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RESEARCH PAPER

Determinants of school dropouts in India: a study through survival analysis approach

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Abstract
The present study aims to study the risk of school dropouts in India using retrospective approach to apply Cox proportional hazard model. Using the 75th round of NSSO data, it is observed that around 74 per cent of population aged 18 years and above have dropped out from school before reaching 12th standard. The survival approach provides strong causal evidence that factors like caste division, wealth quintile, type of institution, and regional difference play a pivotal role in determining school dropouts in India. Further, no interest in education, distance from school, unable to cope up/failure in studies and financial constraint are the major reasons which elevate the risk of school dropouts. Among these reasons, no interest in education and unable to cope up/failure in studies are related to quality of education, whereas financial constraint and distance from schooling are related to poor public-school delivery in India. Among female population, marriage is an important factor of school attrition. Therefore, the study underscores the importance of better school infrastructure and quality of affordable and accessible education to improve the school enrolment for further levels of education. The study recommends implementing school-based programmes aimed at preventing early marriage among females to mitigate the risk of increased school dropout rates.

Keywords School dropouts · Cox proportional hazard model · Survival · India

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Background

Education has been a well-documented crucial indicator for human development, contributing to the welfare of people considerably by increasing remuneration and living conditions through boosting capabilities and self-determination. Parental education also shapes the welfare of future generations through intergenerational communication, as greater the level of education, higher is the chance of the child being better educated and healthier (Agrawal 2014; Dreze and Sen 2002). Notable strides have been made by the developing economies towards universal access to education (Barro and Lee 2013); however, it becomes a far-fetched dream for those countries where learning crisis is considered as a serious issue (Nakajima et al. 2018). The efforts made to lessen the dropout rates have been prioritized, because of the well-known fact that educational attainment is directed towards constructing developmental trajectories at early stages of life (Marphatia et al. 2019; Prakash et al. 2017). Despite these recent efforts, there is still paucity of comprehensive understanding and inaccessibility of education which preceded subsequent socio-economic and health-related negative repercussions. Substantial studies highlighted how school attrition is associated with widening of gender inequality (Kugler and Kumar 2017; Marphatia et al. 2019; Prakash et al. 2017; Warner et al. 2012), severe poverty and starvation (UNESCO 2014), early child marriage (Gouda and Sekher 2014; Hallfors et al. 2011; Raj 2010), increase in partner violence (Ackerson, Kawachi, Barbeau and Subramanian 2008; Hindin, Kishor and Ansara 2008), discouragement of girls' participation combined with household and economic roles (Marphatia et al. 2019; Patton et al. 2016; Prakash et al. 2017), and further effects of the earing capacity (Hoddinott et al. 2011; Maluccio et al. 2009) which in return hampers the life-long autonomy and economic growth of the country. Nonetheless, in a developing nation like India, gender disparity is persistent among females of marginalized sections cut across caste, religion, class, and regional boundaries (Shah 2011; Varughese and Bairagya 2020). High trends of attrition can be seen among those from low-income households, rural sector, low caste status, and Muslim families (UNESCO 2017; UNICEF 2014a; Varughese and Bairagya 2020). These marginalized population groups are facing certain impediments in accessing government benefits and schemes designed to address poverty elimination and promote girl child school attainment (UNESCO 2017).

Evidently, school dropout is associated with biological and health markers which include maternal and child health (Arthur, Bangha, Sankoh and Health 2013; Chowdhury, Garg and Kanchan Sk 2021), child mortality (Ghosh 2012), incidence of teenage pregnancy (Baird, Garfein, McIntosh and Özler 2012; Duflo et al. 2015), fertility rates (Arthur et al. 2013; Prakash et al. 2017), childbearing intentions (Chowdhury et al. 2021; Marphatia et al. 2019), HIV infection (Baird et al. 2012), and risk of diseases (Marphatia et al. 2019). To overcome these socio-economic and health ramifications, Sustainable Developmental Goals (SDGs) have emphasized on girl's education, especially at the primary level of schooling. Nevertheless, in India, acquisition of education is poorly understood resulting in high proportion of dropout rates among female counterparts and rural areas, which builds a barrier not only for school progression but also in achieving SDGs. For example, the dropout is estimated around 11.9 million at primary and secondary school with highest proportion being female children (UNICEF 2014a; b). According to National Family Health Survey (2015–2016), there has been a marked decline in school attendance rates from 90 per cent at primary schooling to 78 per cent at lower secondary schooling and approximately 58 per cent at upper secondary schooling (International Institute for Population Sciences (IIPS) and ICF 2017). Several steps have been taken by the Indian

government to promote universal and mandatory education until secondary level and programmes have been specially designed to encourage girl child education (MoSPI 2015; Nakajima et al. 2018). Although the enrolment has rapidly amplified, necessary actions are required to eliminate the factors responsible for high dropout rates (Nakajima et al. 2018). Empirical studies have pointed out numerous factors accountable for school attrition in India. At first, the school-related factors are spotlighted such as institution infrastructure, availability of female teacher, adequate toilet facility, and most importantly distance from school (Agrawal 2014; Chatterjee et al. 2018; Gouda and Sekher 2014; Siddhu 2011), which are pressing issues responsible for low quality of education. Social norms and practices are also the key players hindering the enrolment rates (Gouda and Sekher 2014; Prakash et al. 2017; Prakash 2008). In addition, social and financial status of the children are correlated with forced attrition from school despite their keen interest in education (Gouda and Sekher 2014; Kishore and Shaji 2012; Prakash et al. 2017). Besides, it has also been observed that parental education status is a crucial positive indicator that promotes school enrolment of their children (Bose 2012; Marphatia et al. 2019; Nakajima et al. 2018). The aforementioned studies have given the glimpse of school dropout in India using those children who were currently attending school. The present study has also emphasized on school dropouts in India with special attention to social and school related characteristics. Deviating from the previous studies, the paper has used the retrospective approach to apply survival analysis for school dropout. Further, using this new approach will provide a different insight in studying school dropouts in India. Unlike previous studies which only focuses on status of enrolment, the present analysis emphasizes the duration of schooling, which provides the time point at which the risk of dropout is high. Moreover, duration of schooling is an important indicator of time event in the study for the purpose of performing survival analysis. For survival analysis, Cox proportional hazard model will be utilized, which is a widely used method in medical research to investigate relationship between survival time of patients and other predictor variables. However, this method can also be used in social science-related fields where the probability or risk of an event can be estimated if data pertaining to time and end event are available. In this study, duration of schooling will serve as time event and dropout from school will be end or failure event. Additionally, latest dataset of National Sample Survey (NSS) has been employed considering the age-group 18–35 years who have presently completed their educational level to rationalize the major factors attributing to school dropout in India.

Research design

Data source

The study utilizes unit level information from household surveys conducted by the National Sample Survey Organisation (NSSO) in India. The social consumption–education schedule of NSSO is an essential source of data providing the information several educational indicators such as literacy rate, attainment rate, dropout rate, incentives received by students, and expenditure incurred on the education. These data play a key important role for planning and policy formulation which is used by various government organizations, academicians as well as researchers and scholars. The present study focuses on the 75th round of NSSO data.

The NSSO survey follows multistage stratified sampling design, where census villages in the rural area and urban frame survey (UFS) blocks in the urban area serve as the first stage units (FSUs). Further, the households in both rural and urban areas are the ultimate stage units (USU). For larger FSUs, the sampling is done by selecting two hamlet groups (hgs)/sub-blocks (sbs) from each rural/urban FSU.

The NSSO data provide the information of both current and completed levels of education for all the population. These data also give the particulars of population (aged 3–35 years) who are currently not attending school/college under the headings like ever attended school, age at first enrolment in school, level of last enrolment, type of education of the course last attended, whether completed the level last attended, age when last attended, type of institution last attended, and reasons for never enrolled/currently not attending school/college. The present study has utilized the aforementioned information for the analysis.

Methodology

The current study focuses on the prominent factors responsible for school dropouts in India. In this study, population selected are in the age group of 18–35 years who have ever attended school/college but currently not attending. Following are the description of outcome and predictor variables included in the study.

Outcome variable

The outcome variable is school dropout, including population aged 18–35 years who have dropped out from school at any level before reaching 12th standard. Therefore, those population who are dropped out are coded as 1, and 0 otherwise.

Predictor variables

Previous research suggests that dropout is influenced by factors at household level, school level, and geographical level. Household level factors include parent's education, household size, and household income. School level factors include school infrastructure, type of school, and distance of schooling. The geographical factors include place of residence and region. As NSSO data do not have the information regarding parent's education, household head's education is taken as proxy. However, for household income, the monthly per capita expenditure (MPCE) quintile is constructed using household consumption expenditure information. School infrastructure-related information is not available in NSSO data, so it is dropped from analysis. Therefore, after considering all the required information the selected variables are gender (male, female), sector (rural, urban), caste groups (scheduled tribe, scheduled caste, other backward class (OBC), and others), religious groups (Hindu, Muslim, Christian, and Others), MPCE quintile (Poorest, Poorer, Middle, Richer, and Richest), household size is categorized in two categories (1. less than 5 members, and 2. more than equal to 5 members), type of institution (government, private), and social groups (OBC-Hindu, OBC-Muslim, ST-Christian, and ST-Non Christian), education of the household head (no schooling, less than 5 years of schooling, 6–10 years of schooling, and more than 10 years of schooling). In addition, dummy variables of the major reason for not

currently attending are also included as predictor such as 1. Not interested in education, 2. Financial constraint, 3. Engaged in domestic activities, 4. Engaged in economic activities, 5. School is far off, 6. Unable to cope up/failure in studies, and 7. Marriage (only for female population).

The states are categorized in six regions: North (Jammu & Kashmir, Himachal Pradesh, Punjab, Chandigarh, Uttarakhand, Haryana, Delhi, Rajasthan), Central (Uttar Pradesh, Chhattisgarh, Madhya Pradesh), East (Bihar, West Bengal, Jharkhand, Odisha), West (Daman & Diu, Dadar & Nagar Haveli, Gujarat, Maharashtra, Goa, Lakshadweep), North-east (Sikkim, Arunachal Pradesh, Assam, Meghalaya, Manipur, Tripura, Nagaland, Mizoram), and South (Andhra Pradesh, Telangana, Karnataka, Kerala, Tamil Nadu, Puducherry, Andaman & Nicobar) (Table 1).

Statistical analysis

The study has used retrospective approach to explore the potential factors associated with school dropout. For this purpose, Cox proportional hazard model is employed. The time event for this model is the duration of schooling, which is calculated using age at first enrolment and age when last attended school. The failure event for the model is the dropout at any level before reaching 12th standard. Population is considered right censored if they completed education 12th standard or above.

T(Duration of schooling in years) = Age at first enrollment − Age when last attended

The Cox proportional hazard model is given as:

$$h_i(t) = \exp\left(\beta' x_i\right) h_0(t),$$

where x_i = is vector representing the set of values of the explanatory variables for the ith individual. β = represents the vector of unknown regression coefficients, and $h_0(t)$ = is the hazard function for an individual for whom $x = 0$, this function is known as basic hazard function.

In the analysis two models are fitted, the first model includes only socio-economic and demographic predictors, while the second model involves predictors like household size, type of institution, and major reasons for dropout. The fitted model is presented using cumulative hazard function curve by different combinations of predictors such as gender and sector, sector and type of institution, religion and caste groups, and type of institution and scheduled caste. The analysis is performed in STATA 16 software.

Results

Figure 1 quotes various reasons of dropout, which negatively impact the acquisition of basic learning in India. The results confirm that multiple reasons play a significant role in escalating dropout level; however, the most pronounced reason is financial constraint. Consequently, this paucity of access to credit leads to engagement in economic activities or child labour reflecting stark socio-economic disparity and inadequate knowledge of accruing education. The role of financial constraint and engagement in economic activities in school attrition has increased implicating the increasing financial burden to pursue further education. Moreover, not interested in studies is a major contributor in amplifying dropout

Table 1 Description of the variables

	Variables	Coding
Dependent variable	School dropouts	1- Dropped out from school before reaching 12th standard
		0-Otherwise
Independent variables	Gender	0-Male
		1-Female
	Sector	0-Rural
		1-Urban
	Caste groups	0-Scheduled tribe
		1-Scheduled caste
		2- Other backward class
		3- Others
	Religious groups	0-Hindu
		1-Muslim
		2-Christian
		3-Others
	MPCE quintile	0-Poorest
		1-Poorer
		2-Middle
		3-Richer
		4-Richest
	Social groups	
	1.OBC-Hindu	0-No, 1-Yes
	2.OBC-Muslim	0-No, 1-Yes
	3.ST-Christian	0-No, 1-Yes
	4.ST-Non Christian	0-No, 1-Yes
	Education of the household head	0-No Schooling
		1- Less than 5 years of schooling
		2- 6 to 10 years of schooling
		3- More than 10 years of schooling
	Household size	0-Less than 5 members
		1-More than 5 members

Table 1 (continued)

Variables	Coding
Type of institution	0-Government
	1-Private
Major reasons for dropout	
1. Not interested in education	0-No, 1-Yes
2. Financial constraint	0-No, 1-Yes
3. Engaged in domestic activities	0-No, 1-Yes
4. Engaged in economic activities	0-No, 1-Yes
5. School is far off	0-No, 1-Yes
6. Unable to cope up with studies	0-No, 1-Yes
7. Marriage	0-No, 1-Yes
Regions	0-North
	1-Central
	2-East
	3-West
	4-North-east
	5-South

from school, which is higher male population. Henceforth, the role of educational quality and school quality is likely to matter. However, level of school dropout because of lack of interest in education as the reason has decreased by 6% compared to previous round. Seemingly, engagement in household chores and marriage intensifies the risk of dropping out of school which has been almost consistent among female population over the period. In India, females are more likely to be affected with their engagement in domestic chores and early marriage due to prevailing gender discrimination in terms of educational attainment. School dropout phenomenon can also be explained based on reasons like school is far off and unable to cope up with studies.

From Table 2, it can be illustrated around 73.65 per cent of the population have dropped out before achieving 12th standard educational level. The leading socio-demographic background characteristic in shaping the dropout behaviour is sector. The difference of about 22 per cent reveals persisting educational gaps in rural and urban areas. Although the gender difference has declined considerably, it has not been eliminated over the years. Markedly, scheduled caste, scheduled tribe, and Muslims have high risk of dropping out which has negative repercussion on acquisition of education. Further, MPCE quintile and dropout are indirectly related to each other, and dropout decreases with the increase in quintile. Rates are also driven by household size and social groups which extensively replicates educational gaps among various socio-demographic sections. Additionally, type of institution contours stark difference in government and private schools, i.e., nearly 39 per cent, likely

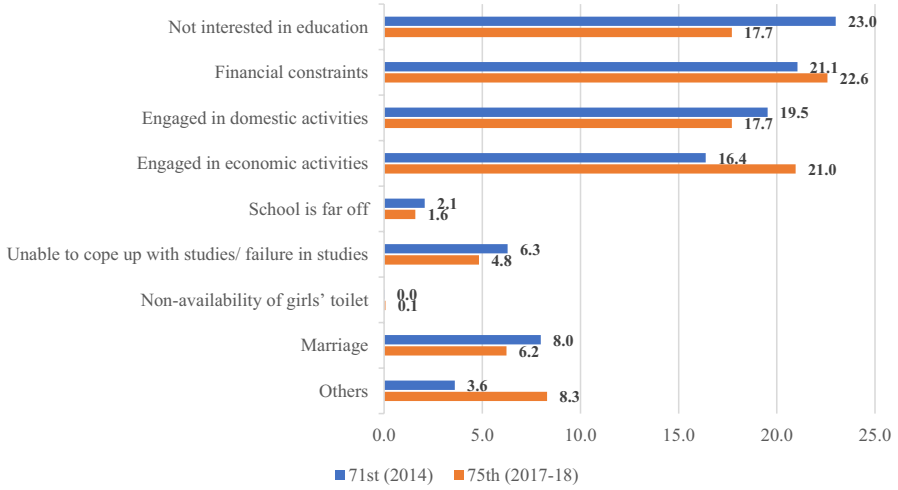

Fig. 1 Main reasons for dropout in India of population aged 18 years and above

to be another reason for high dropout rates due to poor quality of learning and school. Furthermore, distance from school, inability to cope up with studies, and financial constraints play a crucial role in accelerating the dropout rates. The school attrition varies greatly by region. Central, East, and North-eastern regions have highest percentage of dropout compared to other regions.

Table 3 demonstrates that nearly one-third of the population dropped out after secondary level of schooling which has a detrimental effect on school progression. It has been observed that females are more likely to be dropped out after completion of primary level of schooling. Again, in rural areas, students generally discontinue schooling after primary and middle level of completion, whereas in urban areas a marginal difference can be seen in terms of secondary level completion. Further, the percentage of dropout after primary and middle level of schooling is quite high among schedule caste; conversely, the dropout after secondary schooling is moderately high among other caste group. The level of dropout at primary and middle level of schooling is quite high among Muslims compared to other counterparts. Strikingly, the dropout considerably upsurges for Christian community after completion of secondary level of schooling. These obvious results imply unequal educational distribution among socio-demographic groups of the country. Next, as per the household MPCE quintile, percentage distribution for primary and middle level is substantially high in poorest category, while in richer category it turns out to be secondary level of schooling. Similarly, type of institution has prominent effect in shaping the dropout behaviour and it intensifies in government schools at primary and middle level completion. In other words, quintile and type of institution is likely to be one of those factors which ceases and impacts the acquisition of basic learning in the country. ST-Non-Christians have negative influence on educational outcomes and hence upsurge the dropout percentage at primary and middle level completion. When it comes to dropout reasons, the percentage is driven by distance from institution after completing primary and secondary school, although unable to cope up with studies have negative upshots on dropout after secondary level of schooling. School attrition by education level suggests that Central region has highest dropout at primary and middle level compared to other regions.

Table 2 School dropout of population aged 18 and above, NSSO 75th round

Covariates	Percentage	Total population
Gender		
Male	71.62	52,299
Female	75.91	46,911
Sector		
Rural	82.79	58,862
Urban	60.32	40,348
Caste groups		
Scheduled tribe	81.72	15,153
Scheduled caste	81.62	16,749
Other backward class	75.00	39,035
Others	62.75	28,273
Religious groups		
Hindu	72.14	72,550
Muslim	82.15	15,000
Christian	71.90	7,014
Others	72.50	4,644
MPCE quintile		
Poorest	85.39	20,700
Poorer	79.39	21,429
Middle	74.50	17,998
Richer	68.57	19,455
Richest	59.27	19,628
Education of the household head		
No schooling	87.39	21,999
Less than 5 years of schooling	86.00	19,737
6–10 years of schooling	72.02	29,677
More than 10 years of schooling	22.73	2,452
Household size		
Less than 5	70.90	36,898
More than 5	75.28	62,312
Type of institution		
Govt.	81.71	78,679
Private	42.75	20,527
Major reasons for dropout[a]		
Not interested in education	92.55	14,217
Financial constraints	87.85	18,908
Engaged in domestic activities	84.10	15,626
Engaged in economic activities	67.25	22,494
School is far off	95.17	1,243
Unable to cope up/failure in studies	93.60	3,826
Marriage	72.13	6,316
Social groups[b]		
OBC-Hindu	73.59	30,557
OBC-Muslim	81.90	7,392
ST-Christian	75.60	5,737
ST-Non-Christian	84.45	9,416

Table 2 (continued)

Covariates	Percentage	Total population
Regions		
North	69.70	18,828
Central	75.01	19,725
East	83.18	16,531
West	72.40	12,562
North-east	80.87	14,935
South	66.44	11,048
Total	73.65	99,210

Govt. = Government

[a]Major reasons for dropouts are different dichotomous variables, so the whole total will not be 99,210

[b]Social groups are different dichotomous variables, so the whole total will not be 99,210

The findings (Table 4) of Cox proportional hazard model depict that dropout level is influenced by gender. This is true for females who are more likely to be dropping out of the school compared to male counterparts ($p < 0.01$). The model indicates that the rural sector is associated with surge in dropout behaviour. This association turns out to be weaker for urban areas than that of in rural areas. Further, the hazard risk of dropout noticeably dwindled among other caste groups in contrast to schedule tribe ($p < 0.01$). On the other hand, Muslim community have higher risk of dropout compared to Hindu community ($p < 0.01$). The hazard risk significantly attenuates with the increase in MPCE quintile; however, it intensifies with the increasing household size. Those who have pursued education from private school are less likely to be dropping out than those to have pursued from government schools ($p < 0.01$). The pronounced negative effect on dropout can be seen from the reasons namely not interested in studies, distance from school, unable to cope up with studies, and financial constraints. Nevertheless, marriage demonstrates substantial impact on dropout especially for female counterparts. Below table exhibits two models, model 1 includes socio-economic and demographic characteristics, while in second model other predictors are added. As observed from the results, model 2 reflects almost same risk ratio as model 1 even after including additional predictors.

The figures exemplify hazard function (Fig. 2) of school dropouts, indicating higher risk at 10 to 15 years of education. This further elucidate that roughly students are dropping out between 8 and 10th standard. Besides, stark differences can be picturized between gender, sector, caste groups, religious groups, and type of institutions. Graphically, gender and sector-wise hazard curve shows tendency of dropout is quite high among female population residing in rural areas compared to other counterparts. Indeed, as expected the dropout intensifies among those who are attending government school in rural areas, while it is marginal for those attending private schools in urban areas. Correspondingly, those Muslims who are categorized under other backward class status are the most underprivileged group when it comes to acquisition of education. Further, the risk of attrition is substantially high among those attending government school and classified under scheduled caste portraying detrimental effect of caste status on educational attainment in India.

Table 3 Percentage of dropout (population aged 18–35 years) by level of schooling, NSSO 75th round

Covariates	Primary	Middle	Secondary	Higher secondary
Gender				
Male	13.37	25.05	33.84	27.74
Female	17.97	25.63	32.32	24.08
Sector				
Rural	17.26	27.09	32.88	22.78
Urban	12.31	21.89	33.56	32.24
Caste groups				
Scheduled tribe	18.05	27.85	33.18	20.92
Scheduled caste	19.23	27.97	30.87	21.93
Other backward class	15.18	25.01	33.55	26.26
Others	11.80	22.13	34.03	32.04
Religious groups				
Hindu	15.25	25.08	33.03	26.64
Muslim	19.11	28.12	32.07	20.71
Christian	11.56	23.82	37.75	26.87
Others	14.16	21.58	31.08	33.19
MPCE quintile				
Poorest	20.19	28.93	32.35	18.54
Poorer	17.16	27.24	32.84	22.76
Middle	15.18	24.80	33.72	26.30
Richer	12.46	22.88	34.15	30.51
Richest	10.63	20.74	32.73	35.90
Education of the household head				
No schooling	20.14	29.87	31.09	18.90
Less than 5 years of schooling	25.91	26.79	28.29	19.01
6–10 years of schooling	6.86	22.64	38.01	32.49
More than 10 years of schooling	2.99	9.35	28.69	58.96
Household size				
Less than 5	16.11	24.68	33.61	25.61
More than 5	15.30	25.70	32.83	26.18
Type of institution				
Govt.	17.34	27.50	32.93	22.23
Private	4.05	11.06	34.29	50.60
Major reasons for dropout				
Not interested in education	23.08	28.66	30.06	18.21
Financial constraints	18.26	28.21	31.93	21.60
Engaged in domestic activities	17.91	28.70	31.62	21.78
Engaged in economic activities	10.27	22.27	35.05	32.42
School is far off	24.29	31.76	26.13	17.82
Unable to cope up/failure in studies	10.89	23.81	47.15	18.14
Marriage	5.68	18.10	37.34	38.87
Social groups				
OBC-Hindu	14.05	24.64	34.12	27.19
OBC-Muslim	20.29	27.48	30.79	21.44

Table 3 (continued)

Covariates	Primary	Middle	Secondary	Higher secondary
ST-Christian	11.85	25.07	38.21	24.87
ST-Non-Christian	21.41	29.35	30.46	18.78
Regions				
North	15.09	24.61	27.97	32.32
Central	19.54	30.34	26.01	24.11
East	19.33	28.65	35.20	16.82
West	12.27	22.75	35.00	29.97
North-east	13.67	26.05	37.48	22.80
South	11.40	17.24	39.56	31.81
Total	15.59	25.33	33.11	25.97

Discussion

Over the years, India has accomplished remarkable progress in improvising literacy; however, the phenomenon of dropouts is still a black spot in educational achievement. Evidently, about three-fourth of the population have dropped out before attaining 12th standard level education. Additionally, out of these dropouts around one-third of them have left the school at secondary level of education which is supported by the findings of hazard models stating the risk of dropout is very high between 10 and 15th years of education. These figures demonstrate that India has achieved universal level of primary education to a certain extent, but the success of achieving secondary level of education is even so a farfetched dream. The present study illustrates the major attributors for school dropouts in India are social characteristics, geographical variation, economic condition, and type of institution.

The attainment of education varies by gender, caste groups, and religion implicating the struggle of country like India in achieving education for all. Current figure reveals that school dropout of female children is still highest compared to male counterparts, and the risk of getting dropped out from school intensifies in rural areas. Further, the extent of school dropout among female is high at primary and middle level in comparison to male children. NSSO data suggest that among the major reasons of female school dropouts the most standout causes are engagement in domestic activities, marriage, and distance from school (Appendix Fig. 4). Discrimination in terms of education attainment among female children is very common in India, and the norm of son preference is a serious attributing factor behind this disparity (Bose 2012; Kugler and Kumar 2017; Prakash et al. 2017). In Indian household, the daughters are considered as "*Paraya Dhan* (other's wealth)*";* thus, investing in their education is assumed to be unfruitful compared to male children (Gandhi Kingdon 2002; Behrman, Foster, Rosenzweig and Vashishtha 1999).

Being in lower level of social class has a negative implication on educational attainment and it also accelerates the risk of school dropout. For instance, it has been observed from this study that more than 80 per cent of population belonging to ST and SC groups dropped out of school before completing 12th standard. Further, the hazard model also depicts the similar findings after controlling the school and household level factors. Kugler and Kumar (2017) and Prakash et al. (2017) have mentioned the same in their article that there is a great variation in access to education among ST and SC population compared to other caste hierarchy. However, in extension to this finding, the

Table 4 Result of Cox proportional hazard model for school dropout, NSSO 75th round

Covariates	Model-1 (SE)	Model-2 (SE)
Gender		
Male®	1	1
Female	1.184*** (0.008)	1.170*** (0.009)
Sector		
Rural®	1	1
Urban	0.530*** (0.003)	0.729*** (0.006)
Caste groups		
Scheduled tribe®	1	1
Scheduled caste	0.985 (0.012)	0.971** (0.013)
Other backward class	0.800*** (0.009)	0.866*** (0.011)
Others	0.630*** (0.008)	0.746*** (0.031)
Religious groups		
Hindu®	1	1
Muslim	1.522*** (0.014)	1.341*** (0.019)
Christian	0.706*** (0.011)	0.982 (0.037)
Others	0.864*** (0.014)	0.935*** (0.017)
MPCE quintile		
Poorest®	1	1
Poorer	0.830*** (0.008)	0.859*** (0.009)
Middle	0.687*** (0.007)	0.750*** (0.008)
Richer	0.585*** (0.006)	0.676*** (0.008)
Richest	0.455*** (0.004)	0.565*** (0.007)
Social groups		
OBC-Hindu		1.001 (0.041)
OBC-Muslim		0.968 (0.041)
ST-Christian		0.927* (0.039)
Education of the household head		
No schooling®		1
Less than 5 years of schooling		1.079*** (0.011)
6–10 years of schooling		0.718*** (0.006)

Table 4 (continued)

Covariates	Model-1 (SE)	Model-2 (SE)
More than 10 years of schooling		0.226*** (0.002)
Household size		1.015*** (0.001)
Type of institution		
Government®		1
Private		0.467*** (0.005)
Major reasons for dropout		
Not interested in education		3.950*** (0.061)
Financial constraints		2.983*** (0.044)
Engaged in domestic activities		2.859*** (0.044)
Engaged in economic activities		2.085*** (0.031)
School is far off		3.373*** (0.105)
Unable to cope up/failure in studies		3.065*** (0.063)
Marriage		1.896*** (0.037)
Regions		
North®		1
Central		1.352*** (0.0188)
East		1.274*** (0.016)
West		1.173*** (0.015)
North-east		1.056*** (0.014)
South		1.082*** (0.014)

® reference category, population aged 18–35 years-99,210**,** *** ($P<0.01$), **($P<0.05$), *($P<0.10$); Log likelihood (model-1: − 811359.37, model-2: − 800553.56), ST-Non-Christian was omitted

present study also highlights that the risk of school dropout is very high among OBC-Muslims and ST-Hindu population. Moreover, the tendency of school attrition among Muslim population alone is quite stark compared to other religious groups (Gouda and Sekher 2014). IHDS report also reveals the stark difference in terms of discontinuation rates among marginalized communities such as Dalit, Adivasi, and Muslims as compared to forward caste group (Bhatty 2014). The disparity in terms of educational attainment is among marginalized communities' roots back to early 1950s, when eight commission was established to provide direction to different aspects of the education. None of these commissions considered education for marginalized communities as an issue worthy of policy deliberation (Bhatty 2014). Further, National Policies on Education (1968 and 1986) have compromised on the quality of education by only focusing on physical accessibility, thus leaving poor and marginalized sections of society with inferior quality of facilities (Bhatty 2014).

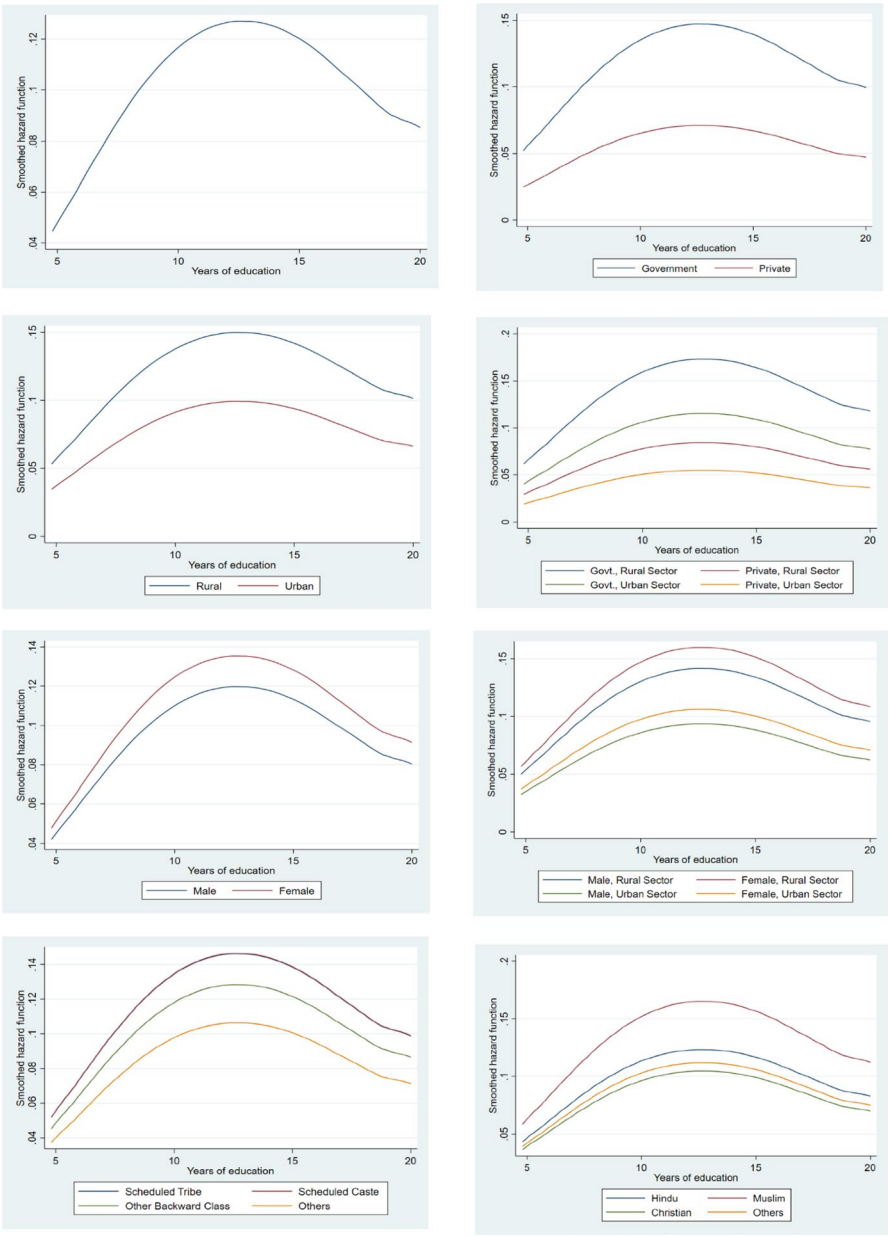

Fig. 2 Hazard curves of school dropout for population aged 18–35 years

The geographical variation in terms of school attrition is quite evident in India. The rural part is having a greater risk of school dropout especially at primary and middle level as compared to urban counterpart. As mentioned in previous studies that in rural India, the likelihood of low educational attainment is characterized by poor physical infrastructure of school, lack of available school nearby, teaching quality, teacher absenteeism, and

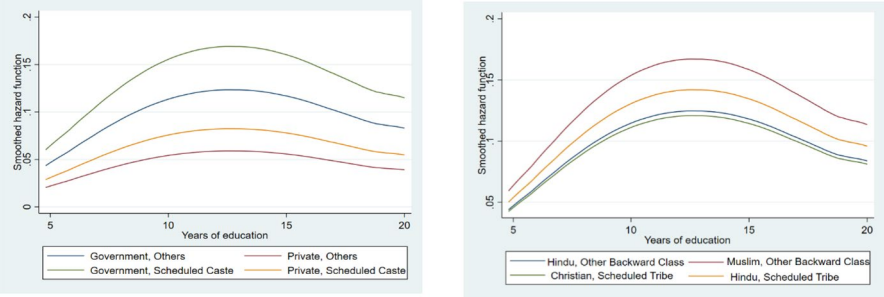

Fig. 2 (continued)

teacher–student ratio (Agrawal 2014; Chatterjee et al. 2018; Kugler and Kumar 2017; Vaidyanathan and Nair 2001). In addition, the rural area is dominated by agricultural activity, so it is more likely that children will be dropped out from school during the harvesting season (Ramachandran 2009). Further, agrarian households tend to have larger family size, but due to crunches of financial resources only selected children get the benefit of continuing education, while rest of them are expected to serve in household activity or to look for other economic opportunity. In the event of familial responsibilities, female children are more often supposed to sacrifice their education to engage in domestic activities (Marphatia et al. 2019). Notwithstanding, the regional difference is also observed from the result, Eastern and Central part of India are having highest risk of school dropout compared to northern region. Eastern region is comprised of Jharkhand, Odisha, Bihar, and West Bengal; most of these states are having highest proportion of rural population which may be the cause of high risk of school dropout, whereas Central region includes Uttar Pradesh, Madhya Pradesh, and Chhattisgarh, which constitute prominent proportion of marginalized and backward communities who are lacking in resources and importance of educational awareness that might have led to high school dropout in these regions (Agrawal 2014; Chatterjee et al. 2018; Ramachandran 2009).

Efficient educational delivery through type of institutes (say private or government) also manifests school level attrition. This pronounced effect can be easily seen through the analysis that in comparison to government institution the risk of attrition is 50 per cent less in private schools. Additionally, stark differences can be observed in primary and middle level of schooling. The scenario spotlights that till today there is paucity of infrastructure, efficient teacher–student ratio, and quality of teaching in government institutions (Agrawal 2014; Vaidyanathan and Nair 2001; Vaijayanti and Kulkarni 2009). Further, the picture becomes quite severe among government institutions situated in rural areas. The poor deliverability of government schools can be exemplified in children's reason for dropout stating they are either not interested in education or not able to cope with studies. On the other hand, private institutions in India have become a synonym of quality education encouraging economically capable sections to prefer private institution instead of government ones (Singh 2015). Apparently, hazard model also underscores that, as MPCE quintile increases, the risk of dropout diminishes. Furthermore, the education of household head also plays a dominant role in defining school dropouts because having educated members in family encourages future generation to pursue higher education.

In Indian society, principle of hierarchy and division is deep rooted which makes it really challenging to achieve the educational strides (Velaskar 2010).

To cope up with these challenges, several programmes and policies have been launched by the ministries like National Policies on Education (1968 and 1986), Right to Education (RTE) bill, Sarva Shiksha Abhiyan (SSA), and Mid-day meal scheme. The National Policy on Education (NPE) 1986 have specifically paid attention to marginal sections of the society as well female children, whereas RTE and SSA aimed in universalizing elementary education by focusing on parameters pertaining to requirement of infrastructure, teacher qualification and curriculum design (Banerji and Mukherjee 2008; Bhatty 2014). These initiatives have been successful in improving the school enrolment at primary level, but completely side-lined the quality of schooling especially at government schools (Bhatty 2014). For instance, RTE emphasized more on school infrastructure than learning parameters (Bhatty 2014). NPE (1986) suffered from poor administration and lack of finance (Bhatty 2014). Moreover, SSA struggled with design flaws as well as improper implementation, which affected the education of marginalized and economically weaker section of society through poor quality of schooling (Banerji and Mukherjee 2008).

In India, access to education is still a matter of concern reflecting great discrepancy within geographic regions and distinguishable subgroups, namely ST, SC, Muslims, and female population (Asadullah and Yalonetzky 2012; Lewin 2011; Wu, Goldschmidt, Boscardin and Azam 2007). Further, growing income disparity also triggers gender and caste-related discrimination which has a detrimental effect on educational attainment. Keeping this in mind, the slogan of "education for all" is still an implausible dream and it will take significant amount of time to achieve this goal. Although Government of India has currently launched New Education Policy 2020 after a period of 34 years, to address the major issues of previous programmes and policies, they have primarily focused on 4 main pillars equitability, affordability, quality, and accountability. This policy is envisioned to achieve the goal of "better quality of education for all" (Kumar, Prakash and Singh 2021).

The article exhibits certain limitations: first, it uses cross-sectional data which can only provide the association between outcome and predictor variables not cause–effect relationship. Second, it might be possible that the older cohort would have different exposure to education compared to younger ones in terms of school availability and educational infrastructure which cannot be captured through cross-sectional data. Third, the present data do not provide the information of quality of education during school/collage, parents educational background, parental occupation, and parents' aspiration towards education which plays prominent role in shaping children's education. Thus, it is necessary that future research should emphasize on longitudinal data which especially focuses on quality and quantity of education attainment and its transition over the period to explore the issues and challenges effectively.

Conclusion

The study provides clear evidence that school dropout is a persisting issue in India which is affecting the progress in educational attainment. Unlike the previous literature which mainly focused on cross-sectional information, the present research using survival approach provides strong causal evidence that factors like caste division, wealth quintile, type of institution, and regional difference play a pivotal role in determining school dropouts in India. Further, no interest in education, distance from school, unable to cope up/failure in studies, and financial constraint are the major reasons which

elevate the risk of school dropouts. Among these reasons, no interest in education and unable to cope up/failure in studies are related to quality of education, whereas financial constraint and distance from schooling are related to poor public-school delivery in India. Further, the geographical and economic variation in educational attainment reflects the inefficient delivery of government institution. The hazard curve shows that the risk of school dropout becomes high between 8 and 10th standard, which means previous programmes and policies of government have been successful in controlling the school dropouts at primary level but failed to capture the same strength at the secondary level. Due to prevalent economic poverty and social backwardness in Indian households, early marriage of girls and the pressure on boys to work for pay may contribute to a higher dropout rate at the secondary level. Therefore, addressing these factors, whether directly or indirectly, is crucial to reduce the dropout rate, especially among girls. To accomplish this, it is essential to halt child marriages, educate parents, and improve the socio-economic conditions. In addition, the government should promote awareness of education, provide incentives for girls to pursue their education, and introduce programmes that facilitate the re-entry of married girls into schools.

Dropout rates at the secondary level in India are influenced by various factors, including inadequate school infrastructure, lack of interest in studies, and familial circumstances. Addressing these issues requires improving socio-economic conditions, enhancing government incentives for education, promoting meaningful employment opportunities for girls after completing their education, and raising awareness about the importance of education. Focus should also be made to address the same on better school infrastructure with adequate toilet facilities especially in government institutions.

Appendix

See Figs. 3 and 4.

See Table 5.

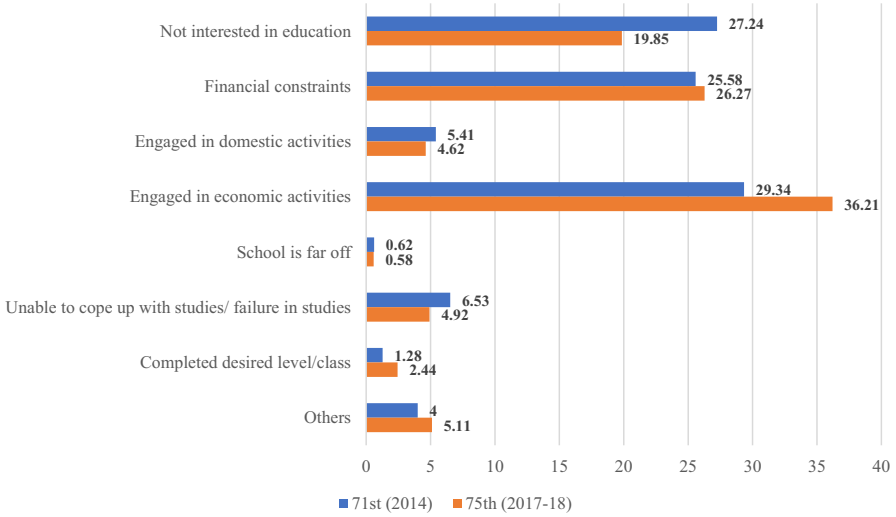

Fig. 3 Major reasons for dropout among male population

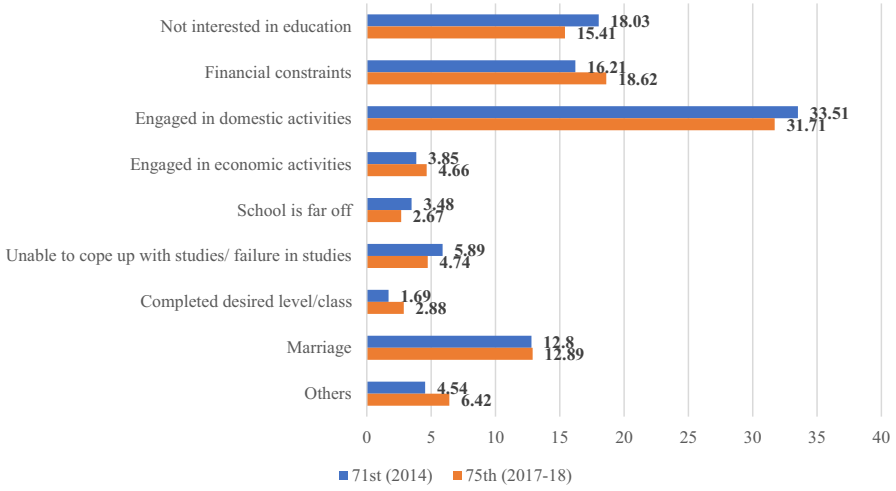

Fig. 4 Major reasons for dropout among female population

Table 5 Descriptive statistics of background variables

Indicators	Frequency	Total Population aged 18–35 years
School dropout: Yes	73.65	73,071
Gender		
Male	52.70	52,299
Female	47.30	46,911
Sector		
Rural	59.30	58,862
Urban	40.70	40,348
Caste groups		
Scheduled tribe	15.27	15,153
Scheduled caste	16.88	16,749
Other backward class	39.35	39,035
Others	28.50	28,273
Religious groups		
Hindu	73.13	72,550
Muslim	15.12	15,000
Christian	7.07	7014
Others	4.68	4644
MPCE quintile		
Poorest	20.86	20,700
Poorer	21.60	21,429
Middle	18.14	17,998
Richer	19.61	19,455
Richest	19.78	19,628
Social groups		
OBC-Hindu	30.80	30,557
OBC-Muslim	7.50	7392
ST-Christian	5.80	5737
Education of the household head		
No schooling	24.45	24,257
Less than 5 years of schooling	23.13	22,949
6–10 years of schooling	41.54	41,208
More than 10 years of schooling	10.88	10,789
Household size	5.60	99,210
Type of institution		
Government	79.30	78,679
Private	20.70	20,527
Major reasons for dropout		
Not interested in education	14.30	14,217
Financial constraints	19.10	18,908
Engaged in domestic activities	15.70	15,626
Engaged in economic activities	22.70	22,494
School is far off	1.30	1243
Unable to cope up/failure in studies	3.90	3826
Marriage	6.40	6316

Table 5 (continued)

Indicators	Frequency	Total Population aged 18–35 years
Regions		
North	18.98	18,828
Central	19.88	19,725
East	16.66	16,531
West	12.66	12,562
North-east	15.05	14,935
South	16.76	16,629
Total		99,210

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Declarations

Conflict of interest No conflict of interest exist.

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