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An Analysis of Cost of Attending Medical Education in Nepal

Rajendra Kumar Pokhrel[1]

Abstract

The purpose of this paper is to investigate cost of attending medical education (MBBS) in Nepal provided by twenty public and private medical colleges affiliated to Tribhuvan University (TU) and Kathmandu University (KU) along with BP Koirala Institute of Health Science (BPKIHS) and Patan Academy of Health Science (PAHS). The basic objectives of the paper are to analyze the costs of attendance (CoA) and its determinants of MBBS education in public and private colleges of Nepal, Primary cost survey upon twenty medical colleges was utilized to gather the cost related data. Four admission cycles (2015-2018) of MBBS students were used for the study. It further revealed differential cost of attendance within universities and within public and private medical colleges. Cost of attendance varies from NRs. 4.3 to 6.1 million and it grew minimum 2.02 percent to maximum 6.4 percent. MBBS education in private medical colleges in Nepal is more expensive than public colleges. It should be made affordable, accessible and reformed on the basis of basic principle of quality health care and health education.

Keywords: *Medical education, Cost of attendance, Commercialization, Public/ Private.*

JEL Classification: *I21, D24, O31, L32.*

Introduction

The health sector is a major employer in all countries. Nepal employ approx. 28,000 that is one third of total public service employment. Among existing health care providers only 4 percent of total are doctors. The efforts of Nepalese Government in attracting doctors in rural health institution is partially successful. HRH strategy envision to ensure equitable distribution and availability of quality health workers as per the country's health service system to ensure universal health coverage. This strategy provides guideline to the Government at all levels in the federal context to fulfill the constitutional right for the access to health services by each citizen through effective management of health work force which is possible by production of doctors (EU, 2017).

[1]**Dr. Pokhrel** is an Associate Professor at Faculty of Education, Tribhuvan University, Kirtipur, Nepal, Email: rpokhreldang@gmail.com; ORCID: https://orcid.org/0009-0004-8435-2333

The Government of Nepal aims to build a healthy, educated, just and progressive social life by ensuring quality service delivery in health and medical education. The Government will further reinforce the role of public sector in education and health services while providing incentives to the private sector to increase their investment. National Medical Education Commission has been established to reform Nepalese medical education system on the basis to increase the investment of the state in the field of medical education, to develop medical education in line with the national needs of Nepal, to regulate medical education in integrated and efficient way, to regulate the establishment and operation of medical institutions, to ensure equal access and maintain quality, professionalism, institutional accountability, geographical balance and social justice in medical education (GoN, 2020).

Education is one of the important factors for economic development of a nation. Quality in medical education is a universal goal (WFME, 2012). Improved health for all people, by improving medical education to present context is the main goal of medical education. Medical education is the responsibility of the government and it should be controlled and regulated by the government itself (WHO, 2013). It should not be subjected to the open market. Constitution of Nepal-2015 has guaranteed health and education as fundamental rights of Nepalese citizen. Government is unable to meet the medical needs of society due to economic constraints. Demand for medical college is high but the supply or the capacity tends to be constant (ADB, 2017).

It is generally claimed that public sector alone cannot keep pace with the growing demand for education. Private sector emerged with the objective of reducing the role of the government in satisfying people's needs. The common factor around the globe is that private medical colleges are more expensive than public. It is compliment to the government and not the alternative to it (Shehnaz, 2010). Medical education in Nepal is facing many challenges. It should be made affordable, accessible and reformed on the basis of the basic principle of quality health care and health education (Mathema, et al., 2015).

Global Trend of MBBS Education

Generally, medical education is provided by both the government and private sector. Global trend of booming private sector economy has led middle class to enter the medical field. Medical education is under the full control of the state in China, France, South Africa, Kuwait and Canada. New Zealand has two schools, both of which are government funded. India tops the list with the largest numbers of medical schools within one country. At present, there are 479 medical colleges in India, out of which 227 in government and 252 are in private sector (MCI, 2019). In the United States of America, out of total 131 medical schools, 62 are private which are heavily supported by government research grants and usually are non-profit institutions (Scheffer & Poz, 2015).

In Japan, there are 79 medical schools out of which 29 are private (Goto & Kakihara, 2016). Malaysia, Thailand, and Philippines have also ventured heavily in privatization of medical education. The United Kingdom and Germany have one private school each out of total of 44 and 36 respectively (Zavlin et al., 2017). Seven medical schools in Greece and eight in Netherlands are fully government funded. Spain has only two private institutions out of total 28. Australia has 19 medical colleges and two of them are private universities. In South America, Chile has a total 60 schools in which 35 of them are private, while in Africa, Nigeria has only two private medical colleges out of total 34 schools. Out of total 32 medical colleges in the Gulf Cooperative Council countries, Yemen has four, The United Arab Emirates (UAE) has three, Bahrain has two medical colleges. Saudi Arabia, Qatar, and Oman have only one private medical college in each country (Shehnaz, 2010).

SAARC Context

India is leading among SAARC countries in medical education system. At present, there are 479 medical colleges, out of which 227 are Government and 252 are private (MCI, 2019). In Bangladesh, both public and private medical education is controlled by the government. Deficiency of doctors in Pakistan has led to a massive growth of the private medical colleges but government medical colleges are the first priority of the students (Nawabi et.al, 2018). Sri Lanka has only one private medical school and many Sri Lankan self-financing students are enrolled in Nepal (Ravishankar, 2011).

Nepalese Context

Medical education in Nepal started in 1933 with the establishment of Nepal Rajkiya Ayurved Vidyalaya (Banerjee, et al., 2011). Institution of Medicine (IoM) under TUTH was established in 1972 with the aims to produce MBBS doctors. Production of MBBS doctors was started in Nepal from the year 1978 A.D. by TU under government investment, then KU affiliated MCOMS, Pokhara, established in 1992 A.D. under private investment, Later, MBBS programme is provided by BPKIHS (1993 A.D.) and PAHS (2010 A.D.) in Nepal (Dixit, 2009). At present, health worker-to-population ratio at 0.67 doctors and nurses per 1,000 individuals, which is significantly lower than the World Health Organization's recommendation of 2.3 doctors, nurses and midwives per 1,000 individuals (ILO, 2017).

Statement of the Problem

Admission to medical school today determines the composition of the medical profession in the future. There are no standards for costs of attendance in medical colleges which vary substantially between public/private colleges. Standards must be clearly defined, and be meaningful, appropriate, relevant, measurable,

achievable (NMC, 2017). There are various issues in medical education as cost of attendance and inclusion. The 'Constitution of Nepal – 2015' has guaranteed the rights related to education and health. Every citizen shall have the right to equal access to health and education as the basic needs. Practice the principles of medical ethics; develop professional attitude and behavioral studies including human values (ADB, 2017). The problems caused by cost and disparity in MBBS education motivate to undertake this study. The research question of the study is - What is the cost of attendance in MBBS and its determinants in public and private colleges in Nepal?

Review of Literature

Theoretical Review

The cost of education could be measured from different angles and perspectives as the suppliers or as the demander/user of education. The CoA refers to the part of expenditure which are incurred by the parents or students for acquiring education. It is borne by the students or parents. (Lang et al., 2014). There are two rules to determine fee: university fee equal to marginal social cost of the tuition supplied and supply of amount of tuition that is demanded. MC may decrease or increase with the number of students who are provided with the educational services and also technology effects (Lloyd et.al, 2006). Increasing class size can reduce some cost of attendance (Toffler, 2012).

Tuition and fees revenue from increasing enrollment will not increase overall revenue for medical colleges. Enhanced revenue sources except tuition are required for both public and private medical colleges in this challenging fiscal environment (Schieffler et. al, 2012).

Efficient resource allocation requires marginal cost pricing. The marginal cost of a subject is determined by the number of teaching hours, teaching loads, support staff requirements, salary levels, the rent for buildings, plus a range of other faculty and central costs (Toffler, 2012).

Demand for medical professionals from foreign countries increased due to globalization. This demand is fulfilled by private medical colleges. Vested interest of political leaders and businessmen to make large earnings from private medical schools in the form of high tuition fees resulted to privatization. Whereas, the commercialization of private medical colleges around the world has become costlier over time and the burden of debt on medical graduates increases due to the high tuition fees (Shehnaz, 2010). Privatization resulted to commercialization of education which enforced to analyze the cost of education. There is a public perception that higher one pays better education s/he gets. Cost analysis in education provides useful guideline to education planners to identify the actual cost involved in producing a graduate. It gives the pattern of educational expenditures and identify possible cost reduction strategy (Khandagale & Pandya, 2014).

Empirical Review

It's important to recognize that simply increasing funding for education may not be enough to achieve desired outcomes. Instead, efforts should be made to address underlying issues and ensure that funding is used effectively and efficiently to improve education systems and outcomes (ADB, 2017). The level of fees per subject within a degree program should ideally be uniform to ensure fairness and equity among students. If there is a great disparity in the rates of payment for different subjects, it could create a financial barrier for students in choosing the subjects of interest which could result in a less diverse student body, could limit educational and career opportunities and contribute to social and economic inequalities (Klein & Huang, 2010).

There is no consistent or standardized amount of money that medical schools charge their students for attending their programs. The cost of medical school attendance can vary significantly even between schools located within the same city. Additionally, there is no agreement or consensus on the precise cost of providing medical education to students. This lack of transparency means that students and society are not able to hold medical schools accountable for their costs (Greysen et al., 2011).

Determining the exact cost of educating a medical student is a complex and multifaceted issue that is difficult to pin down. There are several factors that contribute to the cost of medical school attendance, including tuition, fees, textbooks, equipment, and living expenses. Additionally, the cost of medical education may vary depending on the location and reputation of the medical school, as well as the resources and facilities available to students. Complex and varied sources of income including government funding, private donations, and research grants of medical colleges and universities makes it challenging to track and analyze the budgeting of medical schools, further obscuring the true cost of educating a medical student. The costs of medical education lack transparency regarding how they are calculated or where the funds are allocated (Toffler, 2012).

When making one of the most important financial decisions of their lives - paying for college - students and families lack clarity and information. It is difficult for students and families to make a financially-informed college decision (Burd et al., 2018). The issue of the cost of attendance (CoA) for medical students has been a topic of growing public concern. This is due to the significant variation in estimates of the cost of attending medical school. The high cost of attending medical school can deter many talented and motivated individuals from pursuing a career in medicine, particularly those from underprivileged backgrounds who may not have the financial resources to cover these expenses. There is an urgent need to follow a comprehensive and standardized approach to estimating CoA,

and provide support for financial aid programs to help make medical education more accessible and affordable for all students (Jones & Korn, 2019).

Investors are constantly seeking profitable opportunities to make informed decisions that can ultimately lead to successful investments, and one major factor that drives their interest is the paying capacity of the population. The more people can afford to pay for goods and services, the more potential there is for a return on investment (Sabde et al., 2014). The cost of college has increased dramatically in recent decades. As these costs have increased, the burden on students and parents has become larger (Valenti, 2019).

Undergraduate enrollment has exploded in Asian nations, and new colleges and universities have appeared. Governments have promoted the rise of private education in order to reduce costs by shifting more of the burden to students and their families (ADB, 2017).

Tuition fees alone have no effect on retention, and the price-response equation is elastic. Instead, the cost of attendance and the availability of financial aid are the determining factors in student persistence. Persistence increases when an expense is decreased or financial aid is increased, and vice versa (Lang et al., 2014).

Investing in education is crucial for the development of skilled human resources in the medical sector, which in turn enhances human capital. Education provides the necessary knowledge and training to individuals, allowing them to develop the skills and expertise needed to contribute to the medical field. By investing in education and training programs, healthcare professionals can keep up with the latest advancements and techniques, ultimately improving patient care and outcomes. In addition, investing in education helps attract and retain talented individuals to the medical sector, which can lead to further advancements and innovations. Ultimately, a strong investment in education is essential for producing a highly skilled workforce in the medical sector, which enhances human capital and benefits society as a whole (Khan & Rehman, 2012). Parents believe that investing in their children's education is a key strategy for increasing their future incomes (Lee & Lee, 2018).

Research Gap

The majority of studies on MBBS in Nepal were found to use the socio-economic parameters of gender, caste/ethnicity, inclusion, and access individually. Cost of attendance is a crucial and distinct issue in MBBS that affects equitable access and upholds professionalism, quality, institutional accountability, geographical balance, and social justice in medical education in Nepal, but it hasn't been properly examined yet. This paper makes an effort to address such a research gap.

Objectives of the Study

The study's main goal is to examine the CoA in Nepal's public and private medical colleges as well as the various CoA requirements for MBBS degrees.

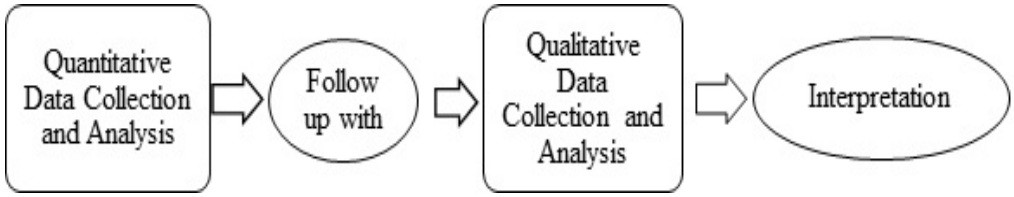
- To identify the cost of attendance (CoA) of MBBS education and its determinants in Nepal.
- To evaluate the costs associated with pursuing an MBBS degree in public and private medical schools in Nepal.

Methodology

Research Design

As the study covers economic issues, a mixed research design that combines quantitative and qualitative data is used. It is easier to describe what is learned from quantitative findings by first gathering and analyzing quantitative data and then identifying specific quantitative results that require further explanation based on qualitative results.

Figure 1: Mixed Method Design



Mixed method provides a better understanding of the research objectives. The qualitative data help to explain quantitative results. Quantitative and qualitative data are collected at different times but quantitative data collection is the priority. Qualitative study helps to interpret quantitative results. It is the most popular design in health science and educational research (Creswell, 2014).

Population and Sample

To identify cost of attendance, primary cost survey was conducted within Tribhuvan University (TU), Kathmandu University (KU), BP Koirala Institute of Health Sciences (BPKIHS) and Patan Academy of Health Sciences (PAHS). For this purpose, total 20 medical colleges, offering MBBS course in Nepal, were taken by using census method.

Table 1: Medical Colleges Offering MBBS Programme in Nepal

Provinces	Universities										No. of Colleges
	T. U.				K. U.				BPKHS	PAHS	
Province-1					NOMC	BMC			BPKIHS*		3
Madesh	JMC	NMC, Bir									2
Bagmati	IOM*	KIST	Nep. Army*	CMC	KMC	NMC	KUSMS*	COMS		PAHS*	9
Gandaki	GMC				MCOMS						2
Lumbini		UCMS			NGMC	LMC	DMC				4
Karnali											0
Far Western											0
Total	8				10				1	1	20

Note: * Denotes Public Colleges.

Selection of the Study Period (Years)

The study analyses MBBS education during the years 2015, 2016, 2017 and 2018 A. D. admissions cycles at public and private medical colleges in Nepal. The study period covers four admission cycles from 2015, the year after which no medical colleges are opened; up to 2018, and latest admission in MBBS during the study. Thus, the study has covered only latest time period.

Research Question and Hypotheses

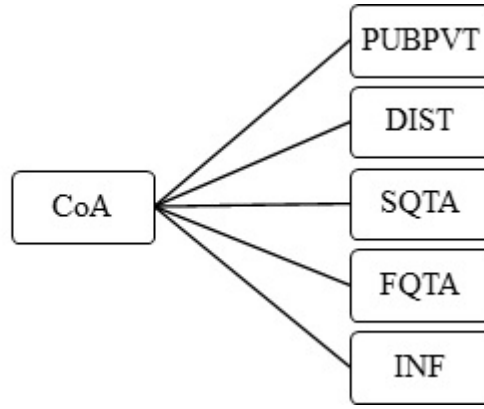
The following research question and hypotheses served as a guide for completing the research.

RQ1: How is the present situation of cost of MBBS education in Nepal?

H1: There is a variation in cost of MBBS in different colleges.

Conceptual Framework and Measurement Tools

Figure 2: Conceptual Framework



Specification of Model

Cost function shows the relationship between cost of attendance (CoA) and other variables. CoA is influenced by various variables like, public/private, distance, student quota, scholarship quota, foreign student quota and inflation. CoA function is expressed as follows:

$$CoA = f\ (PUB / PVT, DIST, SQTA, FQTA, INF) \ldots\ldots\ldots\ldots (1)$$

Functional equation can be transformed to linear form after taking natural logs in both sides,

$$\ln CoA = \beta_0 + \beta_1 \ln (PUB/PVT) + \beta_2 \ln (DIST) + \beta_3 \ln (SQTA) + \beta_4 \ln (FQTA) + \beta_5 \ln (INF) + e \ldots (2)$$

Where,

ln = Natural logarithm,

CoA = Cost of attendance (CoA),
PUB / PVT = Public / Private,
DIST = Distance,
FQTA = Foreign student quota,
SQTA = Student quota, INF = Inflation,
β_0 = Constant term, β_1….to….β_5 are the parameters to be estimated and
e = Error term.

In line with the objective of the paper, the null hypothesis is that cost of attendance does not vary significantly between public and private college. This is captured by the β_1 in the model specified above.

Average cost of attendance is computed as:

$$Average\ CoA = \frac{\Sigma\ CoA\ of\ N\ Colleges}{Number\ of\ Colleges}$$

$$CoA\ Growth\ (\%) = \frac{CoA\ of\ a\ Year - CoA\ of\ Previous\ Year}{CoA\ of\ Previous\ Year}$$

Specification of Variables

Cost of Attendance (CoA):- CoA is the dependent variable. It is the average of annual total amount paid by the parents to attend the college / universities to their children.

Public / Private (PUV/PVT):- Colleges are classified as public, if it is regulated, controlled and managed directly by public education authority whereas private institution is run or managed by non-governmental organization.

Distance (DIST):- Distance is measured in km. with reference to Kathmandu

Valley. Arial distance is measured from Kathmandu to capital of that country using google map.

Student Quota (SQTA):-The variable reflects the number of seats approved by NMC for MBBS to different colleges in Nepal.

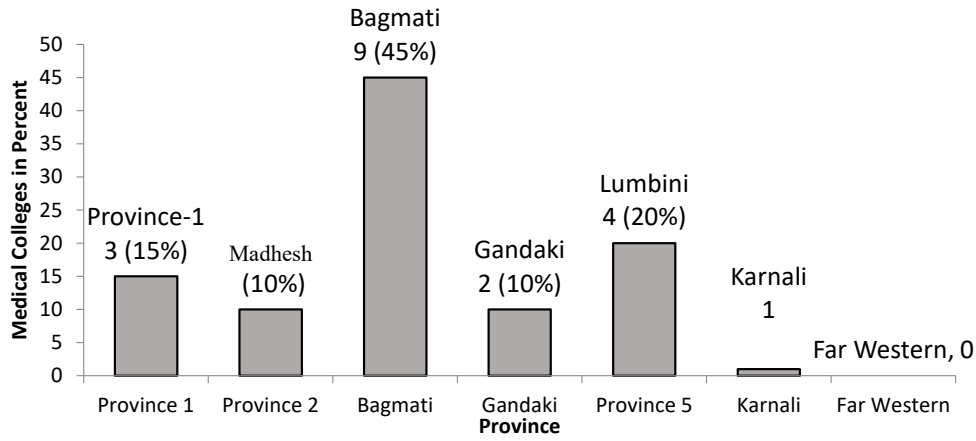
Foreign Student Quota (FQTA):-Foreign student quota refers to the number of MBBS seats allocated to the foreign students. It is also important variable to indicate the flow of international students in Nepal.

Inflation (INF):-Inflation is one of the economic variables which affects cost of attendance. The study has used the inflation rate of Nepal published by NRB during 2015-2018.

Data Presentation, Analysis, and Findings

The research revealed some very interesting and useful findings. There are twenty one medical colleges offering MBBS course in Nepal. Distribution of colleges presents a disheartening picture that Far Western province has no medical college offering MBBS course. Majority of colleges are concentrated in Bagmati Province where there are nine medical colleges out of twenty one.

Figure 3: Provincial Distribution of Medical Colleges in Nepal



Demand for MBBS in Nepal

The demand for medical college offering MBBS is greater than supply in Nepal. The data by Nepal Medical Council (NMC), reveals that the student quota for MBBS in the country is around 2000 per year, but the number of entrance registration to those seats are around more than 15000 per year.

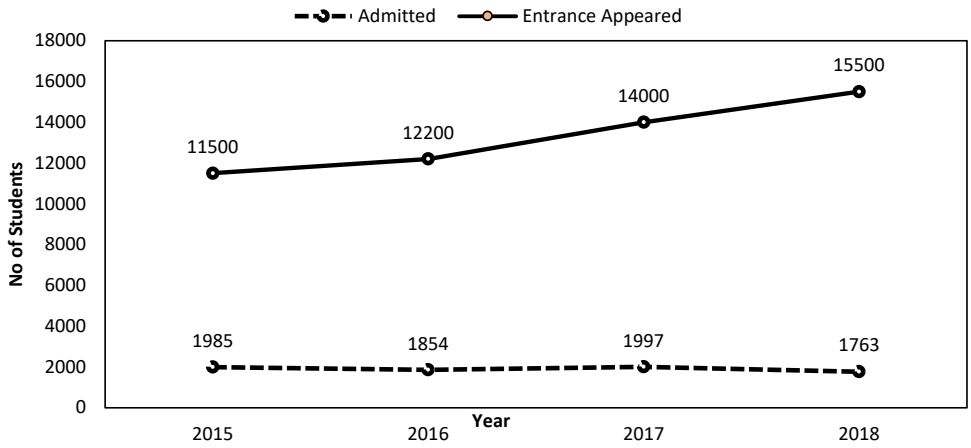
Table 2: MBBS Entrance Attempted and Enrolled Students in Nepal

Years	Universities				Total	
	TU	KU	BPKIHS	PAHS	Admitted	Entrance Attempted
2015	748	1027	150	60	1985	11500
2016	709	965	115	65	1854	12200
2017	929	903	100	65	1997	14000
2018	699	899	100	65	1763	15500

Source: University Dean's Office.

It is obvious that competition for the seats for MBBS is intensive. Selecting the most appropriate candidate is one of the greatest challenge in MBBS programme.

Figure 4: Increasing Trend of MBBS Education in Nepal



Cost of Attendance (CoA): Cost of attendance is the average of annual total amount paid by the parents to attend the college or universities to their children.

Table 3: CoA in Public and Private Medical Colleges (2015-2018)

Years	Nature of Colleges		No. of Colleges
	Public (5)	Private (15)	
	Average CoA (in million)	Average CoA (in million)	
2015	4.300	5.217	19
2016	4.404	5.513	20
2017	4.653	5.767	20
2018	4.747	6.136	20

Source: Researcher's analysis based on cost survey.

It is quite clear that CoA varies by college types as public are associated with lower cost of attendance for MBBS education. CoA varies from NRS 4.3 to 6.1 million and it grew minimum 2.02 percent to maximum 6.4 percent. The growth rate of public is lower than the private medical colleges.

Figure 5: Growing Cost of Attending Medical Education

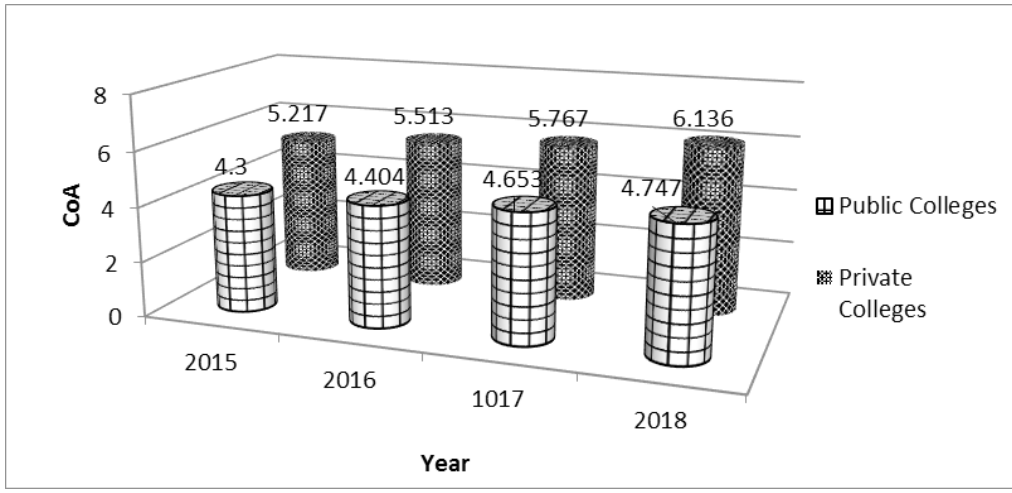


Figure 5 illustrates the growth trend of cost of attendance compared to public and private medical colleges in Nepal. Cost of attendance in public medical colleges has increased less than private medical colleges in Nepal.

Regression Analysis

Panel data models provide information on individual behavior, both across individuals and over time. The data and models have both cross-sectional and time-series dimensions. Panel data can be balanced when all individuals are observed in all time periods. With an objective to estimate the determinants of the cost of attendance, a panel regression model is estimated. The primary interest was to estimate cost differences between private and public medical college in Nepal as stated in hypothesis above. The full results of regression are reported in Annex E.

The R-square is 0.19 suggesting that 19 percent variation in log of cost of attendance is explained by the variables included in the model. While this seems relatively low in absolute terms, low R^2 can be justified in view of panel data. Specifically, the limited number of college and coverage of low span of time might have contributed to the low R^2. Further, the F-ratio is statistically significant at 5 percent supporting that the coefficients of independent variables under consideration are not jointly zero.

Table 4: Regression Results

Variables	Coefficients	Std. Error	t-Statistic	Prob.	Other Values
C	0.0227	0.0202	1.1227	0.2666	R-squared = 0.1957
PUB / PVT	0.0397	0.0115	3.4562	0.0011	Adjusted R^2 = 0.1199
DIST	- 7.09E- 06	2.88E-05	- 0.2462	0.8065	F-statistic = 2.5797 (0.0367)
SQTA	0.0002	0.0003	0.7375	0.4641	N = 59
FQTA	-0.0010	0.0007	- 1.4514	0.1526	
INF	0.0013	0.0014	0.8837	0.3808	

Source: Author's computation based on cost survey.

Except for the public private differences, the estimated coefficients does not show any statistical significance. This implies that variables such as distance, inflation, foreign student quota and national student quota do not have any significance in determining the cost of attendance. The results, however, supports the notion that there is significant variation in cost of attendance between public institutions. The coefficient is positive and statistically significant 1 percent. The estimated coefficients suggest that private college are 4 percent costlier than the public colleges. The findings support the hypotheses and the results are as per the expectations. The results also suggest that more selective medical colleges can keep cost down.

The result of t-test to examine the statistical difference in cost of attendance is given in Table 3. The alternative hypothesis under examination is that cost of attendance in public medical colleges is less than that in private ones. It is found that average cost of attendance is NPR 4.52 million per student while same for the private college is found to be 5.66. The results suggest that public college have statistically less cost compared to private colleges. This result is statistically significant at less than 1 percent. There is significant difference in cost under both two tail and one tail consideration. The two tail test confirms that there are significant differences in cost of attendance between types of colleges. The left tail test further shows that cost of attending public college is less than that of private college. Public colleges on an average have NPR 1.13 million cost less than that of private colleges which is significant at less than 1 percent. The test result is based on the assumption that variances in cost between two types of colleges- private and public- are similar. To confirm this ascertain, F-test is conducted which was found significant at 10 percent.

Table 5: Differences in Cost of Attendance between Public / Private Colleges

Groups	Obs	Mean	Std. Err.	Std. Dev.	95% Conf.	Interval]
Public	20	4.53	0.08	0.35	4.36	4.69
Private	59	5.67	0.07	0.55	5.52	5.81
combined	79	5.38	0.08	0.71	5.22	5.54
Difference		-1.14	0.13		-1.40	-0.88
t = - 8.60				Degrees of freedom = 77		
P value left tail 0.0001				p-value two tail = 0.00012		
F-test for equal variances= 2.76 (0.10)						

Source: Author's Calculation.

Qualitative Analysis

Qualitative analysis regarding the possibility of reduction of fee to complete MBBS programme, the key informants from private medical college answer that MBBS programme can be provided in around Rs. 2.5 million for the national students if student quota is allotted to 150 to each college with foreign student quota of fifty percent and the key informants from public colleges claim that MBBS programme is possible in minimum fee structure only if the financial assistance is ensured by the government. Through annual policies and programmes, 2022/2023, government of Nepal currently has decided to admit MBBS students twice a year, regarding the reduction of cost.

Conclusion

Based on the major findings, distribution of colleges presents a disheartening picture that Far Western province has no medical college offering MBBS course. Majority of colleges are concentrated in Bagmati Province. It is concluded that the demand for medical college offering MBBS is greater than supply in Nepal. Public sector alone cannot keep pace with the growing demand of MBBS. Private medical colleges are complement to the government and not an alternative to it. The cost of attendance for MBBS continues to raise. It varies from NRS. 4.3 to 6.14 million in public to private and private to private medical colleges. The growth rate of cost of attendance of public medical colleges is lower than the private. Medical education should be made affordable and accessible and reformed on the basis of the basic principle of quality health care and medical education. The R-square is 0.19 suggesting that 19 percent variation in log of cost of attendance is explained by the variables included in the model. The t-test results suggest that public college have statistically less cost compared to private colleges.

Qualitative analysis results the possibility of reduction of cost of attendance of MBBS, the Key Informants answered that MBBS education can be provided in Nepal in around 2.5 million for national students if student quota is increased to 150 to each college with foreign student quota of 50 percent to it.

Limitations

The limitation of this study is related to the selection of the study year. The study analyses the medical education related to only MBBS programme in Nepal and includes four admission cycles from 2015-2018 and linked to cost of attendance, which clearly demands the data of cycle cost, a course completing duration. A student completes his/her MBBS programme within four years and goes to internship. Thus, the study has covered only latest time period due to time and resource constraint. Primary data were collected through cost survey. The field selected for cost survey is limited to four universities TU, KU, BPKHS, and PAHS and their affiliated medical colleges offering MBBS course in Nepal

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