Evaluation of change in job knowledge and motivation due to interactions on a Facebook peer group.

Abstract

JEEViKA is a joint initiative of the Government of Bihar and World Bank that strives for the social and economic empowerment of the rural poor. Facebook and the BMGF (Bill and Melinda Gates Foundation) have partnered with JEEViKA to introduce peer groups of JEEViKA cadres on Facebook. As a part of that partnership CSBC (Center for Social and Behaviour Change) will conduct a rigorous evaluation to determine whether online peer training on topic-specific closed Facebook groups with carefully curated content improves topic knowledge, motivation, and job performance. To this end, we will conduct an RCT with a treatment group that includes participants in the health and nutrition Facebook group where they will receive knowledge collaterals as well as opportunities to engage in work-related conversations, and a control group with participants that are not part of any Facebook group. We will use baseline and endline phone surveys to measure the impact of the Facebook groups.

Introduction

Bihar Government, through the Bihar Rural Livelihoods Promotion Society (BRLPS), is spearheading the World Bank aided Bihar Rural Livelihoods Project (BRLP), locally known as JEEViKA with the objective of social and economic empowerment of the rural poor. JEEViKA works towards reducing poverty by enabling the poor households, through supporting Self-Help Groups (SHGs) of women, to access gainful employment and skilled wage employment opportunities, resulting in appreciable improvement in their livelihoods on a sustainable basis. Major focus areas of JEEViKA are social mobilization, financial inclusion, vulnerability reduction combined with the livelihood's enhancement and the sensitive and dedicated support structure to be put in place[1].

Dealing with over 28 thematic areas including Health and Nutrition, it has cadres at various levels helping to disseminate knowledge on these topics and inculcate behaviours such as methods of disease prevention, ante natal care, child nutrition, and growing of vegetable gardens etc. JEEViKA aims at enhancing livelihood of rural poor households as a part of poverty alleviation strategy in Bihar. Under the large mandate of vulnerability reduction and improving human development indicators of poor, it seeks to take a step beyond poverty reduction by empowering communities better utilize available services and resources and encourage them to adopt recommended health, nutrition, and sanitation behaviours. It seeks intensive Social and Behaviour Change Communication to inform, motivate, and support, households and communities.

Training for these cadres take place in in-person sessions based on specific knowledge collaterals. Facebook and BMGF have partnered with JEEViKA to create Facebook groups for each thematic

area that JEEViKA works in, providing an online platform for the trainings. A peer group with cadres at different hierarchical levels to learn knowledge collaterals and engage in discussions and problem-solving exercises will increase learning and motivation, thus impacting job performance[2,3,4].

As a pilot experiment, we will evaluate the effect of health and nutrition Facebook group with three cadres – the Main Resource Person (MRP), the Community Nutrition Resource Person (CNRP), and Community Mobiliser (CM). One Master Resource Person- Health, Nutrition and Sanitation (MRP-HNS) is positioned at each Cluster Level Federation (CLF), which is a unit typically in charge of 30-50 Villages. The MRP-HNS are a Cluster Level Resource Person for HNS whose responsibilities are to train, monitor, and provide support to the Community Mobilizers in rolling out HNS Behaviour Change Communication sessions in the SHGs. Community Nutrition Resource Person (CNRP) has been envisaged with a view to achieve health and nutrition outcomes. They work with targeted households to understand and adopt better health, nutrition, and sanitation practices. They support VOs (Village Offices) and conduct campaigns and community awareness activities on pre-decided HNS issues. CNRP are placed at the Panchayat level covering a maximum number of 10 VOs. In order to maintain SHG accounts and records on weekly basis, ensuring generation of financial reports and nurturing of groups, a VO staff namely 'Community Mobiliser' has been instated functioning across the project. They augment the functioning of SHG and strengthen its entity.

Methods

Experimental Design Overview

Our design is a framed field experiment. JEEViKA cadres of MRP, CNRP and CMs will be recruited into 2 groups (one treatment arm and one control). Details of the recruitment criteria and the treatment arms are explained in the following sections.

Recruitment is followed by a baseline survey that includes questions on knowledge, motivation, job performance indicators, smartphone and social media use, and demographic details. Treatment includes knowledge collaterals and engagement on a health and nutrition Facebook group. A final endline survey will be conducted that matches the baseline survey.

Sample Identification

Our sample consists of women JEEViKA cadres recruited by the JEEViKA organization. The eligibility criterion is the access to smartphones, thus being able to access the Facebook group. All recruited members will undergo training to create a Facebook account (if they don't have one) and use it. Cadres for this pilot experiment will be recruited from the Nalanda district of Bihar.

Data Collection

1. Baseline Phone Survey

A. Informed consent is first acquired along with the participant's phone number.
B. This is followed by questions on primary outcome variables: knowledge on health and nutrition, motivation to do this job, and job performance indicators.
C. Additional questions on smartphone ownership, comfort in using smartphone, time spent on common social media platforms, as well as reasons to use social media are included. Demographic information is also collected as useful covariates.

2. Facebook Group

The treatment group will be added to a Facebook group that will receive carefully curated content on health and nutrition topics, as well as other messages to increase engagement and discussion on job-related topics on the group. The details of the intervention are outside the purview of this evaluation.

3. Endline Survey

A. Endline survey will follow the same format as the baseline survey with questions on primary outcome variables of knowledge, motivation, and job performance.

B. Additionally contamination checks (checking if a control participant has entered treatment), and spill-over checks (checking if knowledge collaterals have reached control participants) will be added.
C. Questions on internet connectivity problems, and usefulness of the group will also be included.

Randomization

Participants from each CLF are to be assigned to one of two groups using stratified cluster randomization. Participants will be clustered at the CLF level, i.e., each CLF will be assigned to treatment or control group. Stratified random sampling process ensures that equal numbers of each block (an administrative unit above CLF) in treatment and control.

Backcheck

To ensure the quality of the data at both baseline and endline, 10% of the participants across treatment and control groups and enumerators will be chosen for an additional short survey. These surveys will be conducted a week after the main data collection by a separate set of enumerators. It will include a few questions on primary outcome variable of knowledge, motivation, and demographic variables.

Sample Size Determination

Our sample size is based on similar previous studies. This being a phase I study, we leaned towards a smaller sample to get a quick estimate of how effective the Facebook group is. Three benchmark papers[5,6,7] was used to estimate the per-arm sample and cluster size required for the JEEViKA Facebook Groups Evaluation (power = 0.8, alpha = 0.05). All three papers conducted a cluster randomised controlled trial with frontline health workers in Bihar, India. Their target sample was similar to JEEViKA's health and nutrition workers, who are also based in Bihar. The outcome indicator of interest was job performance, and effect sizes from secondary outcomes including job satisfaction and job confidence were also extracted. Since none of these papers revealed the intra-cluster correlations of their sample, we estimated sample size assuming three potential ICCs: 0.05, 0.1, and 0.2. Power analysis gives us sample estimates between 35-442 per arm and 1-16 per cluster.

Outcome Variables

In this pilot experiment, we primarily want to test for any increase in knowledge on health and nutrition topics, increase in motivation, and most directly, a change in self-reported job performance measures between endline and baseline surveys.

See Table 1 for a full list of primary and secondary outcome variables below and how the outcome measure is created for each construct.

Table 1: Description of outcome variables

Outcome Variable	Description[1]	Outcome Measure
Knowledge	A total of 14 questions on health, nutrition, and COVID-19 vaccine topics.	Number of correct responses across 14 questions. Variable type: Numerical (0-14)
Motivation	9 Likert scale ratings (1-7) on reasons that motivate them to do this job. These point towards prosocial[7], intrinsic, integrated, identified, introjection, extrinsic, and amotivation[8]. Scale agreement for each reason that goes from 1- completely disagree, 2- disagree, 3- somewhat disagree, 4- neither agree nor disagree, 5 – somewhat agree, 6- agree, 7- completely agree.	For prosocial and intrinsic motivations, there are 2 questions each. Those two ratings will be averaged to create one value per type of motivation. Variable type: Numerical (1-7)
Job performance indicator	5 questions per job designation (CM, MRP, CNRP) that indicate performance during Jan, Feb, Mar, 2021	A composite job performance score is created by adding the answers to these 5 questions. Variable type: Numerical

[1] For further details on all outcome measures across tables, please refer to the survey instrument here.

Smartphone + social media app use[2]	1 Likert scale for smartphone use comfort 1-7 Use of apps – Facebook, WhatsApp, YouTube, Instagram, Twitter, and Telegram in a scale of 1-4	A composite scale for smartphone use is created by subsampling the scale 1-7 to 1-4, and adding all of the values. Variable type: Numerical (0-28)

Demographic information is also collected, which will be used as covariates. See Table 2 for a full description of these variables.

Table 2: Description of demographic variables:

Outcome Variable	Description	Outcome Measure
Covariates: Demo-graphics	Completed education level: did not go to school/ did not complete primary school, primary school, secondary school, 10th grade completed, 12th grade completed, undergraduate degree, post-graduate degree.	Raw data used. 5 levels: 1,2,3,4,5,6,7 Variable Type: Ordinal (1-7)
	People in the household.	Grouped into 3 or less, 4-7, 8+ Variable Type: Ordinal (1-3)

[2] Note: 1 other question on reasons of smartphone use is treated as qualitative data. Similarly, a question on vaccine barriers will also be treated as qualitative data.

	Monthly Household Income grouped into less than Rs. 5000, between Rs. 5000 – Rs. 10000, between Rs. 10000 – Rs. 15000, between Rs. 15000 – Rs. 20000, between Rs. 20000 – Rs. 25000, between Rs. 25000 – Rs. 30000, more than 30000.	Variable Type: Numerical (1-7)
	Religion and Caste combined: Hindu-General, Hindu-OBC, Hindu-SC mahadalit, Hindu-SC non-mahadalit, Hindu-ST, Muslim, Christian, Sikh, Buddhist, Other	Variable (1-10) Variable Type: Categorical (1-10)
	Age	Variable Type: Continuous
	Part of JEEViKA WhatsApp groups	2 levels: 1 = Yes, 2 = No Binary variable
	Additional Employment apart from JEEViKA: Agriculture, Self-employed, none	2 levels: 1 = Additional Employment, 2 = other Binary variable

Model Specifications

Ordinary Least Squares will be used for discrete numerical variables (7 motivation variables, smartphone use, job indicator, except the knowledge construct).

For the knowledge variable, we will apply censoring, using a Tobit regression model.

For every outcome measure we will use three models, with and without controlling for demographic information, and measuring the increase from baseline measures.

With 10 outcome measures (1 knowledge + 7 motivation + 1 job performance score + 1 smartphone use), and 3 models, we have 30 hypothesis tests. Thus, we use multiple hypothesis testing adjustments with pFDR and the q-value[9].

M1: Y ~ treatment_assignment + error

M2: Y ~ treatment_assignment + demographic_covariates + error

M3: Y ~ treatment_assignment + demographic_covariates + baseline_measures + error

Y = outcome measures in Table 1 (10 outcome measures)

treatment_assignment = dummy variable, 1 for treatment and 0 for control.

All analysis including randomization, data checks, etc. will be conducted using custom-made MATLAB (The MathWorks, Inc) scripts in R (R Core Team, 2014)[10].

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