

Improving Women's Mental Health During a Pandemic

Michael Vlassopoulos¹ Abu Siddique² Tabassum Rahman³
Debayan Pakrashi⁴ Asad Islam⁵ Firoz Ahmed⁶

¹University of Southampton & IZA

²King's College London

³University of Newcastle

⁴IIT Kanpur

⁵Monash University & J-PAL

⁶Technical University of Munich & Khulna University

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Motivation

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- Negative impact can be particularly severe in lower income countries (Egger et al., 2021; Miguel & Mobarak, 2021).
- Women in lower income countries are affected disproportionately (Afridi et al., 2021; Bau et al., 2022; Giurge et al., 2021)

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- We evaluate immediate (1-month) and 10-month impacts:
 - ▶ Main: perceived stress, depression, SWB, COVID-19 health behavior
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- We find that the intervention led to significant improvements in mental health ten months post-intervention:
 - ▶ reduction of 20% in the prevalence of moderate and severe stress
 - ▶ reduction of 33% in prevalence of depression
 - ▶ positive impacts on household food security and time invested in homeschooling of children

Related literature

- Covid-19 and mental health: Afridi et al. (2021); Altindag et al. (2021); Guintella et al. (2021); Sadish et al. (2021); Adams-Prassl et al. (2020); Hamermesh (2020); Bau et al. (2021).
- Psychological interventions: Singla et al. (2017); Rahman et al. (2019); Blattman et al. (2017); Baranov et al. (2020); Haushofer et al. (2020); Islam et al. (2021)
- Mental health & economic outcomes: Ridley et al. (2020); Adhvaryu et al. (2019); Persson & Rossin-Slater (2018); Currie & Stabile (2006)

The context: Bangladesh

- Over 1.5 million infections, 27 thousand deaths (underestimated)
 - ▶ Lockdown in 2020: Mar 26 - May 31; Lockdown in 2021: Apr 05 - Aug 10
 - ▶ 90% rural households are food insecure (Ahmed, 2021)
 - ▶ Schools closed for 543 days until Sept 11, 2021.

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 - ▶ 90% working women are in informal sector (93% in rural)
 - ▶ Of all, 40% have no earnings, rely on husband/family income
- Impact on women, mostly rural
 - ▶ 49% rural women don't feel safe during lockdown (UN, 2021)
 - ▶ Unpaid and domestic care by women ↑33%
 - ▶ 43% women are unaware of basic health facilities at local clinics
 - ▶ Mostly rely on information from husbands or other family
 - ▶ 16 million fully vaccinated - 44% female

The telecounseling intervention

Domains & modules

- Collaborated with a local organization (GDRI) to deliver 'telecounseling' to rural women in Khulna division, Bangladesh
 - ▶ 94% rural households own at least 1 basic mobile phone (BDHS, 2017)

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 - ▶ 94% rural households own at least 1 basic mobile phone (BDHS, 2017)
- Four telecounseling sessions, across 3 months
 - ▶ Informational + emotional support (awareness, coping with stress, self and childcare, and importance of communication)
 - ▶ Delivered by female para-counselors (graduates of public health, psychology, or social sciences)
 - ▶ Session modules by Tabassum Rahman (public health expert and coauthor) following COVID-19 mental health guidelines by Red Cross, WHO, etc.

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- More general guidelines from Singla et al. (2017)
 - ▶ targeting 4 psychological domains (behavioral, interpersonal, emotional, cognitive) that contribute to better mental health

Sampling

Map

Balance: individual

Balance: household

Balance: baseline outcomes

- GDRI directory for sampling
 - ▶ randomly selected roughly 2,650 phone numbers that belong to women, one per household

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 - ▶ 114 numbers were switched off, invalid, never answered
 - ▶ 2,533 could be reached and were invited, 2,402 (95%) agreed.

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Balance: individual

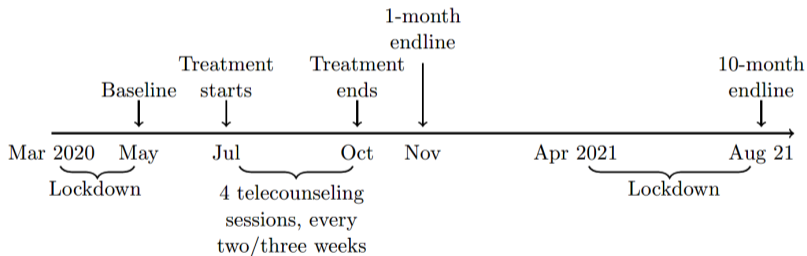
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- 1,299 randomly assigned to treatment, remaining to no treatment
- Data collection: baseline, 1-month and 10-month endlines.
- Stress (Cohen's PSS scale), depression (CES-D-10 scale), food security (Ballard's FIES scale), parental input (Strayhorn & Weidman)
- Pre-registered at AEA RCT Registry (AEARCTR-0005948)

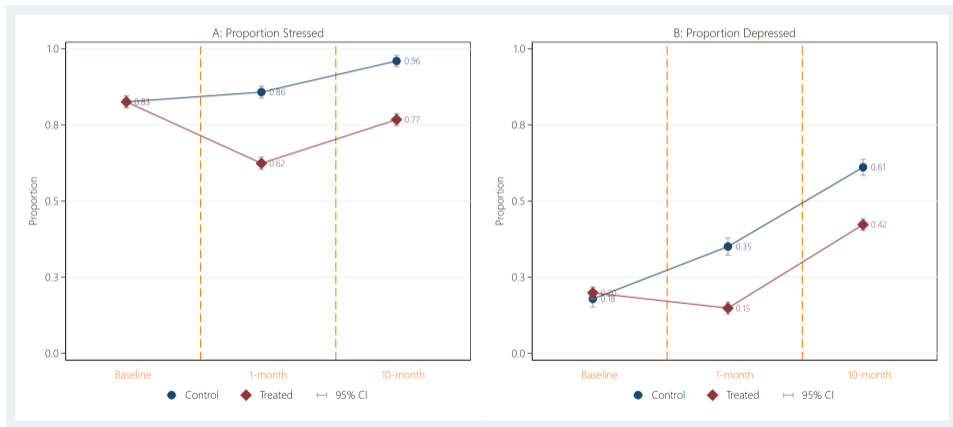
Timeline

Photos



Treatment improved mental health

Distributions



Empirical strategy

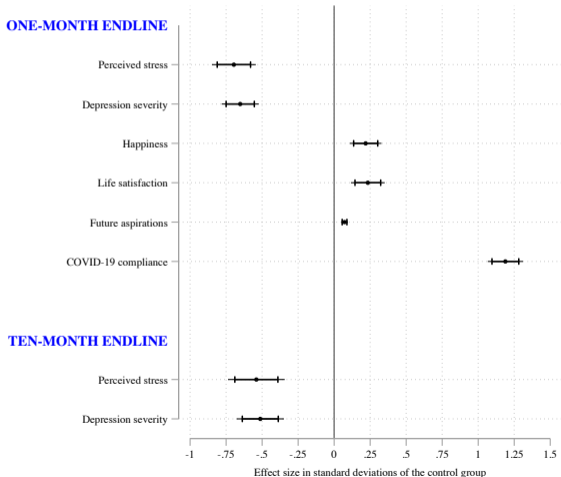
$$Y_{1ij} = \beta_0 + \beta_1 \text{Treat}_{ij} + \beta_2 Y_{0ij} + \Gamma' X_{ij} + \theta_j + \epsilon_{ij} \quad (1)$$

- Y are standardized outcomes, such that control group has mean 0 and SD 1
- Treat is an indicator for treatment group
- X is a vector of controls (age, education, income, etc.)
- θ is union council FE, so comparisons are between households in the same union
- Standard errors clustered at village level

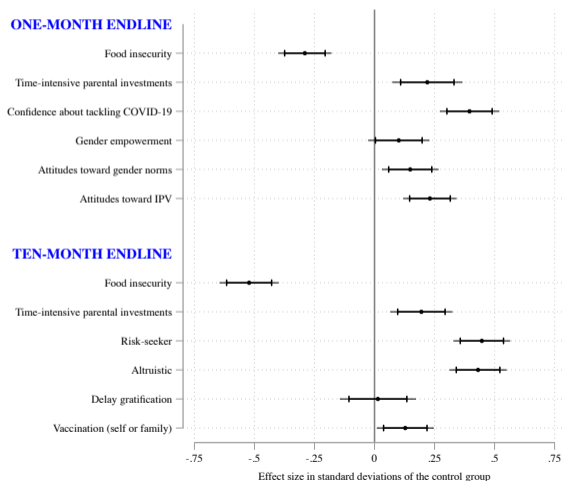
- β_1 can determine where the mean of the treatment group lies in the distribution of the control group in terms of SD

Treatment effects: mental health outcomes

Table 1



Treatment effects: additional outcomes Table 2



Heterogeneity by Baseline Stress

Dependent variables	PSS dummy		PSS continuous	
	Below median	Above median	Coefficient on interaction	Coefficient on interaction
	(1)	(2)	(3)	(4)
A: 1-month Endline				
A.1. Mental health outcomes[§]				
Perceived stress	-0.548*** (0.072)	-0.837*** (0.082)	-0.256*** (0.098)	-0.027** (0.011)
Depression severity	-0.538*** (0.059)	-0.752*** (0.072)	-0.210** (0.086)	-0.016* (0.009)
A.2. Secondary outcomes				
Happiness	0.116** (0.056)	0.305*** (0.064)	0.167** (0.082)	0.006 (0.010)
Life satisfaction	0.147** (0.058)	0.313*** (0.067)	0.134 (0.083)	0.013 (0.010)
Future aspirations	0.335*** (0.058)	0.393*** (0.064)	0.060 (0.085)	0.006 (0.010)
COVID-19 Compliance	1.098*** (0.065)	1.267*** (0.068)	0.173** (0.086)	0.008 (0.010)

Robust SE clustered at the village level are in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Robustness

- Attrition Attrition
- Social Desirability Bias SDB check 1 SDB check 2
- Multiple Hypotheses Testing

Potential mechanisms

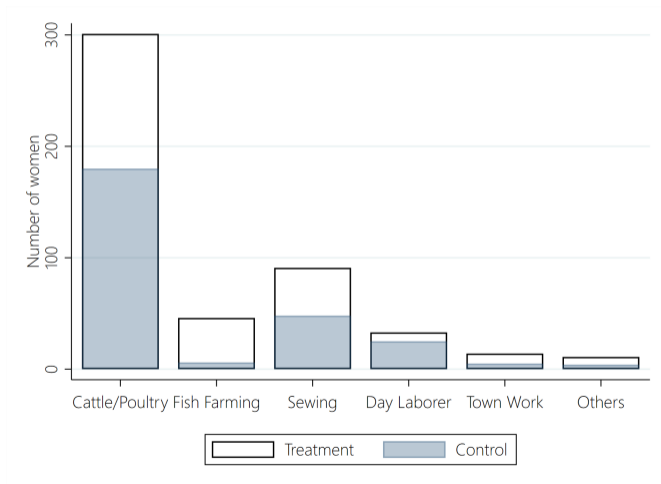
Advice table

VARIABLES	Followed advice (1)	Followed advice (=1) (2)	Borrowing ↑ (3)	Contacted public offices (4)	Husband's work ↑ (5)	New income generating actv. (6)
Treatment	2.083*** (0.130)	0.368*** (0.025)	0.098*** (0.023)	0.012 (0.013)	0.007 (0.007)	0.137*** (0.028)
Control mean	0.827 [1.173]	0.419 [0.494]	0.231 [0.421]	0.069 [0.254]	0.021 [0.145]	0.261 [0.439]
All other controls	Yes	Yes	Yes	Yes	Yes	Yes
Union council FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,254	2,254	2,254	2,254	2,254	2,254
R-squared	0.318	0.221	0.071	0.038	0.064	0.091

Robust standard errors clustered at the village level are in parentheses

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New income generating activities



Conclusion

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- What explains effectiveness?
 - ▶ Timing (high stress period)
 - ▶ Lack of alternative resources
 - ▶ Multifaceted approach

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- What explains effectiveness?
 - ▶ Timing (high stress period)
 - ▶ Lack of alternative resources
 - ▶ Multifaceted approach
- More evidence is needed to understand better greater applicability in other contexts

Broader lessons for policy-makers

Features of mental health interventions

- Safe

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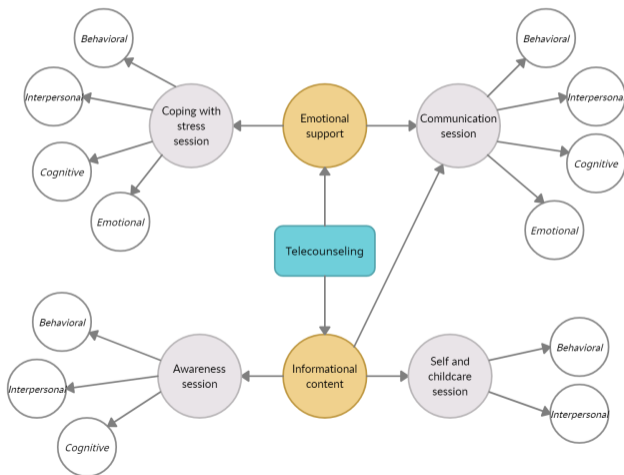
Broader lessons for policy-makers

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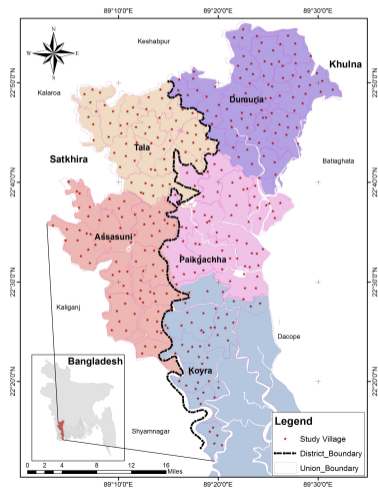
- Safe
- Discreet
- Offer flexibility
- Multifaceted
- Scalable

Psychological domains & session modules

Sampling



Map of the study area Sampling



Baseline respondent characteristics Sampling

	Pooled Mean (Std. Dev.)	Control Mean (Std. Dev.)	Treatment Mean (Std. Dev.)	T-test p-values	RI-test p-values
Age of respondent	35.51 (9.51)	35.73 (9.37)	35.32 (9.49)	0.253	0.288
Education of respondent	8.39 (2.67)	8.32 (2.59)	8.44 (2.73)	0.237	0.253
Household chores increased*	0.26 (0.44)	0.26 (0.44)	0.26 (0.44)	0.736	0.778
Someone helps with household chores*	0.49 (0.50)	0.50 (0.50)	0.48 (0.50)	0.338	0.346
Trusts neighbors*	0.22 (0.41)	0.23 (0.42)	0.21 (0.41)	0.157	0.204
COVID-19 perceptions	0.63 (0.16)	0.63 (0.16)	0.63 (0.17)	0.587	0.604
Worried about: well-being of family*	0.50 (0.50)	0.51 (0.50)	0.49 (0.50)	0.263	0.295
Worried about: providing food to family*	0.75 (0.43)	0.74 (0.44)	0.76 (0.43)	0.240	0.248
Worried about: income*	0.81 (0.39)	0.81 (0.39)	0.82 (0.39)	0.616	0.652
Worried about: well-being of relatives*	0.18 (0.39)	0.19 (0.39)	0.17 (0.38)	0.197	0.228
Afraid of contracting coronavirus	8.09 (2.16)	8.20 (2.15)	8.00 (2.17)	0.026	0.034
Scared of: socializing*	0.86 (0.34)	0.87 (0.34)	0.86 (0.35)	0.599	0.677
Scared of: home visitors*	0.96 (0.19)	0.97 (0.18)	0.96 (0.19)	0.572	0.574
Scared of: going outside*	0.97 (0.16)	0.97 (0.18)	0.98 (0.15)	0.209	0.185
Feeling: anxious*	0.74 (0.44)	0.74 (0.44)	0.74 (0.44)	0.931	0.973
Feeling: lonely*	0.23 (0.42)	0.22 (0.41)	0.25 (0.43)	0.086	0.132
Feeling: hopeless*	0.50 (0.50)	0.51 (0.50)	0.50 (0.50)	0.757	0.817
Feeling: worthless*	0.10 (0.09)	0.10 (0.08)	0.10 (0.09)	0.946	0.944
Sample Size	2,402	1,103	1,299	-	-

Baseline household characteristics

Sampling

	Pooled Mean (Std. Dev.)	Control Mean (Std. Dev.)	Treatment Mean (Std. Dev.)	T-test/CS-test p-values	Rt-test p-values
Age of spouse	38.14 (8.00)	38.23 (7.99)	38.03 (7.92)	0.502	0.566
Education of spouse	8.14 (3.35)	8.10 (3.40)	8.18 (3.30)	0.522	0.541
Number of household members	4.39 (1.37)	4.35 (1.27)	4.43 (1.44)	0.108	0.117
Monthly household income	9,218 (6,974)	9,189 (6,544)	9,243 (7,321)	0.824	0.855
Experienced income loss*	0.94 (0.25)	0.93 (0.26)	0.94 (0.23)	0.197	0.214
Experienced complete income loss*	0.59 (0.49)	0.58 (0.49)	0.60 (0.49)	0.375	0.400
Number of children under five	0.56 (0.74)	0.56 (0.73)	0.56 (0.74)	0.788	0.822
Occupation	-	-	-	0.375	0.625
Farmer*	0.17 (0.38)	0.19 (0.39)	0.16 (0.36)	-	-
Farming Day laborer*	0.10 (0.30)	0.11 (0.31)	0.10 (0.30)	-	-
Non-Farming Day Laborer*	0.33 (0.47)	0.31 (0.46)	0.34 (0.48)	-	-
Business*	0.23 (0.42)	0.22 (0.42)	0.24 (0.43)	-	-
Public Service*	0.03 (0.18)	0.03 (0.17)	0.04 (0.18)	-	-
Private Service*	0.04 (0.21)	0.05 (0.22)	0.04 (0.19)	-	-
Other*	0.09 (0.28)	0.09 (0.29)	0.08 (0.27)	-	-
Sample Size	2,402	1,103	1,299	-	-

Baseline outcomes

Sampling

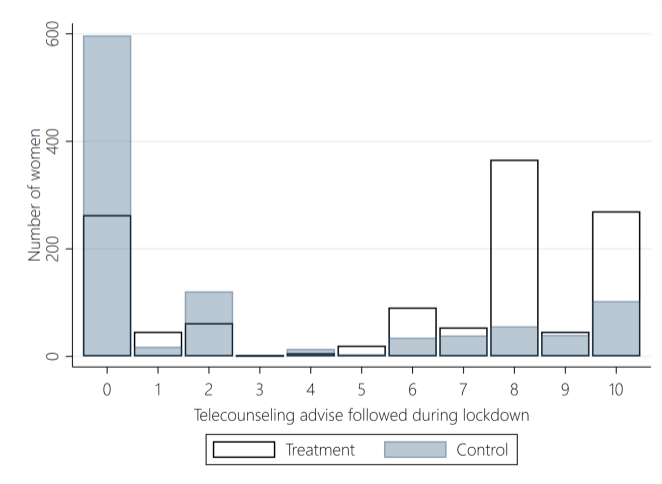
	Pooled Mean (<i>Std. Dev.</i>)	Control Mean (<i>Std. Dev.</i>)	Treatment Mean (<i>Std. Dev.</i>)	T-test p-values	RI-test p-values
Perceived stress scale score	17.22 (4.37)	17.22 (4.29)	17.21 (4.43)	0.935	0.945
Stressed*	0.83 (0.38)	0.83 (0.38)	0.83 (0.38)	0.995	1.00
Compliance with COVID-19 precautionary measures	0.53 (0.26)	0.53 (0.25)	0.53 (0.26)	0.697	0.742
Food insecurity ($0 \leq FIES \leq 1$)	0.63 (0.26)	0.62 (0.27)	0.64 (0.25)	0.050	0.088
Sample Size	2,402	1,103	1,299	-	-

Paracounselors

Timeline



Suggestions followed

[Back to table](#)

Treatment improved mental health

Effect over time

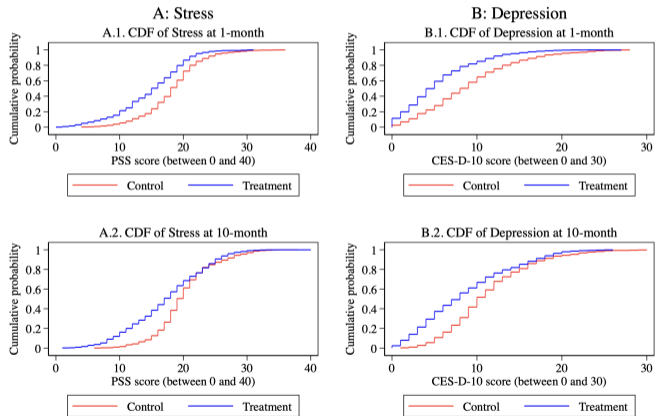


Table 1: treatment effects Coefplot

Dependent variables	1-month endline				10-month endline			
	Without covariates	With covariates	RI p-values	FWER p-values	Without covariates	With covariates	RI p-values	FWER p-values
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Mental health outcomes								
Perceived stress	-0.712*** (0.061)	-0.696*** (0.059)	0.000	0.000	-0.576*** (0.077)	-0.551*** (0.075)	0.001	0.000
Stressed* (=1 if stressed)	-0.229*** (0.023)	-0.220*** (0.022)	0.001	0.000	-0.202*** (0.018)	-0.195*** (0.018)	0.000	0.000
Depression severity	-0.638*** (0.052)	-0.652*** (0.050)	0.001	0.000	-0.525*** (0.065)	-0.513*** (0.063)	0.000	0.000
Depressed* (=1 if depressed)	-0.200*** (0.026)	-0.207*** (0.025)	0.001	0.000	-0.193*** (0.030)	-0.191*** (0.029)	0.001	0.000
B. Secondary outcomes								
Happiness	0.232*** (0.045)	0.219*** (0.042)	0.001	0.000	-	-	-	-
Life satisfaction	0.240*** (0.047)	0.234*** (0.045)	0.001	0.000	-	-	-	-
Future aspirations	0.390*** (0.046)	0.374*** (0.044)	0.001	0.000	-	-	-	-
Covid-19 compliance	1.187*** (0.048)	1.189*** (0.048)	0.001	0.000	-	-	-	-
Observations	2,220	2,220	-	-	2,254	2,254	-	-

Robust standard errors clustered at the village level are in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: treatment effects on additional outcomes Coeplot 2

Dependent variables	1-month endline				10-month endline			
	Without covariates	With covariates	(2)-RI <i>p</i> -values	(2)-FWER <i>p</i> -values	Without covariates	With covariates	(6)-RI <i>p</i> -values	(6)-FWER <i>p</i> -values
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Food insecurity [‡]	-0.310*** (0.042)	-0.276*** (0.041)	0.000	0.000	-0.537*** (0.045)	-0.520*** (0.047)	0.001	0.000
Time-intensive parental investments	0.227*** (0.055)	0.220*** (0.057)	0.001	0.000	0.232*** (0.050)	0.192*** (0.049)	0.000	0.000
Confidence about tackling Covid-19	0.394*** (0.050)	0.396*** (0.048)	0.001	0.000	-	-	-	-
Gender empowerment	0.128** (0.050)	0.101** (0.049)	0.041	0.033	-	-	-	-
Attitudes toward gender norms	0.173*** (0.047)	0.149*** (0.046)	0.001	0.006	-	-	-	-
Attitudes toward IPV	0.250*** (0.044)	0.231*** (0.043)	0.001	0.000	-	-	-	-
Risk-seeking	-	-	-	-	0.441*** (0.043)	0.432*** (0.044)	0.001	0.000
Altruistic	-	-	-	-	0.456*** (0.044)	0.432*** (0.045)	0.000	0.000
Delay gratification	-	-	-	-	0.017 (0.060)	0.003 (0.060)	0.954	0.959
Covid-19 vaccination (=1 if vaccinated)	-	-	-	-	0.059*** (0.018)	0.058*** (0.018)	0.004	0.014
Observations	2,220	2,220	-	-	2,254	2,254	-	-

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*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Social desirability bias Conclusion

VARIABLES	Perceived stress		Depression		Food insecurity		Child investment	
	Endline 1	Endline 2	Endline 1	Endline 2	Endline 1	Endline 2	Endline 1	Endline 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	-0.688*** (0.100)	-0.468*** (0.123)	-0.670*** (0.090)	-0.413*** (0.093)	-0.445*** (0.080)	-0.457*** (0.083)	0.232** (0.102)	0.316*** (0.090)
SDB Score	-0.001 (0.011)	0.028** (0.013)	-0.013 (0.011)	0.028** (0.011)	-0.009 (0.010)	0.021** (0.009)	0.016 (0.012)	0.015 (0.011)
Treatment×SDB Score	0.002 (0.016)	-0.016 (0.018)	0.006 (0.013)	-0.019 (0.015)	0.031** (0.013)	-0.012 (0.013)	-0.002 (0.015)	-0.023* (0.014)
All other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Union council FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,124	2,254	2,124	2,254	2,124	2,254	1,724	1,978
R-squared	0.201	0.160	0.197	0.190	0.162	0.194	0.099	0.149

Robust standard errors clustered at the village level are in parentheses

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Social desirability bias: other 1-month Conclusion

VARIABLES	Happiness	Life satisfaction	Future aspirations	COVID-19 compliance	COVID-19 confidence	Gender empowerment	Gender norms	IPV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.109 (0.085)	0.108 (0.086)	0.378*** (0.078)	1.117*** (0.087)	0.301*** (0.080)	0.127 (0.090)	0.291*** (0.097)	0.416*** (0.080)
SDB Score	-0.010 (0.011)	-0.014 (0.011)	0.005 (0.010)	-0.003 (0.010)	0.001 (0.010)	0.005 (0.011)	0.015 (0.011)	0.010 (0.010)
Treatment×SDB Score	0.018 (0.014)	0.021 (0.013)	-0.002 (0.012)	0.011 (0.013)	0.016 (0.011)	-0.004 (0.014)	-0.024 (0.015)	-0.031** (0.013)
All other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Union council FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,124	2,124	2,124	2,124	2,124	2,124	2,124	2,124
R-squared	0.114	0.107	0.130	0.332	0.152	0.075	0.076	0.101

Robust standard errors clustered at the village level are in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Attrition

Conclusion

- From baseline to 1-month: 7.6% (2.1pp higher in control)
- Not differential by baseline characteristics
- Re-estimate effect using inverse probability weighting and Lee bounds.
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- 88% of 2,402 never attrited; 2.2% always attrited Frequency of attrition
- High session attendance of 98% Session attendance

Frequency of attrition at endlines Attrition

	Treatment		Control		Total	
	N	%	N	%	N	%
(1) Never attrited at any endline	1,165	89.68	959	86.94	2,124	88.43
(2) Attrited at both endlines	25	1.92	27	2.45	52	2.16
(3) Attrited at endline 1 but not 2	61	4.70	69	6.26	130	5.41
(4) Attrited at endline 2 but not 1	48	3.70	48	4.35	96	4.00
Total	1,299	100	1,103	100	2,402	100

Session attendance

Conclusion

	<u>No. of participants</u>	<u>% of 1,299</u>
All four sessions	1,248	96.07
Three sessions	1,252	96.38
Two sessions	1,261	97.07
One session	1,272	97.92
Did not participate in any session	27	2.08
Total participants	1,299	-
