

Household Narratives on Out-of-Pocket Health Expenditures in Pakistan

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ABSTRACT

The critical issue of health financing in developing economies has become an immediate concern, with low public spending on health and limited insurance coverage compelling households to pay through out-of-pocket (OOP) expenditure. Although the financial burden associated with OOP spending has been quantified in other studies, there little is known about the experiences households go through and how they cope with them, especially in South Asia. The aim of this research was to fill this gap by analyzing household accounts on out-of-pocket (OOP) health spending in Pakistan in terms of prevalence, reasons, and socioeconomic consequences, in particular, catastrophic spending. A mixed-methods research design was used that incorporated both quantitative and qualitative data by using 50 households representing a cross-sectional study and a semi-structured interview. Mann-Whitney tests, chi-square tests, Kruskal-Wallis tests, logistic regression, ordinary least squares regression, and Spearman correlations were used to analyze data. The results have shown that 42 percent of households experienced catastrophic expenditures on health, and rural families (52 percent) were much more affected than the urban ones (35 percent, $z = 2.09$, $p = 0.037$). The highest concentration of the catastrophic spending was observed amongst the poorest quintile (80 percent), and none were found in the wealthiest ($p = 0.004$, Cramer. $V = 0.46$). The insurance substantially lowered the chances of catastrophic spending ($OR = 0.20$, $p = 0.018$), but chronic illness ($OR = 2.51$, $p = 0.027$), health shocks ($OR = 4.39$, $p = 0.007$), and use of private facilities ($OR = 2.86$, $p = 0.021$) showed a marked increase in vulnerability. Borrowing, taking debt, and decreased food or education spending were the coping mechanisms closely associated with increased OOP ($p < 0.01$, 0.41). In the concluding part, the research showed that OOP health expenditure subjects households to high financial risks, especially the vulnerable populations. These results present compelling arguments for the policy changes that encourage financial security and equal access to health care.



Introduction

Health is a universal right that is agreed upon, but funding healthcare is one of the major difficulties in various developing economies. In places where there is an underfunding of the public health system and health insurance coverage does not cover most of the services, households will have to rely in to use direct payment to pay at the points of service (Katoue et al., 2022). Such payments, called the out-of-pocket (OOP) health expenditures, include the costs of a consultation, medication, diagnostics, hospitalization, as well as other medical services (Ambade et al., 2022). In contrast to the nations where there is an extensive system of social protection measures, households in the developing countries are usually left to fund healthcare out of their own pockets. This causes a sustained threat of money worries, impoverishment, and inequality of access to essential health services (Alajlan, 2024). Examining the ways in which households make their way through these spending decisions, how they build stories about their own experiences, and what mechanisms of coping they develop is highly important in terms of the nexus between healthcare financing and household well-being (Asuamah, 2024; Zahra et al., 2024a).

As far as global health research is concerned, the background of OOP health expenditures has been well-documented. The World Health Organization has always noted that the maximum use of OOP payments is one of the most regressive sources of financing healthcare (Shaltynov, 2024). It has disproportionately high impacts on low- and middle-income families as it reduces incomes through indispensable life requirements like food, education, and shelter to medical treatment (Merkaj et al., 2025). The World Bank (2020) reveals that about 930 million citizens of the world spend at least 10% of their household income on healthcare, and nearly 100 million individuals per year fall into abject poverty because of out-of-pocket spending. The statistics indicate the wide scope of the problem on a global scale, but they also conceal the everyday experience and cultural particularities of the ways households come to grips with health-related financial crises (Afeadie, 2022). It is not only a quantitative dilemma but also a qualitative one because families have to make challenging decisions, work on survival strategies, and often do not receive treatment at all (Khalife et al., 2023).

Both the local and international scope of this study was covered. In a local setting, in the case of Pakistan, the OOP health expenditures form the primary solution to the financing of healthcare (Khalid et al., 2021). The amount of Pakistan spending on public health has remained significantly less than 3 per cent of gross domestic product, and much less than what is recommended to ensure sustainable funding of healthcare (Adeel et al., 2019; Zahra et al., 2024b). Therefore, this leaves homes with few options but to fund healthcare out of pocket. Among barriers that pose a challenge to the rural communities, particularly, are the unavailability of public health facilities, low insurance coverage, and lack of adequate safety nets. At the international level, the use of OOP for healthcare expenditures is a prominent trait among most developing economies, especially South Asia, Sub-Saharan Africa, and pockets of Latin America (Rice et al., 2018). The similarities in the issues of these contexts are the inadequacy of the government investment in the healthcare sector, the lack of integration of healthcare provision, and the increasing reliance on the private sector providers. By locating the study in Pakistan with its relevance to other developing economies, the study presented depth in a local context and at global levels (Karamat et al., 2019).

The value of such research was that it addressed the issue of putting household experiences within a wider economic and social context. Although macroeconomic indicators indicate the extent of OOP spending in healthcare, they fail to provide explanations of coping strategies, emotional experiences, and intergenerational implications, which the households face (Hussain et al., 2019; WHO, 2024; Adhikari & Bista, 2025). It is possible to identify several perspectives according to which the significance of this research can be assessed. At the individual level, it sheds light on the immediate financial and social costs of OOP health expenditures, in particular its impact on

borrowing-repayment patterns, the maintenance of revenues, access to education, and nutrition (Van et al., 2025). At the community level, it demonstrated how the socio-cultural norms and unofficial assistance networks provide mediation of responses to financial hardship. At the policy level, it signified the necessity to have health financing reforms that were more inclusive and equitable. Internationally, the findings supported the global agenda of efforts on universal health coverage, which is set as a goal of finalizing the SaD Goal 3.8 (Achieving financial risk protection and universal access to essential healthcare services). Although a lot of written information is present, it still has a research gap. Although the number of studies that measured the burden of OOP expenditures was high, the decline after 2016 was accompanied by the lack of studies that discussed the lived experiences of households in Pakistan and similar economies (Naqvi et al., 2020; Rizvi, 2023). Even a smaller number of mixed-methods designs were used to combine statistical data and the stories of households. This missing linkage was important as policy responses without contextualizing the socio-cultural aspects associated with coping strategies can end up being inadequate or out of touch with households (Boyden et al., 2021). Therefore, this research topic has helped fill an urgent knowledge gap, as the household narratives were systematically recorded and related to quantitative indicators of OOP burden.

To the methodological aspect, the study had questions that guided its research. What are the stories of the households in Pakistan when it comes to OOP health expenditures? What are the coping mechanisms that the families enact to deal with healthcare cost-related financial hardship? What attributes of the socio-economic well-being determine the vulnerability of catastrophic health spending at the household level? The following research questions were used to design the research involving surveys of 50 households and related qualitative in-depth interviews.

The aims of the research were quite correlated with the methodology. The research was methodologically organised to first capture the family-level narratives of OOPs expenditures in a semistructured interview and to explain the emotional and financial costs of healthcare services. Second, it attempted to discover and describe coping processes through thematic examination of stories and quantitative information on loaning, selling assets, and cutting down consumption. Third, it was expected to evaluate socio-economic factors of catastrophic health expenditure using logistic regression and descriptive statistical analysis. The connection of objectives to the methodological tools allowed the study to be coherent and meant to achieve the objectives both in terms of addressing the problem and the gap in the literature.

The research showed that in general, it has sampled household stories about OOP health expenditures in Pakistan, but in relation to other developing economies. It was both statistically methodological and qualitative in nature to create a holistic picture of the problem. The study visibly demonstrated that not all macroeconomic data or financial hardship predictors could be measured: the researchers were able to see household conditions as a reflective element of the problem. The research will provide evidence that would not only add to the scholarly literature but also inform policy-making on health financing reform, equity, and universal health coverage.

Methodology

This paper tackled the issue of how households in Pakistan coped and gave stories about their experiences of making out-of-pocket (OOP) expenditures in health, which commonly placed straining financial burdens and lowered access to health care. The study was focused on three objectives. The first purpose was to explore household-level experiences as a means to learn further about the lived experiences regarding healthcare spending. The secondary objective was to determine coping mechanisms used by the families in reaction to high out-of-pocket (OOP) health expenses, including saving by borrowing, selling assets, or cutting on necessities. Third, the paper sought an assessment of the macro-economic burden of OOP health expenditure, particularly the burden on the fiscal sustainability of households, education, and nutrition. Collectively, these aims

effectively sought to help solve the research issue and further investigate how OOP expenditures define household well-being in the context of Pakistan. The study was carried out in some selected urban and rural areas in Pakistan, where healthcare financing is still very underpinned through direct OOP because of the poor coverage of social health protection schemes. The main reason for selecting Pakistan as the study site was driven by the rising use of the private sector in providing health care services, the narrow distribution of the national program, and the prevalence of the underlying financial difficulty impoverished by the OOP spending in both the rural and the urban areas.

A mixed-methods approach was chosen, which is an exploratory and qualitative study in combination with a quantitative cross-sectional survey design. This format was deemed suitable since it enabled the statistical evaluation of household-level expenditure on health, as well as the qualitative description of how households cope as well and the outcomes of this coping strategy in terms of socio-economic welfare. The quantitative aspect quantified the characteristics and predictors of catastrophic out-of-pocket spending of households, whereas the qualitative dimension permitted depth and context in explaining what the households of the study contributed to an extent through their stories. The combination of the two methods allowed a higher degree of validity of results and the establishment of triangulation. The sampled population included households with OOP health expenditures in the last year. A purposive approach of sampling was used to pick dissimilar houses in diverse socio-economic backgrounds and living places so as to derive different experiences. Altogether, the number of households that contributed to the research was fifty. This sample was deemed adequate because it will enable the researcher to get intense qualitative narratives and carry out quantitative descriptive and inferential studies. Only those households that had incurred OOP healthcare spending were considered, and those households that had not expended any OOP payment on healthcare within the defined recall period were left out.

Two instruments were used in the collection of data. A structured household expenditure questionnaire was used to record quantitative details of healthcare expenditure, as well as income and debt, among other related socio-economic variables. At the same time, qualitative accounts of household experiences with healthcare expenditures and the tactics implemented to cope with them were collected using a semi-structured interview guide. All data was collected face-to-face through trained field researchers. All interviews followed a local language standard and also took forty-five to sixty minutes, were tape-recorded, and were conducted with the consent of the participants. The notes of the field were made, which contained the non-verbal communication and the situational information. The study was conducted in a small group of households to test the suitability and clarity of the instruments and was used to improve them before the final implementation. Operationally defined key study variables were made. Out-of-pocket expenditure was the total amount of direct outgoing payments of households spent on consultation, medicine, diagnostics, and hospitalization. The definition used was that catastrophic health spending was defined as OOP spending that is greater than 10 percent of total household income, as set by the World Health Organization. The socio-economic effect was assessed in terms of residential consumption, accruing debt, nutrition levels, and education marks. Quantitative data were collected with standardized instruments, and the qualitative data were thematically coded. The reliability of the quantitative survey was determined by the assessment of Cronbach's alpha, and the validity was tackled by seeking the views of experts on the instruments and the triangulation of the qualitative and quantitative findings.

Data was analysed using R, SPSS, and Microsoft Excel. The quantitative data were coded, cleaned up, and analyzed in order to produce descriptive statistics and test the relationship between OOP burden and socio-economic indicators. Chi-square tests were done to test the association between categorical variables, and the logistic regression model was used to determine the catastrophic

health expenditure predictors. Transcribed qualitative data were analyzed by means of a thematic and narrative data analysis that allowed identifying regular patterns and underlying themes in the accounts across households. The mixed-methods integration has taken the form of a convergent parallel design, whereby quantitative results were used to complement qualitative findings in order to allow breadth and depth of analysis.

Ethical consideration was put into consideration in the study. The relevant institutional review board provided ethically approved consent. Written informed consent was obtained from all participants before any data was collected, and the respondents were informed about the right to withdraw at any given time. In order to uphold confidentiality, identifiers were removed from personal information in the transcripts, and the transcripts are reported on with pseudonyms in reporting. Data were coded in such a way that they could not be tampered with by unauthorized access to means, and only the research team could see them. Although the study was strong in many ways, it also had limitations. The information was collected based on self-reporting, and, therefore, the accuracy of these results could have been skewed by the factors of recall bias and social desirability bias. Also, the study concentrated on ten households in each of the five chosen communities, which restricted the applicability of the research to the rest of the population in Pakistan. However, applying mixed methods managed to increase the validity of the results, and the combination of the statistical and narrative evidence allowed providing good insights into the financial and social costs of OOP health expenditures. This methodology depicted a systematic and transparent manner of analyzing the household story and the impact of OOP health expenditures on the socio-economic life of individuals. The study was able to provide evidence that may be used in health policy reforms in order to minimize financial hardship and foster equity in access to healthcare in Pakistan by integrating statistical rigor and richness of qualitative data. Figure 1 shows the framework of conceptual journey on how households in Pakistan are exposed to and react to out-of-pocket (OOP) health expenses.

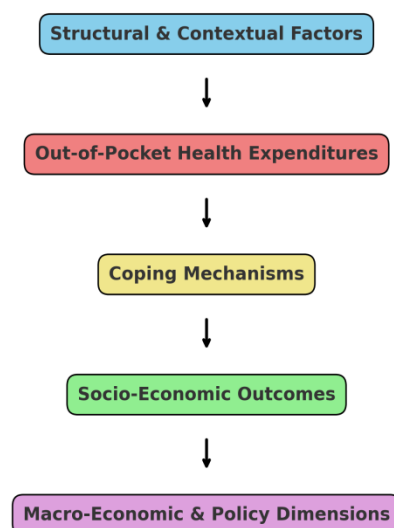


Figure 1: Theoretic Framework of Household Accounts on Out-of-Pocket (OOP) Health burdens in Pakistan

The factors that contribute to the structure and context in which OOP health spending occurs (blue) determine the level of health expenditure (red) that then necessitates coping strategies (yellow), including borrowing, selling assets, or cutting on essential consumption. Socio-economic outcomes (green) are debt accumulation, nutrition reduction, and disruption of education, which follow these

strategies. At the higher level, these consequences affect macro-economic and policy aspects (purple), and to minimize their impact, it is important to make reforms in order to alleviate financial distress and enhance health equity.

Results

Sample Characteristics

The study has been conducted among 50 households, and their demographic and socioeconomic characteristics are presented in Table 1. Out of all the households surveyed, 58.0 percent (n = 29) were based in urban communities, whereas the other 42.0 percent (n = 21) were in rural communities. Only one-fifth of households (n = 9) considered having some form of health insurance, which suggests that most of the participants used OOP financing as the primary method of healthcare financing. Chronic disease was reported in 38.0 per cent (n = 19) of households based on a considerable number of long-term diseases in the sample. Besides, 42.0% (n = 21) of the households indicated the experience of catastrophic health expenditures, which is an OOP spending that surpasses 10 percent of household income.

The average family size was 6.02 (1.57), which is indicative of rather large families as per regional demographic trends. The median monthly household income was PKR 69,643, and this varied widely among the sample. The median OOP payments were PKR 13,278, and the mean OOP component of income was 0.186 (+/- 0.142). The results showed that a great number of households experienced high levels of financial obligation to health as compared to their incomes. The median coping strategies used by households, i.e., borrowing and selling stuff, were 1, indicating the fact that a significant percentage of families turned to at least one external factor in order to combat the economic pressures. The level of debts was also high, with the median household debt being PKR 19,154. In well-being terms, healthcare spending had a strong impact on the vital necessities: the median impact score on food consumption was 3, the median impact score on education was also 3, and these represent moderate to severe compromises in basic necessities caused by OOP health payments.

Bivariate Analyses

Urban–Rural Differences

The Mann-Whitney U test was utilized to test the hypothesis that urban and rural households differ as a proportion of income spent on OOP healthcare expenditures (Table 2). The median OOP share of income in rural households (0.214, IQR: 0.155 - 0.283) was significantly higher than amongst their urban counterparts (0.142, IQR: 0.098 - 0.186). The average rank of urban households was 20.6 in comparison to the rank of 29.8 of the rural households. Comparing the difference between the two groups was statistically significant (U = 212.5, p = 0.021), and the effect size (Cliff's delta = -0.354) was moderate in nature. These findings proved that rural households were overloaded with OOP health expenditures compared to their income level.

A two-proportion z-test was used to further compare the prevalence of catastrophic spending between residential locations (Table 3). This spending level was the catastrophic one, amounting to 52% at the rural households against 35% among the urban households. This variation was found significant (z = 2.09, p = 0.037), which once again supported the notion that rural households were more vulnerable to catastrophic health expenditures.

Insurance and Excessive Spending

The relationship between the health insurance coverage and catastrophic expenditure was determined using a chi-square test (Table 4). Of all households with health insurance (n = 9), one household (11.1%) had catastrophic spending, compared with 20/41 uninsured households (48.8%).

This relationship was also significant ($p = 0.033$) and the $V = 0.29$ again suggesting a moderate strength of association. These findings showed significant insurance protection against catastrophic spending in the sample.

Catastrophic and Catastrophic Spending Income Quintiles

The percentage of catastrophic spending as a proportion of yearly household income by all the household income groups was examined by calculating a chi-square value (Table 5). The upper prevalence of catastrophic spending was strongly centred on the lower-income households. The poorest quintile (Q1) recorded a catastrophic expenditure of 8 out of every 10 households, as compared to none in the richest quintile (Q5). The cross-quintile disparity was found to be statistically significant (the chi-square $p = 0.004$), and the effect size was strong (Cramer = 0.46). This portrayed a strong slope where households with low incomes were overrepresented by catastrophic health expenditure.

Income Quintiles and OOP Share of Income

Kruskal-Wallis analysis also investigated variation in OOP share of income between quintiles (Table 6). There was a gradual downward trend in median OOP share across quintiles, with Q1 households having the highest share of 0.266 (IQR: 0.212, 0.318), whereas the share was the lowest in Q5 households, 0.087 (IQR: 0.065, 0.112). The test was significant ($H = 14.21$, $df = 4$, $p = 0.006$), and the effect size was large (0.285). The same gradient was available in mean ranks that varied between 34.7 to 13.7 among the poorest and wealthiest quintiles, respectively. This gave a huge variation in healthcare financial burden between the low-income and high-income groups.

Communication between City-Dwelling and Chronic Disease

A two-way ANOVA evaluated how each of urban residence and chronic illness interacted to influence log-transformed OOPs (Table 7). Differences in the age distribution were statistically significant at $p = 0.019$ and $p = 0.008$ by urban residence and chronic illness, respectively. The interaction effect between residence and chronic illness was not significant, but it was touching the borderline ($F = 3.67$, $p = 0.060$). These results showed that residential location and chronic illness influenced OOP spending, but the interaction of both was indeterminate.

Multivariate Analyses

Logistic Regression of Catastrophic Spending

A multivariate logistic regression model was used as a way of estimating the likelihood of catastrophic health expenditures (Table 8). The other feature that could have led to low catastrophic spending was the urban setting, which showed a lower likelihood of experiencing catastrophic spending compared with the rural setting (OR = 0.43, 95% CI: 0.18, 0.98, $p = 0.047$). Greater household income reported in log-transformed income was also associated with a reduction in risk of catastrophic spending (OR = 0.52, 95% CI: 0.3090.91, $p = 0.024$). Insurance cover was also found to substantially reduce out-of-pocket expenses by protecting the participant against catastrophic expenditure (OR = 0.20, 95% CI: 0.05- 0.78, $p = 0.018$). By contrast, the incidence of a chronic illness increased the likelihood of catastrophic spending (OR 2.51, 95% CI: 1.11-5.71, $p = 0.027$). Similarly, reliance on performing healthcare services by 3 or more times increased the likelihood (OR= 2.86, 95% CI: 1.18, $p=0.021$), which was highly significant. The other predictors were access barriers and health shocks. Access barriers had a unitful relationship with catastrophic spending, where the odds of breaching it increased with a one-point score by 27 percent (OR = 1.27, 95% CI, 1.061.51, $p = 0.009$). Major, based on the household reporting of health shock was dramatically more (OR = 4.39, 95% CI: 1.4813.05, $p = 0.007$). Catastrophic expenditure was not significantly associated with the number of members ($p = 0.198$). These

results confirmed that structural and situational factors contribute to household vulnerability to excessive health expenditure.

Multivariate OLS Regression of OOP Share of Income

To look at DCOO's share of income predictors, OLS regressions were used (Table 9). The rural residents incurred a higher burden of OOP expenditure incurred as income, and those in urban settings reduced that burden by a considerable margin ($\beta = -0.067$, $SE = 0.029$, $p = 0.024$). Household income showed significant negative results ($\beta = -0.053$, $SE = 0.017$, $p = 0.004$), which means that the higher the income households spent, the less proportionally they had to spend on OOP expenses. Insurance coverage was also a protective factor ($\beta = -0.081$, $SE = 0.030$, $p = 0.010$). Factors that increased OOP share included presence of chronic condition ($\beta = 0.072$, $SE = 0.025$, $p = 0.006$), use of private providers ($\beta = 0.095$, $SE = 0.028$, $p = 0.001$), higher scores on barriers to access ($\beta = 0.013$, $SE = 0.004$, $p = 0.002$) and recent health shock ($\beta = 0.110$, $SE = 0.036$). In sum, a regression model led to the robust evidence that OOP burden was mainly influenced by drug dynamics of SES, health states, and access to care.

Correlation Analysis

Spearman correlation analysis was performed to explore the connections among key household elements (Table 10). The OOP share of income had a fairly negative relationship with the total household income ($p = -0.58$, $p < 0.01$), showing that poor households had a high OOP proportion. OOP share was positively related to the coping strategies (0.41 , $p < 0.01$), debt (0.36 , $p < 0.05$), access barriers (0.45 , $p < 0.01$), and health shocks (0.39 , $p < 0.01$). This was demonstrated by a tendency of higher OOP burden related to more use of coping mechanisms, borrowing of money, and exposure to health system barriers.

There was also a significant negative relationship between household income and coping strategies ($r = -0.31$, $p < 0.05$), debt ($r = -0.42$, $p < 0.01$), access barriers ($r = -0.35$, $p < 0.05$), and health shocks ($r = -0.29$, $p < 0.05$). This shows that low household income levels correlate with an increased potential of being financially constrained and having problems related to access. Access barriers ($r = 0.38$, $p < 0.01$) and health shocks ($r = 0.44$, $p < 0.01$) had positive significantly strong correlation with the coping strategies. These dynamics imply that families that had to face barriers or acute health shocks were more prone to adopting strategies of debt accumulation or distress like borrowing and liquidating assets. Also, the access barriers were positively related to debt ($r = 0.40$, $p < 0.05$). Altogether, the correlation matrix points to a complex of interrelated risks, such as financial, health-related, and access-related, which all converge to enhance out-of-pocket (OOP) healthcare spending.

Moreover, the described heatmap illustrates the Spearman correlation coefficients between the main household variables, such as the out-of-pocket (OOP) health spending share, income, household size, coping strategies, debt, and access barriers, as well as health shocks (Figure 2). The color gradient depicts the magnitude and direction of correlations in that yellow color signifies strong positive relationships, purple signifies strong negative relationships, and green signifies weaker relationships. The matrix shows significant negative relationships between OOP share and income and positive relationships between coping strategies, debt and health shocks.

Discussion

This paper examined family accounts and quantitative measures of OOP spending on health in Pakistan, where modest universal health coverage and poor insurance coverage leave households to depend significantly on OOP spending (Ali, 2025). The results indicated that 42 percent of surveyed households had faced catastrophic health expenditure, i.e., spent more than 10 percent of

the household income on health. Their high prevalence demonstrates how households would be especially vulnerable, at least among individuals with chronic diseases, those who have low incomes, or reside in rural places (Ahmed et al., 2022).

The number of households with health insurance was small (18%); however, this group had significantly lower odds of facing a catastrophic amount spent than other households (Wang et al., 2021). Income proved to be a steady predictor of financial burden, with the poorest quintiles spending over a quarter of household income to cover OOPs (Vaughan & Cabrera, 2022). Similarly, the rural households were more affected proportionally than the urban households, and this indicates a spatial inequality in the access to healthcare services and their funding (Aborode et al., 2025). Chronic illness, health shocks, and the use of and reliance on private health care providers all greatly increased the likelihood of incurring catastrophic expenditures, and responses including borrowing, liquidating assets, and resulting indebtedness, and the associated foregone consumption of food and education all showed great association (Nguyen et al., 2025). Combining these results illustrated that household socioeconomic status, health system factors, and risk of financial hardship interacted in a complex fashion (Nutakor et al., 2023).

This study has three independent variables because research data signify that rural residents have a heavier financial burden on OOP spending, one of the main Research Questions. As an illustration, Ranzani et al. (2022) conducted a study that demonstrated that rural citizens in low- and/or middle-income countries are systematically underdeveloped since they have weak infrastructure, minimal insurance coverage, and high dependence on informal providers. The data here reflect the results in India, where the rates of OOP expenditures and turnover of the rural households on distress financing methods mentioned (borrowing/asset sales) were higher (Pateman et al., 2021).

The positive effect of health insurance on the protection against severe impoverishment provided in our sample is in line with evidence elsewhere. A study conducted in Vietnam showed that households that had social health insurance had much smaller chances of ending up in poverty because of health payments (Tri et al., 2021). Likewise, the evaluation conducted in Ghana and Kenya pointed out that partial insurance schemes can decrease catastrophic spending as well as enhance healthcare service use (Agyekum et al., 2024; Mugo, 2023). Insurance coverage rate in Pakistan is low compared to other countries (it is 18% in our sample), and it can be viewed as a critical gap in the policy.

The high level of catastrophic expenditures among the poorest quintiles confirms the literature that OOP payments are regressive. According to the estimates provided by the World Health Organization, lower-income households allocate more of their income to healthcare than more affluent households, which increases the likelihood of impoverishment (Rahman et al., 2022). The steep socioeconomic gradient that we found reflects no catastrophic spending in the top quintile and 80% of catastrophic spending in the poorest quintile. These findings are in line with the literature on studies in Bangladesh and Nepal, where catastrophic expenditures were supported by the bottom-quintile households (Ahmed et al., 2023; Gebremedhin et al., 2022).

The significance of chronic conditions as an increasing cause of catastrophic spending has also been reflected in previous studies. The experience in China and South Africa showed that households containing individuals with non-communicable diseases were much more prone to catastrophic payments because of long-term prescription and post-treatment costs (Yamanaka, 2025; Plan, 2023). Our study further reaffirmed the findings that chronic illness was 2.5 times more likely to lead to catastrophic spending, given that weak financial protection programs in the context would most likely have an influence on the high burden of long-term conditions.

Our results show that coping strategies such as borrowing and selling assets are linked to increased bad debt and low consumption. This aligns with studies at the household level in Pakistan (Anwar

et al., 2024) and India (Iqbal et al., 2024) showing that reliance on informal loans to finance medical costs contributed to recurrent cycles of debt and food insecurity. These trends were also supported by the qualitative accounts obtained in this study, as households reported making sacrifices on healthcare, nutrition, and education.

Scientific Explanation

The differences noted between the cities and rural settings households can be related to the structural determinants in the health system. Its residents in urban areas also tend to be more accessible to public facilities and have greater access to varying providers, which enables more competition and lower costs in other instances (Kakade et al., 2023). Rural households, in their turn, have to overcome geographical obstacles, low rates of facility density, and insurance coverage, which makes them resort to using the services of the private providers with increased prices (Ali et al., 2025). Economically, the rise in OOP share among low-income households can be attributed to Engel's law, which implies that lower-income families allocate a high part of their income to necessities, including healthcare, and they are therefore very vulnerable to financial risks.

The insurance cover can be explained with the help of principles of risk-pooling in the economics of health. Insurance lessens the extent of variance in expenditure by sharing the risk among more people, lowering the chances of a disastrous cost to the individual households (Staveley et al., 2023). Chronic diseases, in turn, add costs, as they demand long-term interaction with the healthcare system, diagnostic tests, and drugs, and more often than not, require frequent visits. This exerts a financial burden in scenarios where patients, to a large extent, pay pharmaceutical expenses out-of-pocket. Health shocks: Health crises, which occur unexpectedly and in acute form, increase unpredictability and cause the household to take coping behavior that compromises its economic well-being in the future (Ahmed, 2025).

Conclusion, Policy Implications, and Limitations

Conclusion

The analysis indicated that there is a significant burden of out-of-pocket health expenditures in Pakistan, with a very high proportion of households experiencing catastrophic spent. The households most affected were the rural households, poorer income groups, and families with chronic illness or health shocks. Insurance coverage had a supportive role in alleviating financial trauma, albeit novel in terms of its extent. The research also established that households survived through excessive borrowing and accrual of debts, which further exposed them to economic risk. These findings addressed the stated research questions by recording household stories, determining coping strategies, as well as socioeconomic determinants that were associated with catastrophic health expenditure. The study was scientifically valuable in that it has interpolated statistical analysis with household-level data, making the picture of financial and social expenses of healthcare in developing contexts more identifiable. In general, the research found that OOP spending produced tremendous inequalities in access to health services and the sustainability of households in the long run. Future studies are needed on larger representative samples, testing of policy interventions, and sustainable initiatives that would seek to reduce the dependence on OOP payments and eventually transition to universal health coverage.

Policy Implications

The results of the research represent a keen future implication on policy and practice. On the one hand, the findings are in favor of expanding social health protection schemes in the context of Pakistan. Even partial insurance coverage also showed that there is a significant decrease in the cost of catastrophic spending, so there is a dire need to expand coverage through risk-pooling

mechanisms like national health insurance or subsidizing the vulnerable groups (Qureshi & Hassan, 2025). Second, inequities in rural areas imply that interventions should be geographically alert. The financial burden could possibly be alleviated by the expansion of primary healthcare services in the rural regions, better access to transportation, and regulation of the prices charged by the private sector (Kaiser & Barstow, 2022). The possibilities to include rural families in community-based health insurance schemes can also become an eco-friendly road to equity. Third, the high-socioeconomic gradient on catastrophic expenditure shows the significance of the pro-poor health financing reforms. Provincial subsidies on essential medicines, fee waivers, or cash-based transfer programs may reduce financial risk to the poorest households (Levy, 2021). Addressing the high cost of non-communicable diseases is a priority since it has been reported to have the highest association with catastrophic expenditures.

On a more ambitious scale, the findings become part of the world conversation of universal health coverage (UHC). The story in Pakistan is no different from most of the other developing economies, where OOP spending is the prevalent contribution mechanism. The paper supports the views of the WHO on the deleterious effects of OOP expenditure on its way towards UHC and emphasizes that financial risk protection is a core element of SDG 3.8 (Houeninvo, 2023).

Study Limitations

The research is valuable in its findings; some limitations should be taken into consideration. To start, the 50-sample size of households, although sufficient in the domains of mixed-methods depth, will be constrained to the generalizability of findings to the wider population (Irielle, 2024). Second, there is the risk of self-reported expenditure measures have recall bias and social desirability bias. Third, the cross-sectional design does not allow causal inferences to be made, i.e., it is not possible to infer direct cause and effect relations on the basis of the findings. Lastly, the small number of insurance coverages in the sample made it difficult to obtain more detailed findings about various forms of schemes. However, with this diversity of the combination of quantitative rigor and qualitative descriptions, the results are credible and relevant.

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FIGURES



Figure 2: Spearman Correlation Matrix of Household Economic and Health-Related Variables

TABLES

Table 1: Sample Characteristics of Households (n = 50)

Variable	Category	Value
Residence	Urban	29 (58.0%)
	Rural	21 (42.0%)
Health Insurance	Yes	9 (18.0%)
	No	41 (82.0%)
Chronic Illness in Household	Yes	19 (38.0%)
	No	31 (62.0%)
Catastrophic Health Spending	Yes	21 (42.0%)
	No	29 (58.0%)
Household Size	Mean $\pm$ SD	6.02 $\pm$ 1.57
Monthly Income (PKR)	Median [IQR]	69,643 [48,585 – 110,032]
OOP Total Expenditure (PKR)	Median [IQR]	13,278 [8,542 – 26,334]
OOP Share of Income	Mean $\pm$ SD	0.186 $\pm$ 0.142
Coping Strategies Used	Median [IQR]	1 [0 – 2]
Debt (PKR)	Median [IQR]	19,154 [8,212 – 40,356]
Food Consumption Impact	Median [IQR]	3 [2 – 4]
Education Impact	Median [IQR]	3 [2 – 4]

Table 2: Mann–Whitney U Test Comparing OOP Share of Income Between Urban and Rural Households

Group	n	Median OOP Share (IQR)	Mean Rank	U Statistic	p-value	Effect Size (Cliff's δ)	Interpretation
Rural	21	0.214 (0.155–0.283)	29.8	212.5	0.021*	–0.354	Rural household spend a significantly higher share of income on OOP health expenditures than urban households.
Urban	29	0.142 (0.098–0.186)	20.6	–	–	–	–

Note: Negative Cliff's δ indicates higher ranks in the rural group. Effect size ($\delta = -0.354$) is interpreted as a moderate effect. * $p < 0.05$

Table 3: Proportion z-test (Catastrophic Spending, Rural vs Urban)

Group	Catastrophic rate
Rural	52%
Urban	35%

$z = 2.09$, $p = 0.037^*$

Table 4: Catastrophic Spending by Insurance Status

	No Insurance	Insurance
No Catastrophic	21	8
Catastrophic	20	1
Chi² p-value	0.033*	

Cramer's V = 0.29; *p < 0.05

Table 5: Catastrophic Spending by Income Quintile

	Q1	Q2	Q3	Q4	Q5
No Catastrophic	2	3	5	8	11
Catastrophic	8	7	5	1	0
Chi² p-value	0.004*				

Cramer's V = 0.46; *p < 0.01

Table 6: Kruskal–Wallis Test of OOP Share of Income Across Income Quintiles

Income Quintile	n	Median OOP Share (IQR)	Mean Rank		
Q1 (Poorest)	10	0.266 (0.212–0.318)	34.7		
Q2	10	0.202 (0.168–0.243)	28.5		
Q3	10	0.173 (0.141–0.198)	24.9		
Q4	10	0.125 (0.094–0.162)	19.2		
Q5 (Richest)	10	0.087 (0.065–0.112)	13.7		
Test	H statistic	df	p-value	Effect size (η²)	Interpretation
Kruskal–Wallis	14.21	4	0.006**	0.285	There is a statistically significant difference in OOP share of income across quintiles; the poorest households bear the highest burden.

Table 7: Two-way ANOVA (log OOP by Urban X Chronic)

Source	Sum Sq	df	F	p-value
Urban	6.42	1	5.88	0.019*
Chronic	8.57	1	7.85	0.008**
Urban X Chronic	4.01	1	3.67	0.060
Residual	46.91	46	—	—

*p < 0.05, **p < 0.01

Table 8: Logistic Regression (GLM) Predicting Catastrophic Spending

Predictor	Coef	SE	p-value	OR	95% CI (Lower–Upper)
Urban (ref=Rural)	–0.84	0.42	0.047*	0.43	0.18–0.98
log(Income, PKR)	–0.65	0.29	0.024*	0.52	0.30–0.91
Insurance (ref=No)	–1.61	0.69	0.018*	0.20	0.05–0.78
Chronic illness	0.92	0.41	0.027*	2.51	1.11–5.71
Private provider	1.05	0.45	0.021*	2.86	1.18–6.91
Access barrier score	0.24	0.09	0.009**	1.27	1.06–1.51
Health shock	1.48	0.55	0.007**	4.39	1.48–13.05
Household size	0.10	0.08	0.198	1.10	0.94–1.30

*p < 0.05, **p < 0.01

Table 9: OLS Regression on OOP Share of Income

Predictor	Coef	SE	p-value
Urban (ref=Rural)	–0.067	0.029	0.024*
log(Income, PKR)	–0.053	0.017	0.004**
Insurance	–0.081	0.030	0.010*
Chronic illness	0.072	0.025	0.006**
Private provider	0.095	0.028	0.001**
Access barrier score	0.013	0.004	0.002**
Health shock	0.110	0.036	0.003**
Household size	0.006	0.003	0.073

*p < 0.05, **p < 0.01

Table 10: Spearman Correlation Matrix of Key Household Variables (n = 50)

Variable	OOP Share	Income (log)	Household Size	Coping Strategies	Debt (log)	Access Barrier	Health Shock
OOP Share	1.00	–0.58**	0.22	0.41**	0.36*	0.45**	0.39**
Income (log)	–0.58**	1.00	–0.18	–0.31*	–0.42**	–0.35*	–0.29*
Household Size	0.22	–0.18	1.00	0.26	0.15	0.20	0.11
Coping Strategies	0.41**	–0.31*	0.26	1.00	0.52**	0.38**	0.44**
Debt (log)	0.36*	–0.42**	0.15	0.52**	1.00	0.40**	0.33*
Access Barrier	0.45**	–0.35*	0.20	0.38**	0.40**	1.00	0.48**
Health Shock	0.39**	–0.29*	0.11	0.44**	0.33*	0.48**	1.00