

HOUSEHOLD CHARACTERISTICS AND FEMALE LABOR FORCE PARTICIPATION: A CASE STUDY OF DERA ISMAIL KHAN DISTRICT

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Abstract

The aim of the preset study is to investigate the impact of household factors over the decision of female to participate in labor force market in Dera Ismail Khan District. For this purpose, the primary data gathered through well-structured questionnaire about 150 female is used. Binary Logistic Model using maximum Likelihood Estimation Technique (MLE) is used to empirically investigate the impact of household factors over the decision of female about FLFP. The results shows that experience, education, number of children and number of earners are positively and significantly affect the decision of females to participate in labor force, while parents income and family size negatively and significantly affects it. Age, education of the father and education of the husband found insignificant in case of FLFP. The results of qualitative variables indicate that unmarried female are more likely to participate in labor force, while the female belonging to Tehsil Parova and Tehsil Pharpue are less likely to participate in labor force in study area.

Key Words. FLFP, Binary Logistic Regression, MLE, DIK, Parova, Pharpur

1. Introduction

The portion of the society which engaged in the process of production of goods and services for the needs of the society is called labor force. While on the other hand, the portion of the female segment of the society having age 15 and above participate in work force for earning is called female labor force. Participation of young age persons in work force varies from nations to nation and that is all due to availability of job and preferences given to the job sector in the concerned nations. Lack and inefficient use of available resources and a high population growth rate collectively place burden on the labor market to absorb the large number of young people in developing countries. Throughout the world, relative to male, female face many hurdle such as lack of education, household responsibility, social and cultural norms etc. to participate in labor in most of developing nations of the world (Aslam, 2009; UNESCO, 2022). Others factors like, income of the household and poverty has different impact on the decision of the female to participate in labor force market (Chaudhry & Rahman, 2009). The overall female participation in labor force market is 54% throughout the world (ILO, 2024). In the case of South Asian nations, the highest female labor force participation rate was found in Nepal at 86%, while the lowest rates were observed in India and Pakistan, at 28.7% and 23.1% respectively (World Bank Data, 2023).

1.2 Female Participation in Pakistan Prospective

Being the fifth most populous nation, Pakistan faces many challenges in the labor force market due to its high population growth and the large proportion of young people of both genders. Overall, female participation is found to be low compared to their male counterparts, mainly

due to social, economic, demographic, and cultural factors. In Pakistan, the labor force participation rates for males and females are 81% and 23%, respectively (World Bank Data, 2024). The male ego and gender segregation in labor market are the main social norms to prevent female participation (Field & Vyborny, 2022). The study by Irfan et al. (2013) confirmed that females were neglected in participating in the labor force market, mainly due to the social and cultural factors of the household.

1.2.1 Economic Aspects

Many economic factors are found to be major determinant of female labor force participation in Pakistan and the wage is one of them. The lower wage of females relative to males restricts young females from participating in the labor market (Sabir & Aftab, 2007). Within the country, male salaries are found to be 25% higher relative to female salaries (ILO, Wage Report, 2025). Female characteristics such as age, education, workplace environment, and occupational status are the main drivers of low female engagement in the labor market in Pakistan, as mentioned in the ILO report.

1.2.2 Location

The residence of females is another major determinant of their low participation in the labor force. In a society like Pakistan, females are not allowed to work outside their hometown. Safety concern and head ego are the main factor which prevent the female segment of the household to participate in labor market. Female belongs to urban area and have higher education were more likely to participate in labor force market (Batool & Sajid (2011).

1.2.3 Education

Education is also a major contributor of participation of female in labor force market in Pakistan. More often, female education has been found positive impact on the decision female to participate in labor force. Relative to past, the spending on female education increased in present case in Pakistan which increases the numbers of young age female to available for work.

1.3 Female Labor Force Participation in Dera Ismail Khan

Dera Ismail Khan District located at the end of south boundary of KP Province and majority of the population are Saraiki speaker and due to internally displaced person of Waziristan agency, there are large numbers of Pashtuns live in this district now. According to Pakistan Population Censuses 2023, the overall population of Dera Ismail Khan District is 1,822,916, of which 956,098 are males and 866,667 are females. DIK consider the agriculture hub of KP province but the participation of female in labor force market is very low relative to national level. Pakistan Bureau of Statistics (2021) shows that the FLFP in DIK district was 15% while this rate was 19% in overall KP province and this low participation was due to social and cultural norm of concerned district.

1.3.1 Cultural and Religious Constraints

sociocultural and religious factors of DIK society confined the female into household activities and prevent them to take participate in labor force market. Study of Khan & Khan (2018) confirmed that female belongs to Southern areas of KP province including DIK were engaged in unpaid domestic or agricultural work without any return and this types of work not included in labor force statistics.

1.3.2 Educational Barriers

low literacy rate among the female of DIK is another reason of low participation in labor force market. According to Pakistan Economic Survey 2022-23), Female literacy confirm 28% in

D.I. Khan which is significantly below the national female literacy rate of 51%. Low level education and vocational training often restrict the female to unpaid household activities.

1.3.3 Gender Wage Gap and Informal Employment

Agriculture, livestock, and home-based handicrafts are the main sectors in which the majority of females in DIK are engaged. However, earnings from these sectors are lower for females than for males. Ahmad et al. (2020) found that females earn 40% less than their male counterparts in DIK.

1.3.4 Security and Infrastructure Challenges

another important factor which restrict the mobility of female to participate in labor force activities are unsafe work environment and poor transport. The report of International Labour Organization 2019 highlights that due to security issues in southern areas of KP province, the female of these areas were unable to go outside the house to provide their services in labor force market.

1.3.5 Health and Social Constraints

UNDP, 2021 report indicated that high maternal mortality and poor health services specially woman case limit the participation of D.I. Khan Women into household activities and less time available for work.

Throughout literature, there is no single study found which addresses the role of household factors in case of FLFP in DIK. Keeping in mind all the issues related to females that restrict them to household activities and prevent their active participation in the labor force market in DIK, this paper addresses these concerns. Therefore, the main objective of the present research is to highlight the main issues faced by females in participating in the labor force market and to investigate the impact of socio-demographic aspects on the decision of DIK females to participate in the labor force market.

1. Literature Review

The past studies/literature provide foundation to conduct a study on the relevant issue with strong justification. Lots of literature available for determinants of female labor force throughout the world. Some of the most recent and relevant literature about the above mentioned issue is includes generally for the all and especially in case of Pakistan.

Faridi et al (2009) conducted study to explore the impact of socioeconomic and demographic aspects on female labor force participation in rural areas of Bahawalpur District. Data were gathered through questionnaire. Logistic regression results highlights that educational attainment female increases the probability while early marriage as well early children reduced the probability of female labor force participation in study areas. Umbreen and Kokab (2017) used survey data to investigate the impact of household factors on female participation in labor force market in Gujrat. The results of logistic regression analysis concluded that age, social norms, education of the female and family size significantly impact the decision of female to participate in labor force market in study area. There are many hurdle for married woman to participate in labor force Ambreen and Asma (2012). They used the primary data and the results indicated that early marriage and male attitude toward female workers in work place found negative while education level of the female and wage rate found positive determinant of female labor force participation. Ijaz and Tasnim (2009) conducted a study in Punjab, Pakistan and used primary data to investigate the role of household factors in case participate in economic activities. The data were analyzed through logistic regression model and results highlights that married female belong to poor family more likely to participate in labor force to fulfill the daily needs of the family. Chi and Sundjo (2018) conducted a study in Cameroon,

used Cameroon Demographic Health Survey (2011) and data were analyzed through logistic regression model. The main objective of their study was to explore the major determinants of female labor force participation in Cameroon city. Results of the logistic regression shows that woman with non-working husband, increase in age and numbers of women increases the probability of participation in labor force. While on the other hand, more young age children in house and being a Muslim women reduces the likelihood of female participation in labor force. Meltem and Murat (2010) found a low female labor force participation rate in Turkey. According to them, the participation rate among rural women is still higher than that of urban women, and it has remained stable over time. In urban areas, females aged 22–29 exhibited higher labor force participation rates. In Egypt, young age women are likely to participate in labor force before marriage and the main reason behind this was the high cost of marriage. Further, one of the reason of women to participate in labor force before marriage was to help out the husband in future life (Hendy, 2011). In the case of Pakistan, Khadim and Akram (2013) used a logistic regression model, and the results highlighted that females with higher education were more likely to participate in the labor market. Additionally, being married, belonging to an urban area, and having many sisters in the household were positive determinants of female labor force participation, while having a majority of boys in the household and living in a female-headed household were associated with lower participation rates. Mujahid (2014) used cross-sectional data from the Labor Force Survey 2005–06 to investigate the impact of household characteristics on female labor force participation in Pakistan. The results of the study indicated that highly educated women in the study area were more likely to participate in the labor force. The findings further showed that young women with higher wages, experience, and training were also more likely to engage in the labor force.

2. Research Methodology

This section of the study is most important in which we address area of study, data source and data analysis technique.

3.1 Area of study

The present study was conducted in in three Tehsil of DIK district. DIK district consist on five Tehsil such as DIK, Paharpur, Kulachi, Daraban Kalan and Prova. Due to lack of access to the female and security issues, Tehsil Kulachi and Daraban Kalan excluded from the study. Therefore, this study was conducted in remaining three Tehsils DIK, Paharpur and Parova.

3.2 Data Source

Well-structured questionnaire was used to get information about the household factors those influence the decision of the female to participate in FLFP in DIK district. The age of the respondents (Females) lies between 20 to 55 years. The data were collected in year 2024 from Tehsil DIK, Parova and Pharpur respondents.

3.4 Sample and sampling technique

The overall 150 female were selected as sample from all three tehsils with equal sample size 50 from each of the tehsils. Multistage sampling technique was used to gather the data. At first stage we select DIK district and at second stage we select three tehsils such DIK, Pharpur and Parova.

3.5 Data analysis technique

Due to qualitative nature of the FLFP, the dependent variable of our study which indicate that whether the female of the study area participate in labor force or not. Therefore, the best technique for such type of dependent variable is Maximum Likelihood Estimation. The Binary

Logistic model is used to estimate the impact of household factors on the decision on FLFP in study area.

3.5 Variable and their description

The current study based on some household factors which impact the decision of the female regarding FLFP in study area and the description of these are given below:

Table 1 Details Description of Dependent and Independent Variable

Dependent Variable	Detail
FLFP	Female labor force participation FLFP=1, if female in study area participate in labor force market otherwise=0, age of the female lies between 20 year to 55 year
Independent variable	Details
Age	Age of the respondent in year
Edu_R	Education of respondent in year
Exprnce	Experience of the respondent in year
Edu_F	Education of the father in year
Edu_H	Education of the husband in year
Pernt Income	Parent income in Pak Rupee
No_Chldr	Children of the female in number
Fmly_size	Total Household members in numbers
No_Ernrs	Earners of the household in number
D1 (Dummy)	D1 = Respondent marital status, D1= 1, if respondent is unmarried, D1 =0, if respondent is married
D2 (Dummy)	D2 = family system, D2= 1, if joint family system, D2 = 0, if nuclear family system
D3 (Dummy)	D3= Respondent residence, D3 = 1, if respondent residence is Parova, D3 = 0, if respondent residence is DIK
D4 (Dummy)	D4 = Respondent residence, D4 = 1, if respondent residence is Pharpur, D4 = 0, if respondent residence is DIK

3.6 Theoretical model of the current study

The theoretical model of FLFP looks like,

FLFP = f (age of the respondent, education of the respondent, father education, husband's education, parent's income, no of children's of respondent, family size, no of earners, marital, family status, location of the respondent,)

3.7 Econometric Model of FLFP

Due to qualitative nature of the dependent variable such whether the female of study area were participating in labor force market. The logistic model is,

$$\text{Logit}(P) = \ln(P/1-P) \dots\dots\dots (2)$$

The value of "p" which is a real number lies between 0 and 1, so the desired model is,

$$\ln(P/1-P) = \beta_0 + \beta_1 X_1 + \dots + \beta_K X_K \dots\dots\dots (3)$$

In case of FLFP, the logit model looks like that,

$$\ln(p/1-p) = \alpha + \beta_1 \text{Age} + \beta_2 \text{Edu_R} + \beta_3 \text{Edu_F} + \beta_4 \text{Edu_H} + \beta_5 \text{Pernt_Income} + \beta_6 \text{No_Chldr} + \beta_7 \text{Fmly_size} + \beta_8 \text{No_Ernrs} + \beta_9 \text{D1} + \beta_{10} \text{D2} + \beta_{11} \text{D3} + \beta_{12} \text{D4} + e_i$$

Where,

$\ln$ = Natural logarithm

α = Constant

P= Probability that female participate in labor force.

1-p= Probability that female not participate in labor force.

X= Number of variables.

$\beta_1 \dots \beta_{12}$ = Regression coefficient to be estimated.

e_i = Error Term

3. Results and Discussion

The results of binary logistic model are presented below in table 2. The coefficient of age has positive sign but it is statistical insignificant mean no matter what was the age of the respondent they are more likely to participate in labor force in DIK. Our age result consistent with the finding of Hussain et al. (2016) and contrary to the study of Mehak 2011. Education of the respondent found significant with positive sign coefficient and add ratio 1.33 indicated that an additional year of education of the respondent leads to 133 percent more likely to participate in labor force. Similar results are found regarding the education of respondents in the studies of Mehak (2011) and Assaad (2002), respectively. The positive and significant coefficient of experience of the respondent show that an additional year of experience leads to increases the likelihood of participating in labor force by 230% among the female of DIK district as it is shown through the add ratio of the experience. The result of experience consistent with the previous study results of Klasen & Pieters (2015) and Fatima & Sultana (2009). The odd ratio of education father has positive sign but has been statistically insignificant which mean that no matter what is the education of father, the respondent more likely to participate in labor force market. The results of father education also consistent with the findings of Mehmood & Sadiq (2010), Chaudhry & Nosheen (2009) and Faridi et al. (2009) studies. The case of the husband's education is similar to that of the father's education, where the odds ratio is statistically insignificant, indicating that an additional year of the husband's education has no impact on the respondent's decision to participate in the labor force. Our findings regarding husband education supported by the previous studies of Siddiqui & Hamid (2003), Contreras & Plaza (2010), Ejaz, M. (2011) Education of the husband also found insignificant but its coefficient sign is positive and its odd ratio indicated that no matter what is the education of the husband, the female are 40% more likely to participate in labor force. Parental income has significant but negative impact on the decision of the female to take labor force participation in DIK. The odd ratio shows that increases in the monthly income of the parents leads to decreases the likelihood of participation of respondent by 99% in study area. Due to higher monthly income of the parents, female members of the family feel easy to stay at house rather participate in labor market. The study of Mammen & Paxson (2000) confirmed our finding in case of parental income. The decision of respondent to participate in labor force market is significantly affected by number of children as the coefficient value is significant 10% of significance. The odd ratio indicate that an additional children in the house leads to increases the participation of the respondent by 200% in labor force market. The similar findings exists in the studies of Haque & Ahmad (2019) and Iqbal & Javed (2012) whose results confirmed that the coefficient of number of children has positive and statistically significant. Every additional child adds to the respondent's burden in terms of educational, health, and recreational expenses, which forces the respondent to participate in the workforce to meet these expenditures. The sign of coefficient of family size is negative but statistically significant and its odd ratio shows that an

additional family member in the house leads to decreases the participation of female in labor force market by 30%. Our results are consistent with the findings of Klasen & Pieters (2015) and Aslam & Kingdon (2009) and contrary to the findings of Hussain & Sultan (2010) and Chaudhry & Jabeen (2010) studies. Larger family mean heavy pressure of household work on female shoulder which restrict the female to household activities' rather participate in work force in study area. The coefficient value of number of earners has statistically positive impact on the decision of female in case of FLFP. The odd ratio of number of earners indicates that addition of extra earner in house leads to increases likelihood the FLFP by 500% in study area. The findings of Ejaz (2011) and Klasen & Pieters (2015) support our results regarding positive impact of the numbers of earners FLFP in DIK. Presence of multiple earners in society like DIK, encourage the female members of the household to make themselves available for jobs in order to meet their basic needs. D1 is categorical variable which shows that the respondent is unmarried while its base category is married. D1 is statistically significant with positive sign and its odd ratio indicated that relatively to married female, the unmarried females are 500% more likely to participate in FLFP. Our result of marital status are consistent with the previous research works of Hafeez & Ahmad (2002), Contreras & Plaza (2010) and Klasen & Pieters (2015). Family and childcare responsibilities of married female are may be the reasons of low participation in labor force in study area. The D2 is statistically insignificant and its odd ratio is 2.47 which mean no matter whether the female lived in joint family or nuclear are more likely to participate in labor force. The studies of Jamil & Danish (2021) and Mehmood & Shahid (2014) has the same results in case of family system impact on the decision of female to take participation in labor force. D3 and D4 shows the location of the respondent in our study area. D3 shows that respondent belongs to tehsil Parova and its base category is that respondent belong to DIK. D3 is significant at 10% of significant but its coefficient sign is negative and its odd ratio indicates that female belongs to tehsil Parova are 7% less likely to participate in labor force as compared to the female whose belong to DIK tehsil. Away from the city, unavailability of suitable job and family constraint may be the reason of low participation of tehsil Parova female in labor force. The coefficient sign of D4 is also negative but it is statistically significant at 5% level of significance. The odd ratio explain that relative to the female belong to DIK tehsil, the female belong to tehsil Pharpur are 4% less likely to participate in labor force in study area.

Table 2 Results of Binary Logistic Regression of Household Characteristics and Female Labor Force Participation FLFP in D.I.Khan

Variable	Co-efficient	Odd Ratio	Standard Error	P-Value
Age	0.00261	0.9973902	0.0901666	0.977
Edu_R	0.288228	1.334061	0.1955828	0.049
Exprnce	3.136388	23.02056	19.94368	0.001
Edu_F	0.069872	1.072371	0.1944763	0.723
Edu_H	0.098509	1.103524	0.4013152	0.786
Pernt Income	-0.00022	0.9997755	0.0000751	0.003
No_Chldrnr	0.693744	2.001194	0.7406775	0.061
Fmly_size	-1.20108	0.3008684	0.1109499	0.001
No_Ernrs	1.73271	5.65596	4.836696	0.043
D1	3.912169	50.0073	100.7156	0.052
D2	0.906257	2.475041	3.362573	0.505

D3	-2.64164	0.0712442	0.1068715	0.078
D4	-3.1585	0.0424896	0.0683718	0.050
_cons	4.999646	148.3606	622.5585	0.233
Number of Observation 150				
Logistic Regression Chi-Square (12) = 107.19				
Probability value = 0.0000				
Pseudo R-Square= 0.6161				
Log-Likelihood = -33.391832				

Source through Questionnaire (2024)

4. Conclusion and Policy Recommendation

The presents study is conducted in Dera Ismail Khan District to investigate the role of household characteristics on the decision of female to take participation in labor force. The primary data regarding household factors are collected through well-structured questionnaire and total 150 respondent selected as sample size. Our dependent variable is FLFP which categorical in nature having two outcome that whether the respondent participate in labor force or not. We have used eight (8) quantitative and four (4) qualitative variables. In case of quantitative variables, we have age, education of the respondent, experience of the respondent, education father, and education of the husband, parent's income, numbers of children, family size and numbers of earners while marital status, family system, tehsil Parova and tehsil Pharpur are qualitative variables. Binary Logistic Regression used to analyze the data. In case of quantitative variables, age of the respondent, education of the father and education of the husband found statistically insignificant while education of the respondent, experience, parents income, number of children, family size and number of earners are statistically significant. Out of significant variables, parents income and family size has negative impact on the decision of the family to participate in FLFP while others remaining significant variables has positive impact in this regard.

In case of qualitative variables, D1 has positive while D3 and D4 are negative but statistically significant impact on the decision female of the study area to participate in FLFP sign while only one variable D2 found statistically insignificant.

Keeping in view the findings of the current study, it is suggested to the higher authority to focus on the rural segment of the study to provide reasonable jobs in terms of handicraft industry, fashion design industry LHV etc near to their home. The local government arrange seminar to arise awareness about the role of female in the earning process which contributes to finance the household expenditures.

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