Introduction

Inequity in accessing health care is better addressed through interventions that lie outside the conventional biomedical pattern. With lower income levels and unequal social status, poor women are more likely to be impoverished by health-care costs.[1-5] The group lending model of microfinance reduces health inequities by promoting social capital.[6,7] Microfinance programs that assist members to save money and provide access to capital as a business loan have seen widespread coverage in India. Organized as women’s group or self-help groups (SHGs), poor rural women come together voluntarily in groups of 10–20 individuals to save money and to obtain microloan to support livelihoods. These SHGs are promoted extensively through government and nongovernment organizations in India and were estimated to cover 112 million households in 2017; more than 90% are women, impacting over 450 million people in member households.[8]

The National Rural Livelihood Mission (NRLM) is an umbrella program launched in 2011 by the Ministry of Rural Development, aided in part through an investment from the World Bank and other development partners.[9] NRLM aims to improve vocational skills, promote more effective organization of rural poor and create SHG federations from village to national level. Under the NRLM, several states introduced their own large-scale SHG programs: the JEEViKA program in Bihar and the Mission Managalam in Gujarat were designed after the success of Velugu or Indira Kranti Patham program in Andhra Pradesh and the Kudumbashree program in Andhra Pradesh and the Kudumbashree program in Andhra Pradesh.

Abstract

Objectives: Women’s self-help groups (SHGs) are actively promoted to advance women’s empowerment. SHGs are estimated to cover 112 million households in 2017; more than 90% are women. This article answers if membership in women’s group is associated with better health and women’s empowerment. Methods: Data on district level health and empowerment indicators were obtained from the fourth round of the National Family Health Survey 2015–16. Data on SHG activity, defined as concentration of SHG at district, was obtained from publicly available data. Twelve indicators were clubbed to measure four domains: maternal health, women’s empowerment, child health, and health protection. Binary logistic regressions were computed with education and wealth as control in each model to analyze the change in 12 indicators with the presence of SHG. Results: Districts with higher concentration of SHG members were associated with higher odds of women delivering their babies in an institution (OR: 1.53), taking iron pills, sprinklers, or syrup (OR: 1.11), using family planning methods (OR: 1.03), having knowledge of ovulatory cycle (OR: 1.10), owning house or land (either alone or jointly) (OR: 1.18) and lower odds of women suffering from anemia (OR: 0.92). The odds improve when districts with higher concentration of SHG members were compared with those with lower concentration. Conclusion: Membership in women’s group is associated with better health measures as well as asset ownership; higher the concentration of SHG, higher is the impact.

Keywords: Empowerment, health, India, self-help group, women’s group
program in Kerala. Velugu and Kadumahbree programs were hailed as India’s largest and most successful poverty alleviation and empowerment programs. An evaluation of the program found significant positive changes in debt burden, ownership of assets, women’s social empowerment (measured in terms of mobility, decision-making, and collective action), overall per capita consumption households (measured in terms of caloric and protein intake) and decrease in defecation in open fields. The SHG structure involves significant face-to-face interaction among members and promotes mutual trust, solidarity, and social capital.

Recognizing the strength of community-driven initiatives, similar attempts have been made to engage SHGs to enable access to health services and to build bridges between the formal health systems and the communities that they serve. This process has enhanced the relevance and acceptability of the health services, especially with regards to increased health-care seeking by pregnant women, mothers, and new-born. A systematic review (2013) and meta-analysis of randomized controlled trials undertaken in Bangladesh, India, Malawi, and Nepal studied the effects of women’s groups practicing participatory learning and action on population-level indicators including maternal mortality, neonatal mortality, and stillbirths. Meta-analyses of all trials showed that engagement of women’s groups was associated with a 37% reduction in maternal mortality (odds ratio [OR] 0.63, 95% confidence intervals [CI] 0.52–0.74), a 23% reduction in neonatal mortality (0.77, 0.65–0.90), and a 9% nonsignificant reduction in stillbirths (0.91, 0.79–1.03). One of the flagship innovations under reproductive and child health (RCH II) in Maharashtra, India, was the establishment of Mahila Arogya Samiti (women’s health groups) to address the problems of large population size, limited health-care resources, and health-care accessibility. Early evidence from this innovation has generated increased awareness about the importance of antenatal care, immunization, and institutional deliveries and enhanced the Janani Suraksha Yojana uptake among community women. A study in Kerala found that SHG participation can help protect poor women against exclusion from health care and could possibly aid in promoting their mental health. Reshmi et al. in their study in three eastern Indian states found that women who were a part of SHGs demonstrated better control over financial resources, better participation in community activities, and higher receipt of antenatal care services when compared to their counterparts. Apart from these, the membership of SHG on key indicators of health and women empowerment. We obtained health data from the latest data available from the fourth round of the National Family Health Survey (NFHS-4) during 2015–16. As NFHS-4 dataset did not have any data on SHG activity, the same was obtained from the public MIS data from the NRLM. The MIS data of NRLM is for the period 2018–19. As publically available national survey data were used, approval of institutional ethics committee was not required.

**Methods**

Our study updates the earlier, and first to the best of our knowledge, empirical analysis of impact of concentration of SHG on key indicators of health and women empowerment. We obtained health data from the latest data available from the fourth round of the National Family Health Survey (NFHS-4) during 2015–16. As NFHS-4 dataset did not have any data on SHG activity, the same was obtained from the public MIS data from the NRLM. The MIS data of NRLM is for the period 2018–19. As publically available national survey data were used, approval of institutional ethics committee was not required.

**SHG data**

NRLM contains the most up-to-date data on SHG membership. We used the district-wise SHG membership data from NRLM dataset and used the projected 2015–16 district-wise population. This enabled us to calculate district-wise proportion of population enrolled in SHG. Out of 640 districts and union territories, 111 districts lie in the first quartile, that is, SHG membership as proportion of total population is less than 0.92%. These districts are primarily from the northern region of India. Intuitively, the southern states have higher concentration of membership in SHG. Gray are the 93 districts and union territories with no data on SHG membership. These districts are excluded from the analysis. About 80% of all SHGs have a group bank account. A total of 147,687 federations (both first level or village organization and second level or cluster level federation) have been promoted under NRLM with 1817,926 SHGS under NRLM. Available from [https://nrlm.gov.in/shgOuterReports.do?methodName=showShgreport](https://nrlm.gov.in/shgOuterReports.do?methodName=showShgreport [Table 1]).

**Health data**

The National Family Health Survey 2015–16 (NFHS-4), the fourth in the NFHS series, provides information on population, health, and nutrition for India and each state/union territory. NFHS-4, for the first time, provides district-level estimates for many important indicators. The main objective of each successive round of the NFHS has been to provide essential data on health and family welfare and emerging issues in this area. Information on the woman’s characteristics, marriage, fertility, children’s immunizations and childcare, nutrition, contraception, reproductive health, sexual behavior, HIV/AIDS, domestic violence, etc., were canvassed in the Woman’s Schedule. For the purpose of this study, indicators were divided into four components, as discussed in Table 2. Indicators that are reported as sensitive to SHG intervention based on available literature and available from NFHS-4 were included in the study.

District-wise SHG concentration data, explained as proportion of members enrolled in SHG over total population in the district,
were matched with NFHS-4 data to analyze health outcome. The hypothesis tested was that districts with higher concentration of members in SHG will have better health indicators.

**Statistical models**

We computed binary logistic regressions controlled for women’s education and wealth index, as reported under NFHS-4. Two models were estimated for each of the outcome variables: Model 1 by overall SHG concentration and model 2 where first quartile districts were compared with higher quartiles, that is, with more than 0.92% population in SHG. All models used survey weights to account for sample design and population weighting and standard errors are adjusted for clustering at the district level. The focus of the analysis was the change in the coefficient of the presence of an SHG. The results are shown as ORs with 95% CIs. The magnitude of the change was interpreted as the \((\text{exponentiated coefficient } - 1.0) \times 100\).

**Results**

To test the hypothesis that districts with higher concentration of members in SHG have better health indicators, results are presented in two parts: one with comparison against overall SHG concentration and second by comparing districts with SHG concentration over the first quartile, that is, with more than 0.92% population part of any SHG, compared to districts which are in the first quartile. Findings are presented in Table 3.

### Table 1: SHG concentration

| SHG concentration | %   |
|-------------------|-----|
| Maximum           | 22.57 |
| Minimum           | 0.01 |
| Median value      | 2.39 |
| First quartile    | 0.92 |
| Second quartile   | 0.93-2.39 |
| Third quartile    | 2.40-5.19 |
| Fourth quartile   | 5.20-22.57 |

### Maternal health

Districts with high concentration of SHG members are associated with higher odds of maternal health outcomes. The odds improve when districts with higher concentration of SHG members (above first quartile) were compared with those with lower concentration. Districts with SHG concentration above 0.92% have 53% higher odds of women delivering in an institution (CI: 1.52–1.55), 8% lower odds of women suffering from anemia (0.92–0.92), 11% higher odds of women taking iron pills, sprinklers, or syrup, and 3% higher odds of women currently using family planning methods.

### Women’s empowerment

Our findings show that districts with higher concentration of SHG members were at 10% higher odds of women having knowledge of ovulatory cycle (CI: 1.09–1.11), and having control over resources, measured in terms of money that women can decide to spend on her own (OR: 1.15, CI: 1.14–1.16). Further, there is 25% higher likelihood and statistically significant odds of women owning bank or savings account (OR: 1.25, CI: 1.24–1.26) as well as 5–18% significant higher odds, depending on SHG concentration of women owning a house and/or land (alone or jointly with others).

### Child health

Districts with higher concentration of SHG members perform better on key child health indicators. This includes 30% higher odds (CI: 1.29–1.30) of women with knowledge and use of oral rehydration solution (ORS). Among deliveries conducted at home, SHG membership is associated with 17% higher odds of using disposable delivery kits and 4% higher odds of baby immediately wiped dry and wrapped without being bathed.

### Health coverage

Health insurance at community level is primarily paid by government as part of its social insurance scheme. We, therefore, could not find any major effect of SHG concentration on health insurance uptake (OR: 1.04, CI: 1.04–1.05). However, knowledge of entitlement or utilization of health insurance coverage would be something worthy to further analyze, something we could not for lack of data points in NFHS-4.

### Table 2: Indicators to measure health outcome and empowerment

| Health areas      | Indicators                                      | Reference point                                      |
|-------------------|------------------------------------------------|-----------------------------------------------------|
| Maternal health   | Institutional delivery                          | Institutional delivery compared to home delivery     |
|                   | Anemia                                          | Severe, moderate, or mild anemic compared to nonanemic|
|                   | Taking iron pills, sprinklers, or syrup         | Yes or no                                            |
|                   | Currently using any family planning method      | Any modern method compared to no method              |
| Women's empowerment| Knowledge of ovulatory cycle                    | Yes or no                                            |
|                   | Has money that respondents alone can decide     | Yes or no                                            |
|                   | Owns a house or land                            | Own either alone or jointly compared to does not own  |
|                   | Has bank or savings account                     | Yes or no                                            |
| Child health      | Disposable delivery kit used                    | In case of home delivery, yes or no                 |
|                   | Baby immediately wiped dry and wrapped without being bathed | In case of home delivery, yes or no                 |
|                   | Heard or used ORS                               | Heard or used compared to never heard or used        |
| Health protection | Covered by any health insurance (including RSBY, state health insurance, through employer, CHI, ESIS, or CGHS) | Covered by health insurance compared to no insurance |
### Table 3: Odds of key observed indicators in model 1 and model 2

| Key indicators                                                  | India          | SHG concentration more than first quartile (0.92%) |
|-----------------------------------------------------------------|----------------|----------------------------------------------------|
| **Institutional deliveries**                                    |                |                                                    |
| SHG (proportion of population with SHG)                        | 1.06 (1.05-1.06) | 1.53 (1.52-1.55)                                  |
| Wealth index                                                   | 1.54 (1.53-1.56) | 1.53 (1.51-1.54)                                  |
| Women's education                                              | 1.52 (1.50-1.54) | 1.37 (1.34-1.41)                                  |
| $n$                                                             | 258,838 (Y: 78.9%) |                                                    |
| **Anemia (severe, moderate, or mild anemic compared to nonanemic)** |                |                                                    |
| SHG (proportion of population with SHG)                        | 1.01 (1.01-1.01) | 0.92 (0.92-0.92)                                  |
| Wealth index                                                   | 0.92 (0.92-0.93) | 0.95 (0.95-0.96)                                  |
| Women's education                                              | 0.95 (0.94-0.95) | 1.00 (0.99-1.00)                                  |
| $n$                                                             | 1293,953 (Y: 53.0%) |                                                    |
| **Taking iron pills, sprinklers, or syrup**                    |                |                                                    |
| SHG (proportion of population with SHG)                        | 1.06 (1.05-1.06) | 1.11 (1.10-1.12)                                  |
| Wealth index                                                   | 1.11 (1.10-1.12) | 1.08 (1.07-1.10)                                  |
| Women's education                                              | 1.08 (1.07-1.09) | 1.43 (1.39-1.46)                                  |
| $n$                                                             | 245,820 (Y: 23.1%) |                                                    |
| **Using any FP method**                                        |                |                                                    |
| SHG (proportion of population with SHG)                        | 0.96 (0.95-0.96) | 1.03 (1.03-1.04)                                  |
| Wealth index                                                   | 1.03 (1.02-1.04) | 1.12 (1.11-1.13)                                  |
| Women's education                                              | 1.13 (1.12-1.14) | 0.79 (0.78-0.81)                                  |
| $n$                                                             | 341,698 (Y: 53.5%) |                                                    |
| **Knowledge of ovulatory cycle**                               |                |                                                    |
| SHG (proportion of population with SHG)                        | 0.92 (0.92-0.93) | 1.10 (1.09-1.11)                                  |
| Wealth index                                                   | 1.12 (1.11-1.12) | 1.20 (1.19-1.21)                                  |
| Women's education                                              | 1.19 (1.18-1.20) | 0.47 (0.46-0.47)                                  |
| $n$                                                             | 1315,303 (Y: 89.8%) |                                                    |
| **Money that respondent alone can decide**                     |                |                                                    |
| SHG (proportion of population with SHG)                        | 1.15 (1.14-1.16) | 1.15 (1.14-1.16)                                  |
| Wealth index                                                   | 1.11 (1.09-1.12) | 1.10 (1.09-1.11)                                  |
| Women's education                                              | 0.97 (0.96-0.97) | 0.83 (0.82-0.85)                                  |
| $n$                                                             | 228,319 (Y: 42.9%) |                                                    |
| **Having bank or savings account that women uses**             |                |                                                    |
| SHG (proportion of population with SHG)                        | 1.25 (1.24-1.26) | 1.24 (1.23-1.25)                                  |
| Wealth index                                                   | 1.25 (1.24-1.26) | 1.26 (1.25-1.27)                                  |
| Women's education                                              | 1.01 (1.00-1.01) | 0.90 (0.88-0.92)                                  |
| $n$                                                             | 228,319 (Y: 52.2%) |                                                    |
| **Women owning a house and/or land (alone or jointly with others)** |          |                                                    |
| SHG (proportion of population with SHG)                        | 1.05 (1.04-1.05) | 1.18 (1.15-1.20)                                  |
| Wealth index                                                   | 0.92 (0.91-0.92) | 0.91 (0.90-0.92)                                  |
| Women's education                                              | 0.97 (0.96-0.98) | 0.98 (0.97-0.99)                                  |
| $n$                                                             | 228,319 (Y: 46.2%) |                                                    |
| **Hearing or using ORS**                                       |                |                                                    |
| SHG (proportion of population with SHG)                        | 1.31 (1.30-1.32) | 1.30 (1.29-1.30)                                  |
| Wealth index                                                   | 1.64 (1.63-1.66) | 1.66 (1.65-1.67)                                  |
| Women's education                                              | 1.02 (1.01-1.02) | 0.95 (0.94-0.96)                                  |
| $n$                                                             | 1315,617 (Y: 82.8%) |                                                    |
| **Using disposable delivery kit**                              |                |                                                    |
| SHG (proportion of population with SHG)                        | 1.17 (1.15-1.20) | 1.17 (1.14-1.19)                                  |
| Wealth index                                                   | 1.15 (1.13-1.18) | 1.14 (1.11-1.17)                                  |
| Women's education                                              | 1.07 (1.07-1.08) | 1.55 (1.47-1.63)                                  |
| $n$                                                             | 42,612 (Y: 43.7%) |                                                    |
| **Baby immediately wiped dry and wrapped without being bathed** |                |                                                    |
| SHG (proportion of population with SHG)                        | 1.05 (1.02-1.08) | 1.04 (1.02-1.07)                                  |
| Wealth index                                                   | 1.06 (1.03-1.10) | 1.05 (1.02-1.09)                                  |
| Women's education                                              | 1.06 (1.05-1.07) | 1.40 (1.32-1.48)                                  |
| $n$                                                             | 42,612 (Y: 79.3%) |                                                    |

*Contd...*
Discussion

Placing women's empowerment in the form of education, participation in economic activity, and constitutional guarantee of equal rights in the forefront of public policy is considered to be the most powerful strategy for the health achievements made in countries such as Bangladesh. Programs that work with women's groups to encourage empowerment and gender equity in utilization of health services are a potential solution to address health needs of poor women and their children. It is within this context that we analyzed whether districts with higher concentration of SHG membership performed any better on key empowerment indicators.

Through the mechanism of microfinance-based SHGs, poor women and their families are provided not only with access to finance to improve livelihoods but also in many cases with a range of basic health services. With 112 million people organized nationally, the SHGs provide an established population base that can potentially be used to extend health coverage. Our findings clearly suggest that districts with high concentration of SHG members are associated with higher odds of key maternal, child health, empowerment, and health coverage indicators. The odds improve when districts with higher concentration of SHG members (above first quartile) were compared with the lower ones. This suggests that a minimum level of saturation is required for effects to materialize. Primary health care (PHC) depends on the contributions of women, particularly in the area of health education; it increases their self-esteem and empowers them to serve their communities in a number of ways.

Our findings confirm the findings reported by Saha et al. using data from district level household survey Phase III from India. In addition, the major strength of analyzing a national-level dataset, such as NFHS-4, is that it enables drawing a more general conclusion about the relationship between membership in SHG and changes in population health behaviors. In addition, our study found that higher the concentration of SHG, the better is the impact on key variables. More federations in certain regions indicate that these districts have more matured SHGs and could influence health and empowerment outcomes.

Limitations

Despite the strength of drawing a general conclusion, a limitation of this national analysis remains. It masks any regional patterns in SHG presence and health outcomes. There is a higher concentration of villages with an SHG in southern and northeastern regions of India than in other regions. Further, the relationship between membership in SHG and improved outcome may not be deemed as causation. This would remain an area of future research.

Conclusion

By triangulating and combining SHG membership data from NRLM report and health outcome data from national survey, this study makes the findings more credible than analyzing any single data source would have produced. In our opinion, these findings further reinforce the need for more resolute interest and investment in strengthening the SHG movement, not only for livelihood generation and financial inclusion among poor women and their families, but also systematically leverage on the social capital created out of the women's group to better target health programs among the difficult-to-reach population, particularly poor women and their families. In particular, SHGs can play a critical role in improving awareness of critical health issues, facilitating frontline health workers in early detection and screening of noncommunicable conditions, and make progress in relation to financial coverage and utilization of publicly financed national health protection schemes.

Ethics approval and consent to participate

Since the study is based on analysis of de-identified secondary data available from public domain (NFHS and NRLM MIS), no ethics approval was sought.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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