Cognitive Behavioral Therapy in the Context of a Graduation Program

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Project Overview

- This project is a replication and extension of the Ghana Ultra Poor Graduation study
  - The Graduation program involved giving randomly selected participants a package that included skills training, a productive asset, access to health care, a savings account, and consumption support
  - Escaping Poverty (EP) is testing various combinations of the Graduation program's components to understand which are most critical to its effectiveness
- Today's focus
  - Additionally offering cognitive behavioral therapy (CBT) to see its impacts both as a complement to the Graduation program and as a stand-alone intervention

Transitions in Mental Health Status

Rural Northern, Upper East, Brong Ahafo and Ashanti Regions

Panel C: Means and Transition Probabilities, Ghana Socio-Economic Panel Survey, Northern, Upper East, Brong Ahafo, Ashanti Regions, non-Regional Capit

Level of 2009 Mental Distress, Control Group		2013 Mental Distress				
	(1)	(2)	(3)	(4)	(5)	(6)
	Share 2009	No Mental distress	Mild Mental Distress	Moderate Mental Distress	Severe Mental Distress	Total
No 2009 mental distress	0.425	0.703	0.19	0.075	0.032	1.000
Mild 2009 mental distress	0.298	0.656	0.213	0.104	0.027	1.000
Moderate 2009 mental distress	0.168	0.593	0.25	0.12	0.037	1.000
Severe 2009 mental distress	0.109	0.606	0.232	0.125	0.037	1.000
		Share above diagonal (worsened mental health)			0.171	
		Share at diagonal (no change in mental health)			0.386	
		Share below diagonal (improved mental health)			0.442	

Baseline Findings

- In our baseline survey, we found that 16% suffer from moderate distress and 15% from severe distress, so meaningfully higher than the national average
- Baseline furthermore revealed that intimate partner violence (IPV) was a large problem in our study sample
  - Data from a list randomization module of the baseline indicated that 24% of interviewed adults were physically abused by an intimate partner at some point and 17% were sexually abused as an adult

Context: Four-Region Study with More Than 7,000 Households

Escaping Poverty

- Regions: Upper East, Northern, Bono East (formerly Brong Ahafo), Ashanti
- Three districts per region
- 258 communities selected in total
- Approximately 7,700 households that qualified as ultra poor (bottom 25%)
- Peri-urban: close enough to district capitals to be monitored, but rural enough to viably rear livestock

Image from http://districts.ghana-net.com/index.html. Accessed June 18, 2019.

Design

Randomization

- 2-stage randomization
  - Village level
  - Household level
- Selected households were assigned to 1 of 4 groups at the village level
  - Pure control
  - Treatment - CBT only
  - Treatment – Graduation only
  - Treatment – Graduation + CBT
- Households in the 3 treatment groups were subsequently randomized into a sub-treatment category at the household level

Key Research Questions

- What impact does a program designed to improve mental health among the general population have on measures of mental/ psychological well-being?
- Can CBT not targeted specifically at domestic violence offenders still reduce IPV?
- What impact does CBT have on economic outcomes?
- How does improved psychological health affect people's ability to take advantage of the graduation program?

Context: What is CBT?

- Cognitive behavioral therapy (CBT) is a mental health intervention focused on teaching skills to identify negative thought patterns and modify beliefs
- Central idea: when we experience stimuli in the world, we often have an automatic response to them
  - In certain cases, we might automatically have an unproductive interpretation (e.g., my husband ignored me because he is mad at me, rather than because he is distracted or busy)
- It is important to recognize that there is a stage where we interpret the stimulus, so we should stop and consider which interpretations are productive vs. unproductive

Case Scenario

- Counselor narrates the following case scenario. Counselor asks participants to imagine that they were Fusena.

Fusena is half way through with preparing supper. She's a bit late with her meals today. She looks very exhausted. She spent the whole day at the market shouting to draw customers' attention to her yams at the Tamale market. She heard the door opened. She knew it was her husband because she could hear her two children playing outside. Mr. Mustapha opened and banged the door behind him, walked past the kitchen and headed towards the bedroom without saying a word to his wife. He also did not respond to his wife's greeting. Fusena is worried

Example discussion from CBT curriculum on relationship management

Discussion Time

i. **Counselor asks participants what Fusena would think as Mustapha walked past the kitchen without a word.**
ii. **What would you assume might be the problem?**
iii. **How would you (Fusena) react?**
iv. **1. Discuss mind reading and its problems.**
v. **Ask participants to come up with several reasons which might explain why Mustapha came in this way?**
vi. **How can Fusena respond to her husband?**
vii. **What would the results be?**
viii. **Have participants pretend to be Mustapha and respond to Fusena.**
ix. **Emphasize the importance of communicating in relationships and not relying on mind reading.**

The Program: Structure of Sessions

CBT Community Sessions

- Contracted 36 non-professional counselors with backgrounds in psychology and education who spoke local languages
- Two weeks of classroom training

12 weekly meetings, each covering a different CBT module.

- 10 participants per group, one group per community
- Gender-specific groups
- Psychiatric nurses monitored trainings

Data Collection

Two Surveys

Two surveys measured effects of CBT on mental well-being and intimate partner violence.

1. A psychological survey to capture immediate effects of CBT
2. A survey on Intimate Partner Violence (IPV) aimed at understanding whether CBT made a difference in violence perpetrated or experienced by participants

Short Kessler

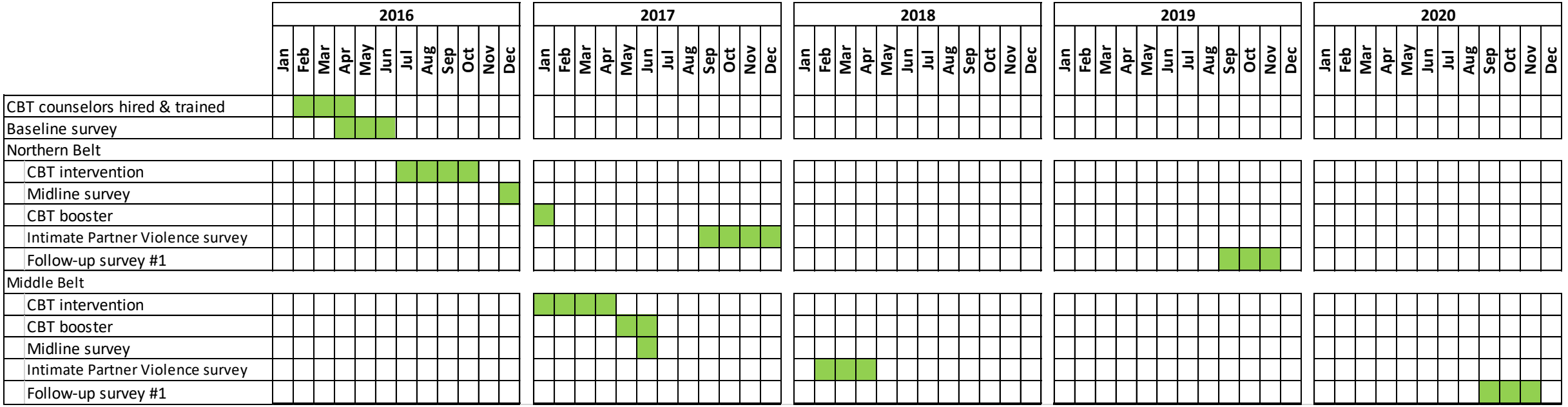
During the past 7 days, about how often did you feel nervous?	1 = None of the time 2 = A little of the time 3 = Some of the time 4 = Most of the time 5 = All of the time
During the past 7 days, about how often did you feel hopeless?	1 = None of the time 2 = A little of the time 3 = Some of the time 4 = Most of the time 5 = All of the time
During the past 7 days, about how often did you feel restless or fidgety?	1 = None of the time 2 = A little of the time 3 = Some of the time 4 = Most of the time 5 = All of the time
During the past 7 days, about how often did you feel that everything was an effort?	1 = None of the time 2 = A little of the time 3 = Some of the time 4 = Most of the time 5 = All of the time
During the past 7 days, about how often did you feel so sad that nothing could cheer you up?	1 = None of the time 2 = A little of the time 3 = Some of the time 4 = Most of the time 5 = All of the time
During the past 7 days, about how often did you feel worthless?	1 = None of the time 2 = A little of the time 3 = Some of the time 4 = Most of the time 5 = All of the time

IPV Example Questions

704	The next questions are about things that happen to many women, and that your current partner, or any other partner may have done to you. Has your current husband / partner, or any other partner ever….	A) (**If YES continue with B. If NO skip to next item**) YES NO	B) Has this happened in the past 12 months? (**If YES ask C only. If NO ask D only**) YES NO	C) In the past 12 months would you say that this has happened once, a few times or many times? (**after answering C, go to next item**) One Few Many	D) Before the past 12 months would you say that this has happened once, a few times or many times? One Few Many
	a) Insulted you or made you feel bad about yourself?	1 2	1 2	1 2 3	1 2 3
	b) Belittled or humiliated you in front of other people?	1 2	1 2	1 2 3	1 2 3
	c) Done things to scare or intimidate you on purpose (e.g. by the way he looked at you, by yelling and smashing things)?	1 2	1 2	1 2 3	1 2 3
	d) Threatened to hurt you or someone you care about?	1 2	1 2	1 2 3	1 2 3

Full Evaluation Timeline

In Detail



Transitions in Mental Health Status: RCT sample

Panel A: Transition Matrix for Control Group						
Level of Baseline Mental Distress, Control Group		Endline Mental Distress				
	(1)	(2)	(3)	(4)	(5)	(6)
	Share @ baseline	No Mental distress	Mild Mental Distress	Moderate Mental Distress	Severe Mental Distress	Total
No mental distress at baseline	0.45	0.566	0.194	0.137	0.103	1.000
Mild mental distress at baseline	0.24	0.423	0.242	0.166	0.169	1.000
Moderate mental distress at baseline	0.16	0.352	0.243	0.184	0.221	1.000
Severe mental distress at baseline	0.15	0.312	0.228	0.195	0.265	1.000
		Share above diagonal (worsened mental health)			0.310	
		Share at diagonal (no change in mental health)			0.381	
		Share below diagonal (improved mental health)			0.308	
Panel B: Treatment Effects for each transition cell						
		CBT Treatment Effects, by Cell				
	(1)	(2)	(3)	(4)	(5)	
		No Mental distress	Mild Mental Distress	Moderate Mental Distress	Severe Mental Distress	
No baseline mental distress		0.057	0.006	-0.054	-0.009	
Mild baseline mental distress		0.048	-0.01	0.005	-0.043	
Moderate baseline mental distress		0.077	0.017	-0.014	-0.08	
Severe baseline mental distress		0.047	0.024	-0.003	-0.067	
P-value of Test: Share above diagonal equal for both groups	0.001					

Treatment Effects of CBT

	Average Treatment Effects	
	Control Mean	CBT Average Treatment Effect, Full Sample
	(1)	(2)
Panel A: Health Outcomes		
Mental Health Index	0.000	0.179***
		(0.031)
Kessler Score	21.390	-1.652***
		(0.251)
No distress (Kessler < 20)	0.448	0.0707***
		(0.017)
No moderate or severe distress (Kessler < 25)	0.691	0.0799***
		(0.015)
No severe distress (Kessler <30)	0.846	0.0472***
		(0.012)
Mental Health Self Rating (1/4)	2.840	0.0745***
		(0.028)
Days in month without poor mental health	25.290	0.815***
		(0.275)
Physical Health Index	0.000	0.198***
		(0.029)
Physical Health Self-Rating (1/4)	3.030	0.157***
		(0.026)
Days in Month without poor physical health	25.570	1.135***
		(0.242)

Treatment Effects of CBT by Baseline Distress

	Average Treatment Effects		Heterogeneity by Baseline Mental Distress		
	Control Mean	CBT Average Treatment Effect, Full Sample	CBT Average Treatment Effect, Minor, Moderate or Severe Baseline Distress	CBT Average Treatment Effect, No Baseline Distress	p-value from Test: Homogenous Treatment Effect by Baseline Distress, 3=4
	(1)	(2)	(3)	(4)	(5)
Panel A: Health Outcomes					
Mental Health Index	0.000	0.179***	0.137***	0.208***	0.269
		(0.031)	(0.037)	(0.057)	
Kessler Score	21.390	-1.652***	-1.287***	-1.962***	0.19
		(0.251)	(0.301)	(0.448)	
No distress (Kessler < 20)	0.448	0.0707***	0.0616***	0.0697**	0.814
		(0.017)	(0.020)	(0.030)	
No moderate or severe distress (Kessler < 25)	0.691	0.0799***	0.0639***	0.0951***	0.333
		(0.015)	(0.017)	(0.029)	
No severe distress (Kessler <30)	0.846	0.0472***	0.0273**	0.0704***	0.0991
		(0.012)	(0.013)	(0.024)	
Mental Health Self Rating (1/4)	2.840	0.0745***	0.0707**	0.0437	0.654
		(0.028)	(0.034)	(0.052)	
Days in month without poor mental health	25.290	0.815***	0.432	1.389***	0.0965
		(0.275)	(0.326)	(0.509)	
Physical Health Index	0.000	0.198***	0.168***	0.215***	0.461
		(0.029)	(0.035)	(0.056)	
Physical Health Self-Rating (1/4)	3.030	0.157***	0.131***	0.165***	0.544
		(0.026)	(0.031)	(0.048)	
Days in Month without poor physical health	25.570	1.135***	0.970***	1.281***	0.554
		(0.242)	(0.289)	(0.459)	

Treatment Effects of CBT by Gender

	Average Treatment Effects		Heterogeneity by gender of recipient		
	Control Mean	CBT Average Treatment Effect, Full Sample	CBT Average Treatment Effect, Female	CBT Average Treatment Effect, Male	p-value from Test: Homogenous Treatment Effect by Gender, 6=7
	(1)	(2)	#REF!	#REF!	#REF!
Panel A: Health Outcomes					
Mental Health Index	0.000	0.179***	0.123***	0.241***	0.0766
		(0.031)	(0.045)	(0.046)	
Kessler Score	21.390	-1.652***	-1.152***	-2.160***	0.0592
		(0.251)	(0.362)	(0.370)	
No distress (Kessler < 20)	0.448	0.0707***	0.0611***	0.0793***	0.605
		(0.017)	(0.024)	(0.025)	
No moderate or severe distress (Kessler < 25)	0.691	0.0799***	0.0576***	0.102***	0.158
		(0.015)	(0.022)	(0.022)	
No severe distress (Kessler <30)	0.846	0.0472***	0.0284*	0.0658***	0.134
		(0.012)	(0.017)	(0.017)	
Mental Health Self Rating (1/4)	2.840	0.0745***	0.0232	0.130***	0.0763
		(0.028)	(0.041)	(0.042)	
Days in month without poor mental health	25.290	0.815***	0.867**	0.801*	0.911
		(0.275)	(0.391)	(0.416)	
Physical Health Index	0.000	0.198***	0.178***	0.224***	0.464
		(0.029)	(0.042)	(0.045)	
Physical Health Self-Rating (1/4)	3.030	0.157***	0.141***	0.177***	0.522
		(0.026)	(0.037)	(0.039)	
Days in Month without poor physical health	25.570	1.135***	1.012***	1.278***	0.616
		(0.242)	(0.346)	(0.373)	

CBT and Economic Outcomes

	Average Treatment Effects	
	Control Mean	CBT Average Treatment Effect, Full Sample
Panel B: Economic Outcomes		
Economic Index	0.000	0.156***
		(0.033)
Days in which poor mental or physical health did not keep individual from doing regular activities	26.860	0.701***
		(0.221)
Self-Reported Economic Status	3.083	0.247***
		(0.075)
Projected Economic Status in 5 years	5.794	0.278***
		(0.083)

CBT and Economic Outcomes

	Average Treatment Effects		Heterogeneity by Baseline Mental Distress		
	Control Mean	CBT Average Treatment Effect, Full Sample	CBT Average Treatment Effect, Minor, Moderate or Severe Baseline Distress	CBT Average Treatment Effect, No Baseline Distress	p-value from Test: Homogenous Treatment Effect by Baseline Distress, 3=4
Panel B: Economic Outcomes					
Economic Index	0.000	0.156***	0.155***	0.0774	0.254
		(0.033)	(0.040)	(0.059)	
Days in which poor mental or physical health did not keep individual from doing regular activities	26.860	0.701***	0.835***	0.194	0.184
		(0.221)	(0.259)	(0.427)	
Self-Reported Economic Status	3.083	0.247***	0.202**	0.14	0.688
		(0.075)	(0.089)	(0.134)	
Projected Economic Status in 5 years	5.794	0.278***	0.264***	0.193	0.674
		(0.083)	(0.098)	(0.150)	

CBT and Economic Outcomes

	Average Treatment Effects		Heterogeneity by gender of recipient		
	Control Mean	CBT Average Treatment Effect, Full Sample	CBT Average Treatment Effect, Female	CBT Average Treatment Effect, Male	p-value from Test: Homogenous Treatment Effect by Gender, 6=7
Panel B: Economic Outcomes					
Economic Index	0.000	0.156***	0.123***	0.190***	0.347
		(0.033)	(0.045)	(0.053)	
Days in which poor mental or physical health did not keep individual from doing regular activities	26.860	0.701***	0.389	1.071***	0.153
		(0.221)	(0.300)	(0.350)	
Self-Reported Economic Status	3.083	0.247***	0.274***	0.205*	0.664
		(0.075)	(0.102)	(0.118)	
Projected Economic Status in 5 years	5.794	0.278***	0.173	0.378***	0.25
		(0.083)	(0.116)	(0.128)	

CBT, Socio-economic skills and Cognition

	Average Treatment Effects	
	Control Mean	CBT Average Treatment Effect, Full Sample
	(1)	(2)
Panel A: Socio-Emotional Skills		
Socio-Emotional Skill Index	0.000	0.278***
		(0.031)
Generalized Self-Efficacy Score	0.000	0.258***
		(0.030)
Grit Score	0.000	0.225***
		(0.032)
Self-Control Score	0.000	0.144***
		(0.032)
Panel B: Cognition		
Cognition Index	0.000	0.0868***
		(0.030)
Raven's Progressive Matrices, Indexed	0.000	0.0606*
		(0.031)
Digit Span: Forwards, Indexed	0.000	0.0855***
		(0.032)
Digit Span: Backwards, Indexed	0.000	0.0495
		(0.032)
Executive Function Test, Indexed	0.000	0.0482
		(0.034)

CBT, Socio-economic skills and Cognition

	Average Treatment Effects		Heterogeneity by Baseline Mental Distress		
	Control Mean	CBT Average Treatment Effect, Full Sample	CBT Average Treatment Effect, Minor, Moderate or Severe Baseline Distress	CBT Average Treatment Effect, No Baseline Distress	p-value from Test: Homogenous Treatment Effect by Baseline Distress, 3=4
	(1)	(2)	(3)	(4)	(5)
Panel A: Socio-Emotional Skills					
Socio-Emotional Skill Index	0.000	0.278***	0.258***	0.282***	0.705
		(0.031)	(0.038)	(0.054)	
Generalized Self-Efficacy Score	0.000	0.258***	0.242***	0.248***	0.919
		(0.030)	(0.036)	(0.055)	
Grit Score	0.000	0.225***	0.214***	0.216***	0.976
		(0.032)	(0.040)	(0.055)	
Self-Control Score	0.000	0.144***	0.128***	0.167***	0.545
		(0.032)	(0.039)	(0.053)	
Panel B: Cognition					
Cognition Index	0.000	0.0868***	0.0756**	0.120**	0.455
		(0.030)	(0.035)	(0.052)	
Raven's Progressive Matrices, Indexed	0.000	0.0606*	0.0663*	0.0987*	0.605
		(0.031)	(0.038)	(0.053)	
Digit Span: Forwards, Indexed	0.000	0.0855***	0.0824**	0.0618	0.745
		(0.032)	(0.037)	(0.055)	
Digit Span: Backwards, Indexed	0.000	0.0495	0.0244	0.101*	0.235
		(0.032)	(0.038)	(0.056)	
Executive Function Test, Indexed	0.000	0.0482	0.0403	0.0696	0.67
		(0.034)	(0.042)	(0.058)	

Risk of Depression and CBT

Table 5: Heterogeneous Effects by LASSO-Predicted Depression Risk Score, using holdout Testing Sample						
	(1)	(2)	(3)			
	Kessler Psychological Distress Score	Mental Health Index	Physical Health Index			
Assigned to CBT	4.2873	-0.5679	-0.5445			
	[0.1756, 8.3696]	[-1.0825, -0.0560]	[-1.0564, -0.0315]			
unadjusted p-value	0.0865	0.0671	0.0809			
p-value to reflect sampling uncertainty	0.1730	0.1342	0.1618			
Predicted Kessler Score from Baseline Covariates	1.0746	-0.1386	-0.1173			
	[0.9807, 1.1689]	[-0.1506, -0.1266]	[-0.1287, -0.1060]			
unadjusted p-value	0.0000	0.0000	0.0000			
p-value to reflect sampling uncertainty	0.0000	0.0000	0.0000			
Assigned to CBT x Predicted Kessler Score	-0.2677	0.0339	0.0325			
	[-0.4592, -0.0749]	[0.0096, 0.0582]	[0.0082, 0.0567]			
unadjusted p-value	0.0216	0.0213	0.0280			
p-value to reflect sampling uncertainty	0.0432	0.0426	0.056			

Notes: Medians over 1,000 simulations.
90% confidence interval from the simulations in brackets; p-values are for the median result of the test that the null hypothesis is equal to 0
In each simulation, the sample in control villages is split in two, a training and testing split. Endline Kessler score is predicted using baseline covariates in the training set, then heterogeneity on the predicted endline Kessler score is tested on the testing sample and treatment households

Risk of Depression and CBT

Table 5: Heterogeneous Effects by LASSO-Predicted Depression Risk Score, using holdout Testing Sample						
	(1)	(2)	(3)	(4)	(5)	(6)
	Kessler Psychological Distress Score	Mental Health Index	Physical Health Index	Economic outcomes Index	Socioemotional Skills Index	Cognition Index
Assigned to CBT	4.2873	-0.5679	-0.5445	0.4502	-0.1369	0.3368
	[0.1756, 8.3696]	[-1.0825, -0.0560]	[-1.0564, -0.0315]	[-0.0893, 0.9946]	[-0.6557, 0.3825]	[-0.2052, 0.8829]
unadjusted p-value	0.0865	0.0671	0.0809	0.1697	0.6448	0.3083
p-value to reflect sampling uncertainty	0.1730	0.1342	0.1618	0.3394	1.0000	0.6166
Predicted Kessler Score from Baseline Covariates	1.0746	-0.1386	-0.1173	-0.0725	-0.0649	-0.0417
	[0.9807, 1.1689]	[-0.1506, -0.1266]	[-0.1287, -0.1060]	[-0.0850, -0.0605]	[-0.0767, -0.0530]	[-0.0530, -0.0301]
unadjusted p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-value to reflect sampling uncertainty	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Assigned to CBT x Predicted Kessler Score	-0.2677	0.0339	0.0325	-0.0120	0.0173	-0.0121
	[-0.4592, -0.0749]	[0.0096, 0.0582]	[0.0082, 0.0567]	[-0.0377, 0.0132]	[-0.0070, 0.0415]	[-0.0375, 0.0132]
unadjusted p-value	0.0216	0.0213	0.0280	0.4308	0.2442	0.4326
p-value to reflect sampling uncertainty	0.0432	0.0426	0.056	0.8616	0.4884	0.8652

Notes: Medians over 1,000 simulations.
90% confidence interval from the simulations in brackets; p-values are for the median result of the test that the null hypothesis is equal to 0
In each simulation, the sample in control villages is split in two, a training and testing split. Endline Kessler score is predicted using baseline covariates in the training set, then heterogeneity on the predicted endline Kessler score is tested on the testing sample and treatment households

Interpretation of Results

- CBT does its work …
- … and more (cognitive improvements, physical health, economic activity)
- Little evidence that it is more effective for those with baseline distress, among this poor population
- Great deal of movement over time into and out of distress
  - More impact of CBT on mental health of those who are more prone to move into distress
  - Economic, socio-economic skills and cognitive improvements more uniform

IPV Results

Results

CBT Treatment Effect on Primary Outcomes, Male Spouse Received CBT

	(1)	(2)	(3)	(4)	(5)
	Child discipline index	Controlling behavior index	Emotionally abusive behavior index	Physically abusive behavior index	Sexually abusive behavior index
Respondent's spouse assigned to CBT	0.0633	-0.0560	0.0236	-0.0366	-0.0123
	(0.0819)	(0.0828)	(0.100)	(0.0942)	(0.102)
Observations	4,392	5,323	5,323	5,322	5,320
control mean	-0	-1.04e-08	4.34e-09	-2.09e-09	8.52e-09

CBT Treatment Effect on Primary Outcomes, Female Respondent Received CBT

	(1)	(2)	(3)	(4)	(5)
	Child discipline index	Controlling behavior index	Emotionally abusive behavior index	Physically abusive behavior index	Sexually abusive behavior index
Respondent assigned to CBT	0.0478	-0.0258	0.161	0.0612	0.0456
	(0.0973)	(0.0857)	(0.0751)	(0.0788)	(0.0896)
Observations	4,443	5,418	5,418	5,417	5,413
control mean	-0	-1.04e-08	4.34e-09	-2.09e-09	8.52e-09

Interpretation of Results

- Not much evidence of a significant impact on primary outcomes
- Why?
  - Perhaps the skills developed by individuals who attended CBT sessions were more local i.e., they didn't consider applying them to an intimate partner context
  - Could be that IPV is intractable enough that the CBT was insufficient to overcome the problem and induce meaningful change in behavior
  - IPV survey round took place one year after CBT had been implemented, so maybe there were immediate effects, but they dissipated by the time we conducted the survey
  - Other theories?

Thank you

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