

Education and Inequality: Understanding Variations and Regional Dropout Trends in India's Secondary Schools

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Abstract

The study investigates the regional variations in secondary school dropout rates across India, examining temporal trends and their implications for educational policy. Secondary education, pivotal for intellectual and vocational growth, is hindered by significant dropout rates influenced by socio-economic, cultural, and infrastructural factors. Using Unified District Information System for Education (UDISE) data from 2012–2020 and statistical tools like ANOVA, the study analyzes variations of dropout rates in six regions of India. Results highlight distinct and significant regional trends and variations. Northern and Northeastern regions show fluctuating trends, while Central and East regions reveal significant increases before tapering. The findings underscore the necessity for region-specific interventions and policy measures addressing local challenges. By identifying trends and variations, this study offers insights for targeted solutions to promote inclusive and equitable access to education, ultimately fostering social stability and sustainable economic growth.

Keywords: Dropout Rate, Regional Variation, UDISE, India

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Introduction

High dropout rates at the secondary education level in India remain a significant obstacle to achieving universal education (Garg et al., 2024). Secondary education is a pivotal stage in shaping students' intellectual development, vocational skills, and social integration, equipping them for higher education and improving their employability (Kayyali, 2024). However, a substantial number of students abandon their education at this critical stage, leading to profound consequences for individuals and society. The causes of school dropouts are multifaceted and vary across regions, influenced by socio-economic, cultural, and infrastructural factors (Venkatesan et al., 2024). Dropping out often results in reduced economic opportunities, social exclusion, and an increased likelihood of engaging in detrimental behaviours such as substance abuse or criminal activities (Saladino et al., 2021). These individuals also face lower earning potential and higher unemployment rates, perpetuating cycles of poverty and inequality.

High dropout rates also burden public resources, as dropouts are more likely to rely on government welfare programs, healthcare services, and social safety nets (Sharma et al., 2021) which started in 2016, aims to achieve universal health coverage (UHC). This perpetuates economic disparities and hampers national development by limiting the country's ability to fully utilize its human capital (Aijaz et al., 2024) specifically how it affects employability, skills, and economic growth, may enhance the development of human capital within the framework of Pakistan's educational system. This research critically examines the economics of education in Pakistan by addressing significant research issues. It examines the financial barriers to education, focusing on issues including financial inequality and procedural hurdles. The research examines how initiatives for curriculum reform and teacher training help educational institutions support human capital development. It also examines the effects of online education, demonstrating its ability to close knowledge gaps and improve digital literacy. Despite obstacles like the digital divide, this research emphasizes the significance of strategic measures to guarantee equal access to high-quality education and build a trained, flexible workforce essential for Pakistan's socio-economic

success. However, implement evidence-based policies to enhance the management of education. Research in the future should concentrate on inventive financing approaches and reliable data. Education is a key driver of social mobility, and high dropout rates undermine this mechanism, adversely affecting productivity and global competitiveness (Valencia Quecano et al., 2024).

The background of this issue highlights India's vast geographical and cultural diversity, which presents unique challenges in addressing dropout rates. The country comprises 28 states and 8 union territories, each with distinct socio-economic profiles, demographic characteristics, and educational infrastructures. While affluent states in the South exhibit relatively lower dropout rates, economically disadvantaged regions, such as the North-East, face persistent challenges due to poor infrastructure, socio-cultural barriers, and limited parental education. These disparities emphasize the need for a region-specific approach to effectively address dropout rates.

Despite extensive research on school dropouts in India, significant gaps remain. Existing studies predominantly rely on cross-sectional data, which provide snapshots of dropout rates but fail to capture their dynamic and evolving nature. Furthermore, while much is known about general causes—such as poverty, inadequate infrastructure, and socio-cultural factors—the regional variations and long-term trends in dropout rates are underexplored. This gap in the literature necessitates a comprehensive analysis that considers both temporal and spatial dimensions to uncover region-specific determinants and patterns.

This study aims to address these gaps by leveraging time-series data from the Unified District Information System for Education (UDISE), which offers longitudinal insights into school enrollment and dropout trends across India.

Understanding regional disparities is crucial for designing effective and equitable educational policies. By uncovering the root causes of dropout rates in different regions, this study informs resource allocation strategies and supports the development of tailored interventions. For instance, improving school infrastructure in remote areas, addressing socio-cultural barriers, and enhancing parental awareness could significantly reduce dropout rates.

Moreover, addressing this issue has broader societal implications, as reducing dropout rates fosters social stability, enhances economic growth, and alleviates public healthcare burdens. Education is strongly linked to better health outcomes and increased civic engagement, making it a cornerstone for national progress.

Reducing school dropout rates is not merely about improving educational outcomes; it is about building a more inclusive and equitable society. By bridging regional disparities and fostering educational equity, this study contributes to India's broader goals of social cohesion, economic development, and global competitiveness. Through this research, India can take meaningful strides toward achieving universal secondary education and ensuring a brighter future for all its citizens.

Literature Review

The issue of school dropouts in India and other developing nations has been the subject of extensive research, uncovering a wide array of factors contributing to the phenomenon. Garg et al. (2024) utilized a Cox proportional hazard model to analyse data from the 75th NSSO round, finding that 74% of individuals aged 18 and above dropped out before completing 12th grade. Key contributors included geographic, economic, and institutional disparities, with lack of interest, financial constraints, and distance to school being critical factors. Similarly, Goel and Husain (2018) focused on gender-specific enrollment and dropout rates, emphasizing the challenges faced by girl students. Sajjad et al. (2022) we present important insights and references for educational interventions/investments to be tailored to local necessities in Pakistan. Several spatial statistical models such as the Global Moran's I-based spatial autocorrelation, multivariate clustering, and the Cluster and Outlier model are used to explore geographic heterogeneities and patterns. Additionally, significant determinants among several socio-economic, spatio-environmental, and infrastructural variables are identified for education status (EdS highlighted the role of socioeconomic variables, noting that parental education and wealth significantly impact dropout rates, with girls being disproportionately affected. Tiwari (2021) examined marginalized youth in Delhi's slums,

identifying poverty, inadequate educational support, and family-related issues as primary reasons for dropouts. Sridevi and Nagpal (2020) extended this by highlighting systemic factors such as child marriage, safety concerns, and inadequate school facilities, offering policy recommendations to improve school culture and provide basic amenities. Rasmy et al. (2017) social and school on student dropout but these factors were examined in a separate fashion and primarily focussed in rural villages. This study aims to develop a comprehensive framework of social environmental determinants of student dropout in secondary school in the the plantation settlement which is understudied. These determinants play a critical role in identifying the measures or interventions that will enhance a child's education. The role of these institutions in the social environment and its influence on student dropout is examined in general and amongst the secondary school students in the plantation settlement in particular. The findings reveal that although family factors contribute predominantly to student dropout as shown in conventional literature, school and social variables appear to be equally important and emerging determinants as well. Mahalanabis and Acharya (2010) connected dropout causes to broader developmental goals, emphasizing the role of community-wide efforts in tackling educational disparities. Regional studies further underline the complexity of the issue. Mishra and Chatterjee (2017) introduced the Index of Susceptibility of School Drop Out (ISDO) to assess risk variations, while Kamal and Illiyan (2023) revealed narrowing rural-urban gaps in dropout rates between 2007-08 and 2017-18. Gender dynamics also remain central, as Maina et al. (2020) reported financial constraints, peer pressure, and early pregnancy as significant factors influencing female dropouts. Comparative studies, such as those by Huisman and Smits (2015), showed that school infrastructure and teacher availability influence dropout rates across 30 developing nations. Hoque et al. (2022) underscored the critical role of teacher interventions in reducing dropouts in underprivileged contexts. Taken together, these studies provide a comprehensive understanding of the multifaceted issue of school dropouts, emphasizing the need for targeted interventions that address systemic, social, and individual factors to achieve sustainable educational outcomes.

Methodology

Data source

The study is based on the data sourced from the Unified District Information System for Education (UDISE). UDISE is a comprehensive data collection system that plays a critical role in managing and analysing educational statistics in India. Launched by the Ministry of Education, UDISE is designed to provide accurate, reliable, and up-to-date data that covers various aspects of the education system. The system collects extensive information from schools across the country, including key indicators such as student enrolment figures, teacher qualifications, infrastructure availability, and available resources. These data points are crucial for understanding the status of education in both urban and rural areas. UDISE is updated annually, ensuring that policymakers, researchers, and education planners have access to the most recent data to guide their decision-making processes. The dataset includes a wide range of variables such as the number of students enrolled at different education levels, dropout rates, teacher-student ratios, availability of school facilities (e.g., classrooms, toilets, libraries), and teacher training programs. By compiling this information at the district, state, and national levels, UDISE enables a comprehensive assessment of the country's educational landscape. This data collection system is essential for formulating evidence-based educational policies and strategies. It helps identify areas of concern, such as regions with low enrolment or inadequate infrastructure, and facilitates targeted interventions to address these challenges. Additionally, UDISE plays a significant role in monitoring the implementation of government programs and schemes aimed at improving the quality of education. The insights generated from UDISE data support long-term educational planning and the equitable distribution of resources across different states and districts. Through its regular updates, UDISE ensures that the education sector in India is consistently monitored and improved, contributing to better educational outcomes for students nationwide.

Methods

The data were analysed using graphical and statistical tools such as bar diagrams, descriptive statistics, and the analysis of variance (ANOVA) test.

A bar diagram, also referred to as a bar chart, is an effective visualization tool for displaying data by using bars to represent various categories or groups. The length or height of each bar corresponds to the value or quantity of the category it represents. Typically, the categories are shown on the x-axis, while the y-axis represents the values or frequencies for each category. This straightforward layout makes bar diagrams a useful method for comparing different quantities across various categories, providing a clear and intuitive way to visualize trends and relationships in the data.

Additionally, the analysis of variance (ANOVA) was employed to determine whether there were significant differences between the means of three or more groups. ANOVA tests the null hypothesis that all group means are equal, against the alternative hypothesis that at least one mean is different. By comparing the variance within each group to the variance between groups, ANOVA helps assess whether the observed differences in group means are due to random variation or represent a true effect. This technique is widely used in experiments and observational studies to evaluate the impact of different factors, providing essential insights for drawing meaningful conclusions from the data (Liu & Wang, 2021).

Mathematically, it can be expressed as

$$F = \frac{MS_B}{MS_w} \quad (1)$$

Where:

- $MS_B = \frac{SS_B}{df_B}$ which indicates Mean Square Between
- $MS_w = \frac{SS_w}{df_w}$ which indicates Mean Square Within

- SS_B and SS_W are the sum of squares between and within groups.
- df_B and df_W are the degrees of freedom for between and within groups.

If the F-ratio is significantly high, we reject the null hypothesis, indicating at least one group mean is different.

Result and Discussion

Regional Variation in School Dropout Level

Table 1 provides a detailed overview of regional variations in school dropout rates from 2012 to 2020. Our study analyzed data across six distinct regions: North (Region 1), Central (Region 2), East (Region 3), Northeast (Region 4), West (Region 5), and South (Region 6). The table delineates the regions and their associated states or territories for analysis. The North Region encompasses Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Ladakh, Punjab, Rajasthan, and Uttarakhand. The Central Region includes Chhattisgarh, Madhya Pradesh, and Uttar Pradesh. The East Region covers Bihar, Jharkhand, Odisha, and West Bengal. The North East Region comprises Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Arunachal Pradesh. The West Region includes Goa, Gujarat, and Maharashtra. Lastly, the South Region consists of Andaman & Nicobar, Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Puducherry, Tamil Nadu, and Telangana.

Table 1: Variation in School Dropout across Regions

Year	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	SD	Variance	F statistic
2012	18.24	8.86	11.83	17.52	25.37	14.21	5.77	33.34	1.08***
2013	18.96	20.09	11.60	18.07	29.48	18.07	5.77	33.32	1.50***
2014	18.69	20.08	20.08	16.88	20.90	14.98	2.27	5.145	1.51***
2015	17.57	20.08	22.11	17.29	17.57	17.82	1.94	3.77	1.49***
2016	9.89	23.25	16.54	17.19	23.41	19.97	5.09	25.69	1.54***
2017	19.04	31.21	23.33	13.3	13.21	18.43	6.79	46.17	1.08***
2018	19.07	29.98	20.18	15.01	14.64	17.63	5.62	31.56	1.45***
2019	19.10	28.76	17.02	16.72	16.08	16.82	4.85	23.52	4.34***
2020	16.67	11.47	15.97	15.2	13.66	17.54	2.21	4.89	3.08***

Note: Here *** denotes statistically significant at 1% level.

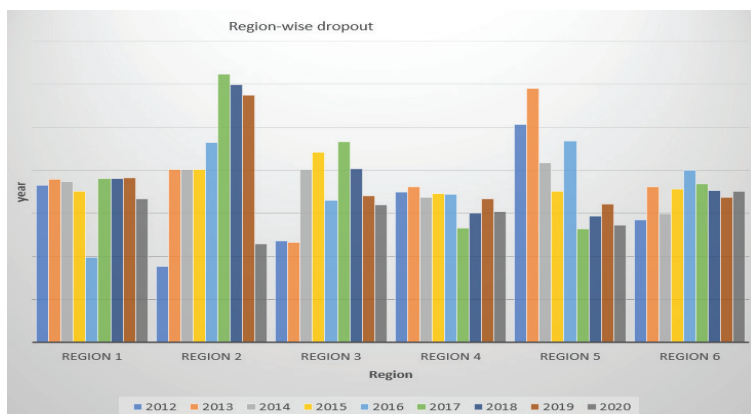
Source: Estimated by Authors based on UDISE data

In order to analyse the variation in school dropouts in India, data has been tested using the technique of ANOVA to find regional variation. In the study, we evaluated regional variations using standard deviation as a measure. In 2012, we found that the deviation from the mean was 5.77. To determine if the variations among regions were statistically significant, we applied an ANOVA test. The F-statistic value for 2012 was 1.08, with a p-value of 0.001, indicating significant variation among the regions. In 2013, the deviation from the mean remained 5.77. The analysis for this year showed an F-statistic of 1.50 and a p-value of 0.000, again indicating significant regional variation. For the years 2014, 2015, and 2016, the regional variations were 5.14, 3.77, and 25.69 respectively. The corresponding F-statistics for these years were 1.51, 1.49, and 1.54, each with a p-value of 0.00, demonstrating that the variations were statistically significant. In 2017, the deviation from the mean increased to 46.16. The F-statistic for this year was 1.08, with a significant p-value of 0.001. For the years 2018, 2019, and 2020, the deviations from the mean were 31.55, 23.52, and 4.89, respectively. The corresponding F-statistics were 1.45, 4.34, and 3.08, with p-values of 0.00, 0.001, and 0.00, respectively. These results indicate that the variations for each of these years were statistically significant. Overall, our study highlights consistent and significant regional variations over the years analysed. The use of standard deviation provided a clear measure of these variations, and the application of the ANOVA test confirmed their statistical significance. This approach allowed us to robustly assess and verify the extent of regional differences year by year.

Trends of School Dropout in India

The trends of dropout rates for six different regions in India from 2012 to 2020 is represented in figure 1. Here, it can be found that Region 1 (North) exhibited a mixed trend over the years. From 2012 to 2013, the dropout rate increased by 0.72 percentage points, followed by a decrease of 0.29 percentage points in 2014. The rate then continued to decline, with a significant drop of 6.98 percentage points between 2015 and 2016. However, this downward trend was interrupted by an increase of 9.15 percentage points in 2017, and the rate remained relatively stable in the following years, with minor fluctuations. By 2020, the dropout rate in region 1 had decreased to 16.67%, a 1.57 percentage point

reduction from 2019. In contrast, Region 2 (Central) experienced a consistent increase in dropout rates from 2012 to 2017, with the rate rising from 8.86% to 31.21%. This represents a significant jump of 22.34 percentage points over the five-year period. However, the trend then reversed, and the dropout rate began to decline, falling by 7.52 percentage points between 2019 and 2020, reaching 11.47%. Region 3 (East) also exhibited an overall increasing trend, though with some fluctuations. The dropout rate decreased slightly from 2012 to 2013 and 2013 to 2014, but then increased by 1.51 percentage points in 2015 and continued to rise, reaching a peak of 23.34% in 2017. Thereafter, the rate began to decline, falling by 2.15 percentage points in 2019 and a further 1.21 percentage points in 2020, ending up at 15.97%. In Region 4 (North-East), the dropout rate showed a generally decreasing trend, with some minor increases. From 2012 to 2013, the rate increased by 0.56 percentage points, but then began a steady decline, falling by a total of 2.31 percentage points from 2013 to 2016. The rate fluctuated slightly in the following years, but by 2020, it had reached 15.2%, a 1.52 percentage point reduction from 2019. Region 5 (West) experienced a more consistent downward trend in dropout rates. After an initial increase of 3.24 percentage points from 2012 to 2013, the rate began to decline, with the most significant drop of 9.16 percentage points occurring between 2016 and 2017. The decreasing trend continued in the subsequent years, and by 2020, the dropout rate had reached 13.66%, a 2.42 percentage point reduction from 2019. Finally, Region 6 (South) exhibited a mixed trend, with both increases and decreases in dropout rates. The rate increased by 3.91 percentage points from 2012 to 2013, followed by a decrease of 0.79 percentage points in 2014. The rate then fluctuated, with some increases and decreases, before reaching 17.54% in 2020, a 0.72 percentage point reduction from 2019. Overall, the data reveals a diverse set of trends across the six regions. While some regions, such as the North-East and West, experienced consistent decreases in dropout rates, others, like the Central and East regions, saw significant increases before eventually reversing course. The varying trends highlight the need for targeted interventions and region-specific strategies to address the unique challenges faced by each area and ensure equitable access to quality education.

Fig 1: Trends of dropout rates of Indian regions

Source: Prepared by author as per UDISE data

Conclusion and Policy Suggestions

The findings of this study highlight the ongoing challenge of high secondary school dropout rates in India, which vary significantly across regions due to socio-economic, infrastructural, and cultural factors. Analysing UDISE data from 2012 to 2020 reveals that economically disadvantaged areas, particularly in the North-East and Central regions, experience higher dropout rates compared to more developed Southern states. These disparities emphasize the need for targeted interventions to bridge the educational gap and ensure equitable access to secondary education. The study further confirms that dropout rates have long-term consequences for both individuals and society, limiting employment opportunities, reducing earning potential, and increasing the risk of social marginalization. At a national level, high dropout rates hinder economic growth, increase dependence on welfare programs, and restrict India's human capital development. Given the regional variations in dropout trends, a uniform policy approach is inadequate, and solutions must be tailored to address the unique challenges of different regions. Addressing the root causes of dropouts will not only improve India's global competitiveness but also enhance social cohesion and contribute to the goal of universal secondary education. The study underscores that reducing dropout rates is not merely an academic policy issue

but a critical step toward achieving sustainable socio-economic development.

To effectively reduce dropout rates and improve secondary education retention, several policy measures must be implemented. Region-specific interventions should address the unique challenges of each area, prioritizing financial incentives and infrastructure improvements in economically weaker states. Strengthening financial support mechanisms, such as expanding scholarships and direct cash transfers linked to school attendance, can help alleviate the economic burden on families. Improving school infrastructure, including classrooms, libraries, sanitation, and transportation, is crucial for enhancing educational access. Additionally, increasing the recruitment and training of qualified teachers, particularly in rural and underdeveloped regions, can improve student engagement and learning outcomes. Socio-cultural barriers must also be addressed through community engagement programs that emphasize the importance of education, particularly for female students, by providing safe transportation and flexible school schedules. Leveraging technology, such as digital learning platforms and mobile-based education programs, can bridge the accessibility gap in remote areas. Schools should implement early intervention strategies using real-time data to identify at-risk students and provide counselling, mentorship, and remedial education support. Integrating vocational training with secondary education can also make schooling more relevant to students' future employment prospects, increasing retention rates. Strengthening collaboration between the government, NGOs, and private sector stakeholders can enhance resource mobilization and policy implementation. Lastly, continuous evaluation of policy effectiveness through data-driven decision-making will ensure that interventions remain relevant and impactful. By adopting these targeted strategies, India can significantly improve secondary education retention, fostering an inclusive and skilled workforce essential for national progress and sustainable development.

References

- Aijaz, U., Lodhi, K. S., Shamim, M. A., & Mughal, S. (2024). Economics of Education and Digital Learning for Human Capital Development in Pakistan: A Critical Review. *Qlantic Journal of Social Sciences*, 5(1), 217–234. <https://doi.org/10.55737/qjss.349367331>
- Garg, M. K., Chowdhury, P., & Sheikh, I. (2024). Determinants of school dropouts in India: A study through survival analysis approach. *Journal of Social and Economic Development*, 26(1), 26–48. <https://doi.org/10.1007/s40847-023-00249-w>
- Goel, S., & Husain, Z. (2018). Gender, caste, and education in India: A cohort-wise study of drop-out from schools. *Research in Social Stratification and Mobility*, 58, 54–68. <https://doi.org/10.1016/j.rssm.2018.10.002>
- Hoque, N., Mahanta, R., & Sarkar, D. (2022). Does free education reduce early school dropouts? Evidence from a legislative reform in India. *Economic Analysis and Policy*, 74, 657–665. <https://doi.org/10.1016/j.eap.2022.03.022>
- Huisman, J., & Smits, J. (2015). Keeping Children in School: Effects of Household and Context Characteristics on School Dropout in 363 Districts of 30 Developing Countries. *SAGE Open*, 5(4), 215824401560966. <https://doi.org/10.1177/2158244015609666>
- Kamal, T., & Illiyan, A. (2023). DROPOUT IN INDIA: AN ANALYSIS OF GENDER AND RURAL-URBAN INEQUALITY BASED ON NATIONAL SAMPLE SURVEY 64th AND 75th ROUNDS. 11(2).
- Kayyali, M. (2024). Career Development in Higher Education: Best Practices and Innovations. In B. Christiansen & A. M. Even (Eds.), *Advances in Higher Education and Professional Development* (pp. 1–19). IGI Global. <https://doi.org/10.4018/979-8-3693-0517-1.ch001>
- K.V. Sridevi, & Nagpal, M. (2020). TRENDS IN SCHOOL DROPOUT RATE IN INDIA. *Researchers' Guild*, 2(1), 2–24. <https://doi.org/10.15503/rg2019.1>
- Liu, Q., & Wang, L. (2021). T-Test and ANOVA for data with ceiling and/or floor effects. *Behavior Research Methods*, 53(1), 264–277. <https://doi.org/10.3758/s13428-020-01407-2>
- Mahalanabis, S., & Acharya, S. (2010). *Socio-Economic Origins of School Dropouts in Rural India*. 1(3).
- Maina, G., Mclean, M., Mcharo, S., Kennedy, M., Djiometio, J., & King, A. (2020). A scoping review of school-based indigenous substance use prevention in preteens (7–13 years). *Substance Abuse Treatment, Prevention, and Policy*, 15(1), 74. <https://doi.org/10.1186/s13011-020-00314-1>

- Mishra, M., & Chatterjee, S. (2017). School dropout susceptibility mapping with fuzzy logic – a study in the District of Purulia, India. *HUMAN GEOGRAPHIES – Journal of Studies and Research in Human Geography*, 11(1), 111–128. <https://doi.org/10.5719/hgeo.2017.111.7>
- Rasmy, M. I., Selvadurai, S., & Sulehan, J. (2017). Social Environmental Determinants Of Student Dropout In The Plantation Settlement. *Geografia-Malaysian Journal of Society and Space*, 13(2), Article 2. <http://ejournal.ukm.my/gmjss/article/view/17858>
- Sajjad, M., Munir, H., Kanwal, S., & Asad Naqvi, S. A. (2022). Spatial inequalities in education status and its determinants in Pakistan: A district-level modelling in the context of sustainable development Goal-4. *Applied Geography*, 140, 102665. <https://doi.org/10.1016/j.apgeog.2022.102665>
- Saladino, V., Mosca, O., Petrucci, F., Hoelzlhammer, L., Lauriola, M., Verrastro, V., & Cabras, C. (2021). The Vicious Cycle: Problematic Family Relations, Substance Abuse, and Crime in Adolescence: A Narrative Review. *Frontiers in Psychology*, 12, 673954. <https://doi.org/10.3389/fpsyg.2021.673954>
- Sharma, P., Yadav, D. K., Shrestha, N., & Ghimire, P. (2021). Dropout Analysis of a National Social Health Insurance Program at Pokhara Metropolitan City, Kaski, Nepal. *International Journal of Health Policy and Management*, 1. <https://doi.org/10.34172/ijhpm.2021.171>
- Tiwari, N. (2021). Problems of Education in Slums of Delhi. *INTERNATIONAL JOURNAL OF EDUCATIONAL SCIENCES*, 32(1–3). <https://doi.org/10.31901/24566322.2021/32.1-3.1164>
- Valencia Quecano, L. I., Guzmán Rincón, A., & Barragán Moreno, S. (2024). Dropout in postgraduate programs: A underexplored phenomenon – a scoping review. *Cogent Education*, 11(1), 2326705. <https://doi.org/10.1080/2331186X.2024.2326705>
- Venkatesan, R. G., Karmegam, D., & Mappillairaju, B. (2024). Exploring determinants of school dropout across regions in India: A comprehensive meta-analysis. *Journal of Computational Social Science*, 7(2), 1665–1697. <https://doi.org/10.1007/s42001-024-00285-4>