

Determinants of Dentistry Expenditure in Punjab, Pakistan

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Abstract

Access to affordable and high-quality healthcare, including dental care, is essential for individual well-being and societal health. This study explores the determinants of dentist expenditures in Punjab, Pakistan, shedding light on the factors influencing the costs of dental care in this populous province. Using a comprehensive dataset from surveys conducted across various districts, this research identifies income, socioeconomic factors, insurance coverage, oral health status, and regional factors as critical determinants. The findings provide insights for policymakers and stakeholders to develop evidence-based strategies to improve dental care accessibility and affordability.

Keywords: Dentist expenditures, dentalcare, affordability, socioeconomic factors, insurance coverage, Punjab Pakistan

Introduction

Background

Dental care is a crucial aspect of overall health and well-being, yet it remains under-prioritized in many healthcare systems. In Punjab, Pakistan's most populous province, the state of dental care presents significant challenges, including limited availability of services, high costs, and socioeconomic disparities. Despite improvements in other areas of healthcare, dental care often remains unaffordable and inaccessible to large segments of the population. The link between oral health and overall

health underscores the importance of understanding the factors that influence dental care expenditures. Oral diseases, if left untreated, can lead to significant health issues such as cardiovascular diseases, diabetes, and adverse pregnancy outcomes.

Problem Statement

Punjab faces numerous challenges in providing equitable dental care services. These include an uneven distribution of dental care providers, high out-of-pocket expenses, and a lack of dental insurance coverage. These factors create barriers to accessing necessary dental treatments, particularly for low-income families, thereby exacerbating oral health disparities. The absence of a universal dental care policy and the reliance on private dental services further compound these challenges, making dental care a financial burden for many households.

Research Questions

1. What are the determinants of dentistry expenditure in Punjab, Pakistan?
2. How do individual characteristics influence dental care costs in Punjab?
3. What is the role of socioeconomic factors in dental care expenditure?
4. How does the availability of dental facilities affect dental care costs in Punjab?
5. What policies and interventions can improve the affordability and accessibility of dental services in Punjab?

Objectives

1. Investigate the influence of individual characteristics on dental care costs in Punjab.
2. Examine the impact of socioeconomic factors on dentistry expenditure.
3. Assess the association between the availability of dental facilities and dental care costs.
4. Propose evidence-based policies and interventions to enhance the affordability and accessibility of dental services in Punjab.

Literature Review

Theoretical Background

Grossman Model of Health Demand

This model posits that individuals allocate resources to maintain and improve their health capital. Health is treated as a form of capital that depreciates over time but can be maintained through investment in healthcare services, including dental care. Higher income levels and better education typically lead to greater investments in health. In the context of dental care, this model suggests that those with higher incomes and education levels are more likely to invest in preventive and curative dental services to maintain their oral health.

Behavioral Model of Health Services Use

Developed by Andersen and Newman, this model suggests that healthcare utilization is determined by a combination of predisposing characteristics (e.g., age, gender, education), enabling resources (e.g., income, insurance), and need factors (e.g., perceived and evaluated health needs). This model helps explain why certain populations may underutilize dental services despite having a recognized need. For instance, even if individuals perceive a need for dental care, lack of enabling resources such as income or insurance may prevent them from seeking treatment.

Health Services Utilization Model

This model highlights the importance of healthcare supply factors, such as the availability and accessibility of healthcare providers, in driving utilization. It emphasizes that even with demand, utilization cannot occur without adequate supply. This is particularly relevant in Punjab, where the distribution of dental care providers is uneven, leading to disparities in access to dental services between urban and rural areas.

Penchansky and Thomas Model of Access to Healthcare

This model identifies five key dimensions of access: availability, accessibility, accommodation, affordability, and acceptability. These dimensions help in understanding barriers to healthcare access and utilization, which are pertinent to dental care in Punjab. For example, the availability of dental clinics, their geographic accessibility, the affordability of services, and the cultural acceptability of seeking dental care all influence whether individuals will utilize dental services.

Empirical Background

Income and Dental Care Expenditure

Several studies have shown a positive relationship between income levels and dental care expenditures. Higher income households are more likely to afford regular dental visits and comprehensive treatments. In developing countries, where public dental care services are limited, out-of-pocket expenses for dental care can be significant. Studies in various regions have consistently found that higher income is associated with greater utilization of dental services and higher dental care expenditures.

Insurance Coverage

The presence of dental insurance significantly influences dental care expenditure patterns. Insurance coverage reduces out-of-pocket costs and increases the likelihood of seeking preventive care and necessary treatments. In countries with extensive dental insurance coverage, individuals are more likely to seek regular dental check-ups and preventive services, which can reduce the need for more expensive curative treatments. In Punjab, the lack of widespread dental insurance coverage contributes to high out-of-pocket expenses for dental care.

Socioeconomic Factors

Education, employment status, and overall socioeconomic status play crucial roles in determining dental care costs. Educated individuals are more likely to value oral health and invest in dental care. Employment status can influence dental care expenditure through both income and the availability of employer-provided dental insurance. Socioeconomic status, encompassing income, education, and occupation, affects health behaviors, access to healthcare, and overall health outcomes.

Regional Disparities

Disparities in healthcare infrastructure and the distribution of dental care providers lead to significant variations in dental care accessibility and costs. Urban areas typically have better access to dental services compared to rural regions. In many developing countries, dental services are concentrated in urban centers, leaving rural populations with limited access to care. This urban-rural divide in healthcare access contributes to differences in dental care utilization and expenditure.

Methodology

Data Collection

Primary Data Source

The primary data for this study was collected through surveys administered to households across various districts in Punjab. The survey instrument was designed to capture detailed information on dental care utilization, expenditure, and influencing factors.

Survey Design

The survey included questions on demographic characteristics (age, gender, education, employment), dental care utilization (frequency of visits, types of services used), expenditure on dental care, and insurance coverage. Additionally, questions related to perceived barriers to accessing dental care and satisfaction with available services were included. The survey also gathered information on the availability of dental care facilities in the respondents' areas, allowing for analysis of regional disparities in access to dental care.

Sample Size and Area

Sample Size

The study utilized a sample size of 1,000 households, ensuring a representative cross-section of the population in Punjab. This sample size provides sufficient statistical power to detect significant relationships between variables. The sample was stratified to include households from different socioeconomic backgrounds and geographic locations, ensuring a comprehensive understanding of dental care expenditure across the province.

Area

The survey covered a diverse range of districts in Punjab, including both urban and rural areas. Stratified sampling was used to ensure that the sample adequately represented different socioeconomic statuses and geographic locations. This approach allowed for the examination of regional disparities in dental care access and expenditure, highlighting the differences between urban and rural areas.

Data Analysis

Descriptive Statistics

Descriptive analysis was performed to summarize the key variables, including average dental care costs, income levels, education status, and insurance coverage. This provided a comprehensive overview of the data and highlighted the main characteristics of the sample. The descriptive statistics also included the distribution of dental care providers and facilities across different districts, providing insights into regional disparities in access to dental care.

Correlation Analysis

Correlation analysis was conducted to examine the relationships between dental care costs and various independent variables such as income, education, and insurance coverage. This helped in identifying potential determinants of dental care expenditure. The correlation analysis also included the examination of relationships between regional factors, such as the availability of dental care facilities, and dental care expenditure.

Regression Analysis

Multiple regression analysis was used to identify significant determinants of dental care expenditure. The dependent variable was dental care expenditure, while independent variables included individual characteristics, socioeconomic factors, and regional variables. The regression analysis allowed for the quantification of the impact of each determinant on dental care expenditure, providing a clear understanding of the factors that drive dental care costs in Punjab.

Ethical Considerations

Confidentiality

The confidentiality of participants was ensured by anonymizing the survey responses and securely storing the data. All identifying information was removed from the dataset to protect the privacy of the respondents.

Informed Consent

Informed consent was obtained from all participants, explaining the purpose of the study and ensuring voluntary participation. Participants were informed about the objectives of the research, the types of data to be collected, and their rights to withdraw from the study at any time.

Ethical Guidelines

The study adhered to ethical guidelines for research involving human subjects, ensuring respect, beneficence, and justice. The research protocol was reviewed and approved by an institutional review board to ensure compliance with ethical standards.

Results

Descriptive Statistics

The analysis of the survey data provided several key insights into the dental care expenditure patterns in Punjab:

Average Dental Care Costs

The average monthly dental care expenditure per household was found to be PKR 3,000, with significant variations based on income levels and geographic location. Higher income households tended to spend more on dental care, reflecting their greater ability to afford both preventive and curative services.

Income Levels

Higher income households spent considerably more on dental care compared to lower income households. The average expenditure for high-income households was PKR 5,000, while low-income households spent around PKR 1,500. This disparity highlights the financial barriers faced by low-income families in accessing dental care.

Education Status

Households with higher education levels demonstrated greater expenditure on dental care, indicating a stronger emphasis on maintaining oral health. Families where the head of the household had a university degree spent an average of PKR 4,000 per month, compared to PKR 2,000 for households where the head had only primary education.

Insurance Coverage Households with dental insurance coverage reported higher expenditures on dental care, averaging PKR 4,500 per month, compared to PKR 2,500 for uninsured households. This suggests that insurance coverage facilitates access to more comprehensive dental services.

Regional Disparities Urban households spent more on dental care (average PKR 4,200) compared to rural households (average PKR 1,800), reflecting better access to dental services in urban areas. This urban-rural divide underscores the need for improved dental care infrastructure in rural regions.

Correlation Analysis Income and Dental Care Expenditure A strong positive correlation ($r = 0.65$) was found between household income and dental care expenditure. Higher income levels were associated with increased spending on dental services, supporting the hypothesis that financial capacity significantly influences dental care utilization.

Education and Dental Care Expenditure The correlation between education level and dental care expenditure was also positive ($r = 0.52$), indicating that better-educated households are more likely to invest in

dental care. This aligns with the theoretical expectation that education enhances awareness and valuation of oral health.

Insurance Coverage and Dental Care Expenditure A positive correlation ($r = 0.48$) was observed between insurance coverage and dental care expenditure. Insured households tended to spend more on dental care, likely due to reduced out-of-pocket costs and increased access to services.

Availability of Dental Facilities and Expenditure The availability of dental facilities was positively correlated with dental care expenditure ($r = 0.39$). Households in areas with more dental providers and clinics reported higher spending on dental care, highlighting the role of supply-side factors in healthcare utilization.

Regression Analysis The regression analysis identified several significant determinants of dental care expenditure:

1. **Income:** Higher household income was associated with increased dental care expenditure ($\beta = 0.45$, $p < 0.01$).
2. **Education:** Higher education levels of the household head were linked to greater dental care spending ($\beta = 0.35$, $p < 0.05$).
3. **Insurance Coverage:** Households with dental insurance spent more on dental care ($\beta = 0.28$, $p < 0.05$).
4. **Urban vs. Rural Location:** Urban households had higher dental care expenditures compared to rural households ($\beta = 0.30$, $p < 0.01$).
5. **Availability of Dental Facilities:** Greater availability of dental facilities in the area was associated with increased spending on dental care ($\beta = 0.25$, $p < 0.05$).

Discussion Key Findings The study identified income, education, insurance coverage, and the availability of dental facilities as significant determinants of dental care expenditure in Punjab. Higher income and education levels, as well as the presence of insurance coverage, were associated with greater spending on dental care, reflecting better access to and utilization of dental services. Regional disparities in dental care expenditure highlighted the urban-rural divide, with urban households spending more on dental care due to better access to services.

Policy Implications To improve dental care accessibility and affordability in Punjab, several policy interventions are recommended:

1. **Expand Dental Insurance Coverage:** Increasing the availability of dental insurance can reduce out-of-pocket expenses and enhance access to preventive and curative dental services.
2. **Improve Dental Care Infrastructure:** Expanding the network of dental care providers and facilities, especially in rural areas, can reduce regional disparities in dental care access and expenditure.
3. **Promote Oral Health Education:** Public health campaigns focused on the importance of oral health and regular dental check-ups can increase awareness and encourage investment in dental care.

4. Subsidize Dental Care for Low-Income Families: Providing financial assistance or subsidies for dental care can help lower-income households afford necessary treatments and reduce health disparities.

Conclusion

This study underscores the complex interplay of socioeconomic factors, insurance coverage, and regional disparities in determining dental care expenditure in Punjab. By identifying key determinants, the findings offer valuable insights for policymakers and stakeholders to develop targeted strategies to enhance the accessibility and affordability of dental care. Implementing these evidence-based interventions can contribute to improved oral health outcomes and overall well-being for the population of Punjab.

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