scientific reports

OPEN

Education cost as a new fickle in higher education for students learning *via* quantitively multinomial logistic regression

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The study was conducted to find out the effects of tuition fee on quality of education for students in the Islamia University of Bahawalpur (IUB), Pakistan to fulfill their future goals. The study used a multinomial logistic regression method for knowing the factors that either make it difficult or easy to pay academic fees. The primary data was gathered using an online survey made with a Google form and sent by email and WhatsApp to students in different departments. A certain amount of time was dedicated to the data collection process. Due to a research deficit on tuition fees for university students in Pakistan, this study was deemed necessary. It entails an examination of the elements that impact graduate quality, taking into account academic achievement, educational expectations, and tuition price donors. The study employed a multinomial logistic regression approach to identify the variables that either facilitate or impede the payment of academic fees. One thousand pupils responded in the positive. The results showed that expensive college tuition causes students to perform poorly academically, lack confidence, have poorly groomed personalities, and have fewer career options. On the other hand, students from well-off households and those who worked part-time performed better. Furthermore, the learning behavior and attitude of students who received scholarships and worked as teaching assistants improved because they were more punctual and attentive in class. By bringing attention to the need for lawmakers and government agencies to take significant steps toward improving student outcomes in higher education—like subsidizing tuition costs, supplying educational resources, and giving out scholarships and studentships—this study helps students. It also fills a research gap in the field of tuition fees in Pakistan by offering new researchers a case study example of how to use multinomial logistic regression to investigate the relationship between students' academic objectives and the expense of their education.

Keywords Education cost, Studentship, Behavior, Higher education, Job, Attitude

Education is a necessary mortal virtue and the foundation of a good life. It is also an essential component of society, a manifestation of individual liberty[1], and an essential factor in the successful integration of distinct entities[2]. Higher education is not only connected directly or indirectly to the progression of the nation, but it is also responsible for the construction of society, the modification of people's lifestyles, and the improvement of their economic standing[3,4]. Countries all over the world, both developed and developing, have already spent a significant amount of money on higher education for betterment of their populations with respect to attains and improve quality of life[5,6]. The community of these countries have high standard of professionalism with super approach for solution of problems, wise decision power abilities and positive critical thinking. Society and education are linked or dependent on each other because they affect each other[7,8]. A perfect society can't be made without education, because it teaches people how to live, how to act, and how to organize and run their lives. In the same way, a stable and well-organized society has always needed a good education system. People who are educated and have good manners make for successful and ideal Society[9,10]. China, an economic superpower, has been investing in and conducting research at their academic institutes and universities, and

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linking this research with private industry, with the goal of raising the quality and standard of education as well as the living conditions of the Chinese people[11,12].

Higher education is essential to the economic growth of any nation, and as such, it requires appropriate infrastructure, adequate money for educational institutions, highly skilled teaching staff, and supportive policies for students[13]. The other side, which is more significant, is that students require financial support from either their families or from educational or institutional scholarships or any other sources in order to be able to pursue their educational goals in an appropriate manner[14,15]. Currently, majority of the nations are facing economically issues which leads to decrease their education budget for indigenous as well as foreign scholarship programs. But priorities for higher education is the only way to cope with all economics practical issues to boost life standard and economic sources of individual as well as for a country[16]. Therefore, the financial assistance in the form of tuition fees is a kind of spirit to improve the quality of education as a facilitator for the success of expanding the economy of the country. Unfortunately, Pakistan faces a number of challenges with regard to the creation of ideal conditions for students and universities, which are necessary for the development of highly trained labor that contributes to the growth of both the society and the economy of the country[17].

There is a significant talent gap in Pakistani universities in terms of the creation of highly professional graduates in their respective professions to serve the community and the industries that can develop a nation or a country[18]. These graduates are needed to act as a resource for the community. Students' perspectives on the value of obtaining a higher education are influenced in Pakistan by a wide variety of other factors, including those pertaining to their families, their communities, the facilities available to them at universities, the policies of the Pakistani government, and also their own abilities[19,20]. There is a gap in the research that needs to be filled in Pakistan regarding the issue of tuition fees for students attending universities. This research needs to investigate the factors that have an effect on the quality of graduates, taking into account the presence or absence of tuition fee funders, academic performance, and what they anticipate will come of their education. It is necessary to conduct a survey of the university using a cross-sectional design in order to collect evidence. The Islamia University of Bahawalpur will serve as the case study area for the trident project, which will explore and collect evidence from the south Punjab region of Pakistan. The main purpose of current study is to know the real situation of higher education tuition fee status of the student and their actual problem linked with financial resources and academic performances. Furthermore, there is an urgent need to highlights the family condition of the individual in higher studies and all the factors which directly or indirectly have impact on them. This study is a pioneering effort to analyze the relationship between students' academic aspirations and the cost of their education. We created a web-based survey using google form, and it contains 20–24 distinct questions pertaining to various parameters that either directly or indirectly correlate with tuition costs. In this section, we will conduct a study to establish the connection between educational apathy and the cost of attending university classes. The current study hypothesis was "The burden of high tuition fee strongly effects on learning attitude and their educational performance of University students". To proof this hypothesis, questions and statement were included in the part of questionnaire which help to know the real situation and their nature. Few examples are given below.

- Does working during higher education affect students' academic progression?
- How is educational attitude of student of a day scholar different than a hosteller?
- Does relationship status influence on studies academic performance?
- Does joint family system has directly or indirectly influence on student performance?Outcome of this study was analyzed statistically and try to highlights the key finding regarding the students in the university at higher education and their problem.

Literature review

Tuition fee has emerged as one of the most serious issues of the students in the higher education sector which directly influenced on their learning attitude. Recently, a reported mention a strong correlation between the education expenditure and trends of higher education in Pakistan. It has been also observed that higher education in Pakistan is essential factor for community to promote their learning attitude which effect on human development, growth, poverty reduction, progress of the country and skilled development[21]. In addition to issues regarding tuition policies, the academic community has launched a number of different endeavors to solve this issue but problem persist continuously. The process of focusing on tuition fee setting is one that is especially difficult and unclear[22].

Nevertheless, a great number of research have been conducted to investigate the factors that have an impact on the cost of tuition[23]. There are a number of factors that may contribute to this problem, including the joint family system, absence of any government facilities, lack of scholarship and no tuition fee relaxation during their studies[24]. All of these problems contribute to a decline in students' academic performance and to a failure on the part of students to achieve their long-term goals.

In another previous reports, we have highlighted the institutional problem in Pakistan such as poor management, knowledge gap, lack of modern technology, old syllabus and less skilled faculty member and lack of infrastructure[25]. However, there were suggestion given to improve the education system for higher education by adding new syllabus and modern touch in the courses, foreign faculty and development in examination system.

The other important factors that affect the level of tuition fee (Easily to Pay, Not Easily Not Hard, Hard to pay) is income of household, provision financial assistance from government or NGOs, Household siblings, marital status of the students, level of degree, type of degree program, and living status of the student. Study reported that Socioeconomic condition of the students, such as, home ownership, retirement benefits, land property were

associated with higher education level. conclusively, it has been observed low-income families have more thrust to attain higher studies as compared to rich families[26].

Similarly, Academic performance of students also effected with class attendance, marital status, part time working, study hours spend at home. In most cases, discussions on tuition fees for university students have been conducted in the literature by taking tuition fees to be either a discrete or a continuous variable. But the tuition fee, on the other hand, will be treated as a categorical variable in the proposed research which has significant advances over literature. The reason why tuition fee is being treated as a categorical variable is because there are a number of factors that are connected with either difficult or easily to pay tuition fees[26].

Recently, Akhtar et al.l has reported that there is an urgent need to change the behaviors of students and teacher to promote the education rather than totally blame to technology. A study conducted on the ability–motivation–opportunity (AMO) theory in which it was observed that green AMO-enhancing practices were found to be very effective for environmental knowledge mediator. The current study not only provide to green human resource management research but also give significant suggestions for decision makers to develop policies for a sustainable environment in higher education institutions of Pakistan[27]. However, Ullah et al. has reported the key quality indicator to promote the higher education trends in Pakistan. Report has mention about drawback of higher education system, polices failure and suggestion was included to increase the level of higher education specially to give scholarship, reduced the tuition fee and another financial ais for better education[28]. De Melo et al. reported, that functional role of financial budget for students and institute. A comparison of the tuition fees charging in Canada, China and Brazil and their social system requirements. It is occluded from this work that the only initiative can boost public higher education institutions is financial support and availability for students and higher education institutes which would be more resources to invest and assist students for better future[29]. Similarly, Zha X et al., investigated that low and high level of tuition fee has influence on higher education and student performance. It is a theoretical view that raising tuition fees will undermine education equity and social welfare. However, study by Zha X examines the effects of different tuition policies on both these factors and concluded that low tuition fee policy fails to effectively improve access to higher education and social welfare for low-income groups. On the contrary, high tuition fee policy may have better effectiveness[30]. One more evidence regarding the tuition fee, Kemnitz A reported that tuition fees affect the quality of higher education with centralized and decentralized decision. Tuition fee level, centralization leads to the efficient quality, fully extracting the income gains from the graduates, while decentralization typically induces inefficiently low spending levels[31]. From the previous reports it has been observed that transformative function of educational funding in shaping national development in south Asian countries in last two to three years which is influential for improving the condition and status of higher education students[32]. In another reposts, it was suggested that financing trends in the universities play key role regarding the global higher education learning, output and their progress with their states[33]. However, few reports have made a clear comparison between different countries with respect to funding and innovation trends and approaches which comes due to availabilities of funds and resources. Furthermore, it has been also observed that cost of higher education gives a lot support to poor universities from online courses and research[34]. A study was reported during the covid regarding the distance learning, and educational inequality in rural areas of Pakistan and China: a situational analysis method which help to give a clear analysis for funding, earning money etc[35]. Keeping invew the above studies, there are universities in the Europe where real studies cost is free which help laymen to get education to improve standard and living quality[36]. In the end, there are few reports which has assessed the attitude and problem-based learning in different subjects through different modeling to explore the real situation. However, the critics is important in education especially to improve the teaching and research methodologies in higher education[37,38].

Methodology

Sampling frame of the Study Population

Students, whether they are attending elementary school, college, or university, encounter a wide variety of challenges throughout their educational careers. Problems with family finances, poverty, families without homes, child abuse, violence, and bullying are some of the primary difficulties that have been highlighted. We consider the high cost of tuition at university to be a significant barrier for students, as it makes obtaining an education of sufficient caliber more challenging. A total of one thousand students from various departments at The Islamia University in Bahawalpur, Pakistan was selected at random to participate in the study. The web-based survey study includes the participation of around one thousand students from 24 different departments at Islamia University of Bahawalpur. There are a total of 538 females and 462 males participating, with the female to male participation ratio being 54–46% correspondingly. The participants come from a wide variety of academic disciplines, including Statistics, Chemistry, Botany, Urdu, Physics, English, Computer Science, Biochemistry, Biotechnology, Bioinformatics, Islamic Studies, Mathematics, Banking and Finance, and Tourism and Hospitality, among others. Students at all levels of education provide feedback via web-based survey: undergraduates, graduates, and postgraduates.

Questionnaires

There were 1000 students responded, coming from more than ten distinct disciplines. Within a week, we were able to finish this survey that was conducted online. These questions were prepared according the hypothesis and problem of the study and approved from the ethical committee. All the statement in the questionaries were approved from ethical committee and participants have no problem from any statement and were agreed.

Data Collection

Data is collected by sharing web-based survey forms via email and WhatsApp among students of different departments. After data collection, we arranged data according to questions and analyze the impact of each element on education.

Statistical analysis

Statistical Package for the Social Sciences was used to performed to demonstrate the quantitative impression of tuition fees on educational attitude. Relationship between job, student's residency, tuition fees, regularity in class, marital status and educational attitude is analyzed by statistical tools. All the monetary values are calculated in the national currency "Pakistani rupees (PKR)[39].

Multinomial Logistic Regression

Logistic regression is a useful tool for situations in which a researcher needs to predict the presence or absence of an attribute or an outcome based on the values of a collection of predictor variables. When conducting regression analysis[40,41], it is inevitable to break the fundamental assumptions that are required for testing the hypothesis, particularly when the dependent variable can only take on two or more possible values. Multinomial Logistic regression is a sort of analysis that has extended the concept of multiple linear regression models. However, it is most effective when applied in the situations in which the outcome variable is categorical. An accurate evaluation of the likelihood that a certain event will take place can be obtained through the utilization of multinomial logistic regression analysis.

In this study intention is to estimate the factors that predict the students 'assessment about academic fee. We hypnotized that income of household, provision of financial assistance from government or NGOs, No of Household, No of Siblings Enrolled in the same university where respondent is studying, marital status of the student, level of degree, type of degree program, and living status of the student will predict whether academic fee is hard to pay (coded as 3), (not hard and no easy to pay coded as 2), and Easy to pay (code as 2). As mentioned before our sample is comprised of n = 1000 observation from university students. Now we explore the nature of predictor variable as follows.

- Household Income of the students is discrete variable report by candidates.
- Financial Assistance is categorical carriable coded as 0 if financial assistance is provided by the government or NGOs otherwise coded as 1.
- No of Household of Students is also discrete variable.
- No. of Sibling enrolled in same university where respondent is studying coded as 0 if yes otherwise 1.
- Marital status of the students if married then coded as 1 otherwise 0.
- Degree level of the students like postgraduate level coded as 3, Graduate level coded as 2, and undergraduate level coded as 1.
- Type of Degree program as self-supporting program (coded as 1) otherwise 0.
- Living status of the students like students living in the university hostel, (coded as 3) living in Private hostel outside the university (coded as 2), and living at home then coded as 1.Furthermore, our objective is to forecast student performance which is reported by the students score of cumulative grade point average (CGPA) categorized as Outstanding if CGPA is ≥ 3.5, very good if CGPA occur between 3.5 and 2.5, and satisfactory if CGPA will be ≤ 2.5. we also fascinated that class attendance, Martial status of Students, Part time working, study hours spend at home will forecast whether students 'performance is outstudying (coded as 3, very good (coded as 2), and satisfactory (code as 1). while predictor variables are explored as follows.
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- Class attendance is discrete variable.
- Marital status of students is also categorical and coded as 1 if Student is married otherwise 0.
- Part time working is a categorical and coded as 1 if working otherwise.
- Study hours spend at home is also discreate variable.
- Household expenditure are categorized as low, middle and high and codded as 1, 2 and 3 respectively.
- Type of degree program as self-supporting program (coded as 1) otherwise 0.
- No. of Sibling enrolled in same university where respondent is studding coded as 1 if yes otherwise 0.Furthermore, the Table 1. presents variables with label and their description.

Results

Descriptive statistics

Students at all three levels—undergraduate, postgraduate, and graduate of each gender were represented throughout all academic departments. The questionnaire survey received responses from females at a rate of 53.8% (538), while males replied at a rate of 46.2% (462). Out of 1000 students, 76% said they pay tuition fees sparingly, while 24% said they do so readily. Female students responded more frequently than male students, who paid tuition fees scarcely, out of the 76% who did. Our data indicates that the majority of students depend on their parents, who earn between 50,000 and 100,000 per month. The majority of them have 4–6 dependent family members, some of whom are also IUB students. It was also noted that few respondents who paid tuition fell into the graduate, postgraduate, and undergraduate categories. Undergraduate respondents made up a maximum of 47% (357) respondents, followed by postgraduate respondents at 33% (251) and graduate respondents at 20% (152), respectively.

Variable label	Description	Variable label	Description
Academic Fee	Not hard or not easy to pay = 0 Easy to Pay = 1 Hard to pay = 2	Household Size	Number of family members in a household
Level of degree programme	Post Graduate level = 0 Graduate level = 1 Undergraduate level = 2	Marital Status	Student married = 0 Otherwise = 1
HH monthly Income	Monthly Income of Household head	Living Status of Students	University hostels = 0 Private hostels = 1 At home stay = 2
Financial Assistance	Government or NGO s Assistance = 0 Otherwise = 1	Siblings Enrolled	Yes = 0 No = 1
Degree Type	Regular = 0 Self Support = 1		

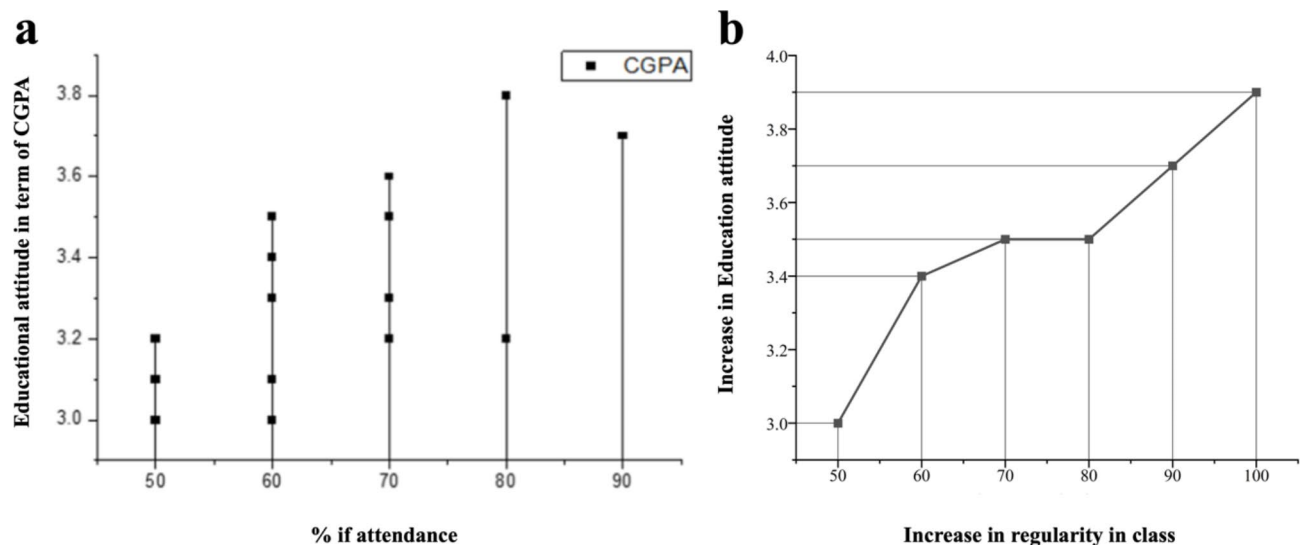**Table 1**. Presents variables with label and their description.

Fig. 1. Educational learning attitude with effect of Tuition fee, class regularly and CGPA. (**a**) interaction between class regularly and CGPA (**b**) Educational attitude and Regularity in the class.

Academic performance of students

The data that were obtained were then studied further to see how the cost of tuition is related to a student's grade point average and how frequently they attend class. It was discovered that those students have an easy time paying their tuition costs, have a positive educational attitude, their attendance in class was approximately 90%, and earn a CGPA that is higher than 3.7 Fig. 1(a). According to these studies, they do not experience any psychological strain because of the cost of tuition. These students maintain a positive mental attitude throughout the school year, which leads to their being more regular in class, paying more attention to what they are studying, and receiving a better education, all of which contribute to increased educational attitude levels Fig. 1. (b). Because of this, it has been demonstrated that the educational outlook and learning behavior of the student is directly proportional to the student's level of regularity in class. When students establish themselves as frequent attendees, they are afforded a greater number of possibilities to learn about contemporary innovations and to connect themselves with these achievements.

The majority of students struggle with their finances for one of two reasons: either their parents have a lower monthly income than average or their siblings are also attending different colleges where they are also experiencing difficulties paying for tuition. There are a lot of students living in either an IUB dormitory or a private hostel Fig. 2(**ab**), and the monthly costs for those students range from twenty thousand to twenty-five thousand rupees. Students from families with lower incomes often must work anywhere from six to eight hours each week to pay for their education at private universities, academies, or at home. On the other hand, their regularity in class is severely compromised, and the rate of attendance ranges between 60 and 70%. Because of these factors, Students have very little time to devote to their studies, which in turn leads to a decline in both their motivation and their educational attitude. Students who live on campus in dorms confront additional challenges due to the high costs of living there, poor dining conditions, and other issues that have an impact on the students' educational outlook. Participants who live at home face additional challenges in terms of tuition costs due to the fact that they are financially dependent on their parents, have low monthly incomes, and have
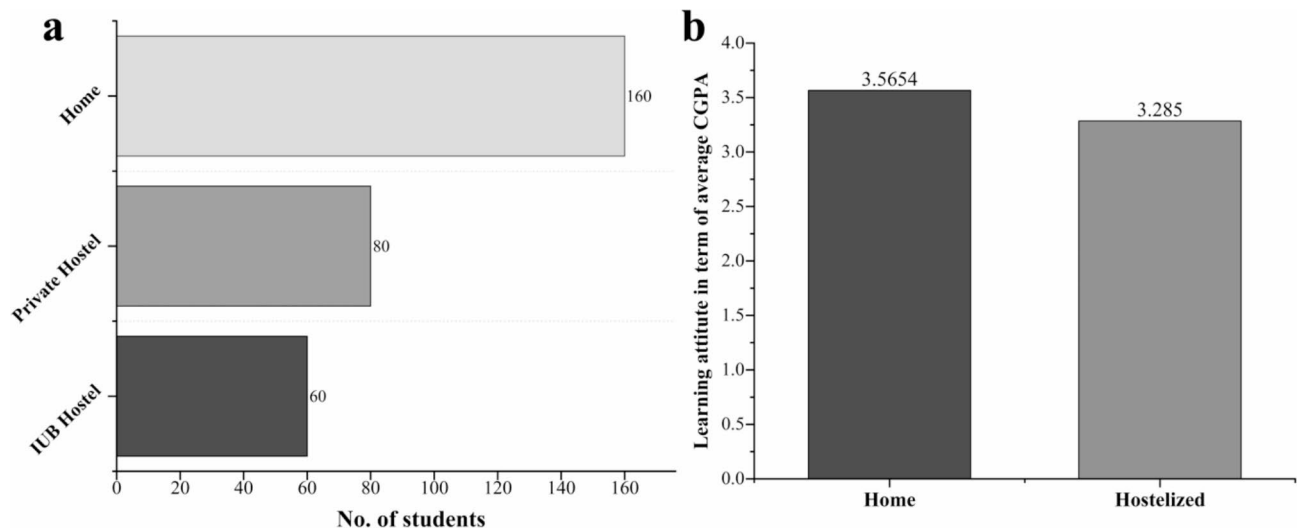
Fig. 2. Tuition fee, educational learning attitude with respect to living area (**a**) Living preference and their educational grades (**b**).

more dependent family members and siblings who are enrolled at IUB or other educational institutions. They are forced to work to make ends meet, leaving them with little time for academic pursuits.

The students were residing in either private hostels or dormitories run by the IUB. Students who were experiencing financial difficulties found to be involves in working jobs while they are staying in the dormitory. It takes more money each month to stay at a private hostel than it does at the IUB dormitory. According to the information that we have gathered, students staying in private hostels suffer greater financial challenges than students staying in university dormitories. This is because students staying in private hostels have monthly fees that range from 20,000 to 25,000. The influence that these economic issues have on a student's capacity for learning is inadequate and undesirable. Their attendance in class became less consistent. The findings of our study demonstrated that a student's commitment to their education is directly related to their educational attitude. Approximately 53% of our members are living in their own homes, while 47% of our participants are staying in hostels. Here, we see a considerable contrast between their perspectives on their university experiences. Students have access to all of the essential amenities and necessities while they were staying in households. The students, particularly those who lived in a joint family, did not experience feelings of loneliness, lived in an environment that was loving and caring, learnt beyond the scope of their textbooks, and improved their educational attitude. On the flip side, students who live in hostels often lack the facilities, requirements, fully relaxed environment, affection, and care necessary to be fulfilled in their lives.

Our findings also indicate a huge difference between the educational attitude of both hosteled and un hosteled students. In turn, tuition fees also affect the educational attitude of hosteled students. In a joint family, the tuition fees are not accounted a big hurdle in getting a quality education. But sometimes joint family also insert a negative impact on the learning behavior of students because of lower family monthly income, a greater number of dependent family members, fewer rooms, lack of better infrastructure, and un-educated parents and the majority of family members. Here we diagrammatically illustrate the positive and negative factors of joint family affecting students' education.

In Pakistan, early age weddings, forced marriages, and marriages between cousins are socially and culturally accepted traditions, particularly in the province of south Punjab. One of the primary goals of our research is to investigate the participants' marital status, as well as the caste system in their families, their financial situation, and their attitude toward education. In Pakistan, many young women are forced into marriage at a young age, particularly in the province of south Punjab. After getting married, very few people continue their education. Because women become economically dependent on their husbands after marriage, their ability to continue their education is directly tied to the amount of money their husbands bring in each month. It is not difficult to pay tuition fees all at once if the monthly income is sufficient and the number of family members on whom the student relies is low. It will not be difficult for her to accomplish her schooling objectives if she is able to create a pleasant and unhurried atmosphere at home and receive approval from her husband. On the other hand, if the monthly income of her spouse is poor, if he is more dependent on other members of the family, and if their environment at home is stressful, then it will be difficult for her to pursue an educational career.

The mentality of students who were married and those who were not married toward their education is depicted in Fig. 3(**a**). Students who have not yet tied the knot typically rely on their parents' high monthly income to endow their university dues at one time. This enables them to devote their whole attention to their studies, which in turn leads to improved educational behavior and attitude. The vast majority of students who are married do not have adequate possibilities to study. Students who are married tend to have attendance issues, which makes it more difficult for them to remain motivated to learn. Participants in our web-based research come from a variety of castes in South Punjab, ranging from the lowest to the highest socioeconomic status. The
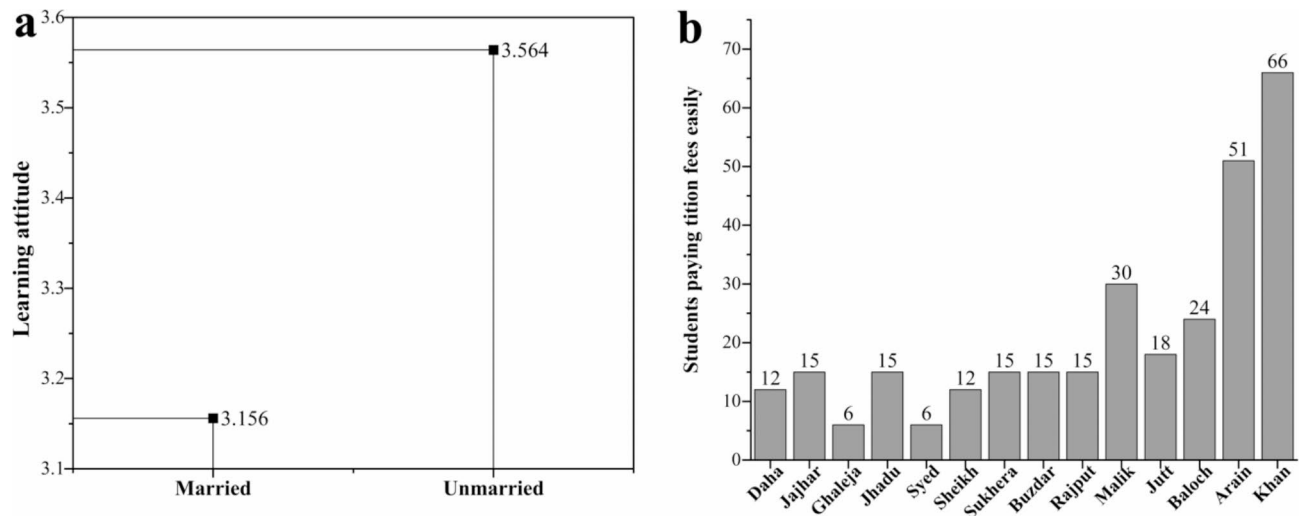
Fig. 3. Tuition fee, educational grades and individual status (**a**) Family caste system based on financial resources (**b**).

	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
For Academic fee				
Intercept Only	191.937			
Final	132.324	59.613	16	0.000
For Academic Performance				
Intercept Only	193.684			
Final	152.510	41.175	14	0.000

Table 2. Model fitting information.

responses of the students from Khan, Arain, Malik, and Baloch indicate that they are able to pay their tuition fees without difficulty and on time Fig. 3(**b**). In comparison to pupils who come from disadvantaged family backgrounds, they have a positive educational mindset. The majority of pupils in South Punjab come from middle-class or upper-middle-class backgrounds. Their average monthly revenue ranges between 200,000 and 300,000. Because of this, it is simple for them to pay their university dues on time, and their attitude toward their education is favorable.

Multinomial logistic regression estimates

The results about multinomial logistic regression are presented below. Table 1 shows some useful information about the model's parameters, which are used to estimate the model. The importance of the "final" model for the Academic fee and Academic Performance is describe in this table. According to the results of the chi-square test, at least one of the independent variables used to predict the level of academic fees and level of academic performance. It is leading us to conclude that the predictor variables and the outcome variables have a meaningful relationship with one another for both model because probability of accepting null hypothesis is less than level of significance 10%, 5% or 1%. Last column of the Table 2 clearly show that p-value is zero.

Table 3 shows the estimated parameter of the model for the level of the Academic fee in the third column, the standard error in the fourth column, the p-value in the fifth column, and the exponent of the parameters in the sixth column. Multinomial logistic regression estimates parameters for the level of academic fee "Easily to pay" and "Hard to pay" with refence to third level "Neutral" separately. The coefficient (β) gives us information about the expected amount of change in the outcome that is caused by a change in one unit of the predictor variable. On the other hand, the exp(β) value represents an odd ratio, which is the chance to move from the category of reference to the category of consequence.

In our case, the result shows that nearly all the coefficients for all outcome variables are significant at 10%, 5% and 1%. It means that all independent variable has a significant impact on the level of academic fee. Specifically, if the level of degree program of the students changes from lower to upper level while maintaining the other predictor constant, then the chance of switching from "neutral" to "Easily to pay (1.197) is lower than the switching from "neutral" to hard to pay (1.604). On the other hand, expected results of monthly household income show that if the household income level move to upper level of household income while maintaining the other predictors unchanged, then the probability of switching from "Neutral" to Easy to pay (2.928) is higher

You pay your tuition fees	β	Std. Error	Sig.	Exp(β)
Easily to Pay				
Intercept	− 0.114	1.694	0.046	
Level of degree program	0.180	0.440	0.082	1.197
HH Monthly income	1.074	0.484	0.026	2.928
Total Number of Household?	− 0.387	0.275	0.910	0.679
Your marital status is	-2.926	1.127	0.009	0.054
You are living Status	− 0.400	0.506	0.029	0.670
Any sibling enrolled along with	1.153	0.748	0.023	2.695
Type of Degree program	− 0.227	0.759	0.065	0.797
Financial Assistance (GOVT or NGOs)	0.422	0.762	0.080	2.780
Hard to Pay				
Intercept	0.405	1.653	0.087	
Level of degree program	0.472	0.438	0.081	1.604
HH Monthly income	0.052	0.476	0.012	1.054
Total Number of Household?	− 0.641	0.273	0.919	0.827
Your marital status is	-2.310	1.191	0.011.	2.76
You are living Status	0.978	0.459	0.033	2.660
Any sibling enrolled along with	0.991	0.733	0.076	3.168
Type of Degree program	0.548	0.717	0.044	1.730
Financial Assistance (GOVT or NGOs)	1.023	0.725	0.058	1.252

Table 3. Multinomial logistic regression estimates for level of academic fee.

than the probability of switching from "Neutral" to Easily to pay (1.054). Similarly, if student is getting financial assistance from (Govt or NGOs) then probability of switching from "Neutral" to easily to pay academic fee (2.780) become more fortunate than Hard to pay (1.252). The self-supporting degree program bears lower probability in the favor of academic fee Easy to pay (0.797) than academic fee hard to pay (1.730). Student living status moving from home to university hostel or Privat hostel increase the chance to pay academic fee hardly as probability of hard to pay (2.667) is higher than easy to pay (0.67). The marital status of the student also has a significant impact on the amount of the academic fee. This is due to the fact that if a student is married, there is a greater likelihood that the academic fee will be hard to pay (2.76), whereas the probability of a married Student paying the academic fee easily (0.054) is extremely low. Similarly, if any sibling of the student enrolled along the same university or any other university also increase the chance to pay academic fee hardly while probability of pay academic fee easily is very low. Total number of households bear insignificant results.

The results for the academic performance are listed in Table 3. Almost all of the predicted parameters are significant, either at the 5% level of significance or the 10% level of significance. In the beginning, we will talk about how having a spouse impacts one's ability or academic performance in the university or college. The results clearly describe that if a student's marital status changes from married to unmarried, the probability of swapping from good academic performance to fair academic performance is only 0.043, while the probability of switching from good academic performance to very good academic performance is 0.391, which is a relatively higher probability. On the other hand, if a student is also working part time with his studies, it will have an effect on his academic performance. This is due to the fact that the results describe that as the student group moves from not working to working group, the probability of switching from good to fair academic will be higher than the probability of shift from good to very good academic performance.

The time spend in studying at home definitely have positive relation with the student's academic performance but result of multinomial regression estimates provide the likelihood of consequence with relative to reference category. So, as well as student spend one more hour on study at home it will increase the chance of moving from good academic performance to very good academic performance which is 1.918 but the chance of moving from good to fair academic performance is very little said (0.205). Total monthly expenditure are also categories as low middle and high expenses and coded as 1, 2 and 3 respectively. So, as well as monthly expenses change by one unit or move from upper category it will increase the chance of switching from good to fair academic performance of the student with relative to moving from good to very good academic performance. On the other hand, the probability of a student's performance changing from good to very good becomes 0.686 if the student moves toward the full attendance category, whereas the probability of a student's performance changing from good to fair is only 0.124 if the student move toward full attendance. Similarly, the results of the degree program and any siblings who were enrolled in the same institute where student in enrolled had the same tendency, the results can be seen in Table 4, column 6. One step toward reliability is the random selection of one thousand students from the university's various departments. It offers a starting point for a sample of students that might be representative. Utilizing an online survey with a high response rate of one thousand students suggests a certain degree of dependability in the technique used to get the data. The poll had a lot of responses, which indicates that a sizable portion of participants found it to be clear and easy to comprehend. Reliability is enhanced by the multinomial logistic regression analysis's precise variable specification and coding. This measuring uniformity

Academic Performance	β	Std. Error	Sig.	Exp(β)
Fair				
Intercept	−0.615	2.199	0.080	
Marital status	-3.141	1.311	0.017	0.043
Are you doing job?	2.854	0.860	0.001	1.758
How much time you study daily?	0.187	0.353	0.097	0.205
How much your total monthly expenses?	0.360	0.451	0.024	1.434
Type of degree program	1.016	1.090	0.052	2.762
Any sibling enrolled along with	2.198	0.799	0.006	0.911
Your attendance in class is	−0.646	0.314	0.040	0.124
Very good				
Intercept	1.576	1.909	0.009	
Your marital status is	−0.940	0.779	0.028	0.391
Are you doing job?	1.411	0.719	0.050	4.099
How much time you study daily?	−0.085	0.298	0.075	1.918
How much your total monthly expenses?	0.138	0.381	0.018	1.148
Type of degree program	0.876	0.934	0.048	2.401
Any sibling enrolled along with	0.882	0.660	0.082	2.416
Your attendance in class is	−0.377	0.280	0.078	0.686

Table 4. Multinomial logistic regression estimates for academic performance.

throughout participants contributes to the comparability and dependability of the data for analysis. The choice of variables, which includes academic achievement, class attendance, and student attitudes, supports the study's goal of examining the impact of tuition fees on educational quality. These factors appear to have some construct validity and are related to the idea of education quality. The web-based survey's design, in accordance with the study's hypothesis, and the ethical committee's approval of it point to some content validity. It suggests that the inquiries were pertinent to the subject of the study. The study's external validity might be hampered by the fact that it was carried out at a particular Pakistani university.

Discussion

Pakistan is a developing country and is far away from achieving the national and international level standard educational targets. There are many hindrance factors in this regard like lack of educational funds, poor facilities in institutes, poor management, unavailability of experienced and highly qualified teachers, and lack of awareness about the importance of education in the community and social level[42–45]. There are some other issues are founded such as drug abuse, unhealthy activities, mismanagement, and violation of rules and regulations. In addition, several students can't pay for their concentration on their study because of financial problems. Students with low-income backgrounds see universities and colleges as impossible[46,47]. There are some reasons for their response as easily. Firstly, most of the students depend on their parents, and tuition fee is paid by them. Their monthly income is between 1.5 and 2 lac and the number of dependent family members is 3–4. Due to high monthly income and low family members, they will pay their tuition fees easily[48]. Secondly, some students among 23.33%, get scholarships to pay their tuition fees. Thirdly, some students do part-time jobs for tuition fees. Some participants respond that they get scholarships. Here we notice the magnificent impact of the scholarship on the educational attitude of students. They have impulsive learning behavior, are more regular in class, are mentally relaxed, and endow more concentration on study. Scholarship directly stimulates regularity, which in turn enhances learning attitude. Informal shreds of evidences suggest that this belief may cause lecturers to compromise the academic rigor often associated with instructional design, delivery, and assessment, and may lead students to believe that they are entitled to certain academic privileges[49]. Despite these concerns, few empirical studies examine the prevalence of student consumerism and the factors that influence it.

The student's finance systems have three core elements. First, the proposed fee increases suddenly without intimating the government. Second, except tuition fee, there are many miscellaneous charges introduction enhance the student and family difficulties. The third is the right bestowed upon universities to charge variable top-up fees[50–52]. High tuition fees directly decline the learning attitude of students. Class attendance is critical to the academic success of developmental education students in introductory science courses[53]. High rates of class attendance greatly increase the probability of high grades, and low rates of class attendance greatly increase the probability of low grades. According to a published study, students who attended at least 80% of classes had a 94–96% chance of making at least an A in the course, whereas those who attended less than 80% of classes had no chance of making an A grade Teaching processes are the main factors influencing student educational attitudes and learning behavior. Some important factors are motivation versus boring, authentic versus theoretical, constructivist versus transmissive, and the teaching style, and the personality of the teacher Fig. 4. The strong relationship between teacher and students has a significant role in the breadth and depth of student involvement in the learning process and the learning outcomes. These important factors were particularly supported by the attendance of the student in class. Students with financial issues are less regular in class, and they are all the time
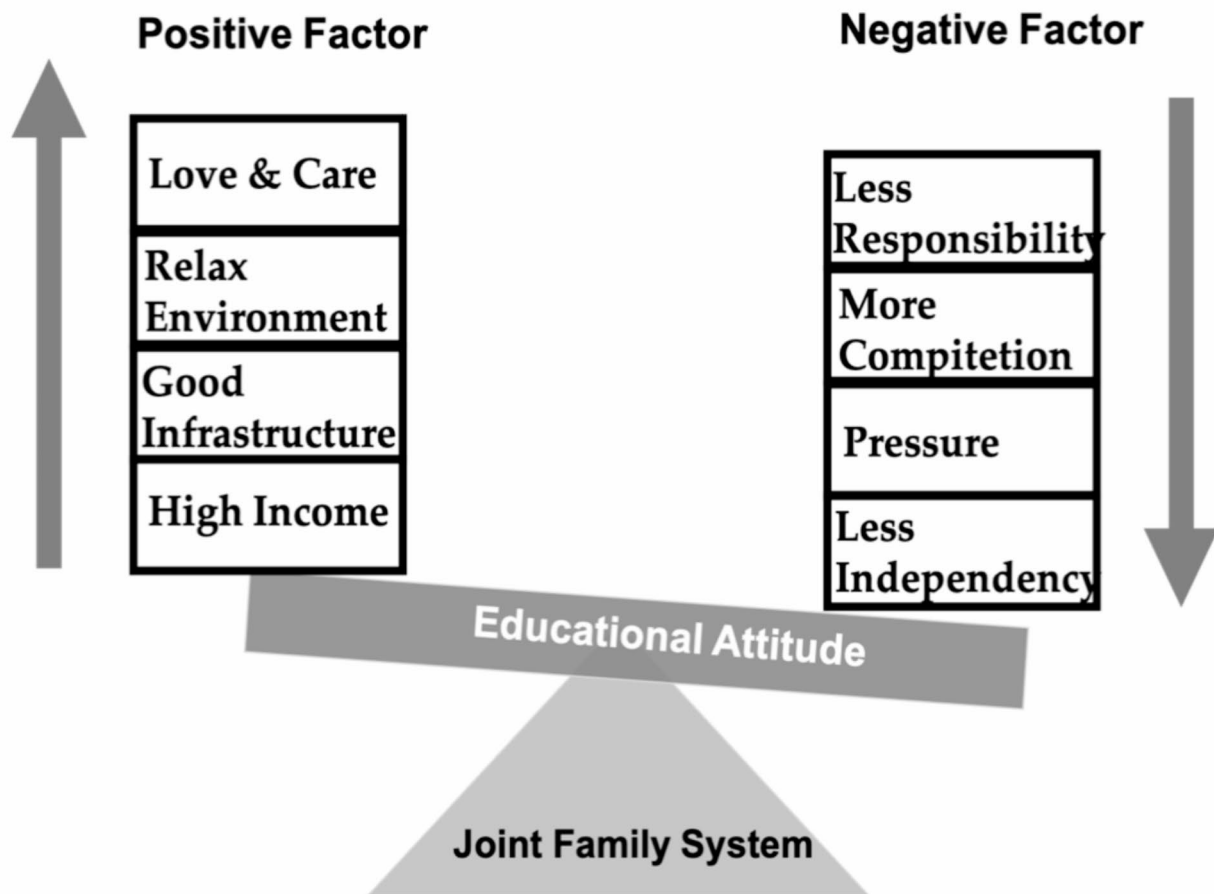
Fig. 4. Joint family system, tuition fee, educational learning attitudes.

worried about tuition fees. That's why their educational attitude becomes less as compared to regular students. A family is a unit of kinship which exert a powerful influence on student's education as well as on achieving something new in life. The family setup is divided into five systems but in Pakistan, only two systems (a) the nuclear family system and (b) the joint family system is very important[54]. The nuclear Family system defines as a family setup that consists of two generations, and the Joint Family is a family setup that consists of three or more than three generations living together under a single-family head. According to Eliot and Gray (2000), all family systems bear a strong primary and secondary relationship that influences the life patterns of their members[55,56]. In the nuclear family, there is a direct relationship between the two generations living together while in the joint family system an indirect and secondary sort of relationship exists between its members. The family system has an important role in building the character, personality, and daily life skills of children. Simply a good family structure and environment stimulate the children's confidence for academic success[57]. Generally, in Pakistan, the joint family system is considered to be a custodian of social and cultural norms but with the advent of science and technology, the concept of living in a nuclear family is increasing in cities and urban areas of Pakistan. It has been concluded that both family systems have a magnificent relation with academic achievements. The role of parents in a nuclear and joint family system is more influential than any other member of the family where students are encouraged and confident by the involvement of the parents and becomes more successful in their academic careers.

Day scholars and hostellers have different educational philosophies in a number of ways. Day scholars might be more disciplined and have higher attendance since they are not as distracted as hostellers, who might have to cope with expensive living expenses and subpar meal options on campus. Academic performance is also subject to variation, as determined by the CGPA. Day scholars may do better and have a more positive attitude due to a more conducive atmosphere at home, while hostellers may encounter financial and living difficulties. Furthermore, day scholars might have a more laid-back home environment that fosters a more positive attitude toward learning, whereas hostellers might suffer from greater psychological strain associated with living expenses and tuition. Statistical indicators such variations in attendance rates, CGPAs, and these variations can be determined by statistical metrics including variations in attendance rates, CGPA, and factor relationship analysis.

Literature that was published in the past demonstrates that young females suffer harmful physical and mental consequences as a result of getting married at a young age. A girl who gets married when she is still a teenager

is not old enough to make sound choices regarding her education and health care, and she is much more reliant on her husband to provide for her financial requirements[58]. The cultural and social standards of a society are the most major contributors to early marriage. In areas where resources are scarce, girls are more likely to have their educational possibilities cut short and are married off at a younger age as a preventative measure against having sexual relations before marriage Fig. 5. There is a correlation between each year that a girl gets married before the age of 18 and a drop in the possibility that she will complete her secondary education, with this loss ranging anywhere from four to ten% points, depending on the country or location. In this study, one of the primary goals is to investigate the relationship between educational attitude and marital status. In Pakistan, many young women are forced into marriage at a young age, particularly in the southern province of Punjab. After entering into a marriage, very few students choose to continue their education. Because women become economically dependent on their husbands after marriage, their ability to continue their education is directly tied to the amount of money their husbands bring in each month. It is not difficult to pay tuition fees all at once if the monthly income is sufficient and the number of family members on whom the student relies is low. It will not be difficult for her to accomplish her schooling objectives if she is able to create a pleasant and unhurried atmosphere at home and receive approval from her husband. On the other hand, if the monthly income of her spouse is poor, if he is more dependent on other members of the family, and if their environment at home is stressful, then it will be difficult for her to pursue an educational career. If one were to begin a career in education under these conditions, she would be unable to devote the appropriate amount of time to her studies and would not succeed academically. The outlook on education held by students who are married as opposed to those who are not married. Students who have not yet tied the knot typically rely on their parents' high monthly income to endow their university dues at one time. This enables them to devote their whole attention to their studies, which in turn leads to improved educational behavior and attitude. The study demonstrates that relationship status has an impact on academic achievement. Changes in marital status had an impact on the odds of various academic achievement levels in the multinomial logistic regression. Married students had attendance concerns compared to unmarried students, which could be quantified as a discrete variable and compared statistically. Additionally, married students could struggle financially and have less time for their studies, whereas single students might have more resources and leisure. This influence is statistically supported by the regression model's coefficients and p-values as well as comparisons of attendance and study hours between various relationship status groups.

The multinomial logistic regression model was developed so that we could accomplish our goal and investigate the factors that have an effect on academic achievement and behavior with relation to academic fees. A large number of other researchers have also used this method to investigate the academic achievement of students and their attitudes on the cost of their education[59,60]. The same model was used for this study's analysis; however, the predictor variables were different. The students' academic performances were ranked on one of three scales: very good, good, and fair. Class attendance and the amount of time spent studying at home were also found to have a positive association with. However, in this study, we describe the probability of a
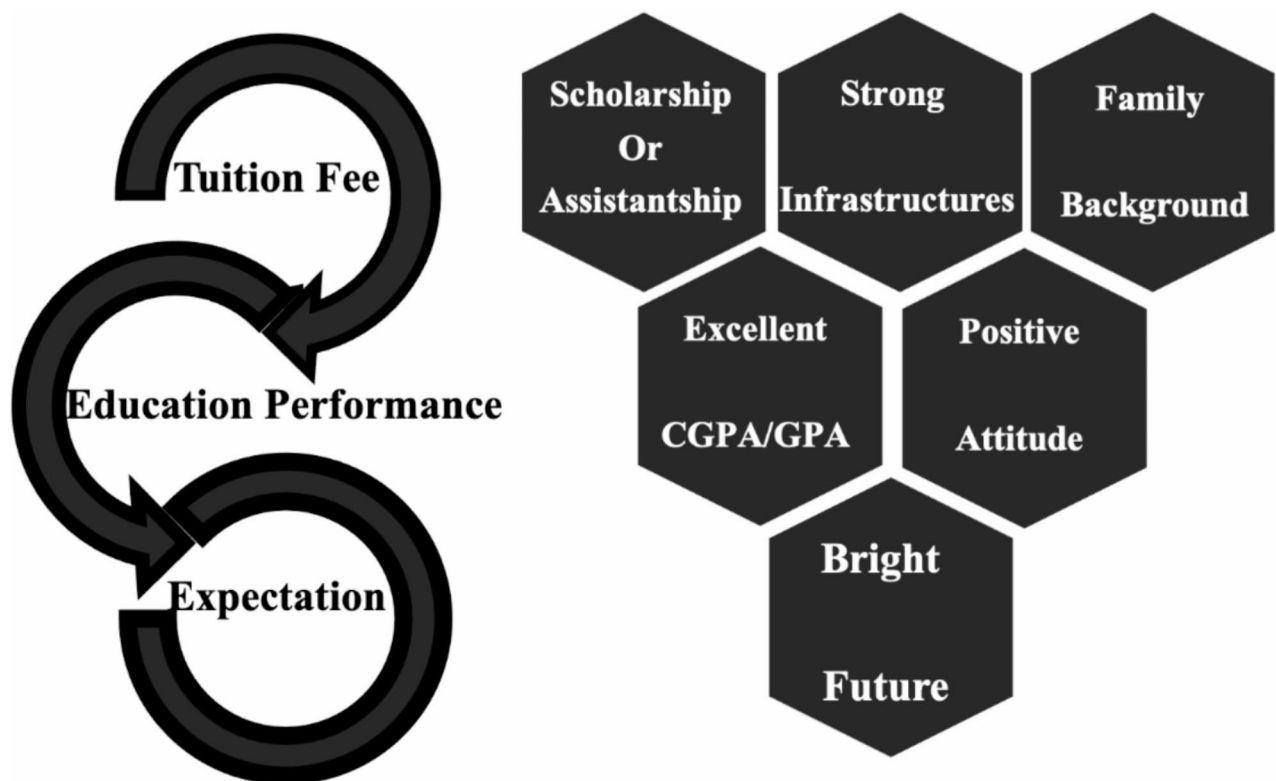

Fig. 5. A trident schematic presents tuition fee, educational performances and expectation.

shift from a fair academic performance to a good or very good academic performance that will occur if the amount of time spent studying at home will increase or maintain regular in the class attendance[61]. Similarly, the prevalence of several other variables has a significant impact on academic performance in either a positive or negative manner, both of which have advancements over research done previously. On the other hand, the issue of academic fees for graduate or postgraduate students is one that never goes away[22]. This is due to the fact that there are a number of factors that make it difficult to pay academic fees like low household income, more than one sibling studying at the higher degree level, marital status of the student, absent of financial assistance, and self-supporting degree program but there are also certain factors that make it easy to pay. There have been many limiting factors which directly or indirectly influenced on current work such as Covid-19 was the main hurdle to collect the data physically. Secondly, regular sending emails and reminder to participants to filled questionnaire and less response was one of biggest limitation to collect relevant data. Thirdly, there were many insecurities to provide correct information. Fourth, there was an issue of funding from the institutes and candidates as well. Sixth, govt institutes have shortage of funds to provide miscellaneous materials to higher education level students. Seventh, Joint family system and religious boundaries also restricts in getting correct and accurate information. Eighth, computer illiteracy was also one of the challenges for students to give or take knowledge at higher level of education to fulfill the questionnaire and sent them back and lastly, Lack of time due to heavy burden of class work on students. The application of this work is very useful for higher authorities to get proper information from the gross level which could be very effective to improve the higher education system by keeping tuition fee rate constant or giving financial support to student during their studies. Expanding financial aid programs, such grants and scholarships, should be the main priority for academic institutions and legislators, especially for students from low-income families. By easing financial strain, this would lessen the burden of tuition costs and enhance academic achievement. The financial load can be lessened by offering flexible tuition payment choices, such installment plans, which would enable students to focus more on their education and lower dropout rates. Furthermore, offering financial counseling and mental health support services in higher education can assist students in better managing their finances and reducing the stress that comes with running into financial troubles, both of which have an adverse effect on their academic performance. According to the report, bad living conditions have a negative impact on students' academic performance, so improving living conditions for those who live in dorms should also be a top focus. Better hostel amenities and more affordable housing would help students living away from home with their financial burden. Universities can also promote student participation in the classroom by enticing students to attend regularly and by providing incentives or scholarships based on performance, which can greatly increase students' academic achievement. Longitudinal studies that monitor students over time should be taken into account in future research to examine the long-term impacts of financial hardship on academic performance and employment opportunities. Deeper understanding of the effects of financial strain on students outside of college would result from this. Furthermore, it is critical to research the psychological and emotional advantages of financial help, such as the ways in which lighter financial loads affect academic motivation and mental health. To better adapt policy to local requirements, research should also examine how financial issues vary between regions. Finally, evaluating the efficacy of various financial interventions—like flexible payment plans and scholarships—can yield important data that helps enhance student support programs and financial aid regulations. The study discovered that financial difficulties had a major impact on students' capacity to pay tuition, including poor household income, having several dependents, and not receiving financial aid. Academic performance was also adversely affected by these variables, with pupils from lower-income households experiencing greater financial and academic difficulties. Because they were under less financial strain, students who got financial aid or scholarships did better academically, attended class more frequently, and had more positive attitudes toward learning. Living arrangements were also important; students in dorms faced greater difficulties than those in homes, which had an impact on their academic performance and financial security. The little investigation of the psychological impacts of financial stress on students' motivation and performance represents a substantial research gap. Subsequent research endeavors may concentrate on longitudinal assessments to monitor the enduring effects of tuition fee obstacles on academic and professional results. An additional avenue for research could be to determine the impact of focused financial assistance initiatives, such scholarships, on students' well-being and academic achievement. The study's conclusion emphasizes the necessity for colleges and legislators to take into account financial aid programs that lessen the financial burden of tuition, particularly for students from low-income families. Resolving these financial concerns may enhance students' general wellbeing and academic achievement. Future studies should look into these interactions in more detail, paying special attention to how financial stress, mental health, and long-term educational outcomes interact.

Conclusions

It has been determined that students at higher education institutions encounter a number of social and economic challenges, which prevents them from receiving an adequate education. One of the other issues that students struggle with on a regular basis, finances are one of the most commonly outlined issues. In this article, we investigate how the burden of paying high tuition affects the students' mentality about learning as well as their desire to pursue it. The monthly income of the parents, the student's learning environment, the student's work, scholarships, attendance history, and marital status are some of the other aspects that might directly or indirectly affect the cost of tuition and are also covered. Scholarships are another direct means through which the educational mindset might be improved. In addition, there is evidence that the majority of students as well as their parents are low-income and unable to afford the tuition costs. Students whose families have a lower average monthly income tend to have poorer views toward their schooling. Students who hold jobs have a very limited amount of time to study, are frequently disruptive in the classroom, and, ultimately, are unable to acquire appropriate moral education behavior. These students must contend with insufficient finance for their education,

which leads to concern and disrupts their ability to concentrate while they are trying to learn. Students who are married and students who are not married exhibit distinct differences in their educational attitudes. Additionally, we have seen that students whose families are of the Khan, Arain, Malik, and Baloch ethnicities have no trouble paying their tuition costs. Keeping an eye on the outcomes, we discover a number of other problems on the social and communal levels that have a direct impact on the educational system. In the same way, we are able to determine the relationship between education and factors such as technology, poverty, infrastructure, the degree of education that students' parents have, and students' overall health. In light of our findings, we believe that it would be beneficial for the Islamia University of Bahawalpur to reduce the cost of tuition. This would encourage students from low-income families to take a more active role in their education, which would ultimately lead to an improvement in the university's ranking.

Limitation of study

Although study was completed successfully but still there were limitations which hinder to collect the accurate data such as emergence of Covid-19, willingness of students to filled the questionnaire, insecurities to provide correct information, unavailability of funding, religious boundaries, lack of time and commuter illiteracy.

Data availability

The raw data and materials are available from the corresponding author upon reasonable request.

References

1. Ryeol, K. H. The relation between character education and global citizenship education: Are education for the good man and education for the good citizen compatible?. *Journal of Ethics* https://doi.org/10.15801/je.1.104.201511.1 (2015).
2. Zuhdi, A., Firman, F. & Ahmad, R. The importance of education for humans. *SCHOULID: Indonesian Journal of School Counseling* https://doi.org/10.23916/08742011 (2021).
3. Le, T. T., Nguyen, T. L., Trinh, M. T., Le, V. T. & Pham, H. H. Investigating Vietnamese undergraduate students' willingness to pay for higher education under the cost-sharing context. *Policy Futures in Education* https://doi.org/10.1177/14782103211011898 (2022).
4. Rexe, D. & Maltais, M. Looking back, looking forward: Canadian higher education research on tuition fees. *Canadian Journal of Higher Education* https://doi.org/10.47678/cjhe.vi0.189289 (2022).
5. Bai, X., Sun, X. & Chiu, Y. H. Does China's higher education investment play a role in industrial growth?. *Technol Soc* https://doi.org/10.1016/j.techsoc.2020.101332 (2020).
6. Sun, H. P., Sun, W. F., Geng, Y. & Kong, Y. S. Natural resource dependence, public education investment, and human capital accumulation. *Pet Sci* https://doi.org/10.1007/s12182-018-0235-0 (2018).
7. Tony Carusi, F. & Szkudlarek, T. Education is society … and there is no society: The ontological turn of education. *Policy Futures in Education* https://doi.org/10.1177/1478210320933018 (2020).
8. Jones, E., Leask, B., Brandenburg, U. & de Wit, H. Global social responsibility and the internationalisation of higher education for society. *J Stud Int Educ* https://doi.org/10.1177/10283153211031679 (2021).
9. Chandrashekar, D. & Bala Subrahmanya, M. H. Exploring the factors of cluster linkages that influence innovation performance of firms in a cluster. *Economics of Innovation and New Technology* https://doi.org/10.1080/10438599.2017.1384102 (2019).
10. Mahmood, I. P. & Singh, J. technological dynamism in Asia. *SSRN Electron. J.* https://doi.org/10.2139/ssrn.329102 (2005).
11. Mahmood, I. P. & Singh, J. Technological dynamism in Asia. *Res Policy* https://doi.org/10.1016/S0048-7333(02)00109-9 (2003).
12. Lacasa, I. D., Giebler, A. & Radošević, S. Technological capabilities in Central and Eastern Europe: An analysis based on priority patents. *Scientometrics* https://doi.org/10.1007/s11192-017-2277-2 (2017).
13. Angeli, C. & Giannakos, M. Computational thinking education: Issues and challenges. *Comput. Hum. Behav.* https://doi.org/10.1016/j.chb.2019.106185 (2020).
14. King, E. W. Multicultural education: Issues and perspectives, 10th education. *Intercultural Education* https://doi.org/10.1080/14675986.2020.1766194 (2020).
15. Popa, S. M. Comparative and international education: issues for teachers. *Comp Educ Rev* **53**, 66 (2009).
16. Jonbekova, D., Serkova, Y., Mazbulova, Z., Jumakulov, Z. & Ruby, A. How international higher education graduates contribute to their home country: An example from government scholarship recipients in Kazakhstan. *High. Educ. Res. Dev.* https://doi.org/10.1080/07294360.2021.2019200 (2022).
17. Hunzai, Z. N. Teacher education in Pakistan: Analysis of planning issues in early childhood education. *J Early Child Teach Educ* https://doi.org/10.1080/10901020903084421 (2009).
18. Habib, M. N., Khalil, U., Khan, Z. & Zahid, M. Sustainability in higher education: What is happening in Pakistan?. *International Journal of Sustainability in Higher Education* https://doi.org/10.1108/IJSHE-06-2020-0207 (2021).
19. Ashraf, M. A. & Ismat, H. I. Education and development of Pakistan: A study of current situation of education and literacy in Pakistan. *US-China Education Review B* https://doi.org/10.17265/2161-6248/2016.11.003 (2016).
20. Majoka, M. I. & Khan, M. I. Education policy provisions and objectives. A review of Pakistani education policies. *Italian Journal of Sociology of Education.* https://doi.org/10.14658/pupj-ijse-2017-2-6 (2017).
21. Ali, G. The correlation between education expenditure and higher education in Pakistan. *International Journal of Education Economics and Development* **13**(3), 1. https://doi.org/10.1504/ijeed.2022.10042152 (2022).
22. Czarnecki, K., Korpi, T. & Nelson, K. Student support and tuition fee systems in comparative perspective. *Studies in Higher Education* https://doi.org/10.1080/03075079.2020.1716316 (2021).
23. Beck, J. C. Inequality and the human right to tuition-free higher education: Mobilizing human rights law in the German movement against tuition fees. *Law and Social Inquiry* https://doi.org/10.1017/lsi.2021.25 (2022).
24. Usman, M., & Rahman, A. A. Financing higher education through Waqf in Pakistan: Issues and challenges (Pembiayaan Institusi Pengajian Tinggi Menerusi Wakaf Di Pakistan: Isu Dan Cabaran). *Jurnal Pengurusan* **62** (2021).
25. Akram, H., Aslam, S., Saleem, A. & Parveen, K. The challenges of online teaching in COVID-19 pandemic: A case study of public universities in. *Journal of Information Technology Education: Research* https://doi.org/10.28945/4784 (2021).
26. Samuel, L. J. et al. Socioeconomic disparities in six-year incident dementia in a nationally representative cohort of U.S. older adults: An examination of financial resources. *BMC Geriatr* https://doi.org/10.1186/s12877-020-01553-4 (2020).
27. Akhtar, S., Khan, K. U., Atlas, F. & Irfan, M. Stimulating student's pro-environmental behavior in higher education institutions: An ability–motivation–opportunity perspective. *Environ Dev Sustain* https://doi.org/10.1007/s10668-021-01609-4 (2022).

28. Ullah, M. H., Ajmal, M. & Rahman, F. Analysis of quality indicators of higher education in Pakistan. *Bull. Educ. Res.* **27**, 1–16 (2011).
29. de Melo Costa, D., Barbosa, F. V., Zha, Q. & Trilokekar, R. D. Higher education systems and the tuition fees charging: Perspectives and perceptions in Brazil. *Canada and China. Brazilian Business Review.* https://doi.org/10.15728/bbr.2019.16.2.3 (2019).
30. Zha, X. & Ding, S. Can low tuition fee policy improve higher education equity and social welfare?. *Frontiers of Education in China* https://doi.org/10.1007/s11516-007-0015-x (2007).
31. Kemnitz, A. Educational federalism and the quality effects of tuition fees. *SSRN Electron. J.* https://doi.org/10.2139/ssrn.1687578 (2021).
32. Zamir, S., Abbasi, B. N., Yu, L., Sohail, A. & Yang, C. Transformative role of educational funding in shaping national development across SAARC countries in the 21st century: A panel NARDL approach. *Heliyon* https://doi.org/10.1016/j.heliyon.2023.e20417 (2023).
33. Jacob, W. J. & Gokbel, V. Global higher education learning outcomes and financial trends: Comparative and innovative approaches. *Int J Educ Dev* https://doi.org/10.1016/j.ijedudev.2017.03.001 (2018).
34. Guzman, T., Pirog, M. A. & Jung, H. Cost of higher education: For-profit universities and online learning. *Social Science Journal* https://doi.org/10.1016/j.soscij.2019.03.010 (2021).
35. Zamir, S. & Wang, Z. Uncovering Covid-19, Distance learning, and educational inequality in rural areas of Pakistan and China: A situational analysis method. *Humanit Soc Sci Commun* https://doi.org/10.1057/s41599-023-02025-x (2023).
36. Psacharopoulos, G. & Papakonstantinou, G. The real university cost in a "free" higher education country. *Econ Educ Rev* https://doi.org/10.1016/j.econedurev.2004.01.003 (2005).
37. Zamir, S., Yang, Z., Wenwu, H. & Sarwar, U. Assessing the attitude and problem-based learning in mathematics through PLS-SEM modeling. *PLoS ONE* https://doi.org/10.1371/journal.pone.0266363 (2022).
38. M, M., Ghinea, G., Mohamed Amin Embi, Saleh, M. M., Alhuwayji, H. A. S., Smeda, A. M., Shiratuddin, M. F., Wong, K. W., Abdelraheem, A. Y., Hassan, B. B., Asad, F., Kumar, A., Arteimi, M. J., Mohamed Amin Embi, Abubakar, B., Hassan, B. B., Saleh, M. M., Wahid, F. A., YILDIZ, S., ... Muumbo, A. The implementation of e-learning in the Arab universities: Challenges and opportunities. *Procedia - Social and Behavioral Sciences*, **3**(1) (2013).
39. Rashid, W., Shi, J., Rahim, I. U., Dong, S. & Sultan, H. Issues and opportunities associated with trophy hunting and tourism in Khunjerab National Park. *Northern Pakistan. Animals* https://doi.org/10.3390/ani10040597 (2020).
40. El-Habil, A. M. An application on multinomial logistic regression model. *Pakistan Journal of Statistics and Operation Research* https://doi.org/10.18187/pjsor.v8i2.234 (2012).
41. Bayar, Y., Sezgin, H. F., Öztürk, Ö. F. & Şaşmaz, M. Ü. Financial literacy and financial risk tolerance of individual investors: Multinomial logistic regression approach. *Sage Open* https://doi.org/10.1177/2158244020945717 (2020).
42. Hoskins, K. Unleashing the 'Undergraduate Monster'? The second-order policy effects of the 1988 education reform act for higher education in England. *J Educ Adm Hist* https://doi.org/10.1080/00220620.2022.2040451 (2022).
43. Fayyaz, H., Rauf, Z., Kalsoom, U. & Samin, T. Major issues of education sector in Pakistan. *International Journal of Academic Research in Progressive Education and Development* https://doi.org/10.6007/ijarped/v3-i4/1366 (2014).
44. Shah, N. A. Social work education in Pakistan: Issues and future opportunities. *Pakistan Journal of Applied Sciences* https://doi.org/10.46568/pjass.v7i0.315 (2020).
45. Maqbool, S. Economic empowerment of women through entrepreneurial education in Pakistan: Issues and challenges. *Pakistan Social Sciences Review* https://doi.org/10.35484/pssr.2021(5-ii)12 (2021).
46. Hübner, M. Do tuition fees affect enrollment behavior? Evidence from a "natural Experiment" in Germany. *Econ Educ Rev* https://doi.org/10.1016/j.econedurev.2012.06.006 (2012).
47. Dietrich, H. & Gerner, H. D. The effects of tuition fees on the decision for higher education: Evidence from a German policy experiment. *Economics Bulletin* **32**, 3 (2012).
48. Purba, R. W. & Damanik, S. W. H. Analisis Perencanaan Dan Penggunaan Keuangan Mahasiswa Pada Masa Covid. *Ekonomis Journal of Economics and Business* https://doi.org/10.33087/ekonomis.v5i2.362 (2021).
49. Mulyaningsih, T., Dong, S., Miranti, R., Daly, A. & Purwaningsih, Y. Targeted scholarship for higher education and academic performance: Evidence from Indonesia. *Int J Educ Dev* https://doi.org/10.1016/j.ijedudev.2021.102510 (2022).
50. Akhtar, M. M. S. & Kalsoom, T. Issues of universities' governance in Pakistan. *Journal of Elementary Education* **22**(2), 66 (2012).
51. Jokhio, A. A., Raza, S. S., Younus, M. & Soomro, A. H. Teaching writing skills in university large classes in Pakistan: Issues, challenges and solutions. *Journal of English Education and Linguistics Studies* https://doi.org/10.30762/jeels.v7i1.1355 (2022).
52. Rafiq, M. Institutional repositories (IRs) in universities of Pakistan: Issues and emergent framework for remedies. *Journal of Academic Librarianship* https://doi.org/10.1016/j.acalib.2021.102480 (2022).
53. Samuel, Y. A., Ernest, K. & Gyamfi, C. Attitudes towards tuition fees payment in tertiary education: A survey of Sunyani Polytechnic marketing students in Sunyani Ghana. *International Review of Management and Marketing* **2**(4), 66 (2012).
54. Totsika, V. et al. Types and correlates of school non-attendance in students with autism spectrum disorders. *Autism* https://doi.org/10.1177/1362361320916967 (2020).
55. Akhlaq, A., Malik, N. I. & Khan, N. A. Family communication and family system as the predictors of family satisfaction in adolescents. *Science Journal of Psychology* **63**, 3 (2013).
56. Lodhi, F. S. et al. Level of satisfaction and its predictors among joint and nuclear family systems in District Abbottabad. *Pakistan. Med J Islam Repub Iran* https://doi.org/10.34171/mjiri.33.59 (2019).
57. Pattayat, S. S., Parida, J. K. & Awasthi, I. C. Reducing rural poverty through non-farm job creation in India. *Indian Journal of Labour Economics* https://doi.org/10.1007/s41027-022-00359-9 (2022).
58. Xu, H., Hsu, W. L., Meen, T. H. & Zhu, J. H. Can higher education, economic growth and innovation ability improve each other?. *Sustainability* https://doi.org/10.3390/su12062515 (2020).
59. Park, K. H. & Kerr, P. M. Determinants of academic performance: A multinomial logit approach. *Journal of Economic Education* https://doi.org/10.1080/00220485.1990.10844659 (1990).
60. Adejumo, A. O. & Adetunji, A. A. Application of ordinal logistic regression in the study of students' performance. *Mathematical Theory and Modeling* (2013).
61. Sothan, S. The determinants of academic performance: Evidence from a Cambodian University. *Studies in Higher Education* https://doi.org/10.1080/03075079.2018.1496408 (2019).

Acknowledgements

Author contributions

A.A: conceptualization, investigation, experimentation, data interpretation. M.H: software, writing — original draft, design, idea. M.G: statistical analysis, writing, review and editing.

Declarations

Competing interests
The authors declare no competing interests.

Ethical approval
The study was approved by the ethical committee which consist of Muhammad Mahmood Ahmad HOD, Bioinformatics, Dr Audil Rashid, director ORIC, University of Gujarat, Pakistan and Dr Fatima Rasool. All the member are the part of ethical review committee. Moreover, all the methods used in current study was also approved by Department of Education, Guangzhou University and Department of Education, The Islamia University of Bahawalpur, Pakistan. In addition to this, please we can also confirm that all methods were performed in accordance with the relevant guidelines and regulations.

Human consent
Informed consent was obtained from all the participants.

Consent for publication
Approval of the final manuscript is granted by all authors.

Additional information
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