Human Nature Journal of Social Sciences
Vol.4, No.1 (March, 2023), Pp.204-215
ISSN(online): 2788-5240, ISSN(print):2788-5232

Human Nature Research Publisher

Original Article http://hnpublisher.com

Determinants of Households' Budget Allocation to Health and Education in Balochistan, Pakistan: Role of Income, Household Size, and Employment

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ABSTRACT

Aim of the Study: The main aim of this research paper is to analyze the behavior of households' budget expenditures on education and health in the province of Balochistan. There are several reasons for our study to select Balochistan, but the most important reason is that Balochistan is the largest province of Pakistan.

Methodology: For this quantitative research, the descriptive statistic, Pearson correlation and Working-Leser model.

Findings: Amongst health categories, households spend lion share of their budget on medicine and education categories, they spend more on school/ college/ university fees. The Pearson correlation result suggests that budget allocation to health is strongly negatively correlated with logarithm income while obtaining a positive correlation between budget allocation to education and logarithm income. Correlations between household size and budget allocation to health and education were negative while a positive correlation between budget allocation to health and employee, and between budget allocation to education and employee. The econometric result suggests that income, household size and employment status are the key drivers for determining household budget allocation to education and health.

Conclusion: The rise in employment and controlling policy of household size could be a valid policy options while the income elasticity is suggesting that rise in income could also be a valid policy option in case of Balochistan for rising budget allocation to health and education.

Keywords: Household, Health, Education, Income, Employment, Balochistan.

Article History

Received:
January 06, 2023

Revised:
March 23, 2023

Accepted:
March 27, 2023

Published:
March 29, 2023

Introduction

Investment in human capital development is one of the key indicators for income growth; being its positive contribution to productivity (Tsaurai, 2018; Yun & Yusoff, 2019). Every government's primary objective is to improve its people's living standards through public expenditure on the development of

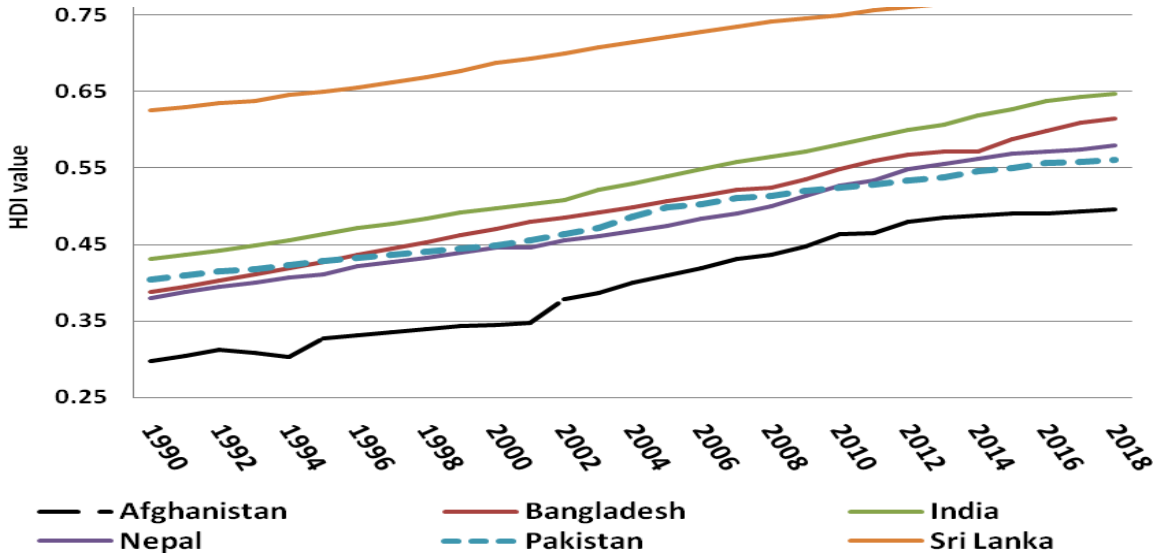
human capital (Azam and Ahmed, 2015). There are various empirical research available (Cole & Neumayer, 2006; Tompa, 2002; UNIDO, 2007) which show that better health improves productivity. Therefore, healthier nations would have a higher productivity level. Education is the other important factor that improves productivity levels. Acemoglu (2009) and Barro and Lee (2013) found a direct and significant relationship between years of schooling and economic growth and productivity. In 2015 the United Nations set 17 Sustainable Development Goals (SDGs) whereby 196 countries have committed to accomplishing the goals by the year 2030. Different reforms have been introduced by 196 countries to achieve these goals (see Fig.1). The developed countries have shown more serious concerns than developing countries in this regard. Two important goals education and health have been given more attention worldwide. Pakistan has also shown its commitment to achieving its goals by the year 2030. For this purpose, the country has implemented various adjustments and structural reform measures.

Figure 1. *17 Sustainable Development Goals*

Source: https://www.un.org/sustainabledevelopment/development-agenda/

Human Development Index is one of the major indexes for measuring the level of national real development. The index is developed by the United Nation Development program (UNDP). The index has three major components: health, education, and standard of living. Pakistan's index score though increasing over the last 30 years however, it is still behind the regional countries' index. The data indicate that Pakistan's Human Development Index (HDI) value for 2018 was 0.560 and that the nation was ranked 152 out of 189 countries, indicating that the country is thought to have medium levels of human development. Figure 2 below compares the HDI trend for Pakistan in the region and shows that only Afghanistan is below Pakistan while Bangladesh, India, Nepal, and Sri Lanka are above Pakistan (Fig.2). It is important to note that Pakistan's situation in human development was better than Nepal and Bangladesh in 1990 however, in 1995 Bangladesh and in 2010 Nepal crossed Pakistan in human development.

Fig. 2. *Human Development Index*



Source: Authors' estimation based on UNDP website dataset Country Insights | Human Development Reports (undp.org)

Health and education are considered one or two of the basic 12 pillars of competitiveness of the country. The World Economic Forum (WEF) has structured 12 pillars which are key for the enhancement of productivity and hence competitiveness. Companies always looking for healthy and educated workers who are more productive, and their performance enhance the competitive level in today's aggressive and competitive markets. Unhealthy and uneducated workers are not efficient, and their performance usually remains below the desired level of productivity. According to WEF data, Pakistan is ranked lowest in both the health and education sectors, and its index score is also declining.

According to the World Economic Forum's report on human capital 2019, Pakistan is the fifth most populated country and ranked 152 out of 189 countries in the human capital index. China has the largest population and ranks 34 in human capital while India is the second largest populated country in the World and ranked 103 followed by Iran and Bangladesh which ranked 104 and 111 in the human capital index, respectively. It implies that the regional countries are better than Pakistan in providing education and health facilities to their nations. Hooda (2015) claims that investment in human capital development leads to positive growth in income and alleviating poverty.

The developing countries including Pakistan are making maximum efforts to stimulate its human capital to achieve an inclusive growth rate. Pakistan has planned a long-term strategy and drafted the National Education Policy Framework (NEPF). Its objectives are to improve quality education, implementation of uniform education standards, minimizing the schooling dropout rate, and the developing of job-oriented skills.

Considering the preceding discussion, the main objective of this research paper is to analyze the behavior of households' budget expenditures on education and health in the province of Balochistan. There are several reasons for our study to select Balochistan, but the most important reason is that Balochistan is the largest province of Pakistan. In terms of area, it occupies about 43.6% area of entire Pakistan[1] while in terms of socio-economic development; it is one of the most backward areas in Pakistan, though. Due to

[1] About Balochistan - Government of Balochistan

the lower socio-economic development, the people of the province deserve more attention. It is because previously, the province of Balochistan was lacking the attention of the federal government for various reasons. However, now and for the last one decade, the federal government of Pakistan is giving more attention to develop Balochistan socially and economically. Thus, while using the data from Pakistan social living standards and measurements (PSLM) 2018-19, this study is an attempt to find the determinants of households' budget allocation to health and education for the province of Balochistan.

With this preface section, the subsequent sections of this paper are literature review, data and methodology, results and discussion, and finally, conclusion and recommendations.

Literature Review

A large number of empirical investigations for seeking the impact of human capital development on economic growth are available. However, this research would focus on the determinants of human capital at the household level. This section, therefore, reviews the determinants of human capital (i.e., education and health) at household level. The existing studies have considered education and health expenditure combined as well as separately. As Qian and Smyth (2011) examined the determinants of parents' expenditure on their children education based on survey data of 32 Chinese cities which is conducted in 2003. Their findings confirmed that income has a positive effect on education expenditure. The study used mother education level and father's employment status as instrumental variables for educational expenditure. The study concluded that the educated family with professional employment status spends more on children's education. Similarly, Vu (2012) examined the effect of household income, parents' schooling level and employment status on education expenditure for Vietnam. The study used the Tobit model for analysis and data from the Vietnam household survey, 2006. Their finding also confirms that the household income and employment status are the key determinants to increase expenditure on education. Acar et al., (2016) estimated the income elasticity of education expenditure for Turkey. The results of the analysis confirmed that the household's budget allocation for education increases over time because of an observed increasing trend in income elasticity of education. The negative and statistically significant effect of household size on education expenditure confirms that the household's budget allocation reduces over time. It was also found that the urban households are allocating more budgets to education than those who live in rural areas of Turkey. Bischoff and Prasetyia (2019) examined the socio-economic, political, and geographical factors which affect the budget allocation to education per student and overall education expenditure in Indonesia. The study used a panel dataset for the period 2005 to 2012. Their study found municipalities' fiscal capacity as one of the driving forces to influence the budget share of education. The study also concluded that education expenditure increases with political parties' influence. Pallegedara and Sisira (2020) examined the trend and determinants of education expenditure in Sri Lanka. They used a micro dataset of Sri Lanka for the period 1990-2013. Their findings confirmed that household expenditure on education is increasing over time. Thus, they concluded that household income is a key determinant that leads to an increase in budget allocation for education.

Some research studies has identified the driving forces of health expenditure. Imran and Muhammad (2005) examined the determinants of health care expenditure for Pakistan. Their findings confirmed that growth income, urbanization, literacy rate and foreign aid are driving forces for determining health expenditure. The study of Magazzino and Mele (2012) estimated the health income elasticity and the findings revealed health expenditure as inelastic. A similar finding are also indicated by Angko (2013) for Ghana. Yetim et al., (2020) assessed the effect of the socioeconomic factors on health expenditure for the Organization of Economic Cooperation Development (OECD) countries. The study used panel data for the period 2000-2007. The empirical findings confirmed that growth income and education are the key factors that influence health expenditure. They observed an increasing trend in health expenditure over time.

Considering the preceding paragraphs, it is feasible to conclude that the determinants of combined education and health spending almost provide the same outcomes as separate determinants of health and

education expenditures. Using time-series data from the Nigeria Living Standards Survey 2003-04 and double hurdle model, Ogundari and Abdulai (2014) found that household income, family size, and head education level are the key determinants for the budget allocation to education and healthcare services. The households dominated by the female allocate more for education and healthcare services than male dominance households. Akca et al., (2017) estimated the nexus among health outlay, income growth, and insurance, out-of-pocket health expenditure for the OECD countries. The findings confirm that growth income, improvement in life expectancy, age dependency ratio, and the number of hospitals increase the OECD countries' health expenditure. Iftikhar and Naqvi (2018) investigated the relationship between accesses to health services and socioeconomic determinants at the household level for selected districts of Punjab-Pakistan. The findings confirm that households prefer private health services to the government. In addition, education, employment and residence status, and income are the major determinants of health accesses services.

In brief, it can be said that substantial studies have been conducted to find the determinants of education and healthcare services at the household level; however, we could not find any study which has specifically focused on the said issue for the province of Balochistan. There are several reasons for our study to select Balochistan, but the most important reason is that Balochistan is the largest province of Pakistan in terms of area (about 43.6% of entire Pakistan) and the most backward area in terms of socio-economic conditions. Due to lower socio-economic conditions, the people of the province deserve more attention. Due to this social backwardness, the federal government is giving more attention to Balochistan which was neglected in the previous decades (1947 to 2006). The latest Award of the Finance Commission has increased the share of Balochistan by approximately 80%[2].

Research Objectives

The main aim of this research paper is to analyze the behavior of households' budget expenditures on education and health in the province of Balochistan. There are several reasons for our study to select Balochistan, but the most important reason is that Balochistan is the largest province of Pakistan.

Research Questions

What correlation between share of health and education in household budget with household income, employment, and household size. In addition, what factors effecting positively household budget share allocated to health and education.

Hypotheses

The income and employment can contribute to budget share health and education positively while household size can contribute negatively.

Data and Methodology

Data

The data for Balochistan households' income, expenditure on education and health, number of employees and household size collected from the Pakistan Social and Living Standards Measurements (PSLM) survey 2018-19. The Balochistan household sample size is 2327. We have excluded those households which expenditure on health and education is zero. We found 2171 and 1332 households which have positive expenditure on health and education, respectively. The description of variables is presented in table 1 below:

[2] Govt raises 18pc revenue share for provinces under NFC Award (nation.com.pk)

Table 1. *Description of study variables*

Variables	Description
household expenditure on health	It covers the expenditure of household on medicine; doctor fee; dental care; teeth cleaning; extraction and other (i.e., test and room charges)
household expenditure on education	It covers the expenditure of household on school/college/university fee; textbooks; hostel expenses and others
household size	It covers household's member who usually lives and eat together while excluding guests and visitors
number of employees	It covers the adults' household who work either on a daily or permanently in agricultural, industrial and services sectors
total income/expenditure	It covers the expenditure made on food and non-food items while excluding saving
budget allocation to health	It is the ratio of expenditure on health and total income/expenditure
budget allocation to education	It is the ratio of expenditure on education and total income/expenditure

Methodology

The Working-Leser model for driving forces impact on budget allocation is applied as follow:

$$S_i = f(driving\ forces\ of\ budget\ allocation) + \varepsilon_i \quad (1)$$

It assumes that the budget share allocation linearly relates to the logarithm of total income/expenditure (Acar et al., 2016). Thus, the specific form of Working-Leser is expressed as:

$$S_i = \beta_0 + \beta_1 lnx + \varepsilon_i \quad (2)$$

In Eq.(2), the S_i is the budget share allocation to goods *i*, where, in our case goods *i* consists of education and health. The variable x_i is total income (expenditure); the $\beta_0 and\ \beta_1$ are parameters to be estimated from the sample data and ε is the error term. The budget share of good Si is computed as:

$$S_i = \frac{expenditure\ of\ household\ on\ good\ i}{total\ household\ income\ (expenditure)} \quad (3)$$

The marginal influence of income/expenditure and income elasticity for good *i* from Eq. (2) are computed as[3]:

$$marginal\ influence\ of\ income\ on\ goodi = \beta_1 + S_i \quad (4)$$

$$income\ elasticity\ (\eta_x) = 1 + \frac{\beta_1}{S_i} \quad (5)$$

The Working-Leser for education and health budget allocation is expressed in matrix notation as:

[3] The marginal effect is obtained through (Castaldo & Reilly, 2007) and income elasticity is estimated through (Acar et al., 2016) techniques.

$$\begin{bmatrix} S_{education} \\ S_{health} \end{bmatrix} = \begin{bmatrix} \beta_0 \\ \beta_0 \end{bmatrix} + \begin{bmatrix} lnx & household\ size & numbers\ of\ employee \\ lnx & household\ size & numbers\ of\ employee \end{bmatrix} \begin{bmatrix} \beta_1 \\ \gamma_1 \\ \alpha_1 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \end{bmatrix} \quad (6)$$

Where, the logarithm income, household size and numbers of employee are instrumental factors for education and health budget allocation. It is hypothesized that, households usually take into account education and health as normal goods; therefore, the coefficient associated with logarithm income would be either positive in luxury $(i.e.\ \beta_1 > 0)$ or negative in necessity$(i.e.\ \beta_1 < 0)$case. Similarly, it is hypothesized that effect of crowded and poorer household would be negative$(i.e.\ \gamma_1 < 0)$, while larger the employee, the positive effect $(i.e.\gamma_1 > 0)$ would be on health and education expenditure (Acar et al., 2016; Yetim et al., 2020).

Finding/Analysis

Descriptive Analysis

The health and education expenditures in table 2are decomposed for the year 2018-19. The results show that the largest household budget allocation for health belongs to medicine and dental care, teeth cleaning and extraction is the second category where 27% budget share of household allocates to it. While on account of education expenses the school/college/university fee expenditure found to be highest, and the book is the second largest educational expenditure. Out of total budget allocation to health, 73.4% is assigning to medicine and dental services. Similarly, out of total budget allocation to education, 90.5% is allocating to school/college/university and book purchases.

Table 2. *Decomposition of health and education expenditures (in % share) for 2018-19*

Types of Expenditure	Health	Types of Expenditure	Education
Medicine	56.02	School/college/university fee	71.27
Doctor fee	07.35	Books	19.19
Dental care, teeth cleaning, extraction, charges	27.37	Hostel expenses	02.27
Others	9.27	Others	07.27

Source: Author calculation; based on PSLM 2018-19 dataset.

Pearson Correlation Analysis

The Pearson correlations are estimated in table 3 between variables of interest. The correlation between the budget allocation of health and growth income is -0.720 and the correlation between budget allocation to education and growth income is 0.553 along with statistically significant. It illustrates a stronger negative association between health and growth income and relatively a strong positive association between education and growth income. The correlations between household members and budget allocation to health and education are respectively -0.234 and -0.057, confirming a weak negative association. Similarly, the weak positive association confirms between employees and budget allocation to health and education. Thus, the statistically significant association between budget allocation to human capital indicators (i.e. health and education) and variables of interest strongly supports the econometric modeling analysis as presented in table 4.

Table 3. *Pearson correlation between variables of interest*

		Share of Health in Household Budget	Share of Education in Household Budget
Pearson Correlation	Share of health in household budget	1.000	1.000
	log income	-0.720	0.553
	household members	-0.234	-0.057
	Employees	0.083	0.116
p-value	Share of health in household budget	.	.
	log income	.000	.000
	household members	.000	.018
	Employees	.000	.000
Households		2171	1332

Source: Authors estimation based on PSLM 2018-19 dataset.

Regression Analysis

The reported results in table 4 are the stepwise regression analysis to examine the significance of the variables for health and education budget share through statistical significance and R^2-change principles. The coefficient associated with logarithmic income in model 1 is found negative in the case of health, and positive in the case of education, suggests a reduction in budget share allocation to health by 0.205 units and an increase by 0.137 units in budget share to education. The logarithmic income and household size are included in model 2. Both factors are found to be statistically significant, and the inclusion of household size improves R^2-change. The coefficient associated with household size suggests a reduction in budget share to health by 0.009 and to education by 0.011. However, the more proportional effect of household size is on education than health. In model 3, logarithmic income, household size and employees are introduced. They are statistically significant and also improve R^2-change. The coefficient associated with employed dummy (1 for employed) is positive and significant, which indicates that employed households spend more on health and education, interestingly this coefficient is the same in both models. This study findings are consistent with Olasehinde & Olaniyan(2017) found for the Nigerian households that income and household size are key determinants for determining health expenditure. Pallegedara & Sisira (2020) found that income is the key factor for budget allocation to education at household level. They further explained that household spending on private schooling is rising with increase in income. Ogundari & Abdulai (2014) obtained the positive and statistically significant impact of logarithm income while statistically insignificant impact of household size on both health and education in case of Nigeria which contradict with this study findings. It may be due to the inclusion of additional control variables and cross-sectional data. Another possible reason for contradicting findings may occur due to model specification.

Table4. *Econometric modeling, marginal effect, and income elasticity*

	Budget Allocation to Health			Budget Allocation to Education		
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
log income	-0.205*	-0.201*	-0.200*	0.137*	0.139*	0.138*
	(.004)	(.004)	(.004)	(.006)	(.006)	(.006)
household size	-	-0.009**	-0.009*	-	-0.011**	-0.011**
		(.002)	(.002)		(.002)	(.002)
Employed	-	-	0.014***	-	-	0.014***
			(.005)			(.005)

Constant	2.580* (.042)	2.592* (.042)	2.577* (.044)	-.757* (.059)	-.706* (.060)	-.721* (.060)
Sensitivity analysis:						
R^2	0.518	0.540	0.560	0.305	0.314	0.317
R^2-Change	0.000	0.022	0.020	0.305	0.010	0.004
F-stat	2332.84	1180.41	787.45	585.01	305.59	207.35
p-value	0.000	0.000	0.000	0.000	0.000	0.000
marginal effect	0.204	-	-	0.728	-	-
income elasticity	0.498	-	-	1.231	-	-

Note: values in parenthesis are standard errors; *, **, *** for 1%, 5% and 10% levels of significant; marginal effect and income elasticity were estimated through Eq. (4) and Eq. (5), respectively.

Source: Authors estimation based on PSLM 2018-19 dataset.

Table 4 also reports the marginal effect and income elasticity of our interest. The marginal effect of income on education is significantly greater than health which suggests that, increase in household income by one unit increases 0.72- and 0.20-units' expenditure on education and health, respectively. Education is considered as a luxury good because the magnitude of income elasticity is greater than one. It implies that the percentage change in education expenditure is 1.231% in the response of 1% change in household income. It is parallel with Pallegedara & Sisira (2020) finding that Sri Lankan households prefer to allocate more budget to education whereas income elasticity for education in greater than one. Health is a necessity good being the magnitude of income elasticity is positive and less than unity. It implies that the response of 1% change in income on health expenditure is 0.4980%.

Discussion

From the above findings it can be discussed that in case of household budget allocation for health the largest allocates by household to medicine and in case of education expenses the school/college/university fee expenditure is the largest than other educational expenses. The correlation between the budget allocation of health and growth income confirms a stronger negative association between health and growth income and relatively a strong positive association between education and growth income. The negative correlation obtains between household size and employment with health and education budget. The regression analysis confirms the positive and statistically significant influence of income and employment on heath and education budget share; however, the negative influence of household size is obtained.

Conclusion and Recommendations

Using the data from Pakistan social living standards and measurements (PSLM) 2018-19, this study has attempted to find the determinants of households' budget allocation to health and education for the province of Balochistan in Pakistan. The study divided the analysis into four parts; firstly, to analyze the scenario, the data set is decomposed into health and education expenditure; secondly, examined the correlation; thirdly, the econometric analysis through Working-Leser modeling; and lastly examined the marginal effect and income elasticity. The decomposed categories of health and education illustrated that the medicine and school/college/university fee are major expenditures. The correlations suggest a strong association between health and logarithm income, and between education and logarithm income. On the other hand, a weak correlation between health and education was found with household size and employment.

The econometric result reveals income and employment as key determinants that lead to an increase in budget allocation for education, while household size decreases budget allocation for health and education. It may be because most households in Balochistan live in rural areas where people live in a joint family system. They may, therefore, not be able to allocate much for health and education, being most of their income spent on other necessary commodities and services.

The result of the marginal effect suggests that the per-unit income effect is more pronounce to education than health. The result of income elasticity implies that health is considered as a necessity while education as a luxury good by Balochistan's households. One reason for this result is that most adult members of households are working as a daily-wage laborer in the agriculture and livestock sectors, and they consider education as a luxury good. The coefficient value of income elasticity for health and education shows that an increase of one percent in household income increases the education budget allocation by more than one percent and health allocation by less than one percent.

To improve Balochistan's household budget allocation for health and education, the authors suggested the following are the recommendations:

- The result of health and education expenditure illustrates that the medicine category of health and school/college/university fee of education are exhausted the largest expenditure. Therefore, measures need to be taken by the policy makers to curtail households' expenditure on these categories. This can be done by expanding the government's initiatives to cover maximum rural and needy urban Balochistan's households. On the education side, an interest-free loan program, indigenous and overseas scholarships for Balochistani students can be a policy measure to reduce the households' budget allocation to school/college/university fee.
- The negative effect of household size on education and health suggests that measures of population control, family planning program and Lady Health Visitors (LHV) birth spacing injection services can be a policy options to reduce family size.
- The positive magnitude of income elasticity and employment effect on education and health suggests that measures are required to be taken by the government (both federal and provincial) to increase job opportunities through public-private partnership for fruit orchards, animal farming, and cheer female empowerment through promotion market for female handy-crafts. By doing so, the government can bring multiplier household employment and income effect which will consequently increase expenditure on health and education.

Acknowledgments

None

Conflict of Interest

Authors declared no conflict of interest.

Funding Source

The authors received no funding to conduct this study.

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