

Pre-Analysis Plan for “Mental Health and Adolescent Schooling: Evidence from a Therapy Field Experiment in Nepal”

Eric Edmonds, Priya Mukherjee, Nikhilesh Prakash, Nishith Prakash, Shwetlena Sabharwal

September 23, 2022

Version History

23 September 2022: Initial submission

1 Introduction

Mental health is a key component of general well-being in the UN Sustainable Development Goals (Patel et al., 2018) and an important dimension of human capital (Barker et al. (2021), Goldsmith et al. (1997)). This study is motivated by the question of whether poor mental health among adolescents influences their schooling. A large number of observational studies document correlations between mental health diagnoses and educational attainment or testing performance (Wickersham et al. (2021) reviews 31 studies). Mental health may impact schooling, schooling may influence mental health (for example, Bennett et al. (2003), Brown et al. (2022), Morrison et al. (2019), Zelazo et al. (2016)), and other aspects of the child’s environment may influence both. We study the impact of a randomized control trial (RCT) of an intervention providing therapy to adolescents at risk of early school termination in Nepal.

The COVID pandemic has brought attention to issues around mental health and schooling to the foreground (Kola et al., 2021). In Nepal, restrictions aimed at limiting the spread of covid-19 have meant that schools have remained closed for extended periods of time. A survey conducted between May 2021 and August 2021 in the Nepali districts of Gorkha, Kailali, Kavre, and Salyan, found that 60% of surveyed adolescents had missed 6 or more months of school during the pandemic (Lacey et al., forthcoming). A recent nationally representative UNICEF survey found that 50% of respondents felt that their children had fallen behind in their education, and 46% said that schools were not doing anything to help their children catch up (UNICEF, 2022). At the same time, the pandemic has also had an adverse impact on the mental health of adolescents with 47% of adolescents reporting at least mild depression or anxiety, in the localities surveyed in Lacey et al. (forthcoming). While of interest in their own right, these mental health challenges may add to school disruption (Klasen and Crombag, 2012) and contribute to the pandemic’s impact on early school termination, which may be especially severe for girls and children belonging to vulnerable communities (Pandey et al., 2021; Sharma, 2020)

In this context, we use a randomized control trial (RCT) to evaluate the impact of providing individualized therapy sessions on the mental well-being and education of adolescents (aged 12-18). Our study is based in selected municipalities of the Nepali districts of Kailali (Dhangadhi and Ghodaghodi municipalities), Kavre (Dhulikhel, Panauti, and Pachkhal municipalities), and Surkhet (Birendranagar and Bheriganga municipalities). Subjects are selected based on teacher reports of students who are vulnerable for early school

termination. No other characteristics associated with mental health are considered in determining eligibility. Of eligible adolescents, half receive up to 8 therapy sessions, delivered weekly and designed and delivered free of cost by the Centre for Mental Health Counselling - Nepal (CMC-N), our implementation partner. The program combines elements from various forms of psychotherapy such as cognitive behavioral therapy (CBT), solution focused brief therapy (SFBT), and systemic therapy.

Our primary interest is in the impact of therapy induced changes in mental health on schooling. We expect therapy to improve mental health and improvements in mental health to increase schooling by improving outlooks in life and enhancing life skills to cope with the various challenges in adolescent life that can disrupt schooling. Therapy itself may directly encourage schooling given the central role of schooling in adolescent life. To separate the impact of therapy from the impact of schooling encouragement, we cross randomize an in-person session aimed at encouraging the adolescents to attend school for half of the sample. Combined this therapy and schooling nudge leads to a four armed design:

1. Psychosocial Treatment Only (T1)
2. Education Encouragement Only (T2)
3. Psychosocial Treatment and Education Encouragement (T3)
4. Pure Control (C)

The evaluation design grouped eligible adolescents in the selected localities in to strata based on their municipality, age, sex, and teacher reported drop-out risk. A random number generator was then used to allocate children in equal proportion to each study arm within each stratum.

The sample was compiled based on in-person visits with schools in the fall of 2021, and the information used in stratification was collected then. Because of a resurgent pandemic, the baseline was conducted as a phone survey in the first months of 2022 followed by the intervention. Potential subjects, eligible based on school records, were included in the randomization even if consent to participate in the study had not been obtained or a baseline survey could not be completed because of a lack of information about a phone number or an inability to contact the subject or their family. Treatment occurred in the spring of 2022 with an endline in-person survey completed in summer 2022.

This pre-analysis plan describes the sampling frame, randomization, interventions, data collection processes, and the methodology used to analyze all the data collected during the course of this study. This pre-analysis plan was filed before the authors received any data for analysis.

2 Study Design

2.1 Sampling Strategy

The target sample for this study consists of students in the 12-18 year age range, who have been identified as being at risk of early school termination (described in more detail below). The study is based in the districts of Kailali (Dhangadhi and Ghodaghodi municipalities), Kavre (Dhulikhel, Panauti, and Pachkhal municipalities), and Surkhet (Birendranagar and Bheriganga municipalities) The sample list for this study was generated through the multi-stage process described below.

2.1.1 School Selection

To generate the sampling frame for this study, we first selected a list of schools in the study municipalities from which to collect student details. The following criteria were used by CMC-N while selecting schools:

1. The school must be government-run.
2. The schools must have grades 6-12 (since the study is targeted at adolescents aged 12-18 years).
3. The school must be located in urban/semi-urban areas.
4. The school must agree to share the required screening information with CMC-N.
5. The school must have students at risk of early school termination.

CMC-N consulted with local governments (LGs) to select schools. Based on the above criteria, 40 schools were selected as catchment areas for the study.

2.1.2 School Listing

A field team recruited by our partner CMC-N was trained and deployed to visit the catchment schools and collected the following information:

1. Names of all students who are currently enrolled in grades 6-12.
2. Names of all students who are not currently enrolled but were enrolled in the past 2 years in grades 6-12.
3. For all currently enrolled students in grades 6-12, a subjective assessment of early school termination risk according to the teacher/headteacher. The teacher/headteacher categorized all currently enrolled students into one of the following 4 categories.¹
 - High risk: You are very sure that the student will not complete their full education and will dropout.
 - Medium Risk: You think that it is likely that the student will not complete their education and may dropout.
 - Low risk: You think there is a small chance that the student will not complete their education and may dropout.
 - No risk: You are very sure that the student will not dropout (i.e. they will complete their education).
4. For all currently enrolled students in grades 6-12, attendance information for the last 2 months.
5. For currently enrolled students with a low, medium, or high risk of dropping out and currently not enrolled students, the field staff collected contact information and address details.

We refer to the above data as the **master data**, which contained 9,782 observations in the 40 schools selected for this study. Subsequent to cleaning, these observations would eventually form the frame for the study

¹Note: When we use the term early school termination for children in grade 6 to grade 9 we mean to end schooling before completing grade 10, and for grade 10 to grade 12 we mean to end schooling before completing grade 12.

2.1.3 Student Listing

From the master data, students were deemed to be at risk of early school termination and thereby eligible for the study if they satisfied one of the following criteria:

1. Child was enrolled in a school at some point in the past 2 years but is no longer enrolled in that school.
2. Child was deemed by the teacher/headteacher to be at a medium to high risk of dropping out.
3. Child was deemed by the teacher/headteacher to be at low risk of dropping out, but in the past 2 months had an attendance rate which was lower than 50 percent.

After this exercise there were not sufficient students from Surkhet district, and a re-emergent pandemic prevented the addition of schools or other in-person subject identification. As a result, 200 students from Surkhet were included that were in the low risk group (as in the third eligibility criterion) but had attendance rates above 50 percent.

Overall, CMC-N shared 2,122 observations from this exercise. From this list, duplicate observations, those without potentially usable contact information, and those that were subsequently identified as being included by error were dropped. In households, which had multiple children who met the eligibility criteria, one was randomly selected for the study and others dropped from the sample. The remaining 1,942 subject were selected for the study, marked eligible for the phone baseline survey, and included in the randomization. Because more students were eligible than permitted by our contract with CMC-N, a lottery was used to drop randomly selected strata, resulting in a initial sample of 1803 students.

2.1.4 Pandemic and Consent to Participate in the Study

The resurgent pandemic in early 2022 prevented us from verifying this sample in person and obtaining consent to participate in the study prior to randomization. As a result, 1803 includes students who would later not consent to be part of the study. In our final analysis, we will drop all randomized subjects where we do not have consent to participate in this study. These would not ordinarily be included in the study frame for randomization. We define a subject as not consenting if we were unable to obtain consent at the time of either the baseline or endline surveys. That is, we attempt to get consent to participate in the study at both baseline and endline surveys. If we fail in both efforts, we drop the subject from the study.²

2.2 Data Collection

Baseline Survey

Before the interventions were implemented, study participants were requested to complete a short baseline survey over the phone in early 2022. This survey has the following sets of indicators:

1. Basic demographic information on the selected adolescent, his/her parents/caregivers, and all siblings (i.e. children born to either caregiver). This includes age, gender, relationship with the selected child, school completion and current attendance, occupation, religion, and caste.
2. Basic household information: Number of adults/minors, number of male/female members, access to electricity, smartphone, and internet, and annual household income bracket.

²There is a separate consent process that CMC-N required before delivery of the treatments. We do not make use of this in defining our sample as they only collected consent on subjects that they were treating.

3. Well-being of the adolescent's parent responding to the survey.
4. Adolescent survey which includes information on social and emotional support, measures of mental well-being, schooling, and the adolescent's professional aspirations.

Eligible subjects were not excluded from the study if we were unable to contact them for the baseline survey. Hence, there is limited and selected baseline data. We are aware of many studies during the pandemic that limited the sample to subjects that they were able to reach on a telephone, but we felt that limiting our sample in this way would exclude some of those potential subjects most in need of treatment.

Endline In-Person Survey

After the completion of the interventions, the study participants were requested to complete a detailed in-person endline survey. This survey has the following sets of indicators:

1. Basic household information: Number of household members by age group and gender, religion, caste, language normally spoken, access to infrastructure, food security, income, and incidence of major shocks such as illness, accident, death, etc.
2. Roster information of all minors living in the household which includes gender, age, onset of menstruation or beard growth, relationship with the selected adolescent, schooling attainment and attendance, marital status, labor force participation.
3. Caregivers' survey which includes information on the caregivers' age, gender, relationship with the selected adolescent, marital status, education attainment, occupations, beliefs and aspirations with regards to the educational attainment, future occupation, and marriage age of their child, caregiver-child relationship, caregivers' beliefs about their child's mental well-being, caregivers' attitudes toward and knowledge about mental health, confidence in supporting children with mental health issues, and own well-being.
4. Child survey which includes information on schooling and related activities, social and emotional support (virtual and in-person), bullying, access and usage of electronic media, measures of mental well-being, social behavior and perspectives, attitude and knowledge about mental healthcare seeking, and cognitive functioning.
5. Enumerator's assessment of the adolescent participant's engagement, demeanor, and bodily cleanliness during the survey, as well as a note on who (if anyone) was present with the child while they were being surveyed.

Endline Migrant Phone Survey

After the completion of the interventions, study participants that could not be contacted in person will be contacted for a phone survey. The respondent for the phone survey is the child (after attaining consent from the parent) and it collects information on the timing of migration, current schooling status, PHQ-8, GAD-7, and questions about attitudes towards mental health. Other than the migration questions, the other phone survey questions are identical to those parts of the endline in-person child survey.

2.3 Treatment arms

We randomized the sample of 1,942 potential participants, roughly equally, into the following four treatment arms:

1. Psychosocial Treatment Only (T1): Adolescents assigned to this arm have the opportunity to receive 4-6 weekly sessions³ of therapy delivered by a trained therapist hired by our implementation partner CMC-Nepal free of cost. These sessions have been designed to address 5 common mental health issues faced by adolescents – (i) anxiety, (ii) depression and suicide risk, (iii) bullying faced at school, (iv) alcohol and substance abuse, (v) stress. During these sessions, the counselor will first explain to the adolescent what psycho-social counseling is and how it works. Next, they will discuss various common psycho-social or mental health problems, typically through case stories, or media content such as videos and chat boxes. Such media content has also been curated in the form of a smartphone app, which participants in this arm are given the option to download and use in their own time, however content from it is also used by the counsellors during their weekly sessions, so it available even to participants who may not have access to smartphones. The aim here is to help the adolescent to understand and identify such problems, and also set the environment where the adolescent feels comfortable to open up about any such problems that he/she may be facing. Based on these discussions, the counselor will work with the adolescent to practice various techniques to counteract problematic emotions, thoughts, and behaviors. These techniques are borrowed from different types of therapy such as cognitive behavioral therapy (CBT), solution focused brief therapy (SFBT), and systemic therapy.

In addition, parents of these adolescents are eligible to receive 2 psycho-education sessions from the same therapist. In these sessions, the counselor will explain to the parent/caregiver the symptoms of the any mental health issues that their child might have and explain how the parents can support the adolescent. They will also teach the parent/caregiver some techniques to manage their own stress

2. Educational Encouragement Only (T2): Adolescents assigned to this arm have the opportunity to receive 1 session of education counseling aimed to increase the positive associations that the adolescent makes with school life and thereby encourage school attendance. This session will be delivered free of cost by staff recruited and trained by CMC-N. As a part of this exercise, the facilitator will guide the participant in drawing a tree, and compare the tree and its parts to various aspects of daily life as follows:

- The roots: The child and the facilitator will first draw the roots of the trees. After spending time drawing and colouring this as per the child's interest, the facilitator will guide the child to think about the people and places from the child's early childhood – i.e., their roots – and list these people and places alongside the main root and the side roots in the diagram. The more important the person or place, the closer it will be to the main central root, and less important the farther away.
- The trunk: Next they will draw the tree trunk, and the facilitator will explain that the trunk provides strength to the tree and so here they should list their strengths and good qualities. These don't need to be superlatives, and the facilitator will nudge the child to think about everyday

³CMC-N will deliver 4 sessions to all adolescents, and provide an additional 2 sessions to adolescents who are in need for greater support

living if the child struggles to come up with some good qualities that they think they have – e.g. I keep my room clean.

- The branches: These will represent the support systems in the child’s life, and as before the participant is asked to think about and note down the support systems that exist in their own life. If a child is confused they can be prompted with questions like: if you miss a day of school, who helps you catch up, if you are feeling down who helps your mood etc.
 - The leaves: These are the child’s achievements. Again, these do not need to be big achievements like winning the best player in the inter-school football tourney, but can be small things – like my mother thinks that I am good at taking care of my brother.
 - The fruits: These are the child’s goals and aspirations.
 - Finally, the facilitator will bring the exercise to focus it on schooling. They will highlight the importance of schooling to reach their stated ambitions and goals (the fruits). They will also ask the student if they are regular at school and if not, what challenges they face in attending school or in doing their school work. They show that they have the support structure (the branches) and the strengths (the trunk) to achieve these goals and to deal with the difficulties in attending school. Their past achievements (leaves) are evidence of the fact that they can achieve things if they try.
3. Psychosocial Treatment and Educational Encouragement (T3): Students assigned to this arm have the opportunity to receive all sessions under T1 and T2, that is 4-6 counselling sessions to the adolescent, 2 psycho-education session for their parents, and 1 education encouragement sessions for the adolescent.
 4. Control (C): Students assigned to this arm will receive no treatment.

2.4 Randomization

We first form strata based on the following indicators:

1. Whether the student has completed the baseline survey prior to randomization
2. Municipality⁴
3. Whether the student is female
4. Whether the student is 15 years or older
5. Whether the student is a high-dropout risk/was previously enrolled but is no longer enrolled in one of the study schools

Within each stratum, we randomly allot students to the four treatment groups: 488 were randomized into the control group (C), 489 into the psychosocial treatment only group (T1), 486 into the educational encouragement only group (T2) and 479 into the psychosocial treatment + encouragement group (T3).

⁴Shortly after the randomization was completed, CMC informed us that during the household listing exercise, households from Pachkhal municipality in the district of Kavre had been mistakenly marked as belonging to Dhulikhel municipality, which is a nearby municipality. There were 13 such households in the sample and during randomization they were treated as though they belonged to Dhulikhel

As per our terms of work with CMC-N, they had agreed to implement the psychosocial treatment with a total of 900 students and educational encouragement with 900 students (compared to 968 and 965 respectively, from the randomization), implying an overall sample size of 1,800 as opposed to 1,942. To reach this number we randomly dropped certain strata until the study sample size was 1,803.⁵

3 Hypotheses

3.1 T1: Psychosocial treatment

Our first hypothesis concerns whether there is a treatment effect from randomization into the psychosocial treatment arm. Some children will have experience with mental health-related care even in the absence of our intervention, but we expect that to be rare such that we reject the null hypothesis that assignment to the psychosocial treatment arm has no effect that the probability the child has received psychosocial treatment.

If we reject this null, we then test the following hypotheses:

3.1.1 Attitudes towards mental health

We expect that children who have received treatment are likely to be more open to mental health issues and more accepting of mental health care. This should occur both as a result of the topics covered in the psychosocial treatment sessions and the experience of therapy itself. We test the null hypothesis of no effect of treatment assignment on attitudes towards mental health using the child's mental health attitudes index and the caregiver's mental health attitude index.

3.1.2 Mental health

Children that receive therapy may experience improvements in their mental health. This may occur as a result of the experience of therapy and need not be accompanied by changes in attitudes towards mental health. We test the null of no effect of treatment assignment on mental health using the mental health presentation index.

If we reject the null of no effect on mental health, we will test the following null hypotheses to understand the mechanisms:

- Self-reported well-being index.
- Moderate to severe anxiety.
- Severe anxiety.
- Moderate to severe depression.
- Severe depression.
- Anxiety or depression.
- Functional limitations.

⁵While selecting strata to be included in the study, we prioritized those strata which included households that had completed the baseline survey. We expect that at endline we will discover that some subjects included in this 1803 sample were not eligible for the study, having moved from the subject area or died prior to randomization or refusing to consent to participate in the study. Those subjects will subsequently be eliminated from the final sample.

- Sought care.
- Unmet care.

There are several secondary outcomes that are related to changes in mental health that may be of interest to some readers as well as to our study partners. In the event of rejecting a null effect on mental health, we will examine the following secondary outcomes:

- Social Support Index
 - Is a Bully
 - Experienced Bullying
 - Safety Issues
 - Friendships
- Soft Skills Index
- Digit Span Index (for cognitive skills)
- Risky Cyber Behavior Index
- Anger Evident
- Self-Care
- Migration

Several of these secondary outcomes are also relevant to understanding schooling attendance changes. Hence, in the event that we reject the null of no effect on school attendance, they will be included in our discussion of understanding school attendance rather than as secondary mental health outcomes.

3.1.3 School attendance

Part of the psychosocial treatment’s purpose is to improve the child’s capacity to cope with challenges in life and positively affect the child’s outlook on her life. These bolstered life skills as well as improvements in mental health should translate to improvements in school attendance. As such we test the null of no effect of treatment assignment on school attendance.

If we reject the null of no effect on school attendance rates, we will test whether the null that there is no effect of treatments on each of the following to understand the nature of the increase in school attendance:

- Enrolled in school
- Any school attendance
- Conditional school attendance
- Skipped school

If we reject the null of no effect on school attendance rates, we will test the following null hypotheses to understand the mechanisms:

- No effect on digit span index. This is our primary measure of improvements in cognitive performance associated with mental health.
- No effect on soft skills index. This is our primary measure of non-cognitive and social skills. If we reject the null of no effect on soft skills, we will test the null of no effect of treatment on its component parts.
- No effect on schooling attitudes. If we reject the null of no effect on schooling attitudes, we will test the null of no effect of treatment on its component parts.
- No effect on caregiver aspirations.
- No effect on caregiver relationship with the child.
- No effect on child perception of parental support.
- No effect on social support. If we reject the null of no effect on social support, we will test the null of no effect of treatment on its component parts.

3.2 T2: Educational Encouragement

Random assignments to the educational encouragement treatment group should be more likely to have a conversation with a counselor concerning the value of education and how to achieve their educational goals. We test the null hypothesis that assignment to the encouragement has no effect on whether the subject has received an educational encouragement.

3.2.1 School attendance

The topics covered in educational encouragement are designed to encourage the child's motivation for schooling which should appear in the child's attendance rates. Hence, we test the null of no effect on the school attendance rate. In the event that we reject this null, we will test the null that treatment assignment to the educational encouragement has no effect on school attendance.

If we reject the null of no effect on school attendance rates, we will test whether the null that there is no effect of treatments on each of the following to understand the nature of the increase in school attendance:

- Enrolled in school
- Any school attendance
- Conditional school attendance
- Skipped school

We expect only a subset of the mechanisms through which therapy might impact school attendance to be relevant to the educational encouragement even though there is a literature (see introduction) that finds that schooling improves mental health. As such if we reject the null of no effect on school attendance rates, we will test the null hypothesis of no effect on schooling attitudes. If we reject the null of no effect on schooling attitudes, we will test the null of no effect of treatment on its component parts.

3.3 T3: Combined Treatments of Psychosocial treatment and Educational Encouragement

Random assignment to the combination treatment group should appear as a child who experienced therapy in their home with both psychosocial elements and educational encouragement. We test the null of no effect on the indicator that the child has received psychosocial treatment and encouragement. We expect this to test the same hypotheses as the counseling encouragement with the additional possibility that this combined treatment could affect schooling directly through the educational encouragement component, not requiring changes in life skills or mental health.

If we reject the null of no effect of the combined treatment on any outcome, we will test the null hypothesis that the combined intervention has the same effect as T1 and T2.

4 Empirical Specifications

4.1 Main Analysis

4.1.1 Intent to Treat

We test these hypotheses by regressing the outcome variable indicated for each hypothesis on a vector of indicators for random assignment and stratification fixed effects while also controlling for a vector of dummy variables for the age that varies by gender. In equation form, this intent to treat (ITT) analysis has the representation::

$$y_{is} = \alpha_0 + \alpha_1 Ttherapy_{is} + \alpha_2 Tednudge_{is} + \alpha_3 Tcombined_{is} + X'_{is}\delta_0 + f_s + \epsilon_{0is} \quad (1)$$

where y_{is} is our outcome variable of interest measured at the individual student (i) level, who belongs to stratum s . $Ttherapy_{is}$ is an indicator that the student has been randomly assigned to the psychosocial treatment-only treatment (T1). $Tednudge_{is}$ is an indicator that the student has been randomly assigned to the educational encouragement-only treatment. $Tcombined_{is}$ is an indicator that the student has been randomly assigned to the combined psychosocial treatment and encouragement arm. Hence, each individual coefficient on random assignment is testing the null hypothesis of no difference between the control group and random assignment to the indicated treatment arm. X'_{is} is a vector of age dummies that vary by gender to capture the strong age trends and gender differences in those age trends associated with our outcome variables in adolescence. f_s are dummies indicating the child's stratum and mean zero standard errors, and ϵ_{0is} that are robust to arbitrary forms of heteroskedasticity.

4.1.2 Compliers

We expect imperfect compliance due to two reasons: administrative hurdles in the implementation by CMC-N and because of some subjects consenting to participate in the study but subsequently declining treatment. We also do not a priori have a strong reason to expect that random assignment will lead to changes in our outcomes if there is no actual delivery of treatment. Hence, complementary to the above ITT analysis, we will also emphasize findings that look at the impact of participating in treatment, using the random assignment as the instrument for participation. This analysis will be implemented using two-stage least squares (2SLS) where the second stage is given by:

$$y_{is} = \beta_0 + \beta_1 therapy_{is} + \beta_2 ednudge_{is} + \beta_3 combined_{is} + X'_{is} \delta_1 + f_s + \epsilon_{1is} \quad (2)$$

where variables are as defined above when repeated. $therapy_{is}$ is the predicted value from a regression of an indicator that the student received psychosocial treatment-only treatment (T1) against the right-hand-side of equation 1. $ednudge_{is}$ and $combined_{is}$ are similarly defined for participation in the other two treatment arms.

4.1.3 Compliers with Baseline Controls

In some instances, we also have baseline values of outcomes from the baseline data (either the administrative data or the baseline survey). In those cases, there may be efficiency gains from controlling for baseline outcomes in the X'_{is} vector in estimating equation 2. Because of missing values of some baseline data, we will replace missing values with zeros and include a dummy variable that takes on the value of 1 if the baseline value is missing.

4.2 Heterogeneous Effects

The existing literature on providing psychosocial treatment and educational encouragement to adolescents does not provide a lot of useful guidance about natural sources of heterogeneity in our analysis. Nonetheless, we expect to examine the following sources of heterogeneity in treatment effects:

- Gender at baseline
- Indicator for age is at least 15 at baseline
- Baseline school non-attendance
- Baseline behind grade for age
- Baseline survey was completed

Some heterogeneity analysis can only be completed for the selected population with a completed baseline survey. These include:

- Indicator for whether puberty has started at the endline
- Indicator for a language other than Nepali is usually spoken at home at endline
- Indicator for the child is a member of a low social status group
- Baseline Mental Health Flag
- Baseline does not have internet or smartphone access

For each type of heterogeneity above, let H be a vector of variables capturing the source of heterogeneity and D be the vector of random assignment measures $D=(Ttherapy_{is} Tednudge_{is} Tcombined_{is})$. We evaluate heterogeneity in intent-to-treat by interacting the two vectors in the functional form of equation 1:

$$y_{is} = H'_{is} * (D_{is} \alpha_2 + X'_{is} \delta_2 + f_s) + \epsilon_{2is} \quad (3)$$

An ITT effect will be considered heterogeneous if the F-test of the joint significance of the interaction of the heterogeneity with treatment assignment has a p-value below 0.05. We expect to focus our heterogeneity analysis on ITT results.

We will only report heterogeneity analysis for the above categories when randomization appears valid in the school records data (see section 5) in each distinct subpopulation.

4.3 Understanding Mechanisms and Multiple Hypothesis Testing

The gated structure of the hypotheses listed above limits the number of simultaneous hypothesis tests and the use of indexes to aggregate data are all designed to minimize the problem of false positive tests in our core results.

When we explore the mechanisms beyond our core results, we anticipate conducting a large number of hypothesis tests in order to take a data-driven approach to understand mechanisms. For this mechanism exploration, we will group hypotheses under the appropriate hypothesis test category (for example, schooling related, mental health-related, etc.) and compute and present FDR corrected q-values following [Benjamini and Hochhberg \(1995\)](#) for all hypothesis tests within a given category. We expect to keep our mechanism discussions focused on our ITT results.

4.4 Missing values and Attrition

The subject listing was conducted by in person visits to schools in the fall of 2021 by CMC-N. CMC is a therapy NGO, not a data collection firm, and if there had not been a pandemic surget in early 2022, we would have verified the sample prior to randomization. However, the pandemic made this impossible, and limiting the sample only to children who had good phone access for the baseline survey seemed inappropriate given the motivation for our study. We expect that during the in-person endline survey process, we will find that some children who have been randomized who were not present at the time of randomization or would not have consented to participate in the study. Those students will be eliminated from our analysis sample.

During the baseline survey, we collect extensive contact information, including on social media to minimize attrition. Nonetheless, it is still potentially a problem in our analysis as we include eligible subjects that were not able to be reached during the baseline survey, and it is not unusual for school children to move early in the Nepali new year (late spring 2022). Given that most outcomes central to testing our main hypotheses are normalized indexes, any bounding exercise needs to be attentive to the continuous nature of our outcome variables. In evaluating attrition, we will test whether attrition is correlated with treatment status by regressing an indicator for attrition on our main ITT specification in equation 1 and test the joint significance of the three treatment groups. In the event that we fail to reject our null hypothesis that treatment is uncorrelated with treatment, we will estimate lower and upper Lee treatment effect bounds based on a trimming procedure that assumes treatment status affects selection monotonically.

5 Validity of Randomization

Our treatment of random assignment as effectively random in our analysis 1 is based on the fact that the research team has conducted the randomization themselves using a random number generator. Given the sample sizes, we do not expect issues associated with randomization. Nonetheless, we will validate randomization by checking for balance in predetermined covariates across treatment status.

We have a small set of baseline data collected from school records available for all study subjects. While this data is not as rich as the endline survey, it is still useful for assessing the validity of randomization. The following data are available for all study subjects and collected before random assignment:

- Gender of the subject
- Age of the subject
- Municipality of residence of the subject at baseline
- Teacher assessment of the risk of the subject dropping out of school
- Whether the subject was enrolled in school at baseline
- School attendance rate at baseline
- Grade of last year of the school attended by subject at baseline
- Child is behind grade for age at baseline
- Whether the baseline survey was completed

To test the validity of randomization, we will regress each item above on the vector of treatment assignments and report the F-Statistic of the null that the vector of treatment assignments is zero and use a seemingly unrelated regression (SUR) approach to test that joint hypothesis across all variables.

We supplemented this school record-based baseline data with a phone survey of subjects with a phone. This is a nonrandom subset of our study population as we did not want to limit our study to subjects with a phone, but the pandemic prevented in-person visits in subjects homes. Despite the phone-access-based selection, this is the only insight we have into the subject’s mental health at baseline, which we believe is important in understanding how treatment works. Assessing the validity of randomization in the selected baseline survey is important for assessing the validity of inference in this sub-sample rather than for the overall study. For subjects with a baseline survey, we examine the validity of randomization across these variables in addition to the variables we have and test for the full sample:

- Child is not Hindu
- Child is a member of a low social status group
- Language other than Nepali is usually spoken at home
- Baseline mental health flag
- Self-reported well-being index at baseline
- Does not have internet or smartphone access at baseline

For the baseline survey population, we will include these additional baseline measures in the test for balance described above.

6 Variable Definitions

All variables below that indicate that they are *standardized* will be done so with respect to the mean and variance of the control sample.

6.1 Treatment Measures

6.1.1 Psychosocial treatment

Child has received psychosocial treatment: This is an indicator that takes value 1 if the child reports having been visited in the home by a therapist and when describing the topics covered in those visits check at least one item that is in the domain of CMC's psychosocial treatment sessions.

6.1.2 Educational Encouragement

Child has received educational encouragement: This is an indicator that takes value 1 if the child reports having been visited in the home by a counselor and, when describing topics covered in the visit, lists the importance of education or her motivation for attending school.

6.1.3 Combined (Psychosocial treatment and encouragement)

Child has received psychosocial treatment and educational encouragement. This is an indicator that takes value 1 if the child reports both educational encouragement and psychosocial treatment.

6.2 Attitudes Towards Mental Health

6.2.1 Child's mental health attitudes

This is an index formed by a simple average of the responses to the following questions/measures after they have been standardized:

- I would willingly be friends with someone who has received mental health treatment (Strongly disagree (1 point), Somewhat disagree (2 points), Neither agree nor disagree (3 points), Somewhat agree (4 points), Strongly agree (5 points)).
- Solving mental health problems is in YOUR control, unlike physical illness such as fever, where you seek external help from a doctor/healer (Strongly disagree (5 points), Somewhat disagree (4 points), Neither agree nor disagree (3 points), Somewhat agree (2 points), and Strongly agree (1 point)).
- Would you advise or encourage people to seek help or counseling for mental health (Yes (1 point), No (0 points))?
- Have you ever sought out help for your mental health (No (0 points), Once (1 point), More than once (2 points))?

6.2.2 Caregiver's mental health attitudes

This is an index formed by a simple average of the responses to the following questions/measures after they have been standardized:

- I would willingly be friends with someone who has received mental health treatment (Strongly disagree (1 point), Somewhat disagree (2 points), Neither agree nor disagree (3 points), Somewhat agree (4 points), Strongly agree (5 points)).

- Solving mental health problems is in YOUR control, unlike physical illness such as fever, where you seek external help from a doctor/healer? (Strongly disagree (5 points), Somewhat disagree (4 points), Neither agree nor disagree (3 points), Somewhat agree (2 points), Strongly agree (1 point)).
- I believe that children with mental health issues deserve access to educational opportunities (Strongly disagree (1 point), Somewhat disagree (2 points), Neither agree nor disagree (3 points), Somewhat agree (4 points), Strongly agree (5 points)).
- I believe that I have the necessary knowledge and skills to support children with mental health issues (Strongly disagree (1 point), Somewhat disagree (2 points), Neither agree nor disagree (3 points), Somewhat agree (4 points), Strongly agree (5 points)).
- I feel confident in my ability to support children with mental health issues. (Strongly disagree (1 point), Somewhat disagree (2 points), Neither agree nor disagree (3 points), Somewhat agree (4 points), Strongly agree (5 points)).

6.3 Presentation of Mental Health

6.3.1 Mental Health Presentation (Index)

This index is the simple average of standardized values of the following variables:

- GAD-7 Score (standardized).
- PHQ-8 Score (standardized).
- Caregiver’s assessment of the adolescent’s mental health (standardized).

6.3.2 GAD-7 Score

We measure anxiety using the 7-item Generalized Anxiety Disorder (GAD-7) questionnaire, which captures the frequency with which the adolescent has experienced the 7 most common symptoms of anxiety in the past 2 weeks. For each symptom, the adolescent must respond with either “Not at all” (0 points), “Several days” (1 point), “More than half the days” (2 points), and “Nearly every day” (3 points). The overall GAD-7 score is obtained by adding the scores on each individual response and lies in the range 0-21.

6.3.3 PHQ-8 Score

We measure depression using the 8-item Patient Health Questionnaire (PHQ-8), which captures the frequency with which the adolescent has experienced the 8 most common symptoms of depression in the past 2 weeks. For each symptom, the adolescent must respond with either “Not at all” (0 points), “Several days” (1 point), “More than half the days” (2 points), and “Nearly every day” (3 points). The overall PHQ-8 score is obtained by adding the scores on each individual response and lies in the range 0-24.

6.3.4 Baseline Mental Health Flag

Child presents at baseline as having a possible major depressive disorder or anxiety disorder.

6.3.5 Possible Major Depressive Disorder at Baseline

Using the PHQ-2 questions in the baseline, answers are converted to the following and summed across the two questions: “Not at all” (0 points), “Several days” (1 point), “More than half the days” (2 points), and “Nearly every day” (3 points). A score of this sum of 3 points is the cut-off for further diagnostic evaluation for possible major depressive disorder.

6.3.6 Possible General Anxiety Disorder at Baseline

Using the GAD-2 questions in the baseline, answers are converted to the following and summed across the two questions: “Not at all” (0 points), “Several days” (1 point), “More than half the days” (2 points), and “Nearly every day” (3 points). A score of this sum of 3 points is the cut-off for further diagnostic evaluation for a generalized anxiety disorder.

6.3.7 Moderate to severe anxiety

We indicate adolescents who have moderate to severe anxiety using a dummy variable which is equal to 1 if the overall GAD-7 score is at least 10.

6.3.8 Severe anxiety

This is a dummy variable that is equal to 1 if the overall GAD-7 score is at least 15.

6.3.9 Moderate to severe depression

We indicate adolescents who have moderate to severe depression using a dummy variable which is equal to 1 if the overall PHQ-8 score is at least 10.

6.3.10 Severe depression

This is a dummy variable that is equal to 1 if the overall PHQ-8 score is at least 20.

6.3.11 Anxiety or depression

This is a dummy variable that is equal to 1 if either the GAD-7 score is at least 10 or if the PHQ-8 score is at least 10.

6.3.12 Sought care

This is a dummy variable that is equal to 1 if the adolescent has ever sought any help for their mental health.

6.3.13 Sought care associated with anxiety or depression

This is a dummy variable which is equal to 1 if the adolescent has depression or anxiety and if the adolescent has ever sought any help for their mental health.

6.3.14 Unmet care associated with anxiety or depression

This is a dummy variable that is equal to 1 if the adolescent has depression or anxiety but has never sought any help for their mental health.

6.3.15 Functional limitations linked with anxiety or depression

This is a dummy variable that equals 1 if any of the following conditions are satisfied:

- The adolescent has ever sought any help for their mental health.
- At some point in the past 2 weeks, the adolescent has had trouble falling or staying asleep, or sleeping too much.
- At some point in the past 2 weeks, the adolescent has had trouble concentrating on things such as reading the newspaper.
- At some point in the past 2 weeks, the adolescent has not been able to stop or control worrying.
- At some point in the past 2 weeks, the adolescent has been so restless that it was hard to sit still.
- The adolescent is almost never able to finish the things that he/she begins.
- The adolescent is almost never able to keep at his/her schoolwork until he/she is done with it.

6.3.16 Caregiver's assessment of the adolescent's mental health

The adolescent's caregivers are asked a series of questions on their perceptions of the child's mental well-being. For each symptom the adolescent must respond with either "Not at all" (0 points), "Several days" (1 point), "More than half the days" (2 points), and "Nearly every day" (3 points). The caregiver's assessment of the adolescent's mental well-being is the standardized sum of the responses to the following questions.

- In the past 2 weeks, how often has your child had little interest or pleasure in doing things?
- In the past 2 weeks, how often has your child felt down, unhappy/miserable, or hopeless?
- In the past 2 weeks, how often has your child felt nervous, anxious, or tensed/worried?
- In the past 2 weeks, how often has your child been able to stop or control worrying?
- In the past 2 weeks, how often has your child had trouble falling or staying asleep, or sleeping too much (i.e., due to nightmares)

6.3.17 Self-Care

An indicator that is 1 if the enumerator's assessment of the child's self-care is that the child has a clean face, hands, fingernails, and breath.

6.3.18 Anger Evident

An indicator that is 1, if the enumerator felt the child was angry one or more times during the interview.

6.4 Positive Psychology Measures of Adolescent Well-Being

6.4.1 EPOCH Engagement

The EPOCH scale is a series of 20 questions aimed at measuring the respondent's levels of engagement, perseverance, optimism, connectedness, and happiness. For each of the 20 questions, the respondent must respond with "Almost never" (1 point), "Sometimes" (2 points), "Often" (3 points), "Very often" (4 points), and "Almost always" (5 points). The engagement sub-score is generated by computing the simple mean of the responses to the following questions:

- When I do an activity, I enjoy it so much that I lose track of time.
- I am completely absorbed in what I am doing.
- I get so involved in activities that I forget about everything else.
- When I learn something new, I lose track of how much time has passed.

6.4.2 EPOCH Perseverance

The EPOCH scale is a series of 20 questions aimed at measuring the respondent's levels of engagement, perseverance, optimism, connectedness, and happiness. For each of the 20 questions, the respondent must respond with "Almost never" (1 point), "Sometimes" (2 points), "Often" (3 points), "Very often" (4 points), "Almost always" (5 points). The perseverance sub-score is generated by computing the simple mean of the responses to the following questions:

- I finish whatever I begin.
- I keep at my schoolwork until I am done with it.
- Once I make a plan to get something done, I stick to it.
- I am a hard worker.

6.4.3 EPOCH Optimism

The EPOCH scale is a series of 20 questions aimed at measuring the respondent's levels of engagement, perseverance, optimism, connectedness, and happiness. For each of the 20 questions, the respondent must respond with "Almost never" (1 point), "Sometimes" (2 points), "Often" (3 points), "Very often" (4 points), "Almost always" (5 points). The optimism sub-score is generated by computing the simple mean of the responses to the following questions:

- I am optimistic about my future.
- In uncertain times, I expect the best.
- I think good things are going to happen to me.
- I believe that things will work out no matter how difficult they seem.

6.4.4 EPOCH Connectedness

The EPOCH scale is a series of 20 questions aimed at measuring the respondent’s levels of engagement, perseverance, optimism, connectedness, and happiness. For each of the 20 questions, the respondent must respond with “Almost never” (1 point), “Sometimes” (2 points), “Often” (3 points), “Very often” (4 points), “Almost always” (5 points). The connectedness sub-score is generated by computing the simple mean of the responses to the following questions:

- When something good happens to me, I have people who I like to share the good news with.
- When I have a problem, I have someone who will be there for me.
- There are people in my life who really care about me.
- I have friends that I really care about.

6.4.5 EPOCH Happiness

The EPOCH scale is a series of 20 questions aimed at measuring the respondent’s levels of engagement, perseverance, optimism, connectedness, and happiness. For each of the 20 questions, the respondent must respond with “Almost never” (1 point), “Sometimes” (2 points), “Often” (3 points), “Very often” (4 points), “Almost always” (5 points). The happiness sub-score is generated by computing the simple mean of the responses to the following statements:

- I feel happy.
- I have a lot of fun.
- I love life.
- I am a cheerful person.

6.4.6 Cantril’s Ladder

The adolescent is asked to rate the quality of their life at the present time on a scale of 0 (worst possible life) to 10 (best possible life). The outcome used is a variable which takes the integer values in the interval [0,10].

6.4.7 Self-reported well-being index

This outcome variable is generated by first standardizing,⁶ all of the following responses/measures, and then taking the simple mean of the resulting variables: This is an index formed using the responses to the following questions/statements/measures:

- Cantril’s Ladder
- EPOCH Happiness
- EPOCH Connectedness

⁶Unless otherwise stated, in this document we standardize variables by subtracting the control group mean and then dividing by the control group standard deviation.

- EPOCH Optimism
- EPOCH Perseverance
- EPOCH Engagement

This can be computed at both baseline and endline.

6.5 Schooling

6.5.1 Enrolled in school

This is a dummy variable that is equal to 1 if the adolescent is currently enrolled in school.

6.5.2 Any school attendance

This is a dummy variable that is equal to 1 if the adolescent has attended school on at least 1 day in the past 2 weeks.

6.5.3 School attendance rate

This is the ratio between the number of days that the adolescent attended school in the past two weeks and the number of days that the school was open in the past 2 weeks. If the adolescent is interviewed during the holidays, these questions will be asked for the last two weeks that the school was open for teaching. Students not currently enrolled in school have an attendance rate of zero. If the child reports that in the past two weeks the school was not open even on one day, this ratio will be replaced as a missing value.

6.5.4 Conditional school attendance rate

This is the ratio between the number of days that the adolescent attended school in the past two weeks and the number of days that the school was open in the past 2 weeks. If the adolescent is interviewed during the holidays, these questions will be asked for the last two weeks that the school was open for teaching. Students not currently enrolled in school are marked as missing. If the child reports that in the past two weeks the school was not open even on one day, this ratio will be replaced as a missing value.

6.5.5 Skipped school

This is a dummy variable which is equal to 1 if, in the past two weeks, the adolescent has attended school on a fewer number of days than days on which the school was open, i.e. if the adolescent has missed at least one day of school in the past 2 weeks.

6.5.6 Hours studying

This is a measure of the number of hours that the adolescent spent studying/doing schoolwork outside of regular school hours in the past 2 weeks. If the adolescent did not attend any school in the past two weeks, then this variable is treated as 0.

6.5.7 Post-Secondary Aspirations

This is a dummy variable that is equal to 1 if the adolescent reports wanting to complete more than the grade 12 level of education.

6.5.8 Schooling Attitudes

This index is the simple average of the following variables after they have been transformed as indicated, and standardized:

- I work very hard on my schoolwork. Recoded Not very true as 1 and Not at all true as 0.
- When I'm learning at home, I just act as if I'm studying. Recoded 4=Not at all true, 3=Not very true, 1=Sort of True, 0=Very true.
- When it comes to school, my parents are always telling me what to do. Recoded 4=Not at all true, 3=Not very true, 1=Sort of True, 0=Very true.
- Hours Studying
- How do you feel about school at present? Recoded as 4=I like it a lot, 3=I like it a bit, 1=I do not like it very much, 0 = I do not like it at all.
- Post-Secondary Aspirations

6.6 Social Interactions

6.6.1 Caregiver Aspirations for Child

This index is the simple average after standardizing the answers to the following three questions asked of the caregiver:

- Expected Education of Child. Caregivers respond to questions on a child's expected education with the following recording:
 - Less than grade 6 (0 points)
 - Grade 6 (1 point)
 - Grade 7 (2 points)
 - Grade 8 (3 points)
 - Grade 9 (4 points)
 - Grade 10 (5 points)
 - Grade 11 (6 points)
 - Grade 12 (7 points)
 - Some college (8 points)
 - Completed undergraduate college (10 points)
 - Higher than undergraduate college (12 points))
 - "other", "don't know" and "refused" transformed to missing.

- Appropriate Marriage Age for Child.
- Expected Occupation of Child. Answer to the question of expected job type, transformed to indicate whether it is an occupation associated with less than primary, more than primary, and more than secondary education in the population census.

6.6.2 Caregiver Relationship with Child

This index is a standardization after the sum of the recoded answers to the following questions asked of the caregiver:

Parent/caregiver perceives a positive connection with child: We ask both parents/caregivers to respond either to the following 3 questions:

- My child easily becomes angry at me. Recoding “Strongly disagree”, “Somewhat disagree”, “Neither agree nor disagree”, “Somewhat agree”, or “Strongly agree” as 4, 3, 2, 1, 0 in that order.
- Dealing with my child drains my energy. Recoding “Strongly disagree”, “Somewhat disagree”, “Neither agree nor disagree”, “Somewhat agree”, or “Strongly agree” as 4, 3, 2, 1, 0 in that order.
- My child is usually pleasant and helpful around the house. Recoding “Strongly disagree”, “Somewhat disagree”, “Neither agree nor disagree”, “Somewhat agree”, or “Strongly agree” as 0, 1, 2, 3, 4 in that order.
- Caregiver’s happiness. Cantril’s ladder rescaled to 4 for values 9-10, 3 for values 7-8, 2 for 5-6, 1 for 3-4, and 0 for under 3.

6.6.3 Child Perception of Parental Support

This index is the simple average of the following variables after they have been transformed as indicated and standardized:

- My parents don’t explain why school is important recoded as very true =0, sort of true =1, not very true=2, and not at all true=3
- My parents don’t seem to have enough time for me recoded as very true =0, sort of true =1, not very true=2, and not at all true=3
- In the past two weeks, have you shared these (aspirations, joy, excitement, fears, anxiety, and stress) types of feelings with your parents or guardians?

6.6.4 Friendships

This index is the simple average of the following variables after they have been standardized:

- How many days a week do you usually spend time with friends right after school hours?
- How many evenings per week do you usually spend out with your friends?
- How many people who are not members of your family would you consider to be good friends of yours?

- How often do you talk to your friends on the phone, send them text messages, or have contact with them through the internet?
- In the past two weeks (14 days), how many times have you shared with your friends your general feelings of (but not limited to) aspirations, joy, excitement, fears, anxiety, and stress?
- In the past two weeks (14 days), have you ever restrained yourself from sharing these feelings with your friends? Transform values to be 1- the answer to the question so that 1 is that they have never restrained themselves and 0 if they have.

6.6.5 In School Relationships

This index is the standardized sum of the answers to the following three questions:

- The students in my class enjoy being together.
- Most of the students in my classes are kind and helpful.
- Other students accept me as I am.

6.6.6 Safety Issues

This dummy variable is one if the child strongly disagrees or somewhat disagrees with either of the following statements:

- I feel safe in school.
- I feel safe traveling to school.

This dummy variable is also 1 if the child strongly or somewhat agrees with the statement "Bullying is a problem in our community" or if the child has seen a person being bullied more than once or twice over the last couple of months.

6.6.7 Experienced Bullying

This dummy variable is one if the child reports any experience of any of the following

- I was called mean names, was made fun of, or teased in a hurtful way
- Other people (classmates, co-workers, peers) left me out of things on purpose, excluding me from their group of friends or completely ignoring me
- Other people told lies or spread false rumors about me and tried to make others dislike me
- I was bullied with mean names and comments about my caste, ethnicity, or religion
- Other people made sexual jokes, comments, or gestures to me

6.6.8 Experienced Frequent Bullying

This dummy variable is one if the child reports experiencing multiple times a month (or more frequently) any of the following

- I was called mean names, was made fun of, or teased in a hurtful way
- Other people (classmates, co-workers, peers) left me out of things on purpose, excluding me from their group of friends or completely ignoring me
- Other people told lies or spread false rumors about me and tried to make others dislike me
- I was bullied with mean names and comments about my caste, ethnicity, or religion
- Other people made sexual jokes, comments, or gestures to me

6.6.9 Experienced Intense Bullying

This dummy variable is one if the child reports experiencing any of the following several times a week:

- I was called mean names, was made fun of or teased in a hurtful way
- Other people (classmates, co-workers, peers) left me out of things on purpose, excluding me from their group of friends or completely ignoring me
- Other people told lies or spread false rumors about me and tried to make others dislike me
- I was bullied with mean names and comments about my caste, ethnicity, or religion
- Other people made sexual jokes, comments, or gestures to me

6.6.10 Is a Bully

This dummy variable is one if the child answers that "I have taken part in bullying another person" in the last couple of months or more frequently.

6.6.11 Social Support

This index is the simple average of the following variables after they have been standardized:

- Friendships
- In-school Relationships.
- Safety Issues. Recoded as 1-values
- Experienced Bullying. Recoded as 1-values
- Is a Bully. Recoded as 1-values

6.7 Soft Skills

6.7.1 Attentive

Following the survey, the enumerator makes a note of the adolescent's attentiveness during the survey. This is a dummy variable that is equal to 1 if the enumerator reports that the adolescent paid close attention the whole time.

6.7.2 Careful

Following the survey, the enumerator makes a note of whether the adolescent was careful and interested in accuracy while responding to questions. This is a dummy variable which is equal to 1 if the enumerator reports that the adolescent took time to think and seemed to make thoughtful choices.

6.7.3 Alert

Following the survey, the enumerator makes a note of whether the adolescent was alert and interactive during the interview session. This is a dummy variable which is equal to 1 if the enumerator reports that the adolescent actively participated in the survey and seemed relaxed.

6.7.4 Confident

Following the survey, the enumerator makes a note of whether the adolescent was confident during the interview. This is a dummy variable which is equal to 1 if the enumerator reports that the adolescent was confident throughout the interview, smiling and laughing at times.

6.7.5 Soft skills index

An index is formed by summing the values of the following questions and standardizing::

- Attentive
- Careful
- Alert
- Confident

6.8 Cognitive Skills

6.8.1 Forward digit span score

Adolescents are given a string of digits and asked to replicate the digits in the same order. The string length will initially be 2 digits, and the adolescent will be given 2 sets of such strings. If the adolescent is able to correctly replicate one of the two strings, they will be given a longer string (3 digits in this case). The task will end when the adolescent is unable to replicate either of the two strings for a particular string length. The forward digit span score is the longest span correctly recalled in this task.

6.8.2 Backward digit span score

Adolescents are given a string of digits and asked to replicate the digits in the reverse order. The string length will initially be 2 digits, and the adolescent will be given 2 sets of such strings. If the adolescent is able to correctly replicate one of the two strings, they will be given a longer string (3 digits in this case). The task will end when the adolescent is unable to replicate either of the two strings for a particular string length. The forward digit span score is the longest span correctly recalled in this task.

6.8.3 Ordered digit span score

Adolescents are given a string of digits and asked to replicate the digits in ascending order. The string length will initially be 2 digits, and the adolescent will be given 2 sets of such strings. If the adolescent is able to correctly replicate one of the two strings, they will be given a longer string (3 digits in this case). The task will end when the adolescent is unable to replicate either of the two strings for a particular string length. The forward digit span score is the longest span correctly recalled in this task.

6.8.4 Digit span index

This outcome variable is generated by first standardizing all of the above-mentioned three measures and then taking the simple mean of the three standardized variables

6.9 Demographics

6.9.1 Child is not Hindu

Based on the question on religion, this variable takes on a value of 1 if the child is not Hindu and 0 if the child is Hindu. In the event that this question is inconsistently answered between baseline and endline, we will rely on the endline response if available and baseline response when not available at endline.

6.9.2 Child is a member of a low social status group

Based on question of ethnicity and caste, the following groups are considered low status in Nepali culture: Muslim, Kelwar, Teli, Hajam/Thakur, Sudi, Paswan, Dusadh, Musahar, Chamar, Harijan, Ram, Dhobi, Khatawe, Khadgi, Naye, Kasai, Jogi, Kapali, Darshandhari, Kami, Sarki, Damai, Badi, Dhobi, Rajak, Sangat, Kulu, Dom/Dusādh, Dyala, Podé, Chyāmaha/Chamāhār, other Dalit, Adivasi Janajatis, Newari impure occupational castes (including Bha, Kapāli, Khadgi/Kasaī, Dhobi, Kulu, Dom, Podhya, Chyamaha/Chandala), Terai occupational castes (including Dhobi, Halkhor, Chamar, Dushad, Dom, Musahars). In the event that this question is inconsistently answered between baseline and endline, we will rely on the endline response if available and the baseline response when not available at endline.

6.9.3 language other than Nepali is usually spoken at home at endline

Based on the question about what language is spoken at home, this indicator is 1 if a language other than Nepali is usually spoken at home.

6.9.4 Migrant

A child is labeled a migrant if they have have changed municipality of residence since February 2022.

6.10 Household Characteristics

6.10.1 Baseline Does not have internet or smartphone access

In response to the baseline question about whether the household has access to a smartphone or the internet, respondents answered no to both.

6.11 Social Media Related Outcomes

6.11.1 Has computer or smartphone access outside of school

This is a dummy variable which is equal to 1 if the adolescent has access to a computer or a smartphone outside of school. or if they provide a social media platform, such as Facebook, Viber or whatsapp on which they can be reached.

6.11.2 Has computer or smartphone access

This, is a dummy variable which is equal to 1 if the adolescent has access to a computer or a smartphone outside of school. or if they provide a social media platform, such as Facebook, Viber or whatsapp on which they can be reached, or if the adolescent has access to a computer or a smartphone while at school.

6.11.3 Weekday more than an hour per day on computer or smart phone

This is a dummy variable which is equal to 1 if the adolescent spends 2 or more hours on a weekday using a computer or a smartphone for chatting, email or homework. This variable is treated as missing if item 2 is 0.

6.11.4 Meets people online

This is a dummy variable which is equal to 1 if in the past 2 weeks the adolescent has had an interaction online with a person who was unknown to them. This variable is treated as missing if item 2 is 0.

6.11.5 Meets online people in real world

This is a dummy variable which is equal to 1 if in the past 2 weeks, the adolescent has met a person in-person, who they initially met online and who was previously unknown to them. This variable is treated as missing if item 2 is 0.

6.11.6 Experienced cyberbullying

This is a dummy variable which is equal to 1 if in the past couple of months, the adolescent was bullied using a computer, email, or picture.

6.11.7 Risky cyber behavior index

This is an index formed using the responses to the following questions/measures:

- I was bullied using a computer, email, or picture (Never (1 point), Once or twice over the last couple of months (2 points), 2 or three times a month (3 times), About once a week (4 points), Several times a week (5 points)).

- Dummy variable which is equal to 1 if in the past 2 weeks the adolescent has had an interaction online with a person who was unknown to them (item 5).
- Dummy variable which is equal to 1 if, in the past 2 weeks, the adolescent has met a person in person, who they initially met online and who was previously unknown to them (item 6)

This outcome variable is generated by first standardizing all of the above-mentioned responses/measures, and then taking the simple mean of the resulting variable.

References

- Barker, Nathan, Gharad T Bryan, Dean Karlan, Angela Ofori-Atta, and Christopher R Udry,** “Mental Health Therapy as a Core Strategy for Increasing Human Capital: Evidence from Ghana,” Technical Report, National Bureau of Economic Research 2021.
- Benjamini, Y and Y Hochhberg,** “Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing,” *Journal of the Royal Statistical Society: Series B (Methodological)*, 1995, 57, 289–300.
- Bennett, Kathryn J, K Stephen Brown, Michael Boyle, Yvonne Racine, and Dan Offord,** “Does low reading achievement at school entry cause conduct problems?,” *Social Science & Medicine*, 2003, 56 (12), 2443–2448.
- Brown, Christina L, Supreet Kaur, Geeta Kingdon, and Heather Schofield,** “Cognitive Endurance as Human Capital,” Technical Report, National Bureau of Economic Research 2022.
- Goldsmith, Arthur H, Jonathan R Veum, and William Darity Jr,** “The impact of psychological and human capital on wages,” *Economic inquiry*, 1997, 35 (4), 815–829.
- Klasen, H and A Crombag,** “What works where? A systematic review of child and adolescent mental health interventions for low and middle income countries,” *Social Psychiatric Epidemiology*, 2012, 48 (4).
- Kola, Lola, Brandon A Kohrt, Charlotte Hanlon, John A Naslund, Siham Sikander, Madhumitha Balaji, Corina Benjet, Eliza Yee Lai Cheung, Julian Eaton, Pattie Gonsalves et al.,** “COVID-19 mental health impact and responses in low-income and middle-income countries: reimagining global mental health,” *The Lancet Psychiatry*, 2021, 8 (6), 535–550.
- Lacey, L, N Mishra, P Mukherjee, N Prakash, N Prakash, D Quinn, S Sabarwal, and D Saraswat,** “Can destigmatizing mental health increase willingness to seek help? Experimental evidence from Nepal,” forthcoming.
- Morrison, Frederick J, Matthew H Kim, Carol M Connor, and Jennie K Grammer,** “The causal impact of schooling on children’s development: Lessons for developmental science,” *Current Directions in Psychological Science*, 2019, 28 (5), 441–449.
- Pandey, A, A Lama, and A Poudyal,** “Unheard Ignored: Impact of COVID-19 Lockdown on Disadvantaged Children in Nepal,” *Social Psychiatric Epidemiology*, 2021, 8 (4), 432–437.
- Patel, Vikram, Shekhar Saxena, Crick Lund, Graham Thornicroft, Florence Baingana, Paul Bolton, Dan Chisholm, Pamela Y Collins, Janice L Cooper, Julian Eaton et al.,** “The Lancet Commission on global mental health and sustainable development,” *The lancet*, 2018, 392 (10157), 1553–1598.
- Sharma, N,** “Half of Nepal’s girls may drop out of school,” *Nepali Times*, 19 August 2020.
- UNICEF,** “United Nations Children’s Fund, Child and Family Tracker (CFT),” April 2022.
- Wickersham, Alice, Holly VR Sugg, Sophie Epstein, Robert Stewart, Tamsin Ford, and Johnny Downs,** “Systematic review and meta-analysis: the association between child and adolescent depression

and later educational attainment,” *Journal of the American Academy of Child & Adolescent Psychiatry*, 2021, 60 (1), 105–118.

Zelazo, Philip David, Clancy B Blair, and Michael T Willoughby, “Executive Function: Implications for Education. NCER 2017-2000.,” *National Center for Education Research*, 2016.