

Research Paper



Impact of familial support on a high school female student's academic journey in stem disciplines in lahore, pakistan

Urwah Nauman*^{ID}

*Student, Department of Engineering (STEM Research Track), Lahore Grammar School, Lahore, Pakistan.

Article Info

Article History:

Received: 03 September 2025

Revised: 12 November 2026

Accepted: 19 November 2025

Published: 05 January 2026

Keywords:

Female STEM Participation

Pakistan Education

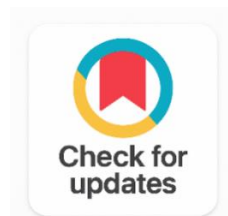
Familial Influence

Societal Barriers

Female Role Models

ABSTRACT

The following research investigates how familial support influences female students' academic journey in STEM (Science, Technology, Engineering, and Mathematics) disciplines in Pakistan. Using a mixed-methods approach, surveys and unstructured interviews were conducted with high school girls among different schools in Lahore. The findings reveal that while patriarchal norms persist, many families, especially in urban middle-class households, are increasingly supportive of their daughters' STEM ambitions. However, societal pressures, traditional career expectations, and lack of female role models continue to pose significant challenges for girls in Pakistan.



Corresponding Author:

Urwah Nauman

Student, Department of Engineering (STEM Research Track), Lahore Grammar School, Lahore, Pakistan.

Email: urwahnauman1010@gmail.com

Copyright © 2026 The Author(s). This is an open access article distributed under the Creative Commons Attribution License, (<http://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. INTRODUCTION

Despite widespread conversations about gender equality in recent decades, female representation in STEM (Science, Technology, Engineering, and Mathematics) fields remains strikingly low across the globe. In 2023, women made up only 28% of the STEM workforce, with regional disparities even more pronounced: 24% in the United States, 17% in the European Union, 16% in Japan, and 14% in India [1]. In

Pakistan, the figures are even more discouraging. Women overall make up only 24% of the labor force [2], and only 1% of women in Pakistan work in technology, as per a report conducted by the local advocacy group Circle Women.

In conservative societies like Pakistan, where women are told to conform to certain stereotypes, it is increasingly difficult for young girls to step out of their comfort zone and pursue passions outside careers dictated by family figures. Fields such as medicine and teaching are often thought of as 'appropriate' for girls and they may be discouraged from traditionally male dominated fields like engineering.

This paper examines the extent to which familial support plays a role in helping girls to pursue STEM education in Pakistan.

Objectives

1. To explore the relationship between family support and female SEM education
2. To present evidence for conclusions on the extent to which support impacts a girl's education
3. To demonstrate, through interviews and data, how a family environment can affect academic pathways taken.

2. RELATED WORK

57% of children in Pakistan who do not attend school are girls, and they face discrimination in the educational system [3]. Pakistani parents continue to believe that STEM fields are not suitable for their daughters, according to a study [4]. 63% of staff members confirmed that students frequently questioned their own abilities. Involvement is further limited by social constraints such as marriage and motherhood, which are perceived as ways to enhance marriage prospects. Girls' access to STEM is supported by wealthier families, but after secondary school, only 47% of girls and 72% of boys are enrolled in STEM programs.

According to [5], many parents consider factors like finances when decided whether to send girls to school. Constraints like marriage and traditional gender roles also played a helping hand. According to [6], women in rural areas are discouraged from pursuing an education at all as parents kept in mind social attitudes. [7] Showed that although some parents in Quetta support education, many don't participate actively in their daughter's education.

According to [8], only 12.6% of parents accepted women working in male-dominated settings, despite 50.6% of parents favoring it. Just 25.1% of parents supported their daughters' freedom to select their career. [9], students whose mothers experienced a lot of stress did poorly academically. [10] Found that female academic achievement in engineering careers directly correlated with family support.

Similar obstacles are faced by girls worldwide, as gender norms discourage early STEM career pursuit [11], [12]. According to STEM Women, 31% of female students worldwide enrolled in core STEM courses in 2022–2023 and only 23% in computer science, which is very low [13]. Studies [14] further showed that cognitive approaches to learning were absent in Pakistan with a high degree of reliance on traditional method of lecturing. In Pakistan, women still only make up 4.9% of engineering supervisory positions, despite advancements [15]. Interestingly as [16] found out in all provinces, social constraints like marriage and traditional customs did shape education of girls but this was higher in urban provinces like Punjab and Sindh.

International comparisons serve to further show Pakistan's gender disparity. Pakistan is ranked 145th on the Global Gender Gap Report 2022, ahead of Afghanistan [17]. According to the World Bank (2024) [18], Pakistani girls have a lower enrolment, retention, and academic achievement rate than boys which may be due to their lack of opportunities. According to a Khairpur study [19], even though many girls were aware of their own potential, only 4% of parents encouraged their daughters to pursue STEM. Low self-esteem and self-doubt continue to be significant obstacles, according to another study [20], with some women attributing differences to "God-given" male technical skills. As women advance to senior, leadership-focused STEM positions, their participation decreases [21]. Additionally, women in academia continue to be under-represented in leadership roles, according to [22].

3. METHODOLOGY

3.1 Overview, Operationalization and Pilot Study

To investigate familial support for girls in STEM in Lahore, both positivist and interpretivist paradigms were employed. Specifically:

- **Quantitative Method:** An online questionnaire was used to collect numerical data, allowing for generalizability and statistical analysis. The questionnaire served to highlight quantifiable steps taken by parents to help their daughters with their education.
- **Qualitative Method:** Unstructured interviews, which provided in-depth contextual insights into participants' experiences and perspectives.

Before conducting the main research, I conducted a pilot study to remove any overlooked errors in the research design.

Prior to data collection, the concept of familial support was operationalized through the following indicators. Common factors that were looked for included the amount of attention, economic support to provide further tuition, motivational support to pursue a desired career, taking steps to support education, hindrance in pursuing STEM careers, and parents' level of support to help the child to do further.

3.2 Quantitative Data

The target population included female school students from different locations in Lahore, Pakistan. As shown in [Figure 1](#), sample of 100 female students in O or A level was selected to fill the survey from various schools. Details of the sample are represented in the chart below. The sample was accessed through individuals like Head Girls and STEM Presidents of the school. No strict sampling frame was followed, and Presidents were made to send the questionnaire in their respective group chats online for students to fill out the form until the required number of applicants was received.

The sample was stratified by grade level, 20 students from each grade (9 to A2) filled the sample from five different schools in Lahore. However, in some cases, schools that did not have a respective A-level or O-level program were only asked to ensure students who fell into the respective grade filled the survey.

To address the issue of a low response rate, I sent frequent reminders to the individuals who accessed the sample, and also provided my email address and phone number so that respondents could contact me. Respondents were asked for consent to include the data gathered in the research.

3.2.1 Sample Composition

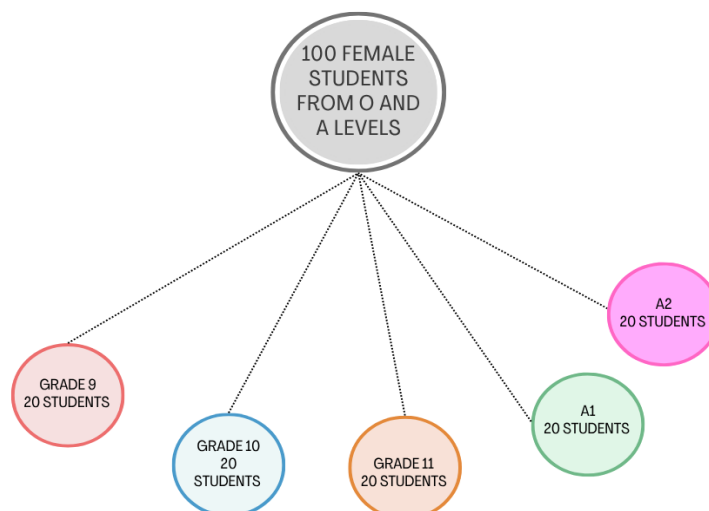


Figure 1. Sample Composition

3.3 Qualitative Data

To gather rich, contextual insight into the perspective of the students, I also conducted unstructured interviews. Respondents were put at ease to ensure a relaxed, comfortable environment.

3.3.1 Sample Composition

10 female students were questioned for interviews, and no strict sample was followed. The participants of the online questionnaire were asked to volunteer for the interviews until the sample of 10 students was reached.

A small sample size was kept to focus more on the respondents' perspectives and provide deeper discussion. The aim was not to generalize patterns. This was done with the questionnaire. All information was kept confidential, and participants were asked for their consent before the interviews were conducted.

Both samples had students from similar socio-economic status and mostly had access to a higher education and could afford tuition and extra help.

4. RESULTS AND DISCUSSION

4.1 Quantitative Data

The survey distributed among students was composed of a series of questions that have been detailed below as tables with each heading featuring the question asked.

Table 1. STEM Major to be pursued

| Informed Consent | Informed Consent | Informed Consent | Informed Consent | Informed Consent |
|------------------|------------------|------------------|------------------|------------------|
| 37% | 0% | 8% | 36% | 13% |

Table 2. Residential Area

| Urban | Rural | Semi |
|-------|-------|------|
| 87% | 0% | 13% |

Table 3. Who Makes your Educational Decisions?

| Father | Mother | Both Equally | I myself | Me and My Parents |
|--------|--------|--------------|----------|-------------------|
| 3% | 8% | 27% | 31% | 26% |

Table 4. Do Your Parents Work?

| Both | Father | s | Neither |
|------|--------|----|---------|
| 29% | 65% | 5% | 0% |

Table 5. Do your Parents Encourage you to pursue your Academic Goals?

| Strongly Agree | Agree | Sometimes | Disagree | Strongly Disagree |
|----------------|-------|-----------|----------|-------------------|
| 54% | 28% | 14% | 4% | 0% |

Table 6. Are your Parents Supportive of your Interests in Stem Fields?

| Yes | No | It Depends |
|-----|----|------------|
| 81% | 3% | 17% |

Table 7. Have your Parents Discouraged you from Choosing a Certain STEM Subject?

| Yes | No |
|-----|-----|
| 21% | 79% |

Table 8. Do Your Family's Financial Resources Affect Your Ability to Pursue STEM Education?

| Yes | No | Not Sure |
|-----|-----|----------|
| 18% | 54% | 28% |

Table 9. Have you ever Been Told STEM Fields are "Not Suitable for Girls?"

| Yes | No |
|------------|-----------|
| 15% | 85% |

Table 10. Do your Parents Prioritize Education for your Brothers Over you?

| Yes | No | Not Applicable |
|------------|-----------|-----------------------|
| 10% | 63% | 26% |

Table 11. Do you believe your Academic Performance would improve with more Support from your Family?

| Yes | No |
|------------|-----------|
| 53% | 47% |

Table 12. Have your Parents Spent Money on Extra Resources like Tuition or Buying Notes to help you with your STEM Education

| Yes | No |
|------------|-----------|
| 88% | 12% |

Table 13. Do your Parents Encourage you to pursue a Career?

| Yes | No |
|------------|-----------|
| 90% | 10% |

Table 14. Do your Parents Encourage you to Become Independent? Do they help you Make Decisions Yourself?

| Yes | No |
|------------|-----------|
| 77% | 23% |

Table 15. Who is more Supportive Comparatively to your STEM Education?

| Father | Mother | Neither | Both |
|---------------|---------------|----------------|-------------|
| 24% | 17% | 4% | 47% |

Table 16. Do your Parents Actively Engage with your Teachers at School Activities Like Ptc's? (Parent-Teacher Conference)

| Yes | No | It Depends |
|------------|-----------|-------------------|
| 42% | 12% | 45% |

Table 17. Do you believe Medicinal Careers are the "Best" for Girls?

| Yes | No |
|------------|-----------|
| 15% | 85% |

Table 18. Do your Parents Believe in the "Doctor for a Girl, Engineering for a Boy" Stereotype?

| Yes | No |
|------------|-----------|
| 13% | 87% |

Table 19. Did your Mother Pursue a STEM Career? (If Applicable)

| Yes | No | Not Applicable |
|------------|-----------|-----------------------|
| 27% | 67% | 5% |

Table 20. Would You Feel Comfortable Working in A Male Dominated Environment?

| Yes | No |
|-----|-----|
| 59% | 41% |

Table 21. Do you take Inspiration from Successful STEM Oriented Females who have made their Mark?
(Eg Arfa Karim)

| Yes | No | Never Thought About It |
|-----|----|------------------------|
| 69% | 3% | 28% |

4.2 Qualitative Data

Results of informal discussions with respondents have been organized into thematic sections as detailed below. In addition, follow-up questions were repeatedly asked to provide further detail into aspects explored and have all been detailed in the 'Other Notes (5.2.13)' section. The sample, consisting of 10 girls between the ages of 14 to 18, was diverse with varying interests from Computer Science to Environmental Engineering.

4.2.1 Academic Journey and Reasons for Choosing Current Field

One reflected, "Forever, I wanted to be a doctor, and for that, I had to take sciences in school. But due to the shift in the world, Computer Science is a demanding field, so I shifted my interests." For others, personal passion remained constant, like a participant who said, "I want to pursue medicine, and I'm doing courses online to help me. The recent pandemics inspired my interest in diseases and vaccines." Parental support also played a key role, as one shared, "I've always been interested in IT, and my parents support what I do." Yet, not all had the freedom to choose. "All of South Asia believes women should just take Biology. I wasn't given a choice in my subjects." Another noted how school limitations affected her path: "My school didn't offer that many subjects. I was very adamant about pursuing engineering."

4.2.2 Family's Reaction to STEM Pursuit

Some found encouragement, like the participant who said, "My parents have never been negative towards what I do. They want me to have a stable career." Family backgrounds in STEM were influential too: "My father has a CS degree, and I got my initial interest from him." Meanwhile, for others cultural expectations played a crucial role. One participant shared, "It's something they wouldn't envision their daughter doing, but they say go for it." Parental opinions often diverged: "My mother wanted me to be in Medicine, but my father was more encouraging to take CS." In some cases, science was seen as obligatory: "Not taking science would have been on my weak personality. I'm just saving myself from my parents' titles."

4.2.3 Challenges Faced at Home

One student mentioned that, "My parents constantly remind me that I need to pursue a good career with a high salary as it is important." For others, gender stereotypes in STEM was a hindrance: "CS is very male-dominated, so my parents didn't like it. Few cultural reasons too were there" Family support varied, as some faced indifference: "It is true my family is not accepting. They haven't done anything." Minor discouragements appeared through casual remarks, such as, "My mother jokingly taunts me. She says cooking will run a house." In contrast, others were reassured by trust and pride from their families: "My parents trust me a lot. They were proud of me." Yet the fear of failure remained, with one participant stating, "When you fail, it's hideous. You are taunted and excluded."

4.2.4 Influence of Traditional Factors like Marriage and Household Duties on Current Studies

Some faced subtle reminders, as one shared, "My parents want me to balance studies and household chores. Few times they say I should go and cook but they don't really force me." For others, household duties were deprioritized: "If I'm studying or busy, my parents go out of their way to make sure nothing gets in my way." However, cultural ideals persisted in some households: "Taking Medicine, families

make it feel like a gold standard. You'll get a good reputation, good marriage ties." Despite this, some participants expressed strong personal boundaries, "I don't like to do any cooking or household stuff. I want to study and go abroad."

4.2.5 Thoughts on Subject Choices

One participant reflected, "I was discouraged from taking Arts subjects, so I took Sciences. But I'm happy with what I take right now." Others were steered by economic reasoning, "Computer Science has more money than the humanities." The disregard for newer or unconventional subjects was evident: "I was discouraged from taking global perspectives because it has no money and no value." However, a few had freedom in choice, as shared, "My parents just say do what you want."

4.2.6 Family Support that would Help Girls More

One remarked, "It starts from emotional support. If you have the money but not the support, it's useless." Others emphasized practical support, "Maybe a personal tutor. Our school does not have a robotics tutor." Financial prioritization of sons was also mentioned: "Parents only focus on their son's education." For rural areas, mindset change was crucial: "Mindset in rural areas needs to change." The importance of allowing room for failure was highlighted, "Parents need to realize there needs to be room for failure."

4.2.7 Aspects on which My Career Will Focus

One expressed, "My career will focus on my passion." Another noted, "I want to be financially independent, but I also want to give back to my parents and community." Social impact was a common goal: "I want to be a teacher and impact society." Others aspired to uplift women: "I want to give back to women as well."

4.2.8 Solution to the Gender Disparity

One said, "Girls outdo themselves, but if a greater percentage of them do, it will be a source of inspiration for others." The lack of education access in rural areas was a significant concern: "There are so many women out there, especially in rural areas with no access to education." Educated mothers were seen as important: "Mothers who are educated know how to take a stand for their daughters." Financial support like scholarships were also thought about: "Scholarships, fair scholarships."

4.2.9 What Defines "Success" for a Girl

For some, it meant traditional milestones: "For my family, it's that you get a good-paying job and by 27, you are married." Academic excellence was also emphasized: "Get a stars and a good SAT score. Get into a good university like LUMS." Independence and societal contribution were personal measures of success: "Success would be gaining independence and giving back to your parents." A participant summed up, "Women who work are more reality-grounded than those who stay at home."

4.2.10 Thoughts on Empowering Campaigns

Some participants expressed strong support: "Yeah, women should fight for their rights in any way they can." Others felt the message gets lost in extreme expression: "The way they express their slogans suppresses the real message and the real woman in pain." A few voiced skepticism, "It's not necessarily a good thing. My father believes rather than going out, we should accept peacefully at home." Yet, there was acknowledgment of the need for awareness: "Women's rights in Pakistan are just a paper practice, there needs to be more solid steps."

4.2.11 Thoughts on Cultural Expectations

One participant shared, "In Pakistan, they say you should be married by 25, be white and fair, skinny, and I don't think this is going to end." The imposition of hijab and lack of choice was also criticized: "Islamic scholars don't explain why we have to wear a hijab; they forcefully push it on you." Participants noted how societal norms pigeonhole women: "Pakistan thinks: Do labor, get married, get a degree, and don't talk about it. Be an educated housewife." The root of these issues was seen as a deep-seated mindset:

“Male toxicity is promoted a lot, and this mindset encourages thoughts like women should be less dominant.”

4.2.12 Had Family Support not existed

One said, “Even if my family didn’t support me, I would still try to do what I want.” Another reflected, “I am where I am because of my parents. They give me space; without it, I could not have done anything.” Some expressed a determination to rebel if needed, “Yeah, I would show them previous women in STEM and rebel.” However, the emotional impact of parental expectations was also noted: “My family has a lot of expectations. Even if something is better than the rest of the class, they would not think that, and I might be a disappointment.”

4.2.13 Other Notes

For many, familial expectations hovered in the background, often subtle yet persistent. One participant remarked, “My parents would love for me to be a doctor, but they would never force me to become one.” Yet, this lack of overt forcefulness did not necessarily translate into freedom, as another participant candidly expressed, “I’m kind of guilt-tripped into taking a career. Like they don’t force me, but they do at the same time.”

The gender dynamics within STEM fields were a recurring point of frustration. A participant shared, “STEM is male-dominated in Pakistan, and it’s annoying. In a competition, if I have another female in the room, I feel more comfortable. They look down on you and make you doubt yourself. I prefer venting about this to my friends.” The disparity between urban opportunities and rural deprivation was starkly highlighted: “it’s crazy how hard life is for women in villages. Women are not even offered the basic education.” Favoritism in educational institutions also discouraged many: “We live in a society where there’s plenty of favoritism.”

The subject of co-education sparked varied sentiments. One participant observed, “Co-education is such a big issue in our society. People aren’t willing to accept it.” The perception of women in STEM as anomalies further alienated female students: “Women in STEM are made to feel that they are an exception, it’s not normal.” Academic choices were often dictated by economic viability rather than passion, with one participant lamenting, “There is a truth that humanities is getting unpopular and doesn’t have money for the job. It’s based on perception.”

Some participants advocated for gradual change: “In a society like Pakistan, change should start slow.” The stigma attached to even traditional paths like early marriage was also highlighted: “Even if someone wants to take a traditional path and get married early, it also has such a social stigma attached to it.” Institutional limitations such as unavailability of desired subject combinations posed further challenges: “My school didn’t offer the subject combo I wanted.” Safe academic spaces were important to some: “I feel more comfortable in an all-girls school.”

As one put it, “Your parents’ choices do matter, but at the end of the day, it’s your choices.” The feeling of invisibility within educational institutions was echoed in statements like, “Average people are not in any books of the teachers, good or bad. They might be good to me, but behind me, I’m just a dumb student”.

4.3 Discussion

While the existing literature review suggests that strong patriarchal influences and cultural constraints exist, the results of this study demonstrate that these factors are not as important now as they once might have been. Instead, the data I gathered seems to suggest that families are now moving forward from traditional views to becoming more expecting towards their daughters’ choices. However, as shown by the proportion of students from different residential areas in [Table 2](#), it is important to note that interviews and the survey were conducted among schools with students who had the financial means to pursue further education and constituted what is [\[23\]](#) called the “middle class”. Thus, the results highlight a significant change of attitude among this class and the rise of more aware progressive middle-class parents who do not apply unfair prejudices to their daughters.

4.4 Quantitative Data

Table 1 to Table 21 show a complete reversal of the situation portrayed by the existing literature available.

4.4.1 Decision-Making and Autonomy

A significant portion of the respondents (especially from senior grades like A1 and A2) indicated that they themselves or they and their parents collectively make educational decisions Table 3. This suggests a gradual shift towards increased autonomy for female students, contrasting with prevailing narratives of male-dominated decision-making in the household. What is important to note was that a high percentage of participants indicated that their parents supported their views. As shown in Figure 2 and Table 1, a major portion of girls wanted to pursue Computer Science as their major. Table 7 indicates that parents allowed their daughters to choose their subjects themselves and a large majority reported as having never been discouraged from taking a particular subject.

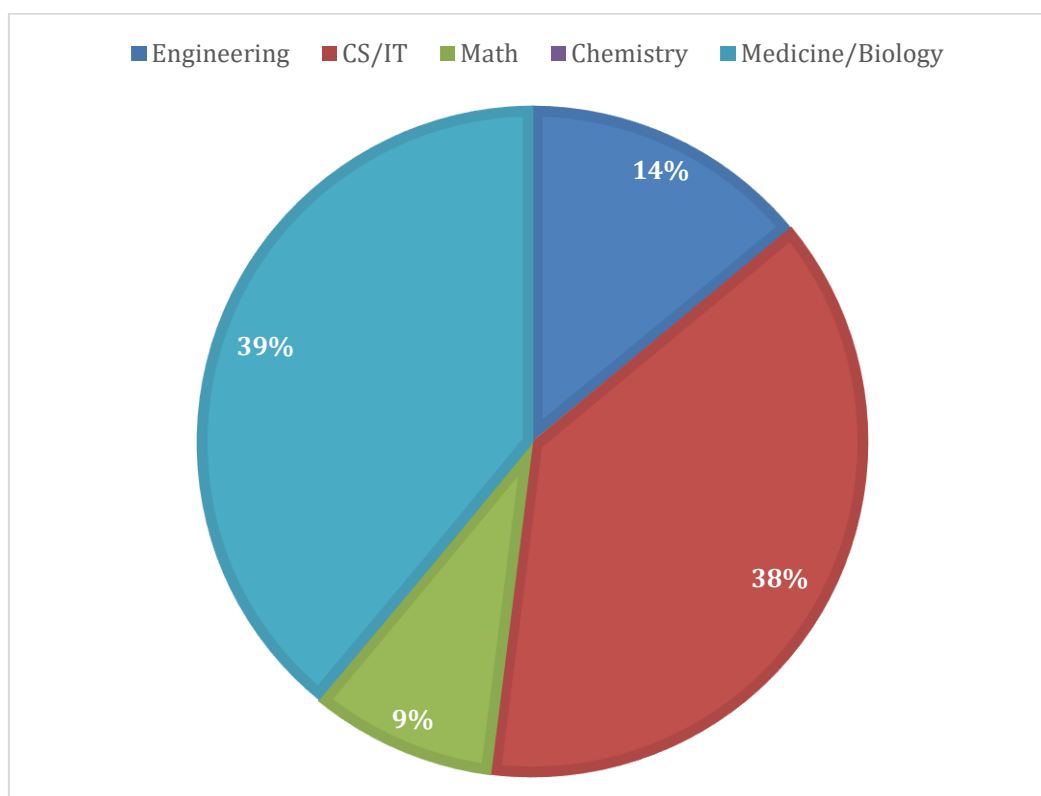


Figure 2. Preferred STEM Majors among Respondents

4.4.2 Parental Encouragement and Support

Most participants reported that their parents encourage them to pursue academic goals and STEM interests Table 5, with the level of support increasing as the girls progressed to higher classes. The perception of STEM fields being "unsuitable for girls" was negated by the respondents Table 6. Similarly, very few girls reported that their parents prioritize education for their brothers over them Table 10, which directly contradicts common assumptions in existing literature that male education is often prioritized in Pakistani families. As shown in Figure 3, a high number of parents supported their girls in their career choices. However as shown in Table 4, it was mostly the fathers who were primarily responsible for income.

Table 9 indicates that despite the prevalent stereotype of girls not being suitable for STEM fields, only 85% had ever been told so. 90% of the girls also stated that their parents encouraged them to be independent and pursue a career Table 13. As shown in Table 15, there was little disparity among parents when it came to support. Table 7 indicates that 79% of the parents did not discourage their daughters from choosing a subject of their choice.

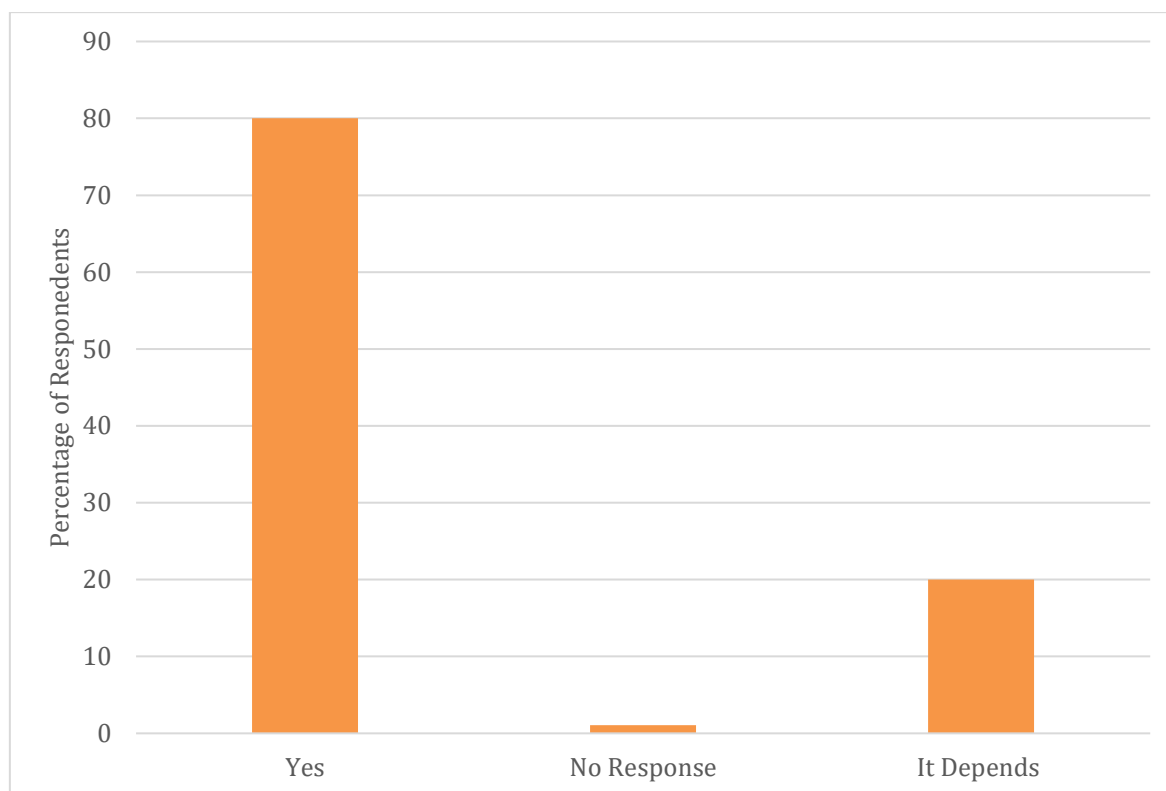


Figure 3. Parental Support for STEM Interests

4.4.3 Financial Constraints and Resource Allocation

While financial resources were not frequently cited as a limiting factor for pursuing STEM education Table 8, some students acknowledged that their families have invested in extra academic resources such as tuition and study materials Table 12. This indicates that for many families, investing in daughters' STEM education is a priority. It also points to a level of privilege within the surveyed group, as many respondents are from urban areas where access to resources is relatively better Table 2. 53% of the girls stated that they could benefit from more support from their family thus highlighting its importance Table 11.

4.4.4 Parental Stereotypes and Career Expectations

Interestingly, responses reflect a decline in rigid gendered stereotypes like "Doctor for a girl, Engineer for a boy" that is one of the most commonly held beliefs in Pakistan Table 18. Most students reported that their parents do not enforce this belief. However, many girls were seen still choosing medicine as their career which may either reflect their personal choices or them aligning themselves to a "safe" career for female future Table 1 and Table 17. Conversely, there is a rise in interest in Computer Science and IT, especially among students who make independent decisions, suggesting an emerging trend of girls exploring STEM fields that were once considered highly male-dominated Figure 2. However, it is important to note that 67% of mothers had not pursued a STEM education themselves Table 19.

4.4.5 Independence, Engagement, and Role Models

Unlike the popular myth of parents enforcing greater control over girls, many participants reported that their parents encouraged them to make independent choices Table 14. However, parental participation in school activities remained unpredictable and could not be surmised as high or low Table 16. Additionally, a relatively high number of girls saw role models like Arfa Karim inspirational Table 21, but many mentioned they had "never thought about it," which may either indicate a gap in exposure but is not the main conclusion.

4.4.6 Comfort in Male-Dominated Spaces

The majority of respondents expressed their confidence in working within male-dominated environments Table 20, thus showing a rising positive attitude in perceptions.

4.4.7 Contradictions to Existing Literature

The data challenges the overly generalized portrayal of Pakistani families as patriarchal towards girls in STEM. The findings underscore the importance of considering socio-economic background, and the fact that many families may have become more accepting of their daughters' choices (see Table 1–21).

4.5 Qualitative Data

4.5.1 Family Support

The interviews further supported the assertion put forth by the survey that families have become more tolerant towards female education and independence. A common observation was that it was the father who encouraged their daughters to pursue STEM fields, while mothers felt that the field of Medicine, often commonly associated with girls, was better for their daughters.

4.5.2 The Role of Emotional and Financial Support

Girls frequently supported the view that emotional support played a much greater role in shaping their educational paths than financial. This not only contrasts with the literature review. Many girls also voiced their encouragement of more female role models.

4.5.3 Parental Expectations

In line with the literature, some respondents did experience pressure to conform to traditional career paths, such as Medicine. Despite this, there was a good number of students who reported that their parents encouraged them to make individual choices. Some girls cited that their fathers encouraged them towards traditionally unacceptable paths like Computer Science.

4.5.4 The Role of Society

This factor was not present in most of the answers. Parents did not put any pressures on their daughters when it came to marriage or traditional roles of cooking and cleaning. Rather, most girls cited that their parents let them focus on their education only.

4.5.5 Changing Attitudes Towards

Many were clear on the path they wanted to take ahead. Careers were supported by their parents and only a few mentioned hindrances like the pressure to choose their parent's desired career path.

4.5.6 The importance of Role Models

Respondents whose mothers had pursued a STEM education themselves reported a higher score on whether or not they were allowed to take independent career choices. They also cited that they looked up to the role models around them as inspiration.

5. CONCLUSION

The research conducted shows that while some patriarchal norms and cultural expectations might exist, there is a significant and growing set of families, particularly within the urban middle class, who are seen supporting their daughters'. They show certain parents, especially fathers, taking grounding steps towards helping their daughters achieve.

Acknowledgements

Thank you to my mentors, Ms Rabiya Muneer and Ms Fareeha Faisal, for helping me edit and perfect this manuscript and ensuring all content is accurate and coherent.

Funding Information

This study did not receive any funding.

Author Contributions Statement

| Name of Author | C | M | So | Va | Fo | I | R | D | O | E | Vi | Su | P | Fu |
|----------------|---|---|----|----|----|---|---|---|---|---|----|----|---|----|
| Urwah Nauman | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

Conflict of Interest Statement

Although all appropriate measures have been taken to ensure data collection is accurate and reflects the wider population of Pakistani girls, the author will be happy to provide detailed insights into the result. Note that, data was collected with an unbiased mind. No previously pre-held notions were kept but the literature review was kept part of the discussion.

Informed Consent

All participants were informed about the purpose of the study, and their voluntary consent was obtained prior to data collection.

Ethical Approval

Consent was taken from all participants both verbally and online. Surveys were only taken by girls who were made aware of the fact that their data would be used as part of the statistics. Interviewees were asked for consent before any discussion was allowed to take place. Participants answered questions as they willed, questions were allowed to be left unanswered.

Data Availability

All data is available at contact: urwahnauman1010@gmail.com


REFERENCES

- [1] S. Kahn and D. Ginther, 'Women and STEM', National Bureau of Economic Research, Cambridge, MA, June 2017. doi.org/10.3386/w23525
- [2] M. A. Beg, 'A review of labour force participation rates in Pakistan', Pak. Dev. Rev., vol. 12, no. 4, pp. 393-406, Dec. 1973. doi.org/10.30541/v12i4pp393-406
- [3] L. Ferguson and S. Harman, 'Gender and infrastructure in the world Bank', Dev. Policy Rev., vol. 33, no. 5, pp. 653-671, Sept. 2015. doi.org/10.1111/dpr.12128
- [4] F. Rizvi, T. Hussain, and D. Walsh, 'Finding the right Balance-Improving the gender profile of the British Council in Pakistan', South Asian Journal of Human Resources Management, vol. 2, no. 1, pp. 85-99, June 2015. doi.org/10.1177/2322093715576162
- [5] S. Tul Hasan, S. Bano, M. Imran, S. Ahmad, and A. Ayyub, 'Dual impact of family structure and parental beliefs on educational access for girls', J. Asian Dev. Studies, vol. 14, no. 1, pp. 101-116, Jan. 2025. doi.org/10.62345/jads.2025.14.1.7
- [6] D. Tullio, 'Gender Equality in STEM: Exploring Self-Efficacy Through Gender Awareness', Italian Journal of Sociology of Education, vol. 11, no. 3, pp. 226-245, 2019. <https://doi.org/10.14658/PUPJ-IJSE-2019-3-13>
- [7] A. Ullah, 'Impact of parental involvement on academic performance of student at secondary level in Quetta district', plhr, vol. 6, no. II, June 2022. [doi.org/10.47205/plhr.2022\(6-II\)65](https://doi.org/10.47205/plhr.2022(6-II)65)

- [8] K. Voigt and M. Spies, 'Female education and social change: Changing perceptions of women's roles in society in the high mountains of northern Pakistan', *Mt. Res. Dev.*, vol. 40, no. 4, Nov. 2020. doi.org/10.1659/MRD-JOURNAL-D-20-00028.1
- [9] Pigart, C Jynx et al. "STEM, gender, and mental health: Understanding depression and anxiety in a national undergraduate sample." *PLOS mental health* vol. 2,8 e0000364. 26 Aug. 2025. <https://doi.org/10.1371/journal.pmen.0000364>
- [10] T. A. Mujtaba, S. Lashari, M. A. Anwar Lashari, K. Khan Khattak, and M. Mujtaba, 'Determining the Effect of Social and Academic Support on STEM Confidence and Learning Environment Among Female Engineering Students in Pakistan', *jtet*, vol. 15, no. 2, pp. 50-60, June 2023. doi.org/10.30880/jtet.2023.15.02.005
- [11] J. Eccles, 'Gendered educational and occupational choices: Applying the Eccles et al. model of achievement-related choices', *Int. J. Behav. Dev.*, vol. 35, no. 3, pp. 195-201, May 2011. doi.org/10.1177/0165025411398185
- [12] P. J. Hartung, E. J. Porfeli, and F. W. Vondracek, 'Child vocational development: A review and reconsideration', *J. Vocational Behavior*, vol. 66, pp. 385-419, 2005. doi.org/10.1016/j.jvb.2004.05.006
- [13] H. Blackburn, 'The status of women in STEM in higher education: A review of the literature 2007-2017', *Sci. Technol. Libr. (N. Y. NY)*, vol. 36, no. 3, pp. 235-273, July 2017. doi.org/10.1080/0194262X.2017.1371658
- [14] M. Shoaib, R. Ahmed, and F. Usmani, 'Feminization in STEM fields in higher education in Pakistan: A case of female acceptability and resistance', *Social Science Review Archives*, vol. 3, no. 3, pp. 646-660, July 2025. doi.org/10.70670/sra.v3i3.899
- [15] F. Iqbal, 'Backlash and challenges faced by Pakistani women who harbor interest in STEM education', *Ittesaal - Journal of Connecting Discourses*, pp. 23-40, Oct. 2025. doi.org/10.64984/ijcd.1.2.2024.02
- [16] 'Exploring the factors influencing gender disparity in STEM education: A comprehensive analysis of societal, cultural, and economic impact', *Pak. Soc. Sci. Rev.*, vol. 7, no. IV, Dec. 2023. [doi.org/10.35484/pssr.2023\(7-IV\)15](https://doi.org/10.35484/pssr.2023(7-IV)15)
- [17] A. Qamar and A. F. Hasnain, 'Country report for Pakistan', in *WOMEN IN PHYSICS: 6th IUPAP International Conference on Women in Physics*, Birmingham, UK, 2019. doi.org/10.1063/1.5110104
- [18] B. Rich, *Mortgaging the earth*. London, England: Routledge, 2014. doi.org/10.4324/9781315070544
- [19] M. A. Shaikh, Z. H. Sahito, and M. A. Dehraj, 'Stem education: Social, cultural, and economic barriers faced by women of Khairpur (Pakistan)', *Global Regional Review*, vol. IV, no. II, pp. 392-403, June 2019. [doi.org/10.31703/grr.2019\(IV-II\).42](https://doi.org/10.31703/grr.2019(IV-II).42)
- [20] H. U. Ullah and S. Nawab, 'Factors Influencing Women's Preferences for STEM Professions: A Case Study of the University of Peshawar', *QJSSH*, vol. 5, pp. 184-193, June 2024. doi.org/10.55737/qjssh.767391422
- [21] A. Bhatti and R. Ali, 'Gender, culture and leadership: Learning from the experiences of women academics in Pakistani universities', *J. Educ. Soc. Sci.*, vol. 8, no. 2, pp. 16-32, Oct. 2020. doi.org/10.20547/jess0822008202
- [22] N. Khokhar, 'Women academic leaders in higher education in Pakistan', *Humanities Commons*, vol. 25, no. 2, pp. 59-76, 2018. doi.org/10.46521/pjws.025.02.0046
- [23] 'Urban space and (the limits of) middle class hegemony in Pakistan', *Urban Geography*, vol. 39, no. 7, pp. 1113-1120, 2018. doi.org/10.1080/02723638.2018.1439555

How to Cite: Urwah Nauman. (2026). Impact of familial support on a high school female student's academic journey in stem disciplines in lahore, pakistan. *Journal of Women Empowerment and Studies (JWES)*, 6(1), 1-14. <https://doi.org/10.55529/jwes.61.1.14>

BIOGRAPHIE OF AUTHOR

Urwah Nauman , As a passionate student of STEM research, I decided to conduct a one on research paper to uncover truths behind family dynamics for girls in Pakistan. Acutely aware of the importance of familial support and the lack of research on this topic, I sought to correct the issue by producing a document that honestly highlights the niche aspects of this field. Email: urwahnauman1010@gmail.com