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Socioeconomic and Demographic Determinants of Out-of-Pocket Healthcare Expenditures in Pakistan: A Provincial Comparative Analysis

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Abstract

The basic aim of the present study is to empirically investigate the role of socio-demographic factors over the household's out-of-pocket healthcare expenditures based on provincial comparative analysis. The micro-level cross-sectional data from PSLM (2015-16) was used for the study. Descriptive as well as quantitative analyses were performed to achieve the objectives. In the case of descriptive analysis, we used the Mean approach, while the multiple regression model was estimated using the Ordinary Least Square Method in the case of empirical investigation of out-of-pocket healthcare expenditures in Pakistan. The results of the descriptive analysis show that there was no difference in mean health expenditures pattern based on the gender of the household head. Further, mean health expenditures were increasing with the increase in the education of both male-headed as well as female-headed households in Pakistan. The result of multiple regression indicates that age, Income, and gender of the household head were found significant and positive determinants of out-of-pocket health expenditures in all provinces. Further, the education of the household head significantly and positively affected out-of-pocket health expenditure in Khyber Pakhtunkhwa (KP) and Punjab, while the education of the spouse was found significant with a positive sign in all cases except in the case of Baluchistan. Additionally, the Industry/type of work of the household head also found significant positive determinants of out-of-pocket health expenditures in KP, Punjab, and Sindh while the industry/ type of work of the household head was found insignificant in the case of Baluchistan province. Based on the findings of the present study, the central authority of Pakistan general and Baluchistan decision-making/planers authority. From the above conclusion, it is suggested to central and provincial authorities provide the incentive to the industrialist in terms of eliminating war & terror, and providing soft loans and stability in government, therefore, the industry plays its role to improve the health condition of Baluchistan province.

Keywords: Out of Pocket, Socio-demographic, Mean comparison, Multiple regression, Pakistan

1. Introduction

There are many basic indicators like education, health, infrastructure, etc., which indicate the development of any nation but health is considered as the most dominant factor in this regard. The pattern and availability of health facilities are not the same in the world and the reasons for that is the financial condition of the peoples and the low budget specification of government for this sector. To provide better healthcare facilities to every citizen and improve the existing healthcare system, every country needs to spend 5% of its GDP on such an important sector (WHO, 2020). A clear difference could be seen in the pattern of spending of rich and poor nations of the world on healthcare facilities, e.g. the rich nations are spending 8-9% while poor nations are spending 2-3% of their GDP on the such very important sector (Musgrove P. et.al. 2002). The low budget allocation for the health sector left no choice for the people to spend on healthcare facilities from their own pocket. In most cases, in developing countries, the household has no option to sell or borrow from someone else to avail the healthcare facilities and reason behind doing that is that they do not have enough resources to finance the healthcare expenditures by own self (Musgrove P. et al, 2002).

Pakistan is considered the less developed nation in the world and has the same issues in providing better healthcare services to their citizen, the main reason being the low percentage of the GDP specified by the state on the health sector. Pakistan has the third lowest budget allocation on health care facilities, after Bangladesh and Afghanistan. Pakistan has allocated 0.7% of its GDP to the healthcare sector, which is low compared to other South Asian nations and significantly lags behind the developed nations (World Health Organization (2019), UNESCO (2019), and World Bank (2019d). Low budget specification from the government side on the healthcare sector shifts the healthcare expenditures' burden on the household sector in Pakistan. Out of total healthcare expenditures, households are spending 56.2% from their own pocket in Pakistan (WHO, 2022). Education of the head as well as patient, gender of the head, location of the household, availability of healthcare facility, type of illness and income of the head are some very important determinants, which jointly affect the head decision regarding healthcare expenditures (Fuchs, 2004, Spasojevic, 2003, Ichoku & Leibbrandt, 2003). Although, the enormous study on out-of-pocket healthcare expenditures throughout the world but very rare studies were founded in the case of Pakistan in this regard. In the case of Pakistan, we have the studies of Malik and Syed, 2012, Khalid Mahmood, 2016 and Shaukat and Baber, 2020 in which the researchers tried their best to address this issue comprehensively. We could not find a single study in the case of Pakistan to highlight the impact of socio-demographic aspects over the out pocket healthcare expenditure on provinces comparative based. To fill this gap, therefore the researchers in the present study have tried to investigate the impact of socio-demographic aspects collectively for all four provinces in Pakistan. Our next contribution to health literature is that the latest micro-level set will be used to highlight patterns and problems of health care in Pakistan.

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The findings of the current study will enable policymakers to craft policies to overcome or minimize the household problem in case of out-of-pocket health expenditure.
The rest of the study follows the sequence, in section 2, we have a brief review of literature on the world as well as Pakistan. Section 3 discusses details of the analytical framework used to analyze the data, section 4 presents results and discussion and section 5 contains conclusion and recommendation.

2. Review of Literature

This section of the paper reviews the literature regarding healthcare expenditures in the world as well as in Pakistan. Many researchers in the distant past and in recent times have put a laudable effort to address the issues and determinants of out-of-pocket healthcare expenditure and some of them have been picked for discussion. The studies of Mwabue (1986) and Gertler (1987) found that the price of healthcare services has a strong and negative impact on household out-of-pocket healthcare expenditure. They found the income of the household as the major and positive determinant of healthcare expenditure in Bangladesh (Ali and Noman, 2010). The education of the household head, the location of the household, and other socioeconomic aspects were found positive and significant contributors to healthcare expenditure and choice of healthcare facilities.
Shaukat Baber (2020) conducted a study to explore the determinants of demand for healthcare facilities in Pakistan and for this purpose, the PSLM (2015-16) micro-level data was used. The results of the multiple regression model showed that the income of the household, age of the head, family size, and education of the head are positive while the location of the household rural/urban is the negative determinant of demand for health care facilities in Pakistan. Khalid (2016) conducted a study in Pakistan to explore the pattern of healthcare expenditure among households based on the provinces and regions. He used six rounds of HIES (1998-99, 2001-02, 2004-05, 2005-06, 2007-08 and 2010-11). The overall results of the study highlighted that compared to other provinces, the households belonging to KP province were spending more on average on healthcare services. Further, the residents of Baluchistan province and rural areas of Pakistan were spending less amount on the health of their family persons. The study of bock et al, 2004 reached at the conclusion that the age of the patient, gender of the person, income, and level of illness was significant and positive determinants of out-of-pocket healthcare expenditures in Germany. In the case of the USA, age, gender and income were significantly affecting the head's decision about healthcare expenditures (Mukherjee and Kamal, 2007). In the case of developing nations, the study of Kumar and Smaratunge (2016) for Sri Lanka, Molla et al. (2017) for Bangladesh, Masiye & Kaanga (2016) for Zambia, Brinda et al. (2014) for Tanzania, confirmed that age, gender, income, location, education, family size, and distance were the major and significant contributors in household out of pocket healthcare expenditures. For a very long time researchers neglect to explore what extent households are suffered to tolerate healthcare expenditure and what are the major determinants of it. Therefore, only a few studies were found in past as well as in recent times on such a very important and universal issue. Malik and Syed, 2012, conduct a study to investigate the role of socioeconomic aspects on the healthcare expenditure decision of households and concluded that income, location, and gender were the significant and important determinants of healthcare expenditure in Pakistan. In the light of previous as well as recent studies on healthcare expenditures, we concluded that age, education of both head and patient, gender of the head, location, and income were the major and vital determinants of healthcare expenditures among the household. Most of the studies discussed above especially in the case of Pakistan only explored the role of household factors in the case of demand/head decision for healthcare expenditures conducted in the case of overall Pakistan and ignore the comparative aspect of this very special issue. Therefore, filling the research gap in the current field of study not only improves the existing education literature but also highlights the healthcare system and pattern of the four provinces of Pakistan. Therefore, keeping in mind the weaknesses of the past studies in the context of Pakistan, the researchers' aim is to explore the pattern of out-of-pocket health expenditures based on the gender of the head education of the head and spouse education in general and to investigate the impact of socioeconomic and demographics aspects on out-of-pocket health expenditure on provincial basis in particular.

3. Analytical Framework

This section highlights the universe of the study, data source & sample size, and data analysis technique. The brief details of the above-mentioned aspects are given below.

3.1. Universe of the Study, Source of Data, and Sample Size

The current study was conducted in Pakistan on a provincial comparative analysis basis. In this study, we tried our best to explore the role of socio-demographic aspects on the head's out-of-pocket healthcare expenditure decision in four provinces of Pakistan. We have used micro-level cross-sectional data from the Pakistan Social and Living Standard Measurement Survey, 2015-16, which is the national representative data conducted by the Pakistan Bureau of Statistics with the assistance of the federal government in regular intervals. The unit of measurement is household level for this study. A total of 23459 households are recorded in this data round but we have taken 17946 households as a sample and the reason for selecting these households is that these households have positive health expenditures. The distribution of the sample based on provinces were, the household belonging to KP and Baluchistan provinces were 3479 and 7740 respectively out of the total number of households. While the remaining 5244 households were taken from Sindh and 1783 households from Baluchistan.

3.2. Data Analysis Technique

We have used many socio-demographic aspects in the current study.

3.2.1. Dependent Variable

Our dependent variable is out-of-pocket healthcare expenditures, which are measured in Pak rupees. There are four subpart of out-of-pocket healthcare expenditures and the details are given below:

- Expenditure on medicine and medical equipment.
- Fees paid to doctors, medical staff, Hakeem, and medicine expenditures from the outside of the hospital.
- Hospitalization charges paid to the doctor, laboratory technician, X-rays, etc.
- All other expenditures like dental/ optical are included in the out-of-pocket healthcare expenditures.

3.2.2. Independent/Explanatory Socio-Demographic Variables

3.2.2.1. Socioeconomics Variable

We have used only a single variable from the socioeconomic side and this was the income of the household head which is quantitative in nature and measured in terms of Pak rupees for the given year of analysis which is one year.

3.2.2.2. Demographic Variables

In the case of demographic variables, we have used 5 variables and these are, age of the head, gender of the head, education of the spouse, and industry of the head. Among these five variables, age, education of the head, and education of the spouse were quantitative variables while the gender of the head and industry of the head was the qualitative variables and details of them is given in the explanation of the econometric model used to investigate their role.

3.2.3. Econometric Model

Due to the quantitative nature of our dependent variable out-of-pocket healthcare expenditures, the best and most appropriate data analysis technique is the Ordinary Least Square (OLS). We used a multiple regression model to explore the impact of independent variables over dependent variable out-of-pocket healthcare expenditures. The basic out-of-pocket healthcare expenditures model used in the present study is the following:

$$\mathbf{OOP_{health_{exp}}}_i = \alpha + \beta_1 \mathbf{age_{hhead}}_i + \beta_2 \mathbf{edu_{hhead}}_i + \beta_3 \mathbf{edu_{spouse}}_i + \beta_4 \mathbf{income}_i + \beta_5 D_{1i} + \beta_6 D_{2i} + \beta_7 D_{3i} + \beta_8 D_{4i} + \beta_9 D_{5i} + \beta_{10} D_{6i} + \beta_{11} D_{7i} + \beta_{12} D_{8i} + \varepsilon_i$$

where,

OOP_{health_exp} = out-of-pocket healthcare expenditures in terms of Pak rupees

$\beta_1,,,,,,\beta_{12}$ are the coefficients to be estimated

age_{hhead}= age of the household head in year

edu_{hhead} = education of the head in year

edu_{pouse} = education of the spouse in year

income = income of the household in Pak rupees

in the above model, we have used two qualitative variables gender and industry of the head. The gender of the head has two categories e.g. male and female and female was taken as a base category while in the case of industry of the head, it has eight categories and agriculture was taken as the base category. We denote the dummy variable with the alphabet "D". The details of both dummies are given below:

D_1= denote the gender of the head and if D1=1, if the male is the head of the household, 0, otherwise

D_2= shows the industry of the head, and if D2= 1, if the manufacturing is the industry of the household, 0, otherwise.

D_3= 1, if the service is the industry of the head, 0, otherwise.

D_4= 1, if the construction is the industry of the head, 0, otherwise

D_5= 1, if the wholesale is the industry of the head, 0, otherwise.

D_6= 1, if the transport is the industry of the head, 0, otherwise.

D_7= 1, if baking and insurance is the industry of the head, 0, otherwise.

D_8= 1, if the education is the industry of head, 0, otherwise.

ε_i = error term

The above model was used for all four provinces as our study is a comparative base.

All the analysis is done through STATA 14 software and due to comparative nature study, we have estimated the separate model for all four provinces of Pakistan.

Due to the cross-sectional nature of the data, we have run Breusch-pagan/Cook-Weisberg test using STATA 14 to check the problem of heteroscedasticity in the model, and the results of its included in result table 4.

4. Results and Discussion

In this section of the study, we have two types of findings to interpret and these are, descriptive results and parametric results.

4.1. Descriptive Analysis

In the case of descriptive analysis, we used the mean approach to explore the role of gender of the head, education of the head, and education of the spouse in the case of out-of-pocket healthcare expenditures. While on the other hand, in the case of parametric analysis, we have used the multiple regression model to estimate the impact of many socioeconomic and demographic aspects of out-of-pocket healthcare expenditure on provinces comparative based. The detailed explanations of both the analysis given below according to the sequence.

Table 1 shows the mean healthcare expenditures of the households based on the gender of the head. The mean healthcare expenditures of males and females are Rs.12373 and 12957 rupees respectively. On average, the mean

healthcare expenditures of both genders are the same in nominal terms in Pakistan. The results of the gender of the head also highlight that does not matter whether the head is male or female, both equally prefer the health of their family person.

Table 1: Mean Healthcare Expenditure Based on the Gender of the Household Head

Gender of the Household Head	Mean Expenditure	Number of Households
Female	12373	593
Male	12957	17353
Total	12938	17946

Author's own calculation based on PSLM (215-16)

In table 2, the details of mean healthcare expenditures based on the education of the head are given. In the below-given table, we have six categories of education of the head and these are, uneducated, primary, middle, high, intermediate, and degree or higher education. According to the table mentioned above, the mean healthcare expenditures of uneducated heads are almost half of degree or higher educated heads and these amounts are Rs.10687 and Rs.17266 rupees respectively. The results of the table also indicate that as the education of the head increases, the mean healthcare expenditures also increase and this proves that education is the positive determinant of healthcare expenditures in Pakistan. The overall mean healthcare expenditures among the Pakistani household are Rs.12938 rupees.

Table 2: Mean Healthcare Expenditure Based on the Education of the Household Head

Education of Household Head	Mean Expenditure	Number of Households
Uneducated	10687	5724
Primary	10995	2826
Middle	13030	2227
High	14318	3215
Intermediate	15004	1495
Degree and higher	17266	2459
Total	12938	17946

Author's own calculation based on PSLM (215-16)

The table 3 give us the details of the mean healthcare expenditures of spouse based on their education. According to the table, the mean healthcare expenditures of household increases as the education of the spouse increases. If we look at the table, we can see that the mean healthcare expenditures of the uneducated spouse are Rs.10111 rupees while this amount is Rs.21239 rupees among the higher educated spouses. The mean healthcare expenditures of the higher-educated spouse are double than the uneducated spouse in Pakistan. The education of spouses is also the major and positive determinant of healthcare expenditures in Pakistan and this is proved in the given results in the table below.

Table 3: Mean Healthcare Expenditure Based on Education of the Spouse

Education of Spouse	Mean Expenditure	Number of Households
Uneducated	10111	7952
Primary	12725	2826
Middle	13371	2391
High	15646	2462
Intermediate	17922	1158
Degree and higher	21239	1157
Total	12938	17964

Author's own calculation based on PSLM (215-16)

4.2. Empirical Analysis

This is the second and most important part of our present study is the identification of the major factors impacting the heads' decision to spend on the health of their family members in Pakistan. For this purpose, we have used the multiple regression model using the OLS method for all four provinces of Pakistan. As our study is a comparative study, that is why we have used a single table for four provinces to see and compare the impact of different aspects on the healthcare expenditure of household heads. A detailed interpretation of the results of the empirical analysis is given as under.

According to table 4, most of the independent variables are significant having a positive impact on healthcare expenditures in KP, Punjab, and Sindh while the case of Baluchistan province is different where only four variables found to impact significantly.

Age of the head has positive and significant impact on out-of-pocket healthcare expenditures because its coefficient values are significant in all four provinces and it indicates that as the age of the head increases this leads to an increase in the mean healthcare expenditure in all cases. The studies of (You & Kobayashi, 2011, Malik and Syed, 2012) support our result in the case of the positive impact of age of the head. Education of the head found was significant and has a positive impact on the dependent variable out-of-pocket healthcare expenditures in the case of KP and Punjab while in Sindh and Baluchistan it has a positive coefficient sign but is statistically insignificant. In the light of

these results the education of the head in the case of Baluchistan and Sindh; does not matter; the year of education of the head is, he/she prefers to spend on the health of the family member. Education of the spouse was found to have significant and positive in the case of Punjab and Sindh and this indicates that increases in the year of education of the spouse lead to increases in the out-of-pocket healthcare expenditures. While in the case of KP and Baluchistan, there is no impact of the education of the spouse on out-of-pocket healthcare expenditures but actually it means that does not matter what the education of the spouse is, she likes to avail the healthcare facilities. Our result in the case of spouse education confirms the general perception that educated spouses are more conscious about the health of their family and for this, they would like to spend more on healthcare expenditure. The coefficients value of the income of the household is significant with positive signs in all cases, which shows that as the income of the household head increase, it leads to increases the out-of-pocket healthcare expenditures. Our result of the significant and positive impact of income of the household is also consistent with the results of previous studies like; Shaukat and Baber (2020), Lee and Shaw (2014), and Kien et al. (2016). More income means a household has a greater ability to avail the better health treatment for the family in terms of spending. We have two qualitative aspects in our model as discussed in detail in the methodology chapter and these are, gender and industry of the head. The coefficient value in the case of the gender of the head was found significant and has a sign in all provinces except in the case of Punjab. The parameter of the gender of the head in Sindh and Baluchistan shows that comparative to female heads, the male household heads are spending Rs.1295.33 and Rs.6365.41 rupees respectively more on average in terms of out-of-pocket health expenditures. While in the case of Punjab, the gender of the head does not matter and the reason is the insignificant coefficient value of it but the positive sign indicates that whether the household head is male or female, both are willing to spend on the health of their family person. Our result on the gender of the head is consistent with the previous study by Azidudin et al. (2012) that the households whose head was male were more willing to spend on the health of their family person while the study of Dong et al. (2004) was contrary to our findings. The result of the gender of the head proves that Pakistani society is a pro-male society where the male head has the authority to take the decision regarding any household activity general and health special. The other dummy variable is the industry of the head and which has eight categories and agriculture is based category. In the case of KP and Sindh, all categories of industry of the head which found significant with a positive sign indicating heads belong to manufacturing, services, construction, wholesale, transport, banking finance, and education industry are spending more on average as compared to the heads who involved in the agriculture industry. While in the case of Punjab, there is no impact on the wholesale and transport category of the industry while all other remaining categories have a significant and positive impact on out-of-pocket health expenditures. The case of Baluchistan province is critical in terms of the impact of industry of the head on out-of-pocket health expenditures because all categories of industry are insignificant but with a positive sign. Due to a lack of consideration from the government side and the unstable condition of Baluchistan province, no one is willing to invest in any type of industry, which is the basic reason for the role of industry. The overall results confirmed that household socio-demographic aspects have a dominant role in head decision-making for healthcare expenditures and it is also proved that not only the government sector but also the household sector is very much important in this regard. Our model in the case of all four provinces is well specified as the value of the F-statistic for each province is significant. As our analysis is based on cross sectional data, therefore, the common problem maybe we face is heteroscedasticity. We have done Breusch-pagan/Cook-Weisberg test to check the problem of heteroscedasticity and the value of the test in all cases found insignificant, which shows that our analysis is free from the problem of heteroscedasticity.

Table 4: Estimated Regression Results of All Provinces of Pakistan

Variables	KP	Punjab	Sindh	Baluchistan
Constant	1850.08	2182.06	2280.117	8732.227
Age of head	29.696***	61.103***	32.447***	54.518***
Education of head	60.413***	143.076***	3.976	0.758
Education of spouse	24.12	113.84***	135.645***	27.876
Income of the head	0.002***	0.003***	0.002***	0.001**
Gender of head	776.608***	243.076	1295.329***	6365.41***
Manufacturing	1466.39***	1134.76***	1360.79***	922.179
Services	573.689**	1119.58***	1043.19***	483.157
Construction	987.238***	1262.2***	1009.32***	481.608
Wholesale	830.714***	157.67	848.844***	84.252
Transport	724.589**	69.574	666.466**	227.77
Banking & insurance	806.397***	1344.65*	1364.53***	1195.556
Education	683.484**	1329.78*	810.057**	1264.565**
R^2	0.30	0.29	0.34	0.26
F-Statistic	111.23	214.12	323.25	49.26
Breusch-pagan/Cook-Weisberg test	1398.22 (.321)	1321 (.234)	1234 (.193)	1141 (.431)

Author's own calculation based on PSLM (215-16)
Note: *, **, *** shows significant at 10%, 5%, and 1% respectively

5. Conclusion and Recommendation

Descriptive as well as quantitative analysis was carried out in this study. The descriptive analysis was done to find out the pattern of the household out-of-pocket health expenditures while investigating the impact of socio-demographic factors on out-of-pocket health expenditures, quantitative analysis was done on provincial bases in the case of Pakistan. In the case of descriptive analysis, we used the mean approach, while in the case of quantitative analysis, we used a multiple regression model for all provinces using the OLS technique. The results of the descriptive analysis revealed that based on the gender of the head, there was no substantial difference in the pattern of mean healthcare expenditures means male and female heads were giving equal importance to the health of their family members. In the case of the education of the head, the mean health expenditures were increasing with the increases in years of education of the head. If we compare the mean healthcare expenditures of uneducated heads to degree holders/higher educated heads, then we found the healthcare expenditures of degree holders' heads were double that of the uneducated heads in Pakistan. The same was the cases of education of the spouse higher/degree holder spouses who were spending double amounts in absolute terms on healthcare facilities as compared to the spouses who were uneducated. The result of the multiple regression model shows that age, income, and gender of the head were the positive significant determinants of out-of-pocket healthcare expenditures. Education of the household head was found significant and positive determinant of healthcare expenditures in the case of KP and Punjab while it was insignificant in the case of Sindh and Baluchistan province. Education of the spouse was found a positive significant determinant of out-of-pocket health expenditures in Punjab and Sindh while it was found insignificant in the case of KP and Baluchistan but with a positive sign. The industry/work status of the household head was another aspect used to find out its impact on out-of-pocket health expenditures and the results indicate that all categories of industry/work status of the household head were found significant with a positive sign in the case of KP and Sindh province. It means that relative to agriculture-based household heads, the household heads belonging to any category of industry mentioned in table 3.4 were spending more on average in KP and Sindh province. In the case of Punjab province, the wholesale and transport category of industry/work status was found insignificant while all other remaining categories were found positive and significant determinants of out-of-pocket health expenditures in this regard. The case of Baluchistan province was not satisfactory in the case of industry/work status of the household head because only the education category was found significant positive determinant of healthcare expenditures while all others remaining categories were found insignificant. It means that no there was no statistical difference in the average healthcare expenditures of the household head belonging to the agriculture industry and the household heads belonging to those other than the agriculture industry in Baluchistan. The results of the quantitative analysis indicate that the majority of the independent variables have no impact on the head's decision in case of out-of-pocket healthcare expenditures in Baluchistan province. Keeping in view the condition of Baluchistan province, it is recommended to the central as well as provincial authorities to pay special attention to providing the basic healthcare facilities free and give incentives to local and foreign investors in terms of soft loans, a safe environment, and local market for their product in the context of industry of household head. Through positive steps of the government, it will increase the capability of the resident of Baluchistan province, to spend on the health of their family members and improve the overall health status of Pakistan.

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