated that Education and Response variable has statistical highly significant (p-value-0.000) association among. Therefore, cases with clients having LLM level of education is (2.166) times greater as compare to cases with clients having LLB level of education in sense of solving cases. Experience was also significant (p-value=0.02) associated with Response variable. Therefore, cases of non-experience lawyer is (0.927) times less delay as compared to cases of experienced lawyer in sense of solving cases. There, is, significant (p-value=0.015) association between have Nature of cases and Response variable. Therefore, civil and criminal nature of cases is (0.443) times less delay justice as compared to other nature of cases in sense of solving cases. The factor duration of cases is strong (p-value=0.000) associated with Response variable. Therefore, clients having maximum duration of cases is (0.465) times less as compared to those clients having zero duration of cases in sense of solving cases. Frequents appeals by the client may also may lead to delayed justice of response variable is significantly (p-value=0.021) associated with response variable. Therefore, clients who have Frequents appeals by the client is 3.068 times more delay justice as compare to those who have not accept Frequents appeals by the client in sense of solving cases.

Table: 3.9 Risk Factor Model Parameters

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 14[a]	**Education**	15.213	2.203	47.669	1	.000	2.166
	Experience	-.076	.033	5.377	1	.020	.927
	Case	-.814	.334	5.948	1	.015	.443
	Duration	-.766	.129	35.230	1	.000	.465
	Frequently appeals	1.121	.487	5.296	1	.021	3.068
	Constant	-12.306	2.075	35.158	1	.000	

3.4.1 FITTING OF LOGISTIC REGRESSION MODEL

Best-suited model outcomes is used for nominated important threat causes of duration of cases were designated further down. Table 4.15 is the first stage called as null model or 'O, model, which includes for only discontinue. Whereas table 4.16 contains of independent cause as well as interrupt. The perfect result of response variable in the design of percentage in identify by step 'O, that was 53.9% while in step 4 prove the value of response variable which be dependent on directly full logistic regression model. The full model percentage is 86.2%, which designate that the model was finest-fitted model. additional it point out that out of 177 predictor, there are 175 predictors are accurate in best model and 2 predictors or incorrect in best model, and there accurate percentage was 98.9%.Similarly, out of 207 observed variable, 51 are incorrect observed and 156 are properly observed in best model, and there observed correctly variable percentage is 75.4%.

Table: 3.10 Classification table with no predictors

	Observed		Predicted		
			Response Variable		Percentage Correct
			> 3 years	<=3 years	
Step 0	Response Variable	> 3 years	0	177	.0
		<=3 years	0	207	100.0
	Overall Percentage				53.9

Table: 3.11 Classification table with predictors

	Observed		Predicted		
			Response Variable		Percentage Correct
			> 3 years	<=3 years	
Step 1	Response Variable	> 3 years	175	2	98.9
		<=3 years	51	156	75.4
	Overall Percentage				86.2

3.4.2 LOG LIKELIHOOD RATIO AND DIFFERENT R-SQUARE

Table 4.17 display the value of log likelihood variation in separate stages and given information concerning the best model. In the first step the likelihood value was 262.813 .the value of log-likelihood is increasing stages by stage and.at stage 4 log likelihood value will be 135.210.The log-likelihood higher value point out that this model be composed of some more parameters and designated the suitable model. Whereas the value Cox and Snell R-square and Nagelkerke R-square contribute information about the quantity of variation in dependent described by model.

Table: 4.12 Log likelihood ratio and different R-Square

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	262.813	.501	.670
2	144.622	.633	.846
3	139.554	.638	.853
4	135.210	.642	.858

3.4.3 VARIABLES IN THE EQUATION

In Appendix E the nominated to the highest degree suitable model contain of independent variables that was Education, Experience in years, Duration of cases and Frequents appeals by

the client may also may lead to delayed justice affected from Response variable. Utilize step forward and step backward technique of logistic regression analysis for the variables selection and decided approximately the risk factors of Response variable by apply the standards of log-likelihood. It also point out standard error of estimates, Wald-statistics, odds-ratio, regression coefficients (B) for the whole of the variables involved in best model.

3.4.4 MODEL IF TERM REMOVED (OF RISK FACTORS)

Appendix portion point out that, the model proceeding to reduces some variables to receive the best logistic regression model.in second stage the model eliminating some factors with smallest changes in the -2log likelihood value the model provides the best fit, and their p-value was also less as compare to remaining complete the models of appendix.it also provide accessible facts that at later stage the factor Frequents appeals by the client may also may lead to delayed justice is reject due to nearly change in 2log likelihood ratio which is (LR=6.733).

3.4.5 RISK FACTOR MODEL PARAMETERS OF ESTIMATION

Table 4.18 the best model point out the risk factors , which be composed of p-value, Wald-statistics, Standard error of estimation, degree of freedom, regression coefficients and odds ratio. The table as well highlighting that Education and Response variable has statistical strongly significant (p-value-0.000). Therefore, cases with clients having LLM level of education is (3.073) times greater as compare to cases with clients having LLB level of education in sense of solving cases. Experience is also significant (p-value=0.047) associated with Response variable. Therefore, cases of non-experience lawyer is (0.941) times less delay as compared to cases of experienced lawyer in sense of solving cases. The factor duration of cases is strong (p-value=0.000) associated with Response variable. Therefore, clients having maximum duration of cases is (0.436) times less as compared to those clients having zero duration of cases in sense of solving cases. Frequents appeals by the client may also may lead to delayed justice of response variable is significantly (p-value=0.012) associated with response variable. Therefore, clients who have Frequents appeals by the client is 3.254 times more delay justice as compare to those who have not accept Frequents appeals by the client in sense of solving cases.

Table: 3.13 Variables in the Equation

		B	**S.E.**	**Wald**	**Df**	**Sig.**	**Exp(B)**
Step 4	**Education**	15.740	2.311	46.405	1	.000	3.073
	Experience	-.060	.030	3.960	1	.047	.941
	Duration	-.830	.134	38.284	1	.000	.436
	Frequents appeals	1.180	.469	6.321	1	.012	3.254
	Constant	-14.132	2.122	44.360	1	.000	.000

Overhead results Corresponding that the excellent model for Response variable predicting is exposed as:

$$Logit(\bar{Y}) = -14.132 + 15.740(\textbf{Education}) - .060(\textbf{Experience}) - .830(\textbf{Duration}) + 1.180(Frequentlyappeals)$$

4. Conclusion and discussion

The present study aimed to investigate the causes of delayed justice in judiciary courts, particularly in Peshawar and Charsadda, using a variety of statistical techniques, including multi-linear regression and logistic regression models. This paper revealed several important factors contributing to the prolonged duration of court cases, shedding light on both institutional and procedural inefficiencies that play a significant role in judicial delays. By employing multiple linear regression and logistic regression models, the analysis reveals that political interference, frequent transfers of judges, and higher levels of legal appeals significantly impact the duration of cases. The findings suggest that political involvement in the judicial system has a particularly strong effect on delays, as indicated by the p-value (0.007), demonstrating a critical need for reforms that mitigate such interference. The research also emphasizes the importance of lawyer qualifications and case characteristics. Higher qualifications of lawyers, such as holding an LLM degree, are associated with more timely resolutions, while inexperienced lawyers tend to contribute to delays. Another critical factor identified is the role of frequent transfers of judges. Frequent judge rotations disrupt case continuity, requiring new judges to familiarize themselves with ongoing cases, which prolongs proceedings. This, combined with corruption within the judicial system, further hinders the timely delivery of justice. The logistic regression model revealed that higher levels of corruption are linked to extended case durations, underlining the need for systemic reforms to reduce corruption and enhance judicial efficiency. Additionally, certain types of cases, particularly civil and criminal matters, are more likely to experience delays, underlining the need for case management reforms. Furthermore, the Rayleigh distribution was found to best fit the data on case durations compared to exponential and Weibull distributions. This highlights the variability and unpredictability of delays, indicating that complex, multifactorial solutions are required to address the issue comprehensively. The conclusions drawn from this study suggest that targeted reforms addressing political interference, improving lawyer training, and optimizing case management processes are essential for reducing delays and ensuring justice is delivered more efficiently. The study's statistical modeling reveals that the Rayleigh distribution provides the best fit for the duration of cases, reflecting the complexity and variability in judicial delays. These findings underscore the need for targeted judicial reforms to reduce political interference, improve legal education, curb corruption, and streamline case management. In conclusion, addressing the multifaceted causes of delayed justice is essential to enhancing the efficiency and fairness of the judiciary system. The study provides a strong empirical foundation for future policy reforms aimed at reducing delays and ensuring timely access to justice in Pakistan.

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