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Women's Career Challenges and Opportunities (A Study of Career and Job Satisfaction among Bangladeshi Women)

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Abstract

The purpose of this research is to learn more about women in Bangladesh and their perceptions of career options and job satisfaction. Women's labor force participation has increased dramatically in Bangladesh, as it has in many other developing countries. But despite these improvements, women still face several roadblocks in the workplace. Women's professional development and job happiness can be aided by policies and environments that take into account the unique obstacles they confront. The study uses a Univariate, Bivariate, and multivariate method, collecting information through both quantitative surveys and qualitative interviews. Participants are professional women from a wide range of fields in Bangladesh. Quantitative surveys analyze issues including work-life balance, gender bias, education status, women's violence in the job sector, support from family members, promotion prospects, and job satisfaction.

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The qualitative interviews dive more deeply into the women's lived experiences, shedding light on the difficulties they face and the strategies they use to overcome them. The study has both theoretical and practical significance. For practical purposes, this research will improve our understanding of the most significant obstacles to women's careers and participation in development processes and the most effective ways to overcome them. This paper will also be useful as a source of information for feminist groups and other organizations with the goal to advance women's rights and equality.

Keywords: Women's career, Job satisfaction, Career challenges, Work-life balance, Gender bias, Hypothesis, Regression Analysis, Chi-square Test.

1. Introduction

Due to its impact on both professional and personal life, the issue of women career and job satisfaction in Bangladesh has captured the attention of researchers and academics in the modern world of competition because of the fact that it has the capacity to bring beneficial results for people on their own, within their families, and within their organizations. The career of women has been characterized by education, occupation, discussed family planning with partners, household decision making, freedom movement, age at marriage, political representation, and legal rights (Tasnim et al., 2006).

In recent years, the percentage of working-age women in Bangladesh has risen dramatically. Women, meanwhile, are stereotyped as having fewer doors opened to them in the workplace. Increasing the participation of women in the development process is often cited as a way to improve the prospects for progress in countries like Bangladesh, where women make up over half the population. It is still the case in Bangladesh that women and men are treated differently. Despite the fact that a substantial number of women labor in the informal sector, their contribution is not recognized in society. They must overcome a number of challenges in order to improve their talents and increase their production. These include a lack of company start-up money, a lack of education, employee-related issues, and limited mobility, which leads to poor access to the market, information, technology, and finance.

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The research shows that women in Bangladesh confront a number of barriers in the workplace, such as societal expectations, a lack of access to education and training, gender-based discrimination, an imbalance between work and personal life, and little chances to grow in their careers. Reduced job satisfaction and stunted professional development are common outcomes of these difficulties. However, the research also reveals areas where advancement is possible, such as expanding access to education, enacting rules to combat gender bias in the workplace, encouraging work-life balance, and establishing support networks for women in a variety of fields.

This study is useful for governments, companies, and organizations that want to establish more inclusive work environments and empower women in their careers because it sheds light on the specific obstacles and opportunities experienced by women in Bangladesh. Working to overcome these obstacles and seize these openings will help women professionals as a whole advance in their careers, which in turn will benefit society at large.

2. Objectives of the Study

The overarching goal of this research is to examine how women's self-power influences their engagement with Bangladesh's development efforts. Those precise goals are:

- To investigate the various opportunities for women's career that are currently available in Bangladesh.
- To analyze how women have been educated in various ways.
- In order to determine the many ways in which women have gained economic independence.
- To find out what kind of jobs and careers Bangladeshi women have and how much they take part in the growth process.

3. Literature Review

The way a person feels about their work can be largely predicted by how satisfied they are with their position. Happock et al., 1935 was the first to define job satisfaction as the "state of mind" that results from a confluence of "I am satisfied with my job" triggers in the worker's immediate physical surroundings, interpersonal interactions, and organizational culture. Low levels of employee contentment are an important warning indicator that things are becoming worse in an organization. It contributes to discontent, low output, disciplinary issues, and other types of workplace strife (Farzana, 2012).

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The issue of gender becomes more prominent after the problems of property and violence, especially in emerging countries. At this point in human history, the 21st century, men and women are each making an equal contribution to the total progress. Both of them work in industry, academia, bank, public and non-government organizations and so on. Still, it has been determined that there is a significant problem with the variation in the percentages of different types of jobs that are available in developing countries for instance Bangladesh (Farzana Sultana, 2012; Alam 2005). Self-empower according to Sen and Batiliwala, 2000 is not just having more success to resources (human, financial, intellectual), but also having more faith in one's own abilities and undergoing a transformation of one's consciousness (Paul et al., 2016).

In developing countries, and particularly in Bangladesh, the number of women working in virtually any field is significantly lower than the global average. The lack of employment opportunities available to women in Bangladesh is a significant barrier to the country's continued economic and social growth. One of the primary factors that contributes to the low employability of women in this day and age is dissatisfaction with their current jobs. According to the statistics, discrimination on the workplace and many elements connected to the job, such as income, advancement, working conditions, social status security, recognition, and so on, are a major determining factor in overall job satisfaction (Raihen et al., 2023). Because the results of the interaction between psychological elements and the work outcome of persons are the most critical parts of human existence, it is vital to consider the situation of female job satisfaction (Afza, 2008).

Job satisfaction has been extensively investigated in organizational research over the past four decades (Currivan, 1999; Lund, 2003). Both its global construct and its notion with numerous dimensions have been described and measured (Locke, 1969, 1976; Price 1997). According to Bullock et al., 1952, a person's level of contentment on the job is based on how well they strike a balance between the positive and negative aspects of their work. According to Smith (1955), it is the degree to which an individual feels his or her employment satisfies his or her numerous needs. The term was coined by Blum and Naylor (1968) to describe an individual's way of thinking that has developed due to their experiences in the workplace, their personality, and their personal relationships.

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It is imperative that action be taken as early as possible in the educational process in order to ensure that women and men have equal possibilities in the digital world and in the development of technology. Young female students around the world are leaving fields of study related to science, technology, engineering, and mathematics (STEM) as they progress in their education and careers. Despite economic freedom and gender equality, this tendency persists in the world's countries and societies. Collen, 2018 indicates that the gender gap in academic ability mostly depends on the women age and current level of proficiency. We could assume that women's job security has a small effect in Bangladesh due to the country's strong patriarchal heritage (Amin, 1995; Cain et al., 1979). Recent research, however, suggests that women's earning a living can result in positive changes, including: better bargaining position within the household (Kabeer, 1997a); increased access to information and support networks (Amin et al., 1997); and increased feelings of self-worth (Sarah Salway, Sonia Jesmin, and Shahana Rahman, 2005). However, there are also negative repercussions, such as an increased likelihood of violence (Paul-Majumder & Begum, 2000).

Women in Bangladesh now have much greater access to higher education than they did a few decades ago, especially in urban areas. Women now make up the largest pool of employment applicants for several fields as they pursue higher education. In order to attract and keep talented women, employers must solve the women career challenge. Administrators should not focus on women career as a women's issue since it's critical to the success of their organizations (MD Ali Aklas, 2015, Oslen, 1995).

4. Women in Bangladesh's Workforce: Where They Stand Today

Equality for women in jobs is a major component of gender equality. From prehistoric times onward, women performed a wide range of roles, including those related to the home, farming, the wedding, and the harvest. Broadus et al., the GDP was \$16 trillion in 1993, according to the government's statistics. Between 10% and 35% of their total income was generated by women. According to a study done in 1990, the global GDP would have increased by 20%-30% if all national income had been accounted for, including the contributions made by women in the workplace (Nuruzzaman, 2004).

In addition to that, it's distressing that fewer woman than man complete postsecondary education at the national level. This inequality emerges in elementary school and grows in colleges and



universities. In 1999, males outnumbered females at admitted to universities by a margin of 77.20% to 22.80%. Some programs made the completion of primary school mandatory, and others prioritized educating girls to narrow the gender gap. Despite this, in 1995 it was observed that male students comprised 63% of the total while female students comprised 37%. It's worth noting that now 95% of children who are school age are enrolled in elementary school, yet 38% of those children will not continue their education through the basic level.

5. Data Source and Methodology

The National Institute of Population Research and training (NIPORT) of the Ministry of Health and Family Welfare of Bangladesh oversaw the 2018 Bangladesh Demographic and Health survey (BDHS) data used in this analysis. There has been usage of both univariate, bivariate and multivariate analysis. To determine what factors contribute to women's career and job satisfaction, researchers utilized multiple linear regression analyses and constructed a women career and job satisfaction related index.

5.1 Univariate Analysis

The purpose of univariate analysis is to examine and summarize data using only one independent variable. Without taking into account any correlations between other variables, it analyzes the data's distribution, central tendency, and variability. Univariate analysis focuses on the description and understanding of a single categorical or continuous variable (Park, 2015), (Charro, Fernando, Alaa Haj Ali, Nurul Raihen, Monica Torres, and Peiyong Wang, 2023).

Table 1: The frequency and the percentage of the respondent's age

	Frequency	Percentage	Valid	Cumulative
	rrequency	Tereentage	Percentage	Percentage
Valid				
15-25	172	27.1	27.1	27.1
25-35	123	37.9	37.9	65.0
35-50	133	29.3	29.3	94.3
50-65	24	5.3	5.3	99.6
65+	2	0.4	0.4	100
Total	454	100	100	

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Comments: Most of the participants belong to the age group 15-50, and the total percentages of them is 94.3% between the interval of 15-50 age.

Table 2: The frequency and the percentage of the women's marital status

	Frequency	Percentage	Valid	Cumulative
	requency	1 creeninge	Percentage	Percentage
Valid				
Single	134	29.4	29.5	29.5
Married	304	67.0	67.0	96.5
Divorced	5	1.1	1.1	97.6
Widowed	9	2.0	2.0	99.6
Separated	2	0.4	0.4	100
Total	454	100	100	

Comments: Most of the participants women are married and the percentage is 67.0%, and the single women's percentage is 29.5%.

 Table 3: Bangladeshi female entrepreneurs' work-life balance

	No. of	Domontogo	Valid	Cumulative	
	respondents	Percentage	Percentage	Perce	
Valid					
Modular	15	3.3	3.3	3.3	
working hours	13	3.3	3.3	3.3	
Transport	53	11.7	11.8	15.1	
facility	33	11.7	11.0	13.1	
Assisted living	9	2.0	2.0	17.1	
facility		2.0	2.0	1/.1	
Child Care	228	50.2	50.2	67.3	
facility	220	30.2	30.2	01.3	
Flexible work	146	32.2	32.2	99.5	
arrangements	140	34.4	34.2	77.3	

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Reduced labor				
hours and	3	.5	.5	100
burden				
Total	454	100	100	

Comments: The percentage of respondents for the factor of childcare facility is highest, and it is 50.2%. From this above result, most of the women are concern about their childcare facility and suitable work management.

Table 4: The frequency and percentage of the participant women's educational level

	No of	Domoontogo	Valid	Cumulative
	respondents	Percentage	Percentage	Percentage
Valid				
Under class 8	5	1.1	1.1	1.1
Secondary				
school	68	13.9	13.9	15.0
certificate	00	13.7	13.7	13.0
(S.S.C)				
Higher				
secondary				
school	93	20.5	20.5	35.5
certificate				
(H.S.C)				
Undergraduate	158	34.8	34.8	70.3
Postgraduate	112	24.7	24.7	95
More than				
university	18	5.0	5.0	100
education				
Total	454	100	100	

Comments: The percentage of undergraduate educational level among the participant women in our survey is highly performed, and it is 34.8%.

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Table 5: Frequency table of the best job for women in terms of safety

	Frequency	Percentage	Valid	Cumulative
	rrequency	Teremage	Percentage	Percentage
Valid				
Doctor	37	8.5	8.5	8.5
Teacher	263	60.5	60.5	69
Artist	13	3	3	72
NGO	2	.5	.5	72.5
Business	12	2.8	2.8	75.3
Journalist	1	.2	.2	75.5
Lawyer	2	5.6	5.6	81.1
Engineer	3	.7	.7	81.8
Bank	49	10.6	10.6	92.4
Other	45	7.6	7.6	100
Total	427	100		

Comments: Most of the participants to this survey are preferring to do the Teaching profession, and their percentage of choosing teaching job is 60.5. Teaching job is selected most secure job among the Bangladeshi women.

5.2 Bivariate Analysis

When it comes to statistics, bivariate analysis means looking at the correlation or causation between two independent variables. The variables in this sort of study are often numerical or quantitative in character. The primary goal of bivariate analysis is to identify any associations or correlations between the two variables under consideration.

5.2 .1. Association between job status and type of school (public or private)

Hypothesis:

H₀: There exists no association between job status and type of school.

H₁: There exists an association between job status and type of school.



Table 6: Association between job status and type of school

Chi-square test					
	Value	df	Assymp.sig (2-sided)		
Pearson Chi-Square	43.865ª	4	0.000		
Likelihood	45.515	4	0.000		
Linear-by-Linear Association	42.270	1	0.000		
N of valid cases	449				

Comments: From the Chi-square table we see that the Pearson Chi-Square p-value is 0.000 which is less than the level of significance 0.05, so we may reject the null hypothesis at 5% level of significance. So can conclude that there exists an association between the job and status and the type of school (public or private). The women from public universities are receiving higher position than the women come from private universities (Raihen et al., 2023).

5.2.2 Association between women's opinion in personal satisfaction according to their job position in their own sector

Hypothesis:

H₀: There exists no association between the job position and women's satisfaction.

H_a: There exists an association between the job position and women's satisfaction.

Table 7: Association between women's job satisfaction and job position

Chi-square test					
	Value	df	Assymp.sig (2-sided)		
Pearson Chi-Square	11.071 ^a	4	0.024		
Likelihood	14.557	4	0.000		
Linear-by-Linear Association	.132 ^b	1	0.036		
N of valid cases	443				

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Comment: From the Chi-square table we can see that the p-value is 0.024 which is less than 0.05 (level of significance). So, we can reject the null hypothesis at 5% level of significance. So, we can conclude that there exists a significant relationship between the women's satisfaction from their own perspective and their job status.

5.2.3 Association between women's violence and type of job sector (government and private sector)

Hypothesis:

H₀: There is no association between women's violence and the types of job sector.

H_a: There is an association between women's violence and the types of job sector.

Table 8: Association between women's violence and types of job sector

Chi-square test					
	Value	df	Assymp.sig (2-sided)		
Pearson Chi-Square	10.081 ^a	1	0.001		
Likelihood	10.482	4	0.001		
Linear-by-Linear	.132 ^b	1	0.002		
Association	.132		0.302		
N of valid cases	372				

Comments: From the chi-square table we see that the p-value is .001 which is less than level of significance .05. So, we may reject the null hypothesis at 5% level of significance. Therefore, we may conclude that there is a strong association between any violence in the job sector and the type of job (government and private).

5.2.4. Association between good position of women in their job and support from family members

Hypothesis:

H₀: There is no association between position in the job and the support from family.

H_a: There is an association between them.



Table 9: Association between the job and the family support

Chi-square test					
	Value	df	Assymp.sig (2- sided)		
Pearson Chi-Square	21.208 ^a	16	0.171		
Likelihood	25.467	16	0.062		
Linear-by-Linear Association	4.381 ^b	1	0.036		
N of valid cases	446				

Comments: From the chi–square table p-value is .171 which is greater than level of significance .05, so we may not reject the null hypothesis at 5% level of significance. So, there is no significant link between the women job position and the support from their family members.

5.2.5 Association between women's job satisfaction with their position according to their gender.

Hypothesis:

H₀: There is no association between women's position and gender.

H_a: There is an association between women's position and gender.

Table 10: Association between women's position and gender

Chi-square test					
	Value	df	Assymp.sig (2-sided)		
Pearson Chi-Square	27.054 ^a	1	0.000		
Likelihood	25.910	4	0.000		
Linear-by-Linear Association	16.905	1	0.000		
N of valid cases	128				

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Comment: From the chi-square table, p-value is .000 which is less than level of significance .05, So we may reject the null hypothesis at 5% level of significance. We conclude that there is an association between women's position in the workplace and gender.

5.3 Multivariate Analysis

We wish to know the dependency of women's job satisfaction in this part by utilizing multiple linear regression and Binary Logistic regression.

Using the chi-square test, it is possible to analyze the relationship between women's job satisfaction and each associated variable and to determine the strength of each relationship. Nonetheless, the dependent variable may be influenced by multiple factors concurrently (Raihen et al., 2017). Multiple regression analysis can be utilized to investigate the relationship between a dependent variable and a set of independent variables. Both dependent variables in this case are continuous. Consequently, we will attempt to fit two multiple linear regression models (Raihen and Stein et al., 2023).

In our multiple regression Analysis, we use women's job satisfaction as a dependent variable, and the explanatory variables are age, education level, gender, and family support.

Table 11: Analysis of variance

Source	SS	df	MS	F-value	P-value
Model	12.5817197	21	0.599129509		
Residual	50.7261982	319	0.159016295	3.77	0.0000
Total	63.3079179	340			

R-squared = 0.1987 Adj R-squared = 0.1460 Root MSE = .39877

Comments: Since, the p-value < 0.05, so we can conclude that at 5% level of significance, mean of the women's job satisfaction are not equal for all predictors. Model fit explains just 19.87% of the total variation in female job satisfaction (R^2 =.1987), indicating the model is inadequate (Raihen et al., 2022).

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5.4 Binary Logistic model

Both the probit and the logit models can be applied because the dependent variable, Y, can take on the values 1 (if the woman is content with her employment) and 0 (if she is not). These two models both make a probability forecast. However, a logistic regression model is utilized here since it is more straightforward and employs a tried-and-true method of analysis (Chauhan 2016, Cramer 1999).

5.4.1 Model of logit regression

Calculation of WJSI (WOMEN JOB SATISFCATION INDEX): Here, our response predictor is

WJSI = mean of the recoded variables.

And Women Job Satisfaction (WJS) =1; if WJSI 0.5

0; otherwise

Here we want to know the dependency of Women job satisfaction with respect to age, educational status, gender, family support as independent variables (LaValley, 2008).

5.4.2 Logistic regression

Log likelihood = -156.06736 Number of observations = 330 Prob > chi2 = 0.0000

Pseudo R2 = 0.1514 LR chi2(18) = 55.67

5.4.3 Interpretation

From the above result, Prob > chi2 = 0.0000 < 0.05. There is significant effect of age, educational status, gender, family support on the dependent variable at 5% level of significance.

6. Result and Conclusion

With the help of this study, an attempt was made to investigate the current situation regarding women career, job, and other factors that contribute to the professional advancement of women in a variety of industries and service sectors in Bangladesh. It is envisaged that the research information that will be offered by this study will prove to be valuable to policy makers in various organizations.

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The results of this research have uncovered a few of the contributing components that are responsible for the formation of women self-power effects. In addition to this, it shed light on a few elements that assist women in furthering their professional development.

Women have to play many roles at home and at work, which can lead to fatigue, stress, and dissatisfaction. Though Bangladesh has made significant work-life improvements in recent years, there is still much to do. According to the poll, 34.8% of female employees were satisfied that their jobs interfered with their studies. 50.2% of respondents said their personal or household life (childcare facilities) interfered with their work. Bangladeshi female teachers' job satisfaction is 60.3%, according to this report. Only when the organization provides modular working hours (roistered days off and family-friendly starting and finishing times), transport facility, assisted living facility, childcare facility, Flexible work arrangements, reduced labor hours and burden for female employees will they be able to contribute to both family and organization. Women employees must care for their families both physically and financially in order to meet their families' demands. Work for the achievement of corporate goals as well as individual advancement to meet career needs. Since the Prob > chi2 = 0.0000, we conclude that demographic factors such as age, education level, gender, and family support have a significant impact on women's job satisfaction in Bangladesh.

Gender parity and women's professional empowerment are not merely an issue of social fairness; they are crucial to Bangladesh's long-term economic success. If discrimination is eliminated and women are given an equal opportunity in the workplace, they will be more productive and happier as a result.

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7. References

Tasnim, S. (2006). Job Satisfaction among Female Teachers: A study on primary schools in Bangladesh (Master's thesis, The University of Bergen).

Hoppock, R. (1935). Job satisfaction.



- Sultana, F., & Begum, B. (2012). Measuring the job satisfaction of female library professionals working in the health libraries in Dhaka city. *Eastern Librarian*, 23(1), 37-50.
- Alam, S. S., Talha, M., Sivanand, C. N., & Ahsan, M. N. (2005). Job satisfaction of university woman teachers in Bangladesh. *Journal of Social sciences*, 1(2), 88-91.
- Presser, H., & Sen, G. (2000). Women's empowerment and demographic processes: Moving beyond Cairo. Oxford University Press.
- Paul, G. K., Sarkar, D. C., & Naznin, S. (2016). Present situation of women empowerment in Bangladesh. *Int J Math Sta Invention*, 4(8), 31-38.
- Raihen, M. N., Akter, S., & Sardar, M. N. (2023). Food Satisfaction among Students: A Study of Present Public University Students in Bangladesh. *Journal of Mathematics and Statistics Studies*, *4*(1), 01-18.
- Afza, S. R., & Newaz, M. K. (2008). Factors determining the presence of glass ceiling and influencing women career advancement in Bangladesh.
- Currivan, D. B. (1999). The causal order of job satisfaction and organizational commitment in models of employee turnover. *Human resource management review*, 9(4), 495-524.
- Lund, D. B. (2003). Organizational culture and job satisfaction. *Journal of business & industrial marketing*.
- Locke, E. A. (1969). What is job satisfaction?. *Organizational behavior and human* performance, 4(4), 309-336.
- Price, J. L. (1997). Handbook of organizational measurement. *International journal of manpower*, 18(4/5/6), 305-558.
- Bullock, R. P. (1952). Social factors related to job satisfaction: A technique for the measurement of job satisfaction (No. 70). Bureau of Business Research, College of Commerce and Administration, Ohio State University.
- Lawrence, L. C., & Smith, P. C. (1955). Group decision and employee participation. *Journal of Applied Psychology*, 39(5), 334.



- Blum, M. L., Naylor, J. C., & Naylor, J. C. (1968). *Industrial psychology; Its theoretical and social foundations*. Harper & Row.
- Ganley, C. (2018). Are boys better than girls at math. Scientific American.
- Amin, S. (1995). *The rise of dowry in Bangladesh*. National Centre for Epidemiology and Population Health, Australian National University.
- Cain, M., Khanam, S. R., & Nahar, S. (1979). Class, patriarchy, and women's work in Bangladesh. *Population and Development review*, 405-438.
- Kabeer, N. (1997). Women, wages and intra-household power relations in urban Bangladesh. *Development and change*, 28(2), 261-302.
- Salway, S., Jesmin, S., & Rahman, S. (2005). Women's employment in urban Bangladesh: A challenge to gender identity?. *Development and Change*, *36*(2), 317-349.
- Paul-Majumder, P., & Begum, A. (2000). *The gender imbalances in the export oriented garment industry in Bangladesh*. Washington, DC: World Bank, Development Research Group/Poverty Reduction and Economic Management Network.
- Olsen, D., Maple, S. A., & Stage, F. K. (1995). Women and minority faculty job satisfaction: Professional role interests, professional satisfactions, and institutional fit. *The Journal of higher education*, 66(3), 267-293.
- Broadus, J. M. (1993). Possible impacts of, and adjustments to, sea-level rise: the case of Bangladesh and Egypt. *Warrick, RA, Barrow, EM, & Wigley, TML (eds.)*, 263-275.
- Nuruzzaman, M. (2004). Neoliberal economic reforms, the rich and the poor in Bangladesh. *Journal of Contemporary Asia*, 34(1), 33-54.
- Park, H. M. (2015). Univariate analysis and normality test using SAS, Stata, and SPSS.
- Charro, F., Ali, A. H., Raihen, N., Torres, M., & Wang, P. (2023). A bifurcation phenomenon in a singularly perturbed two-phase free boundary problem of phase transition. *Nonlinear Analysis: Real World Applications*, 73, 103911.

Publication Date: 05-07-2023 ISSN: 2706-6495



- Raihen, M. N., & Akter, S. (2023). Forecasting Breast Cancer: A Study of Classifying Patients' Post-Surgical Survival Rates with Breast Cancer. *Journal of Mathematics and Statistics Studies*, 4(2), 70-78.
- Raihen, N. (2017). Convergence Rates for Hestenes' Gram-Schmidt Conjugate Direction Method without Derivatives in Numerical Optimization (Doctoral dissertation, University of Toledo).
- Stein Jr, I., & Raihen, M. N. (2023). Convergence Rates for Hestenes' Gram–Schmidt Conjugate Direction Method without Derivatives in Numerical Optimization. *AppliedMath*, *3*(2), 268-285.
- Raihen, M. N. I. (2022). A Bifurcation Phenomenon of Regularized Free Boundary Problems of Two-Phase Elliptic-Parabolic Type (Doctoral dissertation, Wayne State University).
- Chauhan, V., Suman, H. K., & Bolia, N. B. (2016). Binary logistic model for estimation of mode shift into Delhi Metro. *The Open Transportation Journal*, *10*(1).
- Cramer, J. S. (1999). Predictive performance of the binary logit model in unbalanced samples. *Journal of the Royal Statistical Society: Series D (The Statistician)*, 48(1), 85-94.
- LaValley, M. P. (2008). Logistic regression. *Circulation*, 117(18), 2395-2399.

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