"Does Nutrition Provisioning Impact Educational and Learning Outcomes of Adolescent Girls: Empirical Evidence from India"

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Abstract

While extensive literature is available on the impact of the early childhood nutritional food program, little we know about the nutritious food provision at a later stage. Our paper examines the causal effect of one such program. In late 2010, the central government of India introduced the Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (SABLA) for adolescent girls aged 11-18. The implementation of the program provides us with ample variation in the treatment. Using multiple nationally representative datasets, we employ the difference in differences technique to estimate the causal impact of the program on the educational and learning outcomes of treated adolescent girls. Our results reveal that the program significantly improves enrollment status. However, improvement in the learning outcomes (reading ability and math skills) is at the basic level. We identify the significant improvement in the programs' recipient health status (weight and height) and the increase in the child-specific educational expenditure as the possible mediating channels causing these effects. Our findings also suggest that the impact is vital for those who get early access to the program. This implies that government should focus on providing nutritious food in early childhood, rather than later, for the overall development of children. Our findings are consistent across different datasets, tested against potential confounding factors, and are robust to alternative specifications.

Keywords: Education, Health, Human Capital, Difference-in-Differences, School

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1. Introduction

Access to nutritious food during early childhood is essential for the overall development of school children. The nutritious food fosters the macronutrient and micronutrient demands of school children. Yet, around 66 million school children in developing countries suffer from food deprivation (Bundy et al., 2018). As per the United Nations 2021 report, the number of people suffering from hunger is around 828 million.[3] Looking at this abysmal figure, goal 2 (zero hunger) of the United Nations' Sustainable Development Goals (UN SDGs) seems a little contrived.

Food security is a pivotal issue of international development; therefore, along with other 16 SDGs, the international community is committed to achieving zero hunger by 2030. Solving hunger problem is a paramount issue of international development because it has multiple spillover effects. Extensive literature is available on the direct impact of early childhood access to nutrition on childrens' health outcomes (Afridi, 2010; Luo et al., 2012; Mora et al., 2015; Rossin-Slater, 2013; Sylvia et al., 2013; Todd & Winters, 2011). These studies, in general, finds the positive impact of early childhood nutrition program on children's anthropometric health outcomes such as Body Mass Index (henceforth, BMI), anaemic level, obesity, height, and weight for age. Providing early childhood nutritious food has multiple indirect benefits as well, such as improvement in cognitive skills, test scores, school attendance and thereby school enrollment, and lesser truancy behavior (Frisvold, 2015; Glewwe & Jacoby, 1995; Lundborg et al., 2022; Wisniewski, 2010). These studies suggest that the children receiving the nutrition (measured as height for age Z score) witness significant improvement in their test scores.

Nevertheless, there is a lack of evidence on the effects of nutritious food provision when children get it in adolescence instead of early childhood. This lack of evidence has motivated us to carry out this study. Against this backdrop, our paper studies one such flagship program introduced by the central government of India. Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (henceforth, SABLA) scheme was introduced in late 2010 for girls aged

[3]The State of Food Security and Nutrition in the World (SOFI, 2022 edition). Click here for more information.

11-18 in 205 districts. Our study examines the causal impact of this program on adolescent girls' education (enrollment) and learning outcomes (reading ability and arithmetic skills). The program's rollout gives enough variation in the treatment enabling us to use a quasi-experimental design. We carry out the difference in differences (henceforth, DID) framework in our study using multiple rich datasets. Following Chatterjee & Poddar (2022) work, we trace the cohort which receives the earliest access to the scheme. In addition, we also study the impact on the just eligible cohort (11-18 years) and the entire cohort eligible for the program.

Our results reveal that the program significantly improves the enrollment and learning outcomes (reading ability and math skills) of the eligible girl from the treatment districts. This also means that the SABLA program successfully closes the gender gap in education. However, the improvement in the learning outcomes is at a basic level. In particular, we see a slight improvement only at the basic level of reading (identifying letters and words) and math skills (identification of numbers 1-9). We also did the sub-sample analysis using Andhra Pradesh, a southern state of India. We observe qualitatively similar results. Using the audit report of the Administrative Staff College of India, we compare the results of better-performing versus poor-performing states in implementing the SABLA program.[4] We find a strong impact of the SABLA program in better-performing states and no impact (or weak impact in some cases) in the case of poor-performing states. We also used propensity score matching with DID as a robustness check and re-ran the models. We find qualitatively similar results and significant improvement in enrollment and learning outcomes (reading ability and math skills).

Further, we identify three potential mediating channels behind these effects, classified as direct and indirect. We see a positive and significant direct impact of the program on treated adolescent girls' height and weight, albeit no impact on her Body Mass Index (henceforth, BMI) and anaemia level. These findings are similar to Chatterjee & Poddar (2022). In terms of indirect effects, we observe weak positive impact on the child-specific educational expenditure incurred by the parents of a treated adolescent girl and a strong positive and

[4] Click here to read the report.

significant increase in the likelihood of attending private tuition for program recipients.

More interestingly, our findings suggest that the impact is directly proportional to time of access. That is to say, the effect of the SABLA program is more visible for those exposed early to the program. It lookalike the stylized fact that nutritious food provisioning is beneficial for the overall development of children if given at an early stage. It also implies that since early access to nutritious food enhances human capital accumulation at an early stage, it is relatively challenging to accumulate the same level of human capital if children are given nutritious food later. Therefore, such food-feeding programs target children right from their infant stage.

The rest of the paper is structured as follows. Section 2 briefly gives an overview of the context of the study. Section 3 discusses the literature review. Section 4 presents the different datasets used for this study. Section 5 explains the empirical strategy. Section 6 discusses the results and findings, and section 7 is the conclusion.

2. Context

Health is one of the most crucial components of human capital because it contributes significantly towards accumulating human capital and has a strong positive association with human capital formation. Against this backdrop, the government of India introduced the Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (henceforth, SABLA) in late 2010 for girls aged 11-18 years.[5] It is implemented in a phased manner with 205 districts at the initial stage, and from 2018, the scheme becomes a pan India scheme.[6] The geographical distribution of 205 SABLA districts is in appendix under figure A.1.The selection of 205 districts is based on the composite weighted index of four different criteria, the dropout rate of females from school, female literacy rate, girls married before the age of 18 years, and female work participation. The dropout rate has a maximum weightage of 50 percent, followed by 20 percent weight each for female literacy and early marriage and 10 percent for female participation in the labor force. The rationale behind these weights is that all four

[5] Refer tothis for more information.

[6] Actually, as per the official government gazette the program was extended to over 303 additional districts in the year 2017-18 for up to one year and is universalized from 01.April.2018. List of 205 SABLA districts.

components directly impact the individual's capability to accumulate human capital stock. The scheme acts as a catalyst in the empowerment and self-development of adolescent girls by supporting them across multiple dimensions. The focus of this program is to stimulate adolescent girls aged 11-18 to become educated, aware, and economically empowered. As per the official document, the program aims to improve adolescent girls' nutritional and health status, mainstream the out-of-school girls back into formal/non-formal education, and thereby make the adolescent girls self-reliant.

As stated before, the program is multi-facet in nature. The girls eligible for the SABLA program are entitled to get support in the form of supplementary nutrition along with iron and folic acid tablets, like skills and vocational training, health education, and in particular guidance related to reproductive and sexual health, upgradation on managing household chores and practice of child care. The nutritious food is provided to girls as a take-home ration or sometimes cooked and served at the Anganwadi Centres (henceforth, AWCs), the primary delivery points of these services.[7] Moreover, Nutrition is provided 2-3 times a week to out-of-school girls and two times a month to in-school girls. The sample pamphlets prepared by the central government of India are in the appendix under figure A.2.

Actually, the commencement of SABLA is because of the failure of two erstwhile schemes, Kishori Shakti Yojana (henceforth, KSY) in 1993-94 and Nutrition Program for Adolescent Girls (NPAG) in 2002-03, due to poor operation and management and limited financial outlay and geographical coverage.[8] E.g., the financial assistance is about INR 0.4 million per project for SABLA, whereas it is INR 0.1 million for KSY. Further, the CAG's (Comptroller and Auditor General) performance audit report for Uttar Pradesh claims that SABLA coverage is about 70 percent while KSY coverage is only 5 percent.[9] The Ministry of Women & Child Development's annual reports reveal that the difference between the annual planned budget expenditure and the revised budget converges over the years, especially from 2012 onwards. For 2017-18, the budget and revised estimates are the same, INR 4.6 billion.

[7]In the case if AWCs are not having adequate facilities to cater the SABLA girls, then school/panchayat communities could be used.

[8]KSY scheme is still active in the Non-SABLA districts.

[9]Refer to the CAG report and (Chatterjee & Poddar, 2022) for more information.

The SABLA program differs from the Mid-Day Meal Scheme (henceforth, MDMS). First, the program is only for girls aged 11-18. Second, unlike MDMS, where food is usually cooked and served in school, AWCs are responsible for supplying nutrition supplements to adolescent girls. Third, these provisions are for both in and out-of-school adolescent girls.

3. Literature review

Student's educational outcomes and their health status complement each other (Gomes-neto et al., 1997; Variyam et al., 1999) because the health status of children is a significant determinant of their academic achievement (Alderman & Headey, 2017; Aturupane et al., 2013; Frisvold, 2015; Glewwe & Jacoby, 1995; Yamauchi, 2008). Glewwe et al. (2001) find that better-nourished children in the Philippines enter school earlier, perform better, and repeat fewer grades. Similarly, Frisvold (2015) studied the impact of the USA's School Breakfast Program (SBP) and found that the program recipients experience a significant increase in their math skills and reading ability.

Extensive literature is available on the direct impact of early childhood access to nutrition on children's health outcomes (Afridi, 2010; Luo et al., 2012; Mora et al., 2015; Rossin-Slater,2013; Sylvia et al., 2013; Todd & Winters, 2011). These studies, in general, finds the positive impact of early childhood nutrition program on children's health outcomes such as Body Mass Index (henceforth, BMI), anaemic level, obesity, height, and weight for age. A growing body of literature is also available examining the indirect impact of access to early nutrition on the educational and learning outcomes of school and college students (Adair et al., 2021; Glewwe et al., 2001; Glewwe & Jacoby, 1995; Millán et al., 2020; Todd & Winters, 2011; Wisniewski, 2010; Yamauchi, 2008). These studies suggest that the children receiving the nutrition (measured as height for age Z score) witness significant improvement in their test scores and lesser truancy. In contrast, malnourished children experience a delay in entering schools and attain lower schooling.

Another strand of literature examines the long-run effect of early childhood exposure to nutrition on college students and labour market outcomes (Bütikofer et al., 2018; Lundborg et al., 2022; McEwan, 2013). Lundborg et al. (2022) did a study in Sweden. They found that the recipient of the program earns a 3% higher lifetime income compared to the non-recipient and a significant increase in the years of schooling and university attendance.

As discussed before, vast literature is available on the impact of early childhood nutrition on health outcomes, educational outcomes, and labour market outcomes. However, there is a lack of evidence on the effect of nutrition provisioning to adolescents on their health and educational outcomes, especially the latter. The question of what would happen to adolescents' health and educational level if they get nutrition access, not at early childhood but at a later stage, is not yet well explored. This lack of evidence has motivated us to carry out this study. Therefore, our paper is the first to study the causal impact of nutrition provisioning to adolescents' educational outcomes.

4. Data

4.1 ASER Household Level Data

Our main data source is Annual Status of Education Report household level data (henceforth, ASER). ASER Centre is a part of a Non-Governmental Organization called Pratham. Every year since 2005, ASER surveys the academic achievement of the children of India aged 5-16. It covers almost every rural district in the country. The enrollment data is recorded for every child aged 3-16 years, while the learning outcomes like reading ability and math skills, are recorded only for children aged 5-16 years. The ASER survey is a nationally representative repeated cross-sectional data at the district level. Generally, the cognitive tests are done in the schools but ASER does it, in the sampled household, for every child aged 5-16 year on weekends; therefore, it captures the learning ability of both in and out of school children. This makes the dataset unique and rich because it includes data on currently enrolled children who have dropped out of schools and never attended the schools. For our analysis purpose, we have used the ASER data for the year 2016.

For measuring learning outcomes, every child is asked four questions in their native languages to check their reading ability and math skills. To understand the child's reading ability, the child is asked if he/she cannot read, can identify letters, can read words, can read standard

I level text, can read standard II level test. The entry against every child is 1 for the question he/she answers correctly and it is zero otherwise. For example, if the child can read letters and can also read words but cannot read either standard I level text or standard II level text then he/she would be marked 1 for the letters and words but zero for grade I text and grade II text. Similarly, for understanding the math skills of the child, the child is asked if he/she cannot do math, can recognize numbers between 1-9, can recognize numbers between 11-99, can do two-digit subtraction, can do division The entry against every child is 1 for the question they answer correctly and it is zero otherwise, as done in case of reading ability. Apart from the education specific data, ASER enumerators also collects data on demographic factors like age and gender, household level data (whether the sampled household has TV, vehicle, electricity connection, toilet, reading new paper, mobile, computer, and type of household, whether father and mother have gone to school), and village level variables (whether village has pucca road, primary and secondary school, electricity, bank, post office, anganwadi center).

4.2 NSSO Data

Our second primary data source is data collected by the National Sample Survey (henceforth, NSS) Organization. NSS data is a nationally representative dataset. The data is from all the states and union territories of India except Andaman and Nicobar Islands, Chandigarh, Dadra and Nagar Haveli, and Lakshadweep. In particular, we used NSS 71^{st} Round survey (January 2014 – June 2014) because this round is earmarked for social consumption survey with a particular focus on education.[10] The survey captures information on the individual's enrollment status, such as an individual who is never enrolled or was enrolled but currently not attending. The survey also captures demographic factors such as the child's age, marital status, and gender. Household socioeconomic status like religion, caste, household size, household type based on the livelihood of the household, household's usual monthly consumer expenditure, whether the household stays in rural sector or urban sector, distance to the school, type of school (government, private aided, and private unaided). Moreover, the

[10]We could not use NSS 75^{th} round survey (July 2017 – June 2018) because SABLA scheme was launched in another 303 districts in 2017-18 and became pan India from 2018 onwards.

surveyors also asks information on the education-related expense incurred (such as course fee, expense on books and uniforms, private coaching, transport, and other expense which includes expenses incurred in school projects, school tours, interest paid on educational loan) on the child.

4.3 National Family Health Survey

To measure the health outcomes of the girls exposed to SABLA program, we used National Family Health Survey (henceforth, NFHS) Round 4 data collected in 2015-16. It is a nationally representative dataset providing rich information on health such as child's weight, height, Body Mass index (henceforth, BMI) level, anemia level of the child. We used household member file alone because it is having all the information about the household members including their health information. We restrict our sample to only 16-23 years because we track down the first cohort when SABLA scheme was introduced, similar to Chatterjee & Poddar (2022).[11] Chatterjee & Poddar (2022) study the impact of SABLA on Intimate Partner Violence faced by women. Therefore, considering gender as a control is redundant. To evade this issue, they compare girls aged 15-22 years with girls aged 23-28 years with respect to SABLA and Non-SABLA districts. We cannot employ the similar strategy because our main results are based on gender.[12] In this study, our cohort of interest is children aged 16-23 years from SABLA districts.

4.4 Young Lives

We used Young Lives longitudinal dataset as a robustness check and sub-sample analysis of our main results. The survey administer young children cohort born in 2001-02 and old cohort born in 1994-95. So far, survey is done in 2002, 2007, 2009, 2013 and 2016. The dataset covers seven districts of Andhra Pradesh state of India, out of which four

[11]Although the sample of Chatterjee & Poddar (2022) is the 15-22 years considering that the official announcement of the policy is in October 2010 (Read this for more information). They assume that actual execution begins from 2011. But, the official document (Appendix H, p.21) clearly mentions the financial outlay declared for Supplementary Nutrition Program of SABLA for the year 2010-11. That's why we consider 2010 as the enanctment year. Nevertheless, for the purpose of robustness we also follow Chatterjee & Poddar (2022) method, and the results are qualitatively similar.

[12]We also used identification strategy used by Chatterjee & Poddar (2022) as a robustness check. Results re qualitatively similar.

districts are eligible for SABLE scheme.[13] The enumerators have tracked down the health status, education level, their demographic characteristics, and the corresponding household socioeconomic status. The overall attrition rate is about four percent since the 2007. The dataset, being longitudinal, takes care of time invariant unobserved heterogeneity. It will also help us account for the prior accumulation level of human capital. We used fifth wave 2016 to see the impact of SABLA program.[14] However, we used wave 2009 for the common trend assumption. To measure educational outcomes using this dataset, we used child's enrolment status and school attendance. We used the child's weight, height, and BMI to measure the health outcomes. In addition, we also used time spent in doing household tasks and household chores. Panel A, B,C, and D shows the summary statistics of the variables used in our study for ASER, NSSO, NFHS, and Young Lives data.

5. Empirical strategy

The main objective of this paper is to study the impact of the SABLA program on the educational and learning outcomes of school children. Simple OLS (ordinary least squares) model would give us biased estimates. First, since the SABLA program is a targeted program and not a random rollout, the likelihood of the difference between the treatment districts and the control districts is very high (in terms of districts characteristics such as population density, GDP per capita, literacy per person, SC and SC population, etc.) which could lead to selection bias. Second, girls from the treatment districts could also be different from those of control districts because of the selection criterion of districts such as dropout rate, early marriage, and female labour participation. This could lead to serious potential omitted variable bias. Therefore, employing simple OLS model will not yield the true causal estimate.

To circumvent the selection bias and the time invariant unobserved heterogeneity, we used a quasi-experimental research design and employ the DID technique. Our treatment group

[13] Four districts eligible for SABLA scheme are West Godavari, Anantapur, Mahabubnagar, and Hyderabad. Mahabubnagar and Hyderabad are now a part of Telangana state.

[14] Although, the older cohort is eligible for SABLA scheme from 2007 wave itself but the scheme is launched in late 2010. Also, we did the analysis considering 2013 wave of Young Lives because children become eligible for the SABLA scheme only from 2013. We did not present the results here but the same are available upon request.

consists of SABLA-eligible girls from the SABLA districts. Since the SABLA program is for only adolescent girls aged 11-18, our comparison group is a cohort of adolescent boys, aged like SABLA eligible girls, from the SABLA districts. This would give us the first difference across gender in the SABLA districts. Similarly, the second difference is also across gender, adolescent boys and girls of same age as before, but in the NON-SABLA districts. The relevant DID equation are discussed below

Enrollment

$$y_{ihd} = \beta_0 + \beta_1 female_i + \beta_2 treatment_d + \beta_3 female_i \text{ x } treatment_d \\ +\alpha_1 X_i + \gamma_1 H_h + \delta_1 D_d + \epsilon_{ihd}$$

As previously mentioned, we used NSSO data for enrollment status of school children.[15] In the above specification, y_{ihd} stands for the enrolment status of child i from household h in district d. It is a binary variable which is 1 if the child is ever enrolled in school and 0 otherwise. As per Oster (2019), the omitted variable bias is limited if the coefficient of interest is stable after including the controls.D_d stands for the district fixed effects, and ϵ_{ihd} is the idiosyncratic error term. $female_i$ is a dichotomous dummy variable that takes value 1 if the child is female and 0 for male child. $treatment_d$ is a binary variable which is 1 if the district is a SABLA district and 0 if it is not. X_i represents the individual level control variables such as age, religion, marital status, social group, and gender of the child. H_h comprises of all the household level control variables like household size, type of the house, whether any member of the sampled household has access to a computer and knows how to operate a computer, access to the internet, type of household, logarithm of household's usual monthly per capita expenditure, and distance from school (primary, upper primary, and secondary), type of institution (government, private aided, private un-aided) and distance from the residence to the institution. Our coefficient of interest is β_3 which yields the causal estimate of SABLA program on educational and learning outcomes of school children. All the standard errors are clustered at the level of intervention, that is, district level as suggested

[15] We could not use the enrolment status from the ASER data as done in Shah & Steinberg (2019) because only 1.5 percent of the sample is not enrolled. Even after following the NSSO definition of enrolment status, the proportion of not enrolled children are less than two percent.

in (Abadie et al., 2017). We track down the first cohort, eligible during 2010, and match it as per the data availability. It is similar to what Chatterjee & Poddar (2022) have followed. Apart from this, we consider the cohort just becoming eligible (11-18 years) and the entire cohort. This exercise aims to see the differential impact of the SABLA scheme.

Learning Outcomes

$$y_{ihvd} = \beta_0 + \beta_1 female_i + \beta_2 treatment_d + \beta_3 female_i \text{ x } treatment_d$$
$$+\alpha_1 X_i + \gamma_1 H_h + \delta_1 V_v + \psi_1 D_d + \epsilon_{ihvd}$$

We rely on ASER data for the learning outcomes. In the above specification, y_{ihvd} stands for the learning outcomes (reading ability, and math skills) of child i from household h in village v from district d. The reading ability and math skills are constructed as aforementioned in the data section and also done in Balakrishnan & Tsaneva (2021). D_d stands for the district fixed effects, and ϵ_{ihvd} is the idiosyncratic error term. $female_i$ is a dichotomous dummy variable that takes value 1 if the child is female and 0 for male child. $treatment_d$ is a binary variable which is 1 if the district is a SABLA district and 0 if it is not. X_i represents the individual level control variables such as age and gender of the child. H_h comprises of all the household level control variables like whether sampled household has TV, vehicle, electricity connection, toilet, mobile, computer, and type of household, whether mother has gone to school. V_v denotes the village control variables like whether village has pucca road, primary and secondary school, government primary health clinic and private health clinic, electricity, and anganwadi centre. Our coefficient of interest is β_3 which gives the causal estimate. All the standard errors are clustered at the level of intervention, that is, district level as suggested in (Abadie et al., 2017).

6. Results

6.1 Main results

Table 1 presents the enrollment results. Column 1 of Table 1 indicates the effect of the SABLA program on the enrollment of the first cohort, eligible in 2011 who are now 15-22 years old, is positive and statistically significant. However, the impact on the enrollment of

11-18 years cohort is insignificant and the impact on the entire cohort is weakly positively significant. This suggest that adolescent girls just becoming eligible for the SABLA program are not immediately joining the school. One possible reason could be that these girls' health status is already very low; therefore, it takes time, around two to three years, for them to regain the normal health status. Table 3 and 4 presents the DID estimates of the SABLA program's effect on adolescent girls' learning outcomes. It is apparent that SABLA scheme improves the learning outcomes (reading ability and math skills), although basic level. The adolescent girls can only identify the letters and words, and the numbers 1-9.

Our main results rely on the assumption that the SABLA program shouldn't affect the educational and learning outcomes of children not eligible for the SABLA program, also referred to as the placebo test. That is to say, the SABLA program should not have any impact on the educational and learning outcomes of children below 11 years and individuals aged 19 and above at the time of introduction of the SABLA program. We test this assumption by restricting the NSSO data to children aged 6-10 years and 25-45 years and re-run equation (1) separately for each cohort.[16] For ASER data, we restrict the sample to children aged 6-10 years only and re-run the equation (2) aforementioned.[17] Table 4 shows the results of the placebo test for enrollment status. The β_3 coefficient is statistically insignificant for both cohorts. This gives us evidence in favour of our results. Corresponding to table 2 and 3 are table 5 and 6. Like before, the β_3 coefficient is statistically insignificant for children aged 6-10 years. This hints that there is no spillover effects of the SABLA scheme, and the impact is only intended. Tables 4 (column 1), table 5, and table 6 also safeguard our results against the Right to Education Act 2009, a potential confounding factor explained in detail under section 6.3. We also separately run the DID regression mentioned in equation (2) using ASER wave 2009 and 2008 for children aged 11-16 years to check if there exist any differential effect pre-SABLA program between our treatment and control group (in terms of

[16]We also do the falsification test using strict cut-off, that is, age group of 23-45 years and the results are consistent. We did not report it here but it is available upon request.

[17]ASER does not administer children above 16 years of age and that's why we could not do not the falsification test for the older cohort of children not eligible for the program. In 2016, the older cohort not eligible for the program would be 25 and above.

learning outcomes), also commonly known as falsification test.[18][19] Table A.3 and A.4 in the appendix shows the relevant result. We observe β_3 to be statistically insignificant suggesting that there is not statistically significant differential impact between treatment and control pre-SABLA program.

6.2 Robustness checks

6.2.1 Alternative estimation technique

Alternative Identification Strategy

As discussed before, earliest exposure to the SABLA program is strongest. To ensure this, we used *"years of exposure to the SABLA program"* as an exogenous variation. The years of exposure to the program varies only for the potentially exposed adolescent girls whereas it is zero for the boys in the same age group. The econometric specific is given below

$$y_{ihd} = \beta_0 + \beta_1 Exposure_i + \beta_2 treatment_d + \beta_3 Exposure_i \text{ x } treatment_d$$
$$+\alpha_1 X_i + \gamma_1 H_h + \delta_1 D_d + \epsilon_{ihd}$$

In the above specification, y_{ihd} stands for the enrolment status of child i from household h in district d. $Exposure_i$ is a continous variable. It measures the number of years a child is exposed to the program. Our coefficient of interest is β_3 which gives the causal estimate. The rest of the specification remain same as before.[20]

Table 7 presents the corresponding results. The beta coeficients are positive and statistically significant for enrollment as well as for the learning outcomes. Hence, these results indeed confirm our conjecture that SABLA program benefits the cohort having relatively more years of exposure to the program.

[18] Results for ASER wave 2008 is not present in the paper but can be shared upon request.

[19] Although, we have ASER repeated cross-sectional waves from 2007 to 2016 (except 2015). Yet, we cannot implement the flexible event study framework used in Bailey & Goodman-Bacon (2015). The general specification is $Y_{it} = \theta_j + \lambda_t + \Sigma_{j=2}^{J}\beta_j\,(Lead\ j)_{it} + \Sigma_{k=2}^{K}\gamma_k\,(Lag\ k)_{it} + X'_{it}\delta + \epsilon_{it}$. In our case, if we run this regression then all the Lead coefficients (β_j) are missing from the results because many controls in X'_{it} such as mother's age, type of household, whether household has access to toilet, Television, mobile, computer, and whether the village has pucca road are missing from ASER waves before 2009.

[20] The econometric specification for the learning outcomes is same as before except for the fact that $female_i$ dummy is replaced by a continous variable $Exposure_i$.

Propensity Score Matching

As a robustness check, we run DID coupled with propensity score matching (henceforth, PSM). We match the individuals from the treatment group to individuals in the control group. Following Glinksya & Jalan (2013) and Jalan & Ravallion (2003), we matched our treatment and control groups predominantly at individual and household level variables. Child's gender, age, type of house (kutcha or pucca), whether father and mother have gone to school, and whether the household has access to mobile, toilet facility, electricity connection, and television. We also use two village-level variables (whether the village has a ration shop and bank). Yet, another reason to select these variables is the assumption that the implementation of the SABLA program should not affect them, which makes these variables exogenous to the SABLA program. WE adopt similar strategy for using PSM with DID for NSSO 71^{st} data. Figure 1 presents the common support graph for enrollment (NSSO 71^{st}) and learning outcomes (ASER 2016). The corresponding balance table is A.2 (Panel A is for ASER data and Panel B is for NSSO data) in the appendix. Since the mean difference between the treatment group and control group is statistically insignificant ($p < 0.5$) for all the variables, it suggests that the two groups now have ample commonality, also referred to as the common support assumption of PSM. Table 8, 9, and 10 shows the final results of DID combined with PSM for enrollment and learning outcomes. Figure 1 shows the common support graph for the enrollment (using NSSO 71^{st} Round data) and learning outcomes (using ASER 2016 data). These results link to table 2 and table 3. The results are qualitatively similar to our main results.[21] There is a significant impact of the SABLA program on the learning outcomes of adolescent girls in the treatment group, but only at a basic level.

Entropy Balance

Although PSM estimates the propensity scores and controls for the differences between the treatment and the control group using covariates, the propensity scores are as good as the

[21] We also run the falsification test using PSM with DID for learning outcomes and enrollment. We get the consistent result, insignificant β_3 confirming the falsification test. The results are not presented here but are available on request.

relevance of the covariates (King & Nielsen, 2019; Smith & Todd, 2001). Hainmueller (2012) proposed an alternative method, called as entropy balancing, which essentially reweights the control group by specifying the moments for each covariates and thereby minimizing the entropy distance (Hainmueller, 2012). The advantage of this method is that it mimics the randomized experiments (Athey & Imbens, 2017), is doubly robust (Zhao & Percival, 2017), and as per "the entropy weights can be easily combined with any standard estimator (Hainmueller, 2012, p.33)."

Table 11 presents the results for entropy balance and it is qualitatively similar compared to our main DID specification and PSM with DID results as well available in table 1 to 3, and 7 to 9 .[22].

Test of Exact Randomization

Following Bharadwaj et al (2014) and Buchmueller et al (2011), we also exploit the test of exact randomization. It is another way of ensuring that our main results, discussed previously, are not driven by any other confounding factor but solely due to the SABLA program. Here, we randomly assign the districts to treatment and control group and estimate the placebo beta coefficient of interest. We repeat this excerise 1000 times. In return, we get the sampling distribution of our original beta coefficent from these 1000 placebo beta coefficients. The test statistic for the null hypothesis, which in our case is the impact of SABLA program is no different between treatment and control group, is determined by measuring the percentile where the original beta coefficient lies in the distribuition of placebo betas. Now, we compare our main baseline beta coefficient with the distribution of the beta coefficients obtained after random assignment of districts between treatment and control group. Figure 2 shows the result (part (a) for the enrollment status and remaining parts are for the learning outcomes). The figures suggests that our main beta coefficients (of enrollment and learning ability i.e., reading ability and math skills) are significantly different, ,the p value corresponding to the test statistic is close to zero, from all the other

[22]The balance table between the treatment and control group before and after the entropy weights is not shared here but is available upon request. Further, the treatment group consist of 11532 and the control group consist of 25642 for ASER data. Whereas, for NSSO 71^{st} the numbers are 31720 and 61103 respectively. Post entropy weights, the treatment group and control group is balanced

beta coefficients.[23]

6.2.2 Heterogeneous Analysis

The Administrative Staff College of India (henceforth, ASCI) did the evaluation of SABLA program. They did a survey of 9222 respondents from 15 districts spread across 12 states.[24] The survey period is from December 2012 to April 2013. Their findings suggest that out of 12 states, few states are better performing states while few states did poor job in implementing the SABLA scheme.[25] Based on this audit report, we also confirm if we are getting similar results. To execute it, we run DID equation separately for good performing states and poor performing states. Table 12, table 13, and table 14 presents the results of enrolment status, reading ability, and math skills respectively. There is a significant increase in enrolment status (higher magnitude) and significant increase in the reading level and math skills at all levels (except for math skills). These results clearly indicates that the impact of SABLA program is strong in better performing states. The corresponding results for poor performing states are also reported in table A.5, A.6, and A.7 in the appendix. The statistically insignificant β_3 coefficient suggest that the government of Uttar Pradesh and Bihar did not implement the SABLA program effectively.

6.2.3 Subsample analysis

So far, we have presented and discussed our findings of the SABLA effect for pan India. We would like to know if any differential impact of the SABLA program exists on the states of India. We substantiate our hypothesis by conducting a sub-sample analysis for Andhra Pradesh, an Indian state. The intent of selecting Andhra Pradesh is twofold. The first is for the sub-sample analysis, and the second is the rich longitudinal data availability. The

[23]The results of exact randomization on math skills is not shown here, because it is similar to that of reading ability, but can be shared upon request.

[24]Refer to this (p.54) for more information. The 12 states are Andhra Pradesh, Assam, Bihar, Haryana, Karnataka, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Tripura, and Uttar Pradesh

[25]Andhra Pradesh, Odisha, Maharashtra, Karnataka, Tamil Nadu, and Haryana are better performing states in terms of educational outcomes. Bihar is a poor performing state. Remaining states perform well in some parameters but equally bad in other parameters. However, the report also emphasizes that Rajasthan did well in health coverage this (p.68) but poor in educational outcomesthis (p.74). That's why we removed Rajasthan from education while doing the analysis for good performing states.

Young Lives longitudinal dataset captures all the apposite information such as educational and health outcomes and demographic and household socioeconomic variables. We follow the first cohort, eligible during 2010, in 2016, giving us the age group of 17-24. But the oldest individual in Young Lives data is 22 years; therefore, we consider our final sample of individuals of age-group 17-22. We followed a methodology similar to Zhang & Xu (2016). We used one data point per individual for waves three and five collected during 2009 and 2016 respectively. We exploit the fifth wave to estimate the effect of the SABLA program. The third wave (2009) is used to check if the treatment group and control group followed a similar trajectory before the SABLA program, commonly known as the common trends assumption.[26] Also, the maximum age of the child in third wave of Young Lives data is 15 years and minimum is 7 years, thereby the sample is 7-15 years while using wave three. Specifically, we run cross-sectional DID similar to equation (1) for these three waves. The concerned DID econometric specification is same as equation (1). Here, y_{ihd} stands for the current enrolment level and hours spent at school of child i from household h in district d. $treatment_d$ is a binary variable which is 1 if the district is a SABLA district and 0 if it is not. $female_i$ is a dichotomous dummy variable that takes value 1 if the child is female and 0 for male child. X_i represents the individual level control variables such as age, gender, ethnicity, religion and marital status of the child. H_h comprises of all the household level control variables like household size, number of male and female below 5 years, consumer durables index, wealth index, housing quality index, household head age and gender, whether sampled household has electricity connection, toilet facility, drinking water facility, mother's age, area of residence (rural or urban). D_d is the district fixed effects, and ϵ_{ihd} is the idiosyncratic error term. Our coefficient of interest is β_3. Standard errors are clustered as equation (1).

Table 15 shows the relevant result. There is a positive and statistically significant impact of the SABLA program on the enrollment level of adolescent girls in the treatment districts.[27]

[26] Since, children from older cohort becomes 13 years old which gives a very small sample size and our DID regression specification did not work after including controls. That's why we did not use the data before 2009.

[27] We also restrict our NSSO 71^{st} Round data to only Andhra Pradesh and re-run the DID equation (1). We are getting qualitatively similar results, positive and statistically significant. The results are not presented here, though it can be shared upon request.

We run the DID regression for wave 2009 alone to vindicate the parallel trends assumption. Table 16 shows the result, and like before, the β_3 coefficient is statistically insignificant and thereby providing confidence to our main results. Since there is a significant improvement in the enrollment of adolescent girls from the treatment districts. We also examine whether the treated adolescent girls attend more schools post-SABLA program. Further, if they are (not) spending more time in school, then are they spending less (more) doing unproductive work like household chores. Table 17 shows the results and suggests that the program recipients spend significantly less time doing household chores and household tasks (farming) and attend more school, although the effect is weakly significant.

6.3 Potential Confounding factors

One of the major confounding factor for our study is Right to Education Act, 2009 (henceforth, RTE).[28] The RTE act is applicable since 01.April.2010. Under this Act, every child aged 6-14 years is entitled to get free education in a neighbourhood school. India became one of the 135 countries to make elementary education free and mandatory, and also the fundamental right of every child. Shah & Steinberg (2019) have shown a steep rise in the enrollment rate post-implementation of the RTE Act. The study also finds a sharp decline in the learning outcomes (reading ability and math skills) of school children aged 6-14. Given that, it might be possible that our results (especially the enrolment status) are biased and driven by RTE Act. To verify, we run the DID model in equations (1) and (2) for children aged 6-10 years (below 11 years) for enrollment status and learning outcomes, respectively. The reason is twofold. Children aged 6-10 years are eligible under RTE Act but not eligible under the SABLA program. Therefore, this sample acts as a placebo test and a robustness check against the confounding factor (RTE Act). Table 4 (column 1) shows the result for the enrollment status. Tables 5 and 6 show the results of the learning outcomes. The β_3 coefficient is statistically insignificant across all specifications and thereby, we can conclude that RTE Act does not affect our results.

6.4 Channels

[28]Click here for more information. Also, refer to this link for official announcement.

Our findings suggest that the SABLA program improves potentially exposed adolescent girls' enrollment and basic-level learning outcomes. Therefore, it successfully closes the gender gap in education. But what could be the possible mediating channels that make this program successful? We discuss the two possible potential mediating channels. We classify them as direct and indirect channels.

6.4.1 Direct Channels

The major component of the SABLA program is to provide nutritious food to adolescent girls (both in and out of school). Nutrition was provided either as a take-home ration or as a hot-cooked meal for 300 days a year. The provision of nutritious food under SABLA contained 600 calories and was rich in protein and other micronutrients. The regular supply of iron and folic acid tablets was supplementary. Furthermore, routine health check-ups like measurement of height, weight, and BMI were also a part of the program to monitor the changes in the anthropometric health outcomes of the recipients of the program.

Given the special focus on the health status of adolescent girls, it could be the direct channel reducing the illness related truancy from schools. The program recipients' enrollment could improve significantly because of their better health status (improvement in anthropometric outcomes). It is vividly evident from the literature that access to nutritious food results in better health outcomes for children, such as BMI, anaemia level, height, and weight. Bütikofer et al (2018) and Lundborg et al (2022) studied the long-term impact of the early childhood nutrition program in Sweden and Norway on educational outcomes. They employ DID and find significant improvement in the schooling level of the treatment group compared to the control group. Similarly, Alderman et al (2009) and Glewwe & Jacoby (1995) study concludes that malnourished children experience a delay in entering schools and attain lower schooling. As Gomes-neto et al (1997) conjecture that students' academic achievement and health status complement each other, the latter acts as a significant determinant of the former. In order to explore this conjecture, we exploit the NFHS Round 4 data to measure the anthropometric health outcomes such as the BMI, height, and weight along with the anaemia level of SABLA-eligible girls from the treatment districts. We restrict our sample to the cohort of children aged 16-23 years, similar to Chatterjee & Poddar (2022), because these are the adolescent girls who got early access to the program in 2010 and our comparison group is the adolescent boys of the same age group. We run the same DID regression equation (1). Our outcome variable y_{ihd} stands for the anaemia level, BMI, height, and weight of child i from household h in district d. $Treatment_d$ is a binary variable which is 1 if the district is a SABLA district and 0 if it is not. $Female_i$ is a dichotomous dummy variable that takes value 1 if the child is female aged 16-23 years and 0 for male child aged 16-23 years. X_i represents the individual level control variables such as age, gender, ethnicity, religion, marital status, whether a person smokes, and pregnancy status of the child. H_h comprises of all the household level control variables like household size, number of male and females below 5 years, wealth index, household head age and gender, whether the sampled household has electricity connection, toilet facility, drinking water facility, mother's age, the structure of the house (nuclear or joint family), area of residence (rural or urban). D_d is the district fixed effects, and ϵ_{ihd} is the idiosyncratic error term. Our coefficient of interest is β_3. Standard errors are clustered same as in equation (1).

Table 18 shows the results. The β_3 coefficient of child's weight and height are positive and statistically significant, suggesting significant improvement in the health outcomes of SABLA-eligible girls in the treatment group. Therefore, our results confirm the findings from the literature. We did not find any significant impact on beneficiaries' BMI and anaemia level. Results are also qualitatively similar to Chatterjee & Poddar (2022) and Krämer et al (2021).[29]

Thomas et al (1996) finds that BMI declines with schooling.[30] Likewise, Siddiqui & Donato (2020) analysed the issue of obesity and overweight in India using NFHS Round 3 and Round

[29] Chatterjee & Poddar (2022) study the impact of SABLA program on intimate partner violence. They did not consider anaemic level. They find significant improvement in child's height and weight. They also did not find any significant impact on BMI. Krämer et al (2021) study the impact of providing parents' with the health information (related to anemia) on health status and cognitive outcomes of school children in the context of India. They did not find any impact on health outcomes and cognitive scores. Longfils et al (2005) did not find any significant impact of iron and folic acid tablets on haemoglobin (anemia) level of younger children aged 12-14 years.

[30] The study of Thomas et al (1996) also suggest that child's height for age is a good indicator of long run nutritional status of a child whereas child's weight for height is a good indicator of child's short run health status.

4. They find a negative relationship between education level and overweight (or obesity) for females. Their analysis shows that overweight/obesity increases till the females aged 7-9 years and then falls after that. Cohen et al (2013) provides an explanation that females with low level of education are associated with heterogeneous pattern of physical activities compared to females having high level of education who associate themselves with healthier and weight reducing activities. Similarly, we also utilize the Young Lives data to validate our national-level findings with the sub-sample unit (Andhra Pradesh). The outcome variables are child weight and BMI. The DID equation remains the same as equation (1). Table 19 presents the results. We find positive, though weak, effects on BMI and a child's weight but no significant impact on the child's height. Apart from this, we also verify our channel for the better-performing and poor-performing states. We find strong evidence for better performing states and statistically insignificant impact for poor performing states. Table A.8 shows the results for the better-performing states. The impact of SABLA program, in better performing states, on child's height is statistically significant and more strong (magnitude wise) but weak impact on child's weight.[31] We did not find any impact on BMI and anemic level, same as before.

6.4.1 Indirect Channels

While school feeding programs can improve school children's educational and learning outcomes, they also motivate the household to invest in their children's education (Wang & Cheng, 2022). Studies have vindicated the significant increase in child-specific education expenditure via conditional cash transfers (CCTs) (Aizawa, 2020; Gitter & Barham, 2008) and increase in parental income (Alam, 2012; Behrman & Knowles, 1999; Glick & Sahn, 1999). There is also evidence of a significant increase in non-food expenditure and child-specific educational expenditure due to the school feeding program (Babu & Hallam, 1989). As the government usually sponsors a nutritional food program or provides a cash transfer, it affects the household consumption expenditure, which the parents could invest in some productive activities such as in their children's education (Chatterjee & Poddar, 2021; Wang & Cheng, 2022). In our study, the central government is a sponsoring body of the SABLA

[31]Results are not presented here for poor performing states but are available on request.

program; therefore, the parents of the potentially exposed adolescent girls can channel these funds, which they would have spent on their daughters had the SABLA program not been introduced.

Following Chatterjee & Poddar (2021) and Wang & Cheng (2022), we estimate the effect of the SABLA program on the child-specific educational expenditure incurred by the parents and on the likelihood of attending private tuition.[32] We used NSSO 71^{st} Round for the former outcome and ASER 2016 wave for the latter outcome. The econometric specification remains same as equation (1) and (2) for child specific expenditure and tuition respectively. Table 20 shows the result for the impact of SABLA program on child specific educational expenditure. We find positive and statistically significant effect on the first cohort (column 1 of table 18). We did the falsification test as aforementioned and here also our β_3 coefficient is statistically insignificant (significant at five percent) in Table 21, which suggests that there is a mild spill over effect for younger siblings of the potentially exposed adolescent girls. Table 22 shows DID estimates of likelihood of attending private tuition for the eligible cohort (11-16 years in column 1) and ineligible cohort (6-10 years in column 2). The results are significant for the eligible cohort and insignificant for the ineligible cohort.[33] This signifies that beneficiary parents of SABLA recipient girls are making investment in the education of their daughters conditional on observing the substantial improvement in their health condition, which happens in medium run as our results are showing. The impact is strong for the earliest cohort exposed to the SABLA program compared to the cohort which receives SABLA benefits later.

7. Conclusion

The disparity in human capital persists if children do not access nutritious food early in childhood (Lundborg et al., 2022). Extensive studies show the positive and significant impact

[32] Unlike NSSO, ASER enumerators asks if the child is taking paid private tuition. Therefore, we estimate the likelihood of attending private tuition among the recipients of the SABLA program.

[33] We also run the same model using PSM with DID, logit, and probit model. The results are qualitatively similar. Further, we did the falsification test as well using PSM with DID, Logit, and Probit, models. We find insignificant impact in the falsification tests using these three methods. Results are not present here but are available on request.

of an early childhood nutritional food program on children's health (Mora et al., 2015; Sylvia et al., 2013; Todd & Winters, 2011; Variyam et al., 1999), educational (Alderman et al., 2012; Glewwe et al., 2001; Glewwe & Jacoby, 1995), and long term labour market outcomes (Bütikofer et al., 2018; Lundborg et al., 2022; McEwan, 2013). Nonetheless, less is known about health intervention at an adolescent age. Our paper examines the causal impact of one such policy introduced in India, the Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (SABLA), in late 2010 for girls aged 11-18 years on their educational and learning outcomes (reading ability and math skills). The program's rollout gives enough variation in the treatment enabling us to use a quasi-experimental design. We employ DID framework in our study using multiple datasets. Our results reveal that the SABLA program has a positive and statistically significant impact on the enrollment of adolescent girls. However, we experience a slight improvement in reading ability and math skills. Specifically, there is a positive and significant improvement only at the basic level of reading (identifying letters and words) and math skills (identification of numbers 1-9). We also conducted the sub-sample analysis and witnessed qualitatively similar results. We also study the possible mediating channels causing these changes. We find the direct impact of the SABLA program on the health status of our treatment group. In particular, we observe a positive and statistical increase in the height and weight of the adolescent girls from the treatment group but no impact on their BMI and anaemia level, similar to what Chatterjee & Poddar (2022) find. In addition, we find weak evidence of a positive and significant increase in the child-specific educational expenditure incurred by the parents of an adolescent girl from the treatment group and a strongly positive and significant increase in the likelihood of attending private tuition for program recipients. These results indicate that the program has somewhat closed the gender gap in health and education.

The policy implication of our findings is that although access to nutritious food at an adolescent stage positively and significantly impacts educational and learning outcomes, these favorable changes are more pronounced and visible for those who get early access. It resembles the stylized fact that nutritious food provisioning is beneficial for the overall development of children if given at an early stage. Hence, for the policy to be more effective and show desired results, the government of India should introduce an early childhood nutritious food policy similar to Mid-day Meal Scheme rather than bringing it later.

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Table 1: DID estimates of enrollment of SABLA eligible girls (NSSO-71^{st} Round)

	Enrollment		
	15-22 years	11-18 years	11-22 years
Variables	(1)	(2)	(3)
Female	-0.0133**	-0.0236**	-0.0128**
	(0.00635)	(0.0117)	(0.00599)
Treatment	0.00579	0.397***	0.0550***
	(0.0145)	(0.0333)	(0.0149)
Female x Treatment	0.0226**	0.0201	0.0211**
	(0.00976)	(0.0178)	(0.00930)
Constant	-0.0201	-1.119***	-0.510***
	(0.256)	(0.344)	(0.136)
N	15,506	6,559	16,712
R^2	0.138	0.233	0.163
Demographic Controls	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes

Notes: Individual level control includes such as age, religion, marital status, social group, and gender of the child. Household level control are household size, type of the house, whether any member of the sampled household has access to computer and knows how to operate computer, access to internet, type of household, logarithm of household's usual monthly per capita expenditure, and distance from school (primary, upper primary, and secondary), type of institution (government, private aided, private un-aided) and distance from the residence to the institution. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2: DID estimates of reading ability of SABLA eligible girls (ASER 2016)

	Reading Ability (11-16 years)			
	Letters	Words	Grade-1 Text	Grade-2 Text
Variables	(1)	(2)	(3)	(4)
Female	0.000752	-0.000260	0.0124***	0.0293***
	(0.000927)	(0.00202)	(0.00284)	(0.00367)
Treatment	0.0290***	0.0586***	0.0973***	0.152***
	(0.00192)	(0.00363)	(0.00497)	(0.00618)
Female x Treatment	0.00408**	0.00682*	0.00491	0.00721
	(0.00189)	(0.00374)	(0.00531)	(0.00696)
Constant	0.713***	0.171***	-0.405***	-0.858***
	(0.0296)	(0.0571)	(0.0761)	(0.0913)
N	140,065	140,065	140,065	140,065
R^2	0.036	0.094	0.135	0.170
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3: DID estimates of math skills of SABLA eligible girls (ASER 2016)

	Math Skills (11-16 years)			
	Numbers 1-9	Numbers 11-99	Subtraction	Division
Variables	(1)	(2)	(3)	(4)
Female	-0.000622	-0.0221***	-0.0240***	-0.0248***
	(0.000833)	(0.00237)	(0.00404)	(0.00450)
Treatment	0.000410	0.0157***	0.0561***	0.0990***
	(0.00156)	(0.00401)	(0.00696)	(0.00701)
Female x Treatment	0.00384**	0.00612	0.00573	-0.000552
	(0.00157)	(0.00420)	(0.00736)	(0.00863)
Constant	0.828***	0.265***	0.0351	-0.468***
	(0.0235)	(0.0582)	(0.0901)	(0.0978)
N	139,908	139,908	139,908	139,908
R^2	0.029	0.106	0.168	0.181
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Falsification test: DID estimates of enrollment of girls (NSSO - 71^{st} Round)

	Enrollment	
	below 11 years	25-45 years
Variables	(1)	(2)
Female	0.00722	-0.00665
	(0.0158)	(0.00718)
Treatment	-0.471***	0.265***
	(0.134)	(0.0182)
Female x Treatment	0.00609	0.00699
	(0.0225)	(0.0110)
Constant	0.762***	-0.636
	(0.257)	(1.385)
N	2,173	15,163
R^2	0.474	0.166
Demographic Controls	Yes	Yes
HH Socioeconomic Controls	Yes	Yes
District FE	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Falsification Test: DID estimates of reading ability of SABLA eligible girls (ASER 2016)

	Reading Ability (6-10 years)			
	Letters	Words	Grade-1 Text	Grade-2 Text
Variables	(1)	(2)	(3)	(4)
Female	0.00708***	0.00998***	0.0213***	0.0258***
	(0.00239)	(0.00318)	(0.00334)	(0.00298)
Treatment	0.102***	0.229***	0.163***	0.131***
	(0.00481)	(0.00566)	(0.00588)	(0.00516)
Female x Treatment	-0.00174	0.00336	0.00705	0.00396
	(0.00471)	(0.00542)	(0.00567)	(0.00531)
Constant	-0.854***	-1.084***	-0.459***	-0.00714
	(0.0429)	(0.0543)	(0.0500)	(0.0340)
N	146,762	146,762	146,762	146,762
R^2	0.232	0.316	0.292	0.228
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Falsification Test: DID estimates of math skills of SABLA eligible girls (ASER 2016)

	Math Skills (6-10 years)			
	Numbers 1-9	Numbers 11-99	Subtraction	Division
Variables	(1)	(2)	(3)	(4)
Female	-0.00421*	-0.0173***	-0.00331	-0.00676***
	(0.00215)	(0.00317)	(0.00300)	(0.00214)
Treatment	0.0179***	0.0609***	0.0440***	-0.0225***
	(0.00397)	(0.00571)	(0.00528)	(0.00368)
Female x Treatment	0.00227	0.00225	0.00433	0.00168
	(0.00418)	(0.00568)	(0.00483)	(0.00370)
Constant	-0.735***	-0.755***	0.102**	0.394***
	(0.0424)	(0.0503)	(0.0407)	(0.0206)
N	146,642	146,642	146,642	146,642
R^2	0.217	0.332	0.256	0.154
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Years of exposure effect of SABLA program on enrollment and learning outcomes of potentially exposed adolescent girls.

Panel A: Enrollment Status (NSSO 71^{st} Round data)				
Variables	11-22 years			
Treatment x Years exposed	0.00656**			
	(0.00256)			
R^2	0.180			
N	16,928			
Panel B: Reading Ability (11-16 years) Aser 2016 data				
Variables	Letters	Words	Grade-I Text	Grade-II Text
Treatment x Years exposed	0.000787**	0.00199**	0.00204*	0.00216
	(0.000399)	(0.000795)	(0.00115)	(0.00154)
R^2	0.036	0.094	0.135	0.169
N	140,065	140,065	140,065	140,065
Panel C: Math Skills (11-16 years) Aser 2016 data				
Variables	Numbers 1-9	Numbers 11-99	Subtraction	Division
Treatment x Years exposed	0.000545*	0.00146*	0.00144	-0.000552
	(0.000320)	(0.000748)	(0.00164)	(0.00208)
R^2	0.029	0.106	0.168	0.181
N	139,908	139,908	139,908	139,908
Demographic Controls	Yes	Yes	Yes	Yes
HH Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: For enrollment status in Panel A (NSSO 71^{st} Round data), the controls are childs' age, age square, religion, distance to institute, type of institute, whether the child can operate computer, whether free textbooks and stationary is given to child. For learning outcomes in panel B and C (ASER 2016 data), the controls are child's age, age square,type of school child is enroled into, mother's age, whether mother has gone to school, household size, type of house, whether house as access to electricity, toilet, mobile, computer, television, newspaper, reading materials, whether village has government primary health center, private health care center, pucca road, government primary school from standard I to V, government middle school from standard I to VIII, government middle school from standard VI to VIII, government secondary school from standard I to X,private schools, and anganwadi center. Entropy weights are used in all the specifications. District Fixed Effects are used in all the specifications. The robust standard errors are clustered, by district ID, are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

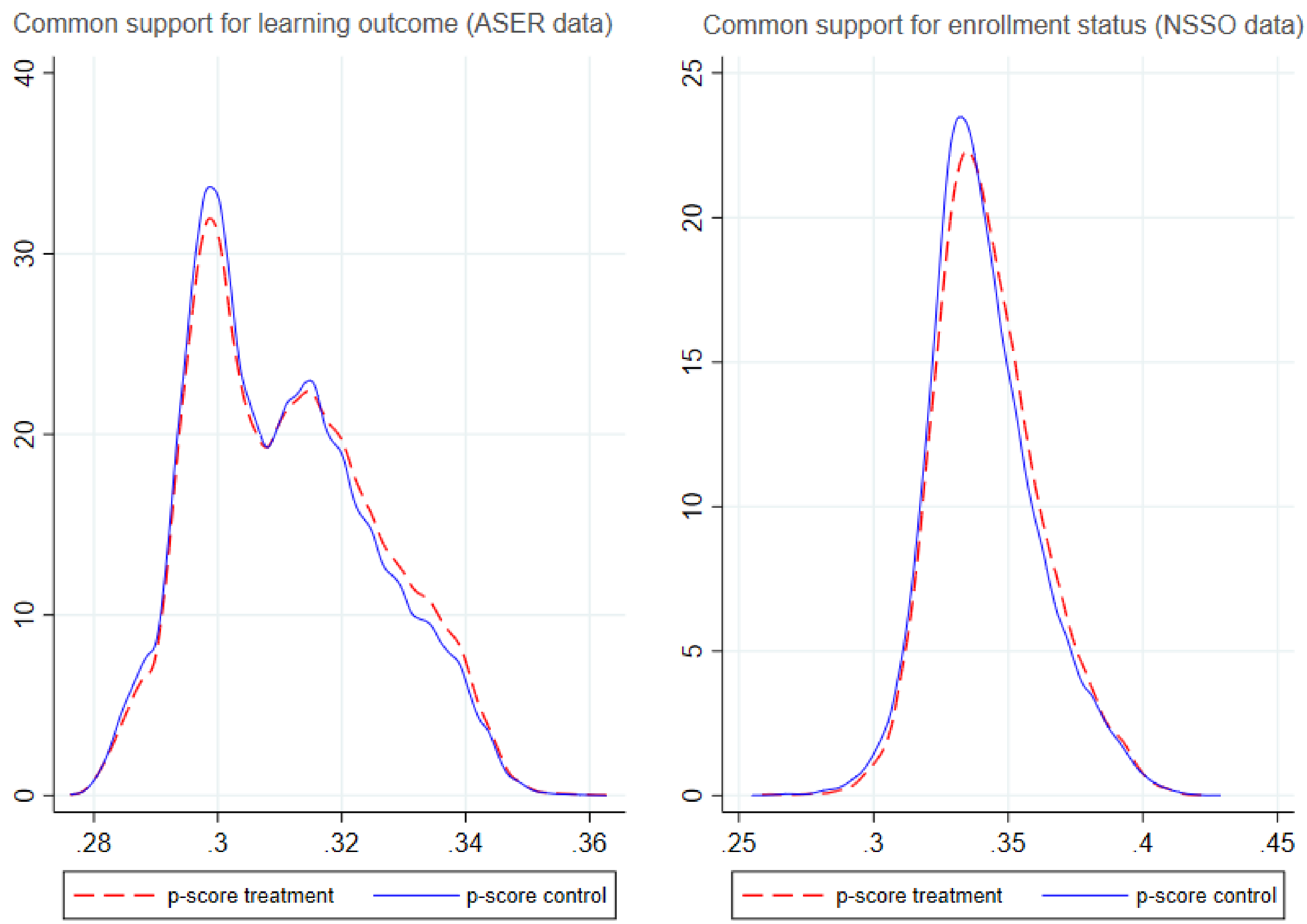

Figure 1 shows the common Support graph for NSSO 71^{st} Round data and ASER 2016 data.

Table 8: DID with matching estimates of enrollment of SABLA eligible girls (NSSO-71^{st} Round)

	Enrollment		
	15-22 years	11-18 years	11-22 years
Variables	(1)	(2)	(3)
Female	-0.0129**	-0.0225**	-0.0127**
	(0.00632)	(0.0117)	(0.00592)
Treatment	-0.00247	0.397***	0.0356***
	(0.0132)	(0.0305)	(0.0134)
Female x Treatment	0.0232**	0.0188	0.0211**
	(0.00974)	(0.0179)	(0.00928)
Constant	0.859***	0.333***	0.761***
	(0.0274)	(0.0562)	(0.0278)
N	15,506	6,559	16,712
R^2	0.135	0.229	0.154
Demographic Controls	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes

Notes: Individual level control includes such as age, age square, religion, Household level control are, whether any member of the sampled household knows how to operate computer,distance from school (primary, upper primary, and secondary), type of institution (government, private aided, private un-aided), and whether child receive textbooks and stationary from school. District fixed effects are included in all the specifications. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 9: DID with matching estimates of reading ability of SABLA eligible girls (ASER 2016)

	Reading Ability (6-10 years)			
	Letters	Words	Grade-1 Text	Grade-2 Text
Variables	(1)	(2)	(3)	(4)
Female	0.00109	-0.00122	0.0116***	0.0270***
	(0.000981)	(0.00217)	(0.00301)	(0.00383)
Treatment	0.0175***	0.0248***	0.0525***	0.0775***
	(0.00186)	(0.00368)	(0.00511)	(0.00719)
Female x Treatment	0.00378**	0.00714*	0.00556	0.00719
	(0.00193)	(0.00396)	(0.00560)	(0.00707)
Constant	0.952***	0.867***	0.698***	0.390***
	(0.00451)	(0.00954)	(0.0149)	(0.0176)
N	136,113	136,113	136,113	136,113
R^2	0.029	0.075	0.105	0.138
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age square, mother's age, type of school child is enroll in. Household-level control includes household size, whether the household has access to newspaper, and reading materials. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, government secondary school, private school, government primary health center, and private health center. The robust standard errors are clustered, by district ID, are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 10: DID with matching estimates of math skills of SABLA eligible girls (ASER 2016)

	Math Skills (11-16 years)			
	Numbers 1-9	Numbers 11-99	Subtraction	Division
Variables	(1)	(2)	(3)	(4)
Female	-0.000629	-0.0230***	-0.0276***	-0.0287***
	(0.000845)	(0.00252)	(0.00426)	(0.00473)
Treatment	-0.00120***	0.00183***	0.0226***	0.0151***
	(0.00159)	(0.00403)	(0.00703)	(0.00729)
Female x Treatment	0.00361**	0.00612	0.00640	0.00210
	(0.00157)	(0.00441)	(0.00745)	(0.00894)
Constant	0.983***	0.913***	0.727***	0.322***
	(0.00430)	(0.00991)	(0.0184)	(0.0180)
N	135,953	135,953	135,953	135,953
R^2	0.024	0.086	0.134	0.148
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age square, mother's age, type of school child is enroll in. Household-level control includes household size, whether the household has access to newspaper, and reading materials. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, government secondary school, private school, government primary health center, and private health center. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 11: DID estimates, with entropy weights, of effect of SABLA program on enrollment and learning outcomes potentially exposed adolescent girls.

	Panel A: Enrollment Status (NSSO 71^{st} Round data)			
Variables	15-22 years	11-18 years	11-22 years	
Female x Treatment	0.0233**	0.0205**	0.0209**	
	(0.00974)	(0.00179)	(0.00925)	
R^2	0.131	0.229	0.151	
N	15,506	6,559	16,712	
	Panel B: Reading Ability (11-16 years) Aser 2016 data			
Variables	Letters	Words	Grade-I Text	Grade-II Text
Female x Treatment	0.004251**	0.00781**	0.00627	0.00910
	(0.00194)	(0.00391)	(0.00627)	(0.00910)
R^2	0.022	0.4048	0.064	0.075
N	140,065	140,065	140,065	140,065
	Panel C: Math Skills (11-16 years) Aser 2016 data			
Variables	Numbers 1-9	Numbers 11-99	Subtraction	Division
Female x Treatment	0.00420***	0.00742**	0.00790	0.00180
	(0.00162)	(0.00442)	(0.00769)	(0.00901)
R^2	0.018	0.059	0.095	0.099
N	139,908	139,908	139,908	139,908
Demographic Controls	Yes	Yes	Yes	Yes
HH Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: For enrollment status in Panel A (NSSO 71^{st} Round data), the controls are childs' age, age square, religion, distance to institute, type of institute, whether the child can operate computer, whether free textbooks and stationary is given to child. For learning outcomes in panel B and C (ASER 2016 data), the controls are whether village has government primary health center, private health care center, pucca road, government primary school from standard I to V, government middle school from standard I to VIII, government middle school from standard VI to VIII, government secondary school from standard I to X,private schools, and anganwadi center. Entropy weights are used in all the specifications. District Fixed Effects are used in all the specifications. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

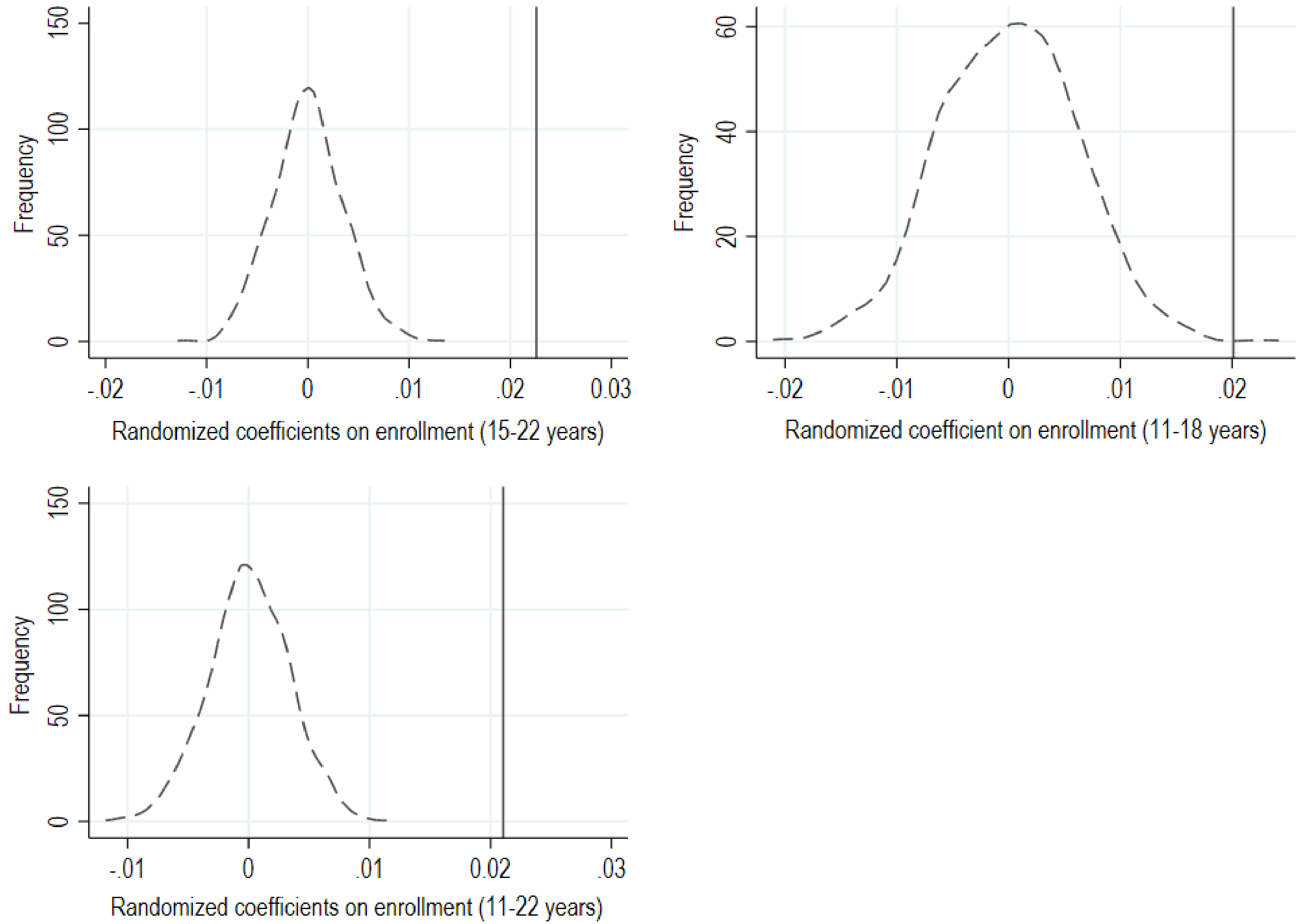

Figure 2 shows the Exact randomization on enrollment status

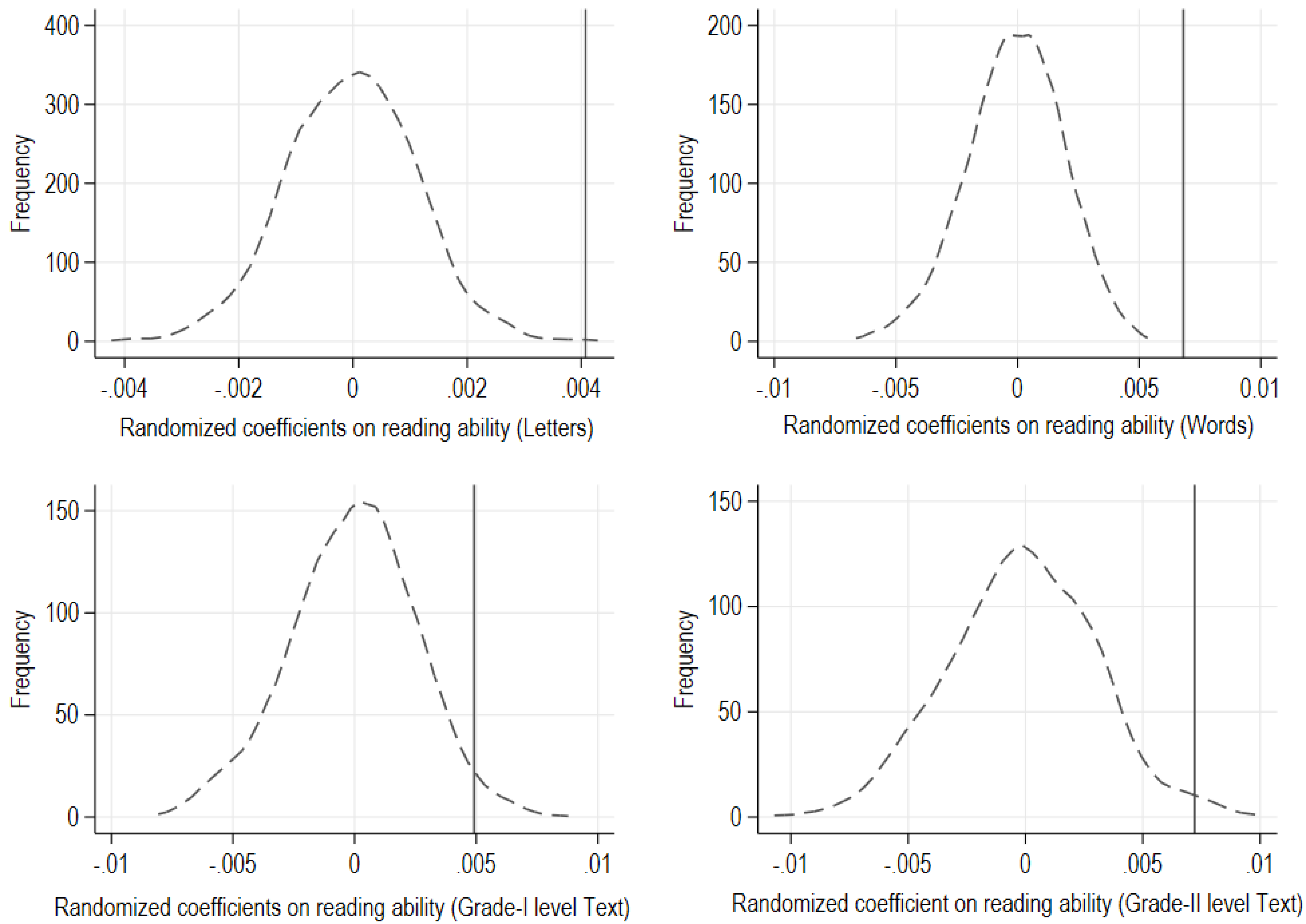

Figure 2 shows the Exact randomization on reading ability

Table 12: DID estimates of enrollment of SABLA eligible girls in better performing states (NSSO - 71^{st} Round)

	Enrollment		
	15-22 years	11-18 years	11-22 years
Variables	(1)	(2)	(3)
Female	-0.0134	-0.0335**	-0.0156*
	(0.00987)	(0.0166)	(0.00890)
Treatment	0.00847	0.119	-7.63e-05
	(0.0262)	(0.0980)	(0.0268)
Female x Treatment	0.0249*	0.0316	0.0266*
	(0.0148)	(0.0313)	(0.0146)
Constant	-0.458	-0.443	-0.445*
	(0.422)	(0.814)	(0.268)
N	3,887	1,402	4,079
R^2	0.132	0.281	0.158
Demographic Controls	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes

Notes: Individual level control includes such as age, religion, marital status, social group, and gender of the child. Household level control are household size, type of the house, whether any member of the sampled household has access to computer and knows how to operate computer, access to internet, type of household, logarithm of household's usual monthly per capita expenditure, and distance from school (primary, upper primary, and secondary), type of institution (government, private aided, private un-aided) and distance from the residence to the institution. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 13: DID estimates of reading ability of SABLA eligible girls in better performing states (ASER 2016)

	Reading Ability (11-16 years)			
	Letters	Words	Grade-1 Text	Grade-2 Text
Variables	(1)	(2)	(3)	(4)
Female	0.00348**	0.0117***	0.0342***	0.0618***
	(0.00169)	(0.00265)	(0.00436)	(0.00590)
Treatment	-0.0277***	-0.00973***	-0.0678***	-0.174***
	(0.00214)	(0.00357)	(0.00519)	(0.00744)
Female x Treatment	0.00479	0.0127**	0.0170**	0.0290***
	(0.00354)	(0.00553)	(0.00808)	(0.0109)
Constant	0.692***	0.359***	-0.129	-0.584***
	(0.0595)	(0.107)	(0.153)	(0.183)
N	37,086	37,086	37,086	37,086
R^2	0.031	0.058	0.092	0.129
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 14: DID estimates of math skills of SABLA eligible girls in better performing states (ASER 2016)

	Math Skills (11-16 years)			
	Numbers 1-9	Numbers 11-99	Subtraction	Division
Variables	(1)	(2)	(3)	(4)
Female	0.00196	-0.00102	0.0232***	0.0286***
	(0.00151)	(0.00320)	(0.00626)	(0.00680)
Treatment	-0.0181***	0.0109***	-0.0267***	-0.0926***
	(0.00138)	(0.00346)	(0.00693)	(0.00843)
Female x Treatment	0.00450*	0.0119*	0.0237**	0.00994
	(0.00233)	(0.00611)	(0.0117)	(0.0139)
Constant	0.845***	0.432***	0.130	-0.424**
	(0.0415)	(0.104)	(0.172)	(0.178)
N	37,042	37,042	37,042	37,042
R^2	0.026	0.081	0.151	0.157
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 15: DID estimate of SABLA eligible girl's enrollment (Young-Lives 2016 Data)

	Enrollment
	17-22 years
Variables	(1)
Female	0.0827
	(0.361)
Treatment	-0.502
	(0.326)
Female x Treatment	0.798**
	(0.323)
Constant	-2.487
	(2.655)
N	909
R^2	0.182
Demographic Controls	Yes
HH Socioeconomic Controls	Yes
District FE	Yes

Notes: Individual level control variables such as age, gender, ethnicity, religion and marital status of the child. Household level control variables like household size, number of male and female below 5 years, consumer durables index, wealth index, housing quality index, household head age and gender, whether sampled household has electricity connection, toilet facility, drinking water facility, mother's age, area of residence (rural or urban). The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 16: Parallel Trend Assumption of SABLA eligible girl's on enrollment (Young-Lives 2009 Data)

	Enrollment
	7-15 years
Variables	(1)
Female	0.0962
	(0.846)
Treatment	2.264**
	(0.864)
Female x Treatment	-0.427
	(1.129)
Constant	2.829
	(4.702)
N	494
R^2	0.226
Demographic Controls	Yes
HH Socioeconomic Controls	Yes
District FE	Yes

Notes: Individual level control variables such as age, gender, ethnicity, religion and marital status of the child. Household level control variables like household size, number of male and female below 5 years, consumer durables index, wealth index, housing quality index, household head age and gender, whether sampled household has electricity connection, toilet facility, drinking water facility, mother's age, area of residence (rural or urban). The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 17: DID estimate of SABLA eligible girl's time spent in doing household tasks, household chores, and in school (Young-Lives 2016 Data)

	Time spent in		
	17-22 years		
	HH Tasks	HH Chores	School
Variables	(1)	(2)	(3)
Female	-0.102	1.713***	-0.0590
	(0.220)	(0.147)	(0.304)
Treatment	1.060***	-0.198	-0.277
	(0.267)	(0.130)	(0.369)
Female x Treatment	-0.718**	-0.530**	0.932*
	(0.233)	(0.206)	(0.449)
Constant	3.226	2.375***	-1.147
	(2.465)	(0.642)	(1.625)
N	830	741	741
R^2	0.192	0.498	0.214
Demographic Controls	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes

Notes: Individual level control variables such as age, gender, ethnicity, religion and marital status of the child. Household level control variables like household size, number of male and female below 5 years, consumer durables index, wealth index, housing quality index, household head age and gender, whether sampled household has electricity connection, toilet facility, drinking water facility, mother's age, area of residence (rural or urban). The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 18: DID estimates of health outcomes of SABLA eligible girls (NFHS- Round 4)

	Health outcomes (16-23 years)			
	BMI	Weight	Height	Anaemia
Variables	(1)	(2)	(3)	(4)
Female	-8.48e-06	-0.116***	-0.0545***	0.293***
	(0.00431)	(0.00696)	(0.00361)	(0.0127)
Treatment	-0.0239*	-0.0894***	-0.0442***	-0.200***
	(0.0136)	(0.0232)	(0.0117)	(0.0313)
Female x Treatment	-0.00196	0.0239**	0.0147***	-0.0171
	(0.00755)	(0.0105)	(0.0105)	(0.0243)
Constant	7.585***	6.100***	7.298***	-1.466***
	(0.0227)	(0.0398)	(0.0216)	(0.0622)
N	22,191	22,328	22,331	22,089
R^2	0.095	0.392	0.450	0.771
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Individual level control variables such as age, gender, ethnicity, religion, marital status, whether a person smokes, and pregnancy status of the child. Household level controls include household size, number of male and female below 5 years, wealth index, household head age and gender, whether sampled household has electricity connection, toilet facility, drinking water facility, mother's age, structure of the house (nuclear or joint family), area of residence (rural or urban). The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 19: DID estimate of SABLA eligible girl's Weight and BMI (Young-Lives 2016 Data)

	Health outcomes (17-22 years)		
	Child height	Child weight	BMI
Variables	(1)	(2)	(3)
Female	-14.3374***	-13.50***	-1.509***
	(0.271)	(0.783)	(0.00361)
Treatment	0.0209	-1.629**	-0.644**
	(0.568)	(0.554)	(0.241)
Female x Treatment	-0.151	1.940*	0.800*
	(0.437)	(0.966)	(0.403)
Constant	160.335***	43.19***	16.44***
	(5.51352)	(3.494)	(1.619)
N	903	903	903
R^2	0.659	0.424	0.229
Demographic Controls	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes

Notes: Individual level control variables such as age, gender, ethnicity, religion and marital status of the child. Household level control variables like household size, number of male and female below 5 years, consumer durables index, wealth index, housing quality index, household head age and gender, whether sampled household has electricity connection, toilet facility, drinking water facility, mother's age, area of residence (rural or urban). The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 20: DID estimates of Child specific total educational expenditure of SABLA eligible girls (NSSO - 71^{st} Round)

	Child specific total educational expenditure		
	15-22 years	11-18 years	11-22 years
Variables	(1)	(2)	(3)
Female	-0.00510	0.0123	0.0106
	(0.0168)	(0.0158)	(0.0135)
Treatment	0.358***	0.629***	0.327***
	(0.0428)	(0.0420)	(0.0351)
Female x Treatment	0.0580**	0.0449*	0.0429*
	(0.0278)	(0.0271)	(0.0221)
Constant	-0.872	5.997***	3.015***
	(0.569)	(0.378)	(0.226)
N	27,861	23,323	37,842
R^2	0.445	0.593	0.555
Demographic Controls	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes

Notes: Individual level control includes such as age, religion, marital status, social group, and gender of the child. Household level control are household size, type of the house, whether any member of the sampled household has access to computer and knows how to operate computer, access to internet, type of household, logarithm of household's usual monthly per capita expenditure, and distance from school (primary, upper primary, and secondary), type of institution (government, private aided, private un-aided) and distance from the residence to the institution. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 21: Falsification test: DID estimates of Child specific total educational expenditure of child below 11 years and between 25-45 years (NSSO - 71^{st} Round)

	Child specific total educational expenditure	
	below 11 years	25-45 years
Variables	(1)	(2)
Female	0.00256	0.0145
	(0.0176)	(0.0242)
Treatment	0.657***	0.743***
	(0.0511)	(0.0574)
Female x Treatment	0.0619*	-0.0362
	(0.0353)	(0.0353)
Constant	10.74***	8.762*
	(0.334)	(4.644)
N	13,001	15,573
R^2	0.707	0.479
Demographic Controls	Yes	Yes
HH Socioeconomic Controls	Yes	Yes
District FE	Yes	Yes

Notes: Individual level control includes such as age, religion, marital status, social group, and gender of the child. Household level control are household size, type of the house, whether any member of the sampled household has access to computer and knows how to operate computer, access to internet, type of household, logarithm of household's usual monthly per capita expenditure, and distance from school (primary, upper primary, and secondary), type of institution (government, private aided, private un-aided) and distance from the residence to the institution. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 22: DID estimates of likelihood of taking private coaching of SABLA eligible girls (ASER 2016)

	Likelihood of taking private tuition	
	11-16 years	6-10 years
Variables	(1)	(2)
Female	-0.0419***	-0.0175***
	(0.00355)	(0.00309)
Treatment	-0.0806***	-0.246***
	(0.00709)	(0.00708)
Female x Treatment	0.0130**	0.00189
	(0.00635)	(0.00548)
Constant	0.505***	-0.151***
	(0.0995)	(0.0388)
N	91,934	87,417
R^2	0.280	0.266
Demographic Controls	Yes	Yes
HH Socioeconomic Controls	Yes	Yes
District FE	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, cable TV, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school, and internet cafe. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.1: Descriptive statistics of the variables used in our study

Variables	**N**	**Mean**	**S.D.**
PANEL A (ASER 2016 DATA)			
Child's age	3,65,648	10.3018	3.363
Age square	3,65,648	117.4374	70.10886
Household size	3,65,648	6.516	3.09
Household Type			
Yes	3,65,648	0.3077	0.4615
No	3,65,648	0.25	0.433
Electricity connection			
Yes	3,65,648	0.8277	0.37763
No	3,65,648	0.17229	0.37763
Toilet facility			
Yes	3,65,648	0.54063	0.49837
No	3,65,648	0.4593	0.49837
Access to mobile			
Yes	3,65,648	0.8054	0.395873
No	3,65,648	0.19457	0.395873
Father gone to school			
Yes	3,65,648	0.25734	0.437122
No	3,65,648	0.742654	0.437122
Tuition			
Yes	3,65,648	0.21671	0.4712
No	3,65,648	0.78328	0.4712
Mother gone to school			
Yes	3,65,648	0.4439	0.496844
No	3,65,648	0.5561	0.496844
Private health clinic in village			
Yes	3,65,648	0.738287	0.439676
No	3,65,648	0.26191	0.439676
Village has pucca road			
Yes	3,65,648	0.165528	0.371657
No	3,65,648	0.834472	0.371657
Village government primary school			
Yes	3,65,648	0.041261	0.198894
No	3,65,648	0.958739	0.198894
Village has government middle school			

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Variables	N	Mean	S.D.
Yes	3,65,648	0.456	0.498062
No	3,65,648	0.54399	0.498062
Village government secondary school			
Yes	3,65,648	0.82426	0.380599
No	3,65,648	0.17574	0.380599
Village government middle school			
Yes	3,65,648	0.338265	0.471579
No	3,65,648	0.666174	0.471579
Village private school			
Yes	3,65,648	0.584056	0.492885
No	3,65,648	0.415944	0.492885
Village Anganwadi centres			
Yes	3,65,648	0.080258	0.271692
No	3,65,648	0.080258	0.271692
Village government health clinic			
Yes	3,65,648	0.58596	0.429556
No	3,65,648	0.41404	0.492556
PANEL B (NSSO 71^{st} Round)			
Age	72,811	18.04429	6.691
Age square	72,811	370.3652	235.1562
Log(household usual consumer expenditure in a month)	72,811	9.184698	0.618295
Household size	72,811	5.3013	2.491116
Sector			
Rural	72,811	0.7767	0.4164
Urban	72,811	0.2232	0.4164
Whether household has computer			
Yes	72,811	0.3739	0.4838
No	72,811	0.4838	0.4838
Social Group			
Scheduled Caste	72,811	0.101427	0.3018
Scheduled Tribe	72,811	0.12163	0.3268
Other Backward Caste	72,811	0.389145	0.4875
Others	72,811	0.387799	0.4872
Religion			
Hinduism	72,811	0.757385	0.4286
Islam	72,811	0.1471	0.354

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Variables	**N**	**Mean**	**S.D.**
Christianity	72,811	0.06867	0.252
Sikhism	72,811	0.00311	0.0557
Jainism	72,811	0.0066	0.0815
Buddhism	72,811	0.0098	0.0985
Zoroastrianism	72,811	0.006043	0.0245
others	72,811	0.006592	0.0809
Marital status			
Never married	72,811	0.328165	0.46954
Currently married	72,811	0.60837	0.48811
Widowed	72,811	0.058933	0.2355
Divorced/Separated	72,811	0.004532	0.06717
Distance to nearest primary school			
distance $<$ 1km	72,811	0.915727	0.2777
1km $<$ distance $<$ 2km	72,811	0.0737	0.26132
2km $<$ distance $<$ 3km	72,811	0.008747	0.093125
3km $<$ distance $<$ 5km	72,811	0.000879	0.02963
distance $\geq$ 5km	72,811	0.00092	0.0303
Distance to nearest upper primary school			
distance $<$ 1km	72,811	0.80633	0.39517
1km $<$ distance $<$ 2km	72,811	0.14767	0.35477
2km $<$ distance $<$ 3km	72,811	0.0354	0.18484
3km $<$ distance $<$ 5km	72,811	0.007856	0.08828
distance $\geq$ 5km	72,811	0.002719	0.052
Distance to nearest secondary school			
distance $<$ 1km	72,811	0.6745	0.46855
1km $<$ distance $<$ 2km	72,811	0.2213	0.41516
2km $<$ distance $<$ 3km	72,811	0.0723	0.25911
3km $<$ distance $<$ 5km	72,811	0.0234	0.15122
distance $\geq$ 5km	72,811	0.0083	0.0908
Distance of institute from residence			
distance $<$ 1km	72,811	0.455288	0.498
1km le distance $<$ 2km	72,811	0.16305	0.3694
2km le distance $<$ 3km	72,811	0.0937	0.2915
3km le distance $<$ 5km	72,811	0.06755	0.2509
distance $\geq$ 5km	72,811	0.2203	0.4144
Household type			

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Variables	N	Mean	S.D.
Self-employment in agriculture	72,811	0.42451	0.4942
Self-employment in non-agriculture	72,811	0.386631	0.4869
Regular wage/Salary earning	72,811	0.12322	0.3286
Casual labour in agriculture	72,811	0	0
Casual labour in non-agriculture	72,811	0	0
Type of institution			
Government	72,811	0.52693	0.49927
Private-aided	72,811	0.160237	0.366828
Private un-aided	72,811	0.30955	0.46231
Not known	72,811	0.003287	0.05707
Anyone in the house is able to operate computer			
Yes	72,811	0.32904	0.4698
No	72,811	0.67095	0.4698
Panel C (NFHS Round 4)			
Log(women height)	62,740	7.33	0.15
log(women weight)	62,735	6.19	0.3
log(BMI)	62,344	7.64	0.18
Anemia level	62,111	3.32	0.73
Household head's education	62,745	5.4	5.79
Household size	62,745	6.08	2.97
Number of children below 5 years	62,745	0.7	0.98
Household's head age	62,745	46.95	12.85
Highest education level attained	62,745	10.5	1.03
haemoglobin level	62,745	125.93	89.45
Marital status			
never married	62,745	0.26	0.44
currently married	62,745	0.65	0.47
married, but gauna not performed	62,745	0.004	0.069
widowed	62,745	0.06	0.24
divorced	62,745	0.003	0.05
separated	62,745	0.004	0.067
deserted	62,745	0.001	0.037
don't know	62,745	0	0.003
Household's head gender			
Male	62,745	0.78	0.41
Female	62,745	0.22	0.41

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Variables	N	Mean	S.D.
Drinking water source			
piped into dwelling	62,745	0.16	0.38
piped to yard/plot	62,745	0.12	0.48
public tap/standpipe	62,745	0.13	0.18
tube well or borehole	62,745	0.4	0.25
well	62,745	0.91	0.1
Spring	62,745	0.23	0.17
river/dam/lake/ponds/stream/canal/irrigation	62,745	0.17	0.27
Type of toilet facility			
flush to piped sewer system	62,745	0.02	0.14
flush to septic tank	62,745	0.28	0.45
flush to pit latrine	62,745	0.08	0.28
flush to somewhere else	62,745	0.006	0.08
ventilated improved pit latrine (vip)	62,745	0.0008	0.08
pit latrine with slab	62,745	0.007	0.08
pit latrine without slab/open pit	62,745	0.05	0.23
Religion			
Hinduism	62,745	0.79	0.4
Muslim	62,745	0.12	0.33
Christianity	62,745	0.04	0.21
Sikhism	62,745	0.01	0.1
Others	62,745	0.04	0.07
Sector			
Urban	62,745	18	0.38
Rural	62,745	0.82	0.38
Panel D (Young Lives Data)			
Enrollment	1,732	5.35	7.04
Household size	1,732	4.73	1.9
Household head education	1,732	5.46	5.7
Household head age	1,732	46.56	10.5
Wealth index	1,732	0.632	0.15
Housing index	1,732	0.71	0.22
Consumer durable index	1,732	0.4	0.13
Number of males below 5 years	1,732	0.15	0.45
Number of females below 5 years	1,732	0.15	0.43
Access to sanitation			

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Variables	**N**	**Mean**	**S.D.**
Yes	1,732	0.49	0.5
No	1,732	0.51	0.5
Religion			
Christianity	1,732	0.04	0.21
Muslim	1,732 0.06	0.24	
Buddhism	1,732	0.008	0.08
Hinduism	1,732	0.875	0.33
Sikhism	1,732	0.001	0.03
Others	1,732	0.00	0.0
Ethnicity			
SC	1,732	0.23	0.4
ST	1,732	0.11	0.31
OBC	1,732	0.46	0.49
Others	1,732	0.001	0.03
Other, Hindu	1,732	0.15	0.35
Other, Muslim	1,732	0.05	0.23
Other, Buddhist	1,732	0	0.01
Other, Christian	1,732	0.002	0.05
Marital Status			
yes	1,732	0.76	0.43
No	1,732	0.26	0.43
Drinking water access			
No	1,732	0.015	0.12
yes	1,732	0.95	0.12

Table A.2: Panel A: Balance Table for Propensity Score Matching uisng ASER 2016 data

	Mean			
Variables	Treated	Control	t-statistic	p-value
Gender of the child	1.487	1.487	-0.40	0.687
Age of the child	9.518	9.515	0.18	0.856
Whether father has gone to school	.734	.734	-0.12	0.901
Whether mother has gone to school	.550	.550	0.34	0.735
Whether household has mobile	1.20	1.20	0.85	0.395
Whether household has toilet facility	1.4722	1.4725	-0.13	0.895
Whether household has electricity connection	1.4722	1.4725	-0.13	0.895
Type of house	2.0869	2.0855	0.43	0.666
Whether household has TV	1.4613	1.4613	0.02	0.985
Whether village has ration shop	1.6868	1.6879	-0.63	0.527
Whether village has bank	1.2817	1.2793	1.46	0.145

Table A.2: Panel B: Balance Table for Propensity Score Matching using NSSO 71^{st} data

	Mean			
Variables	Treated	Control	t-statistic	p-value
Age of the child	18.195	18.214	-0.36	0.716
Household size	5.3706	5.3463	1.26	0.209
Gender of the child	1.4873	1.486	0.34	0.733
Marital status	1.5815	1.5815	0.00	1.000
Sector (Urban or Rural)	1.2349	1.2341	0.25	0.800
Household type	2.1453	2.1415	0.25	0.800
Social group	4.9764	4.9969	-0.80	0.425
loh(1 + household expenditure)	9.1731	9.1659	1.50	0.133
Private coaching	1.7353	1.7351	0.04	0.971
Mid Day Meal	1.6637	1.661	0.72	0.470
Access to internet	1.4788	1.4852	-1.62	0.105

Table A.3: Falsification Test: DID estimates of reading ability of SABLA eligible girls (ASER 2009)

	Reading Ability (11-16 years)			
	Letters	Words	Grade-1 Text	Grade-2 Text
Variables	(1)	(2)	(3)	(4)
Female	0.000162	0.000437	0.00365	0.00877**
	(0.00151)	(0.00185)	(0.00257)	(0.00355)
Treatment	0.0630	0.0751*	0.0875**	0.0890*
	(0.0390)	(0.0402)	(0.0355)	(0.0528)
Female x Treatment	0.00117	-0.00153	-0.00720	-0.00628
	(0.00274)	(0.00371)	(0.00511)	(0.00672)
Constant	0.869***	0.460***	-0.186**	0.632***
	(0.0584)	(0.0743)	(0.0928)	(0.0423)
N	90,280	90,280	90,280	90,280
R^2	0.068	0.076	0.094	0.143
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.4: Falsification Test: DID estimates of math skills of SABLA eligible girls (ASER 2009)

	Math Skills (11-16 years)			
	Numbers 1-9	Numbers 11-99	Subtraction	Division
Variables	(1)	(2)	(3)	(4)
Female	0.000789	-0.00140	-0.00472	-0.00537
	(0.00166)	(0.00201)	(0.00307)	(0.00417)
Treatment	0.0688**	0.0834*	0.0770	0.220**
	(0.0311)	(0.0477)	(0.0542)	(0.100)
Female x Treatment	-0.00166	-0.00572	-0.00816	-0.00637
	(0.00285)	(0.00385)	(0.00560)	(0.00730)
Constant	0.837***	0.463***	-0.334***	-1.667***
	(0.0560)	(0.0824)	(0.111)	(0.169)
N	90,280	90,280	90,280	90,280
R^2	0.069	0.084	0.129	0.206
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.5: DID estimates of enrollment of SABLA eligible girls in poor performing states (NSSO – 71^{st} Round)

	Enrollment		
	15-22 years	11-18 years	11-22 years
Variables	(1)	(2)	(3)
Female	-0.0230	-0.0357	-0.0358
	(0.0336)	(0.0346)	(0.0754)
Treatment	-0.145**	-0.176***	-0.0656
	(0.0634)	(0.0523)	(0.102)
Female x Treatment	0.0552	0.0447	0.0818
	(0.0527)	(0.0490)	(0.107)
Constant	-0.481	-0.629	-0.916
	(1.021)	(1.668)	(0.633)
N	893	404	970
R^2	0.123	0.290	0.139
Demographic Controls	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes

Notes: Individual level control includes such as age, religion, marital status, social group, and gender of the child. Household level control are household size, type of the house, whether any member of the sampled household has access to computer and knows how to operate computer, access to internet, type of household, logarithm of household's usual monthly per capita expenditure, and distance from school (primary, upper primary, and secondary), type of institution (government, private aided, private un-aided) and distance from the residence to the institution. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.6: DID estimates of reading ability of SABLA eligible girls in poor performing states (ASER 2016)

	Reading Ability (11-16 years)			
	Letters	Words	Grade-1 Text	Grade-2 Text
Variables	(1)	(2)	(3)	(4)
Female	-0.00631*	-0.0279***	-0.0326***	-0.0348***
	(0.00369)	(0.00930)	(0.00769)	(0.00943)
Treatment	0.0283***	0.0377***	-0.00755	-0.0756***
	(0.00550)	(0.00912)	(0.0113)	(0.0123)
Female x Treatment	0.00287	0.00993	0.00667	-0.00193
	(0.00838)	(0.0139)	(0.0168)	(0.0185)
Constant	0.541***	-0.269	-0.921***	-1.208***
	(0.0959)	(0.254)	(0.257)	(0.296)
N	12,261	12,261	12,261	12,261
R^2	0.059	0.115	0.158	0.179
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.7: DID estimates of math skills of SABLA eligible girls in poor performing states (ASER 2016)

	Math Skills (11-16 years)			
	Numbers 1-9	Numbers 11-99	Subtraction	Division
Variables	(1)	(2)	(3)	(4)
Female	-0.00714**	-0.0369***	-0.0668***	-0.0959***
	(0.00318)	(0.00581)	(0.00869)	(0.0103)
Treatment	0.0268***	0.0416***	-0.0215*	0.0165
	(0.00448)	(0.00678)	(0.0117)	(0.0142)
Female x Treatment	0.00347	0.00600	-0.0110	-0.0279
	(0.00609)	(0.00868)	(0.0150)	(0.0233)
Constant	0.709***	-0.319*	-1.204***	-1.224***
	(0.110)	(0.188)	(0.262)	(0.302)
N	12,252	12,252	12,252	12,252
R^2	0.039	0.106	0.163	0.180
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
Village level Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Demographic control includes a child's age, child's gender, whether father has gone to school, and whether her mother has gone to school. Household-level control includes household size, type of household, and whether the household has access to the toilet, electricity connection, mobile, computer, newspaper, or reading paper. Village level control includes whether the village has a pucca road, government primary school, government middle secondary school, or government secondary school. The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.8: DID estimates of health outcomes of SABLA eligible girls in better performing states (NFHS- Round 4)

	Health outcomes (16-23 years)			
	BMI	Weight	Height	Anaemia
Variables	(1)	(2)	(3)	(4)
Female	-0.0200*	-0.138***	-0.0560***	0.345***
	(0.0110)	(0.0180)	(0.0101)	(0.0270)
Treatment	-0.0328	-0.0610*	-0.0276*	-0.0312
	(0.0237)	(0.0314)	(0.0143)	(0.0517)
Female x Treatment	0.0186	0.0433*	0.0197*	0.0243
	(0.0190)	(0.0228)	(0.0101)	(0.0546)
Constant	7.511***	5.948***	7.230***	-1.269***
	(0.0551)	(0.0997)	(0.0566)	(0.150)
N	3,714	3,741	3,741	3,704
R^2	0.117	0.488	0.566	0.785
Demographic Controls	Yes	Yes	Yes	Yes
HH Socioeconomic Controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes

Notes: Individual level control variables such as age, gender, ethnicity, religion, marital status, whether a person smokes, and pregnancy status of the child. Household level controls include household size, number of male and female below 5 years, wealth index, household head age and gender, whether sampled household has electricity connection, toilet facility, drinking water facility, mother's age, structure of the house (nuclear or joint family), area of residence (rural or urban). The robust standard errors are clustered, by district ID, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

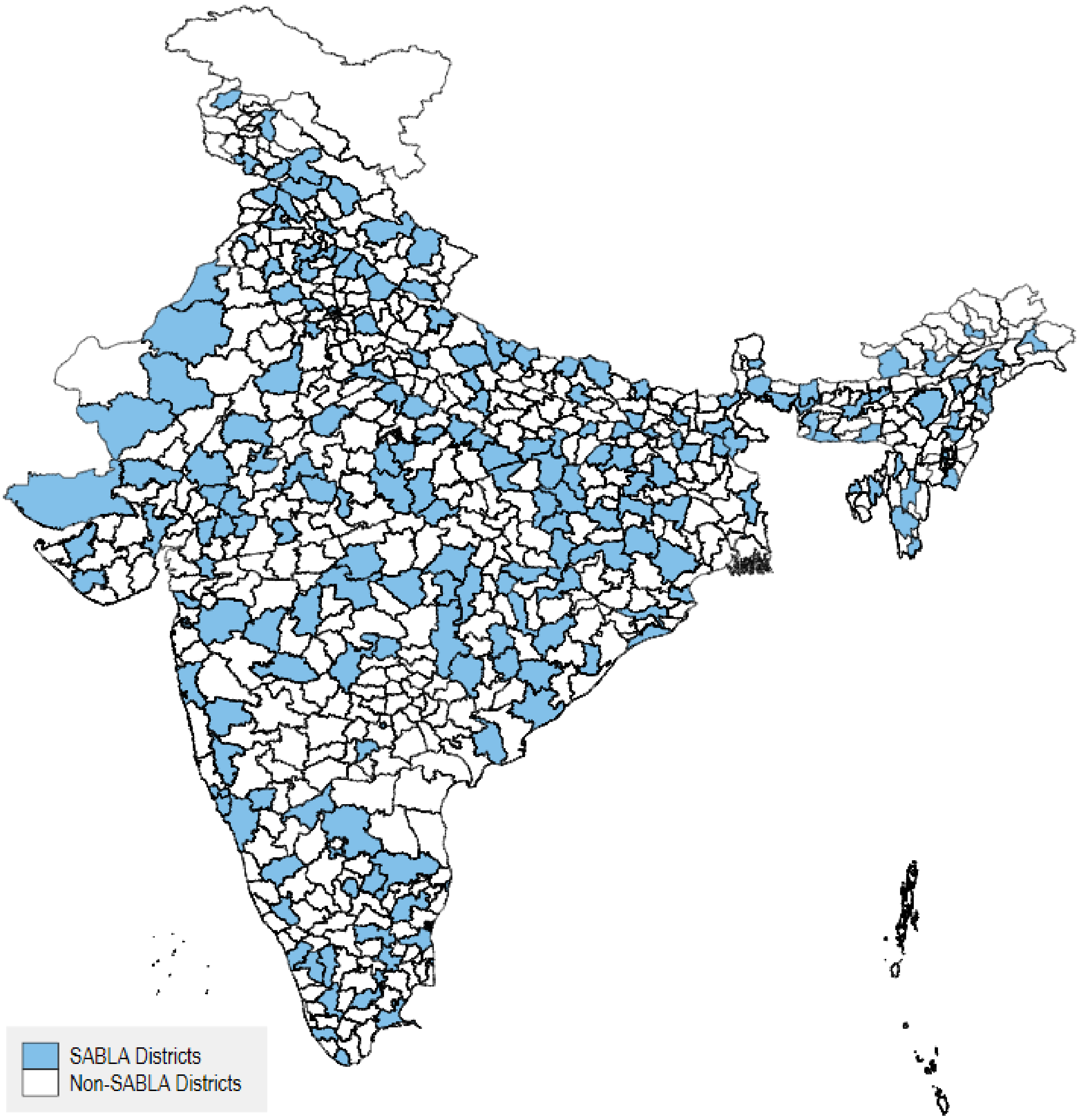


Figure A.1: Geographical distribution of SABLA districts

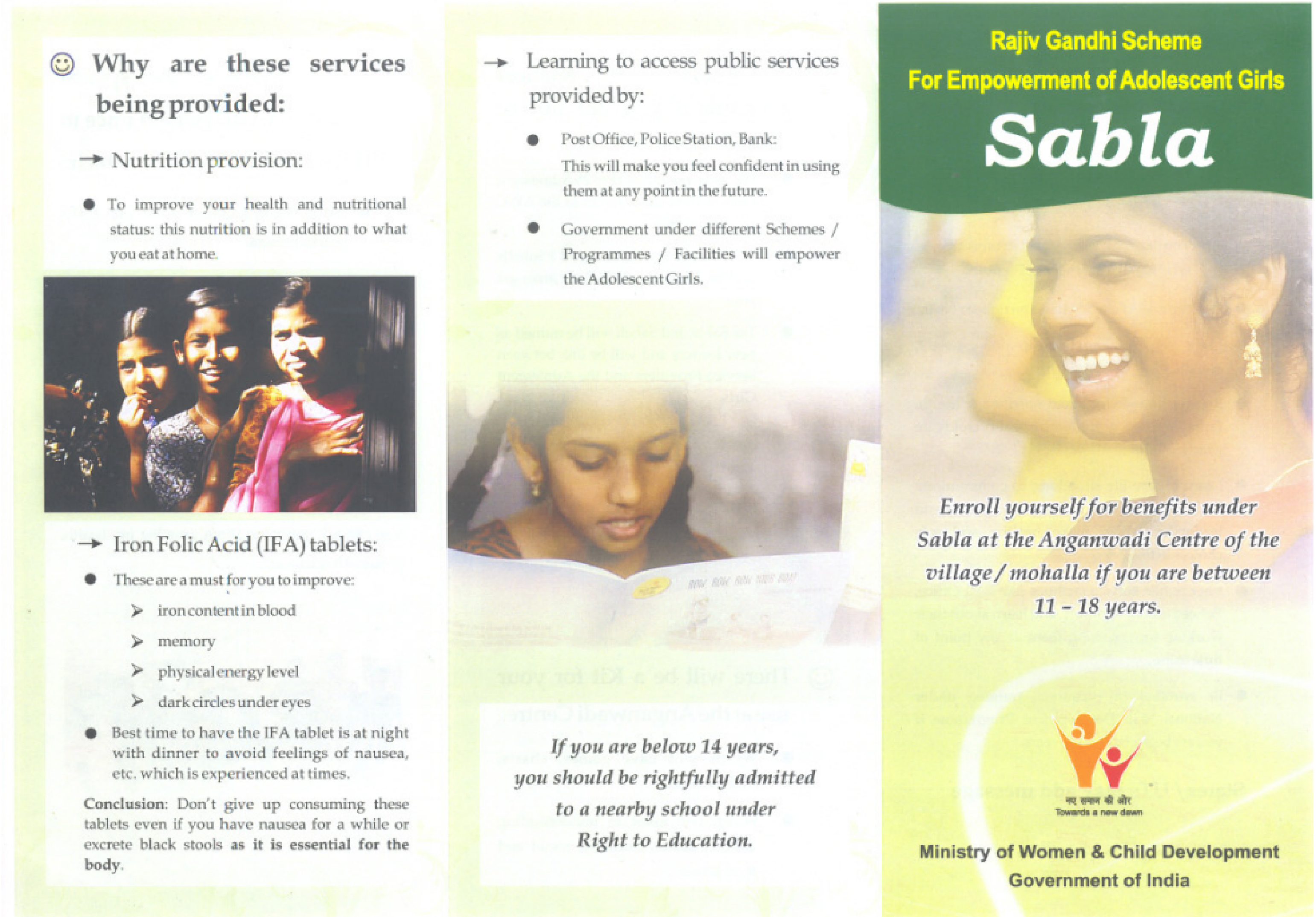
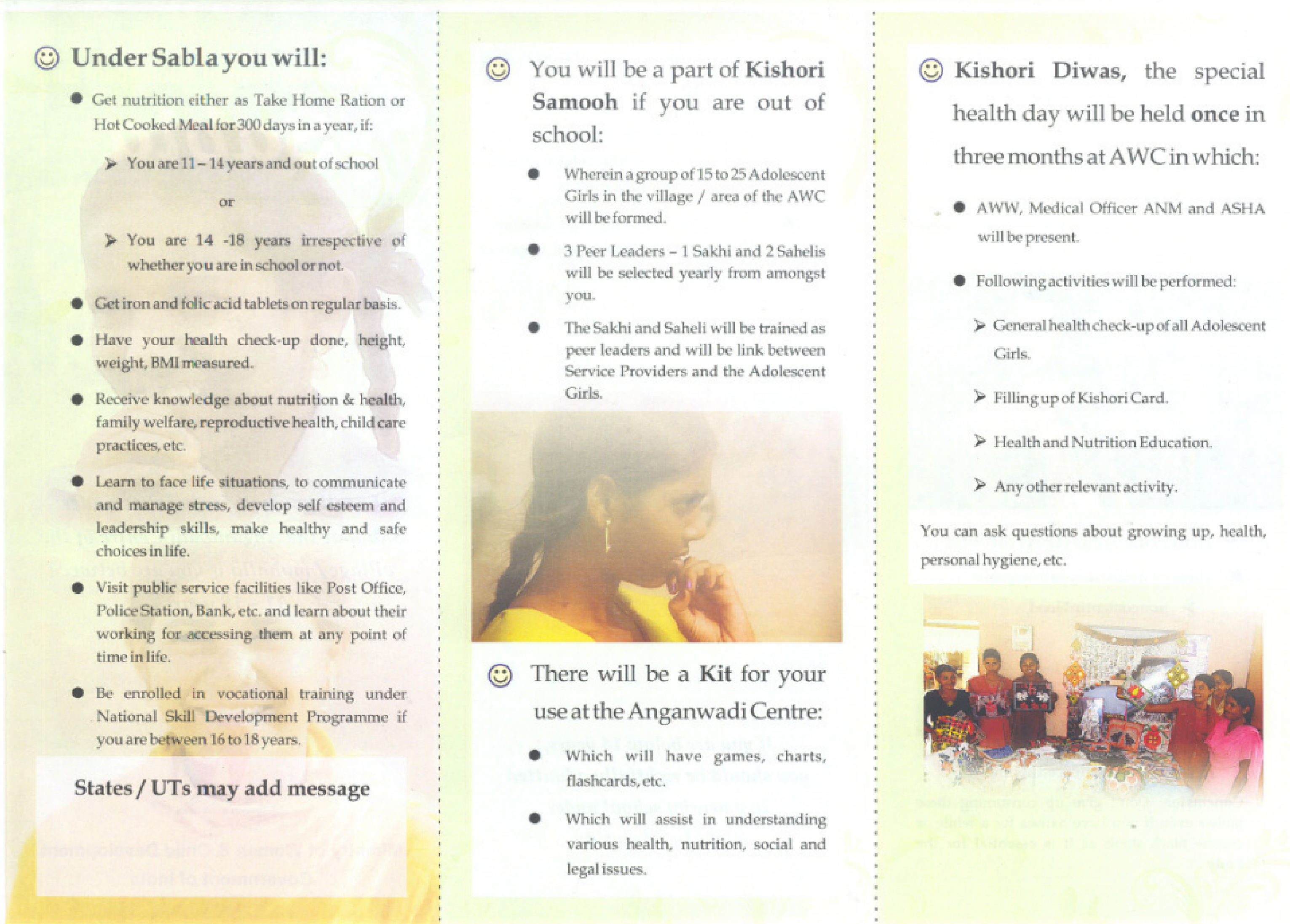


Figure A.2: Handouts and pamphlets made by the government for the SABLA program.



Under Sabla you will:

- Get nutrition either as Take Home Ration or Hot Cooked Meal for 300 days in a year, if:
  - You are 11 – 14 years and out of school

    or

  - You are 14 -18 years irrespective of whether you are in school or not.
- Get iron and folic acid tablets on regular basis.
- Have your health check-up done, height, weight, BMI measured.
- Receive knowledge about nutrition & health, family welfare, reproductive health, child care practices, etc.
- Learn to face life situations, to communicate and manage stress, develop self esteem and leadership skills, make healthy and safe choices in life.
- Visit public service facilities like Post Office, Police Station, Bank, etc. and learn about their working for accessing them at any point of time in life.
- Be enrolled in vocational training under National Skill Development Programme if you are between 16 to 18 years.

States / UTs may add message

You will be a part of **Kishori Samooh** if you are out of school:

- Wherein a group of 15 to 25 Adolescent Girls in the village / area of the AWC will be formed.
- 3 Peer Leaders – 1 Sakhi and 2 Sahelis will be selected yearly from amongst you.
- The Sakhi and Saheli will be trained as peer leaders and will be link between Service Providers and the Adolescent Girls.

There will be a **Kit** for your use at the Anganwadi Centre:

- Which will have games, charts, flashcards, etc.
- Which will assist in understanding various health, nutrition, social and legal issues.

Kishori Diwas, the special health day will be held **once** in three months at AWC in which:

- AWW, Medical Officer ANM and ASHA will be present.
- Following activities will be performed:
  - General health check-up of all Adolescent Girls.
  - Filling up of Kishori Card.
  - Health and Nutrition Education.
  - Any other relevant activity.

You can ask questions about growing up, health, personal hygiene, etc.

Figure A.2 Continued: Handouts and pamphlets made by the government for the SABLA program.