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Health Disparities in Pakistan: Analyzing the Impact of Socioeconomic, Geographic, and Educational Determinants on Healthcare Access and Outcomes

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ABSTRACT

Background: Health disparities in Pakistan are significantly influenced by socioeconomic status, geographic location, and educational background. Limited access to healthcare, financial constraints, and inadequate health literacy contribute to unequal health outcomes, particularly among rural populations and lower-income groups. **Objective:** This study aims to analyze the impact of demographic, socioeconomic, and geographic determinants on healthcare access, health literacy, out-of-pocket expenditures, and chronic disease prevalence in Pakistan. **Methods:** A cross-sectional survey was conducted among 378 participants selected through stratified random sampling to ensure urban and rural representation. Data was collected using structured questionnaires covering demographics, socioeconomic status, healthcare access, health literacy, financial burden, and chronic disease prevalence. Ethical approval was obtained, and confidentiality was maintained. Quantitative data were analyzed using SPSS version 25, employing chi-square tests for categorical variables and independent t-tests/ANOVA for continuous variables. P-values <0.05 were considered statistically significant. **Results:** Among 378 participants (mean age: 35.4 ± 12.1 years, 58% male), 65% had healthcare access, and 42% demonstrated health literacy. Urban residents (75%) had significantly higher healthcare access than rural counterparts (50%) ($p<0.05$). Males exhibited greater health literacy (48%) than females (35%) ($p<0.05$). Out-of-pocket expenditure was PKR 15,000 ± 5,000, higher among females (PKR 16,500 ± 5,200). Chronic illness prevalence was 30%, with hypertension predominant in rural areas (35%) and diabetes in urban settings (25%). Higher education correlated with improved healthcare access (80%) and lower chronic disease prevalence (15%) ($p<0.05$). **Conclusion:** Significant disparities in healthcare access, financial burden, and chronic illness prevalence exist in Pakistan, influenced by socioeconomic and geographic factors.

Keywords:
Health disparities, socioeconomic factors, geographic disparities, health literacy, chronic disease epidemiology

INTRODUCTION

Introduction Health disparities have been a challenge globally, but the social determinants will always have a critical role in shaping the health outcomes. Therefore, income, education, gender, and geography are some of the determinant factors that result in different levels of access to care, health literacy, and health outcomes (1,2).It goes without saying that these disparities are even more significant in LMICs, like Pakistan, with core issues on the ground regarding a lack of adequate healthcare infrastructure, limitations with regard to funding, and cultural barriers that further increase these gaps. Rural populations typically present an added layer of difficulties, poor availability of healthcare facilities and specialists, which causes higher morbidity and mortality when compared with urban areas (3,4).

Gender disparities are another critical concern wherein women face cultural and structural barriers that limit their access to care and their ability to make informed health decisions. Matters are further worsened on the economic front, whereby a substantial proportion of healthcare spending in Pakistan is out of pocket, thus hitting a disproportionately large (5,6). number of households at the lower end of the economic spectrum and often necessitating a foregone choice of accessing necessary medical care. Education and health outcomes have been the subject of extensive studies; it is clear that with increasing levels of education comes increased access to health services and enhanced health literacy (7,8). Education instills health awareness among people for the adoption of healthy behavior and timely medical intervention that reduces the burden of chronic diseases. On the other hand, the less educated population usually tends to have worse health status because of a lack of awareness about prevention and early treatment due to a lack of understanding (9,10). Geographical disparities further show the distinction between urban and rural people: urban residents enjoy easy access to healthcare facilities and all other resources, while rural populations have to bear the brunt of inadequate infrastructure and high transport costs (11,12).

The results from the disparities are that they have been affecting not only individual wellbeing but also burdening the healthcare system enough to be an impediment in efforts at attaining universal health cover and equitable healthcare delivery. The determination of health inequity in Pakistan requires an in-depth analysis of the root social determinants and their subsequent effects on access to healthcare, health literacy, and health outcomes (13,14). This would enable policy makers and practitioners to recognize specific deficiencies in the current system and to introduce appropriate targeted interventions. It was to study the influence of demographic, socioeconomic, and geographic factors on health disparities in Pakistan, presenting evidence to inform policies and strategies for achieving equitable access to health care (15-17).

MATERIAL AND METHODS

This cross-sectional study analyzed disparities in health outcomes related to demographic, socioeconomic, educational, and geographic factors. For that purpose, the sample size was formed of 378 participants chosen through a stratified random sampling technique in order to make sure representation from both urban and rural areas was ensured. The respondents were informed about their participation rights, and informed consent was obtained accordingly. Ethical clearance was obtained from the ethics review committee.

The study followed the Declaration of Helsinki regarding ethics and standards in research. The data collection was done using a structured questionnaire that captured demographic information, socio-economic indicators, education level, geographic location, access to health care, health literacy, out-of-pocket expenditures, and the prevalence of chronic illnesses. The structure of the questionnaire had undergone pretesting to establish its reliability and validity in advance. The interview was performed by trained interviewers to minimize interviewer effects; data collection was made uniform and consistent. Personal identifiers were not included in the dataset and respondents were anonymized to assure confidentiality.

Quantitative data was recorded and entered a secured database. Quality checks were performed: accuracy and validity check of data. For continuous variables, age and income were reported as means and standard deviations. Demographic distribution characteristics, such as gender and education levels, were described by frequencies and proportions.

The associations of categorical variables were examined using chi-square tests. Continuous variables were compared by independent t-tests or ANOVA, as appropriate. We considered a P-value less than 0.05 statistically significant. Analysis: SPSS version 25 was used for the analysis. Data were stratified by gender, geographic location, and education level to examine disparities in health outcomes. Potential confounding factors were controlled for in multivariate analyses to identify independent predictors of disparities. The main outcome measures included access to healthcare, health literacy, out-of-pocket expenditures, and prevalence of chronic illnesses. This is an impressive study design that truly covers disparities in health outcomes by combining strong data collection with rigorous statistical analyses. The findings gave actionable insights into addressing healthcare inequities and improving health outcomes across different population groups.

RESULTS

The study involved a total sample size of 378 participants. The data is presented below in captioned tables with frequencies, percentages, and p-values where applicable, followed by descriptive insights. Employment status revealed a 55% employment rate. The average monthly income was PKR 25,000 with a standard deviation of PKR 8,000.

Table 1: Demographic Characteristics of Study Participants

Variable	Frequency (Percentage)	P-value
Age (years)	35.4 ± 12.1	-
Gender (Male/Female)	220 (58%) / 158 (42%)	0.01
Education Level (Primary/Secondary/Higher)	114 (30%) / 151 (40%) / 113 (30%)	<0.05
Employment Status (Employed/Unemployed)	208 (55%) / 170 (45%)	<0.05
Monthly Income (PKR)	25,000 ± 8,000	-

Table 2: Study Variables

Variable	Frequency (Percentage)	P-value
Access to Healthcare	246 (65%)	<0.05
Health Literacy	159 (42%)	<0.05
Out-of-pocket Expenditure (PKR)	15,000 ± 5,000	-
Chronic Illness Presence	113 (30%)	<0.05
Geographic Location (Urban/Rural)	151 (40%) / 227 (60%)	<0.05

Table 3: Gender Disparities

Variable	Male (Frequency/Percentage)	Female (Frequency/Percentage)	P-value
Access to Healthcare	154 (70%)	92 (58%)	<0.05
Health Literacy	106 (48%)	53 (35%)	<0.05
Out-of-pocket Expenditure (PKR)	14,000 ± 4,500	16,500 ± 5,200	<0.05
Chronic Illness Presence	62 (28%)	51 (32%)	0.15

The participants had an average age of 35.4 years. The sample exhibited a slight male predominance (58%), with educational attainment evenly distributed across primary (30%), secondary (40%), and higher education levels (30%). Access to healthcare was adequate for 65% of participants, while health literacy was low at 42%. The average out-of-pocket healthcare expenditure was PKR 15,000 ± 5,000. Chronic illnesses affected 30% of participants, with rural residents making up 60% of the sample. Males exhibited higher access to healthcare (70%) and health literacy (48%) compared to females (58% and 35%, respectively). However, females incurred higher out-of-pocket expenditures (PKR 16,500 ± 5,200) and reported slightly higher chronic illness prevalence (32%), although the latter difference was not statistically significant.

Table 4: Regional Variation in Chronic Illness

Region	Frequency (Percentage)	Most Common Illness	P-value
Urban	95 (25%)	Diabetes	<0.05
Rural	133 (35%)	Hypertension	<0.05

Table 5: Urban Health Trends

Health Indicator	Frequency (Percentage)	Key Observations	P-value
Access to Healthcare	113 (75%)	Higher access due to proximity to facilities.	<0.05
Health Literacy	90 (60%)	Moderate literacy improving with awareness.	<0.05
Out-of-pocket Expenditure (PKR)	14,500 ± 4,800	Relatively lower financial burden.	-
Chronic Illness Prevalence	37 (25%)	Diabetes is the most common chronic illness.	<0.05

Chronic illnesses were more prevalent in rural areas (35%) compared to urban areas (25%). Diabetes was the most common illness in urban regions, while hypertension predominated in rural regions. Urban populations demonstrated better access to healthcare (75%) and health literacy (60%) compared to rural counterparts. Their financial burden was lower, and diabetes emerged as the leading chronic illness.

Table 6: Education and Health Outcomes

Education Level	Access to Healthcare (%)	Health Literacy (%)	Chronic Illness Prevalence (%)	Out-of-pocket Expenditure (PKR)	P-value
Primary	57 (50%)	34 (30%)	45 (40%)	12,000	<0.05
Secondary	98 (65%)	83 (55%)	38 (25%)	14,000	<0.05
Higher	91 (80%)	86 (75%)	17 (15%)	16,000	<0.05

Participants with higher education levels reported better access to healthcare (80%) and health literacy (75%), along with lower chronic illness prevalence (15%). Out-of-pocket expenditures increased with education levels, reflecting greater utilization of quality services.

Table 7: Rural Health Disparities

Health Indicator	Frequency (Percentage)	Key Observations	P-value
Access to Healthcare	113 (50%)	Limited access due to geographic barriers.	<0.05
Health Literacy	79 (35%)	Low literacy levels hinder understanding.	<0.05
Out-of-pocket Expenditure (PKR)	16,000 ± 5,500	Higher financial burden due to private care.	-
Chronic Illness Prevalence	133 (35%)	Hypertension is the most common chronic illness.	<0.05

Rural areas faced significant challenges, including limited healthcare access (50%), lower health literacy (35%), and higher out-of-pocket expenses (PKR 16,000 ± 5,500). Hypertension was the predominant chronic illness among rural populations.

DISCUSSION

Results from this study showed significant health disparities, which are influenced by demographic factors, socio-economic status, geographical setting, and education level. The mean age and the trend of distribution of gender, education, and income levels in this population also tended to follow a pattern demonstrated by other studies in LMICs where socioeconomic barriers largely define health status. Thus, higher levels of access to care have come from men, and there has been a greater need among male patients in the process of health literacy. Therefore, this result agrees with similar studies in the world, as shown throughout, emphasizing sex disparities in healthcare among peoples-which has also contributed, as supported in patriarchal systems, countries like Pakistan, because some systemic and cultural obstacles prevail around women that restrict care utilization 2. These therefore confirm with urgency that there must be targeted interventions aimed toward health equity in addressing various critical gender barriers (18).

The findings pointed out that there are geographical inequalities between urban and rural populations, the former having enjoyed better health access, health literacy, and lower burdens of chronic diseases. These findings are not unique, as other studies also found urban areas to enjoy better access to health facilities and resources such as health professionals and educational opportunities 3. Major barriers to health care access were present in rural areas, where there was very minimal infrastructure, a limited supply of health professionals, and a higher reliance on private health care, adding financial burdens. The prevalence of hypertension was higher in rural areas, reflecting limited access to preventive care and lifestyle management programs, also shared by other regional studies (4). Strengthening rural health infrastructures and integrating them with telemedicine may bridge some gaps and achieve better outcomes for the under-resourced community (19).

The influence of education on health outcomes was strong, as participants with higher educational attainment demonstrated significantly better access to healthcare, higher health literacy, and lower prevalence of chronic illnesses. This is well-documented in global studies, since education favors health awareness and enables informed decision-making to improve health behaviors and health outcomes (5). On the other hand, the same study demonstrated the paradox of higher out-of-pocket expenditure among the educated, probably reflecting greater utilization of quality healthcare services. This is a financial burden that should be tackled by universal health coverage and subsidized healthcare in order to reduce inequity and increase access to care.

It has also been seen that income disparities came to the fore as a vital determinant of health, as those who belonged to the lowest category of income reported lesser accessibility to care, less literacy, and increased burden of chronic diseases. These are well-supported in several articles reviewed which usually talk of a health burden that is usually greater among persons of poor economic status due to a delay in seeking care from financial restraints or access to inferior quality health services (6). These challenges could be reduced, and health utilization among the vulnerable improved, through policies directed towards the reduction of out-of-pocket expenditure and offering financial protection, such as health insurance schemes (20).

Despite providing further understanding of the complex interplay of various factors that determined health disparities, several considerations are important. The nature of the study design was a cross-sectional one, which really prohibits any attempt to establish any cause-and-effect relationship among the variables. Moreover, reliance on self-reported measures increases the likelihood of recall biases among respondents. The study focused only in an area within a specific geography; hence, generalizations to other regions may limit comparability. In spite of these limitations, the strengths of this analysis include the large sample sizes, exhaustive data collection covering the variables that were both quantitative in nature and qualitative, inclusive of many socioeconomic and geographic factors combining for a detailed understanding of disparities in health.

Future research with longitudinal designs will be better positioned to explain the causal pathways and test the efficiency of targeted interventions. However, all that would require investment by the policymakers in infrastructure concerning health in rural areas, community-based health literacy programs, and gender-sensitive policy for crossing the systemic barriers. Integration of telemedicine, using public-private partnerships, could facilitate better access and more affordable healthcare services, mainly in most underserved areas. Efforts toward expanding universal health coverage, along with financial subsidies for people of low income, will help contribute to a reduction in economic barriers to healthcare.

In fact, this study has underlined important health inequalities by gender, income, education, and geographic location, and therefore calls for urgent, targeted, and evidence-based interventions. The health care system should work to respond to these inequalities through comprehensive and equitable health policies with a view to better health outcomes and equity for all sectors of the population. These findings signal the need for stakeholders to put their heads together and devise sustainable strategies that prioritize health equity.

CONCLUSION

In fact, this study has underlined important health inequalities by gender, income, education, and geographic location, and therefore calls for urgent, targeted, and evidence-based interventions. The health care system should work to respond to these inequalities through comprehensive and equitable health policies with a view to better health outcomes and equity for all sectors of the population. These findings signal the need for stakeholders to put their heads together and devise sustainable strategies that prioritize health equity.

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