# Impact of Women's Self-Help Groups on Health Literacy and Empowerment in Rural Wardha, India

## ABSTRACT

Background and Objectives: Women empowerment and health literacy are very important concepts in societal development and improvement of health status of the community. We aimed to assess the effect of women's self-help group (SHG) membership on health literacy and women empowerment.

Materials and Methods: We performed a cross-sectional study using quantitative method and PLA tool. Semi-structured questionnaire-based survey was conducted with randomly selected 180 SHG and non-SHG women each. 3 gender resource mapping activities were also conducted with both the groups. Ordinal and logistic regression analysis was performed to study the determinants of health literacy and women empowerment respectively.

Results: Overall, 65% and 20% SHG and non-SHG women respectively had sufficient health literacy. The proportion with excellent health literacy was very poor (1% and 0% respectively). The overall women empowerment index was 0.376 (0.548 in SHG and 0.208 in non-SHG women). SHG women had higher odds of being empowered [aOR=1.18 (1.09-1.30)] and about 8 times higher odds of having better health literacy [aOR=8.70 (5.24-14.79)]. Belonging to open and scheduled caste [aOR=0.81 (0.66-0.99) and 1.19 (1.07-1.34) respectively], having sufficient/excellent health literacy [aOR=1.20 (1.02-1.42)] were other significant determinants of women empowerment. Age [aOR=0.96 (0.94-0.98)], belonging to Scheduled tribe [aOR=0.47 (0.22-0.97)], having standard of living index class 3 [aOR=3.42 (1.29-9.11)] were other significant determinants of health literacy among women. Mostly, men had better access and control of resources i.e. basic needs and assets of day-to-day living. Women from both groups had better access and control over clothes, jewellery and their own earnings. In addition, SHG women had equal or better control over household stuffs, education, and food than their spouses.

Conclusion: Further promoting such groups and understanding of the group dynamics may help in enhancing health literacy and women empowerment in addition to overall efforts of improving these in the community as a whole.

**Paper Type:** Research Article

Keywords: Community-Based Organizations, Gender, Gender Resource Mapping, Health Promotion, Household Resources.

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## Introduction

Community mobilization is defined as "a capacity-building process through which community individuals, groups, or organizations plan, carry out, and evaluate activities on a participatory and sustained basis to improve their health and other needs, either on their initiative or stimulated by others"(1). It is a key strategy enabling communities to identify their needs, resulting in better awareness, demand and utilization of services. It improves the ownership, monitoring and sustainability of any program (1). It also improves resilience and reduced dependence on external aids (2). The importance of community participation has also been acknowledged by India's National Health Mission (NHM) as one of the core values to attain the highest possible levels of health (3).

Community-based organizations (CBOs) such as Self-Help Groups (SHGs) are non-profit entities representing a community and are engaged in meeting human, educational, environmental, or public safety community needs (4). CBOs help augment the health and wellness of people by promoting information dissemination, experience and thought sharing among members, social and peer support, advocacy opportunities for leadership, acquiring new knowledge and health and wellness-related activities by addition of health activities in their agenda(5).

There is a great heterogeneity and divergence in the role of women in society from professional excellence on one hand, while on the other, they face conventional and orthodox practices of discrimination, inequity, and gender-based violence (6). Women empowerment is multidimensional and has many aspects. While some focus that women empowerment is about decision making ability, others argue that it is more of the ability to make strategic life choices (7, 8). It has been defined as a process by which women acquire the ability of making strategic life choices after having been denied this ability previously (9). As per Brody et al. SHGs positively influence women empowerment through financial empowerment, social network, and solidarity (10).

Health literacy is a multidimensional concept and consists of different components. As per WHO, it is the ability of people to access, understand, appraise and use health related information and services to fulfil the demands of different health contexts (11). Various studies suggest that the health literacy levels are low in India (12, 13). Low levels of health literacy can have undesirable health outcomes and may lead to poor economic and social outcomes due to increase in treatment expenses, morbidity and mortality due to various health conditions (14, 15). Evidence suggests that community mobilization through SHGs has positive effect on health-related knowledge and behaviour, however, there is limited evidence in Indian context regarding its effect on health literacy (16, 17).

The Department of Community Medicine (DCM), MGIMS, Sevagram has developed a model of decentralized healthcare delivery at the village level through Community-based Organizations and the Panchayat Raj Institutions. The DCM, MGIMS acts as a catalyst to form such CBOs and builds their capacity for health action. We have catalyzed formation of SHGs in every village of our field

practice area. Women have an important role in making decisions on health care seeking in the families. They are also key seekers and disseminators of health-related information (15). The Government is taking efforts to encourage the SHGs and support formation of new SHGs as well (18, 19). The increasing number of SHGs can be a force to reckon in order to enhance the empowerment and health literacy among women. Therefore, we conducted this study with the intent to assess the effect of community mobilization through Women's Self-Help Groups (SHGs) on health literacy and women empowerment.

## Materials and Methods

### Study design

This is a cross-sectional analytical study using quantitative and participatory learning methods.

### Study setting

The study was conducted in the villages under field practice areas of KRHTC Anji, RHTC Bhidi, and Talegaon PHC under the Dept. of Community Medicine, MGIMS Sevagram.

### Study population

The study participants were married women aged above 18 years and currently residing in the selected villages. Women who have been part of SHGs formed by DCM, MGIMS for at least 1 year were considered as SHG women whereas those women who have not been part of any of the SHGs (neither MGIMS nor others) were chosen as non-SHG women. Information on SHG women was readily available with us and was used to identify them. However, for non-SHG women, we contacted presiding members of SHGs in the villages, frontline workers, etc. to get the relevant information.

### Sample size and sampling

We assumed the proportion of non-SHG women having sufficient or excellent health literacy being 30% (20) and the proportion among SHG women to be around 60%. Taking the ratio of respondents in both the groups as 1, power of 80% and 95% confidence, the sample size came out to be 98. We inflated the sample size assuming 10% non-response rate to 109. The said number of respondents were to be enrolled from three sectors of the field practice area. The villages from these three field practice areas were stratified depending upon the size of the village as those with <1000 population, 1000-3000 population, and >3000 population. 6 villages (2 per strata) were chosen randomly from each of the field practice areas. For the ease of rounding off, from each village, 10 SHG and 10 non-SHG women were chosen taking the final sample size to 360 women (180 SHG and 180 non-SHG). A list of SHG and non-SHG women in the selected villages was made and then they were selected randomly for the quantitative exercise.

The hypothesis of our study was based on the conceptual framework as shown in figure 1. Adding health agenda to activities of SHGs can be achieved by either health awareness activities or health promotion activities. We hypothesized that these activities help in improving the health literacy which in turn facilitates the behaviour change process. We further hypothesized based on the literature that SHGs improve women empowerment and decision-making abilities. This serves as an enabler for improved behavioural practices, thereby having a potential for improving the health outcomes among the SHG members.

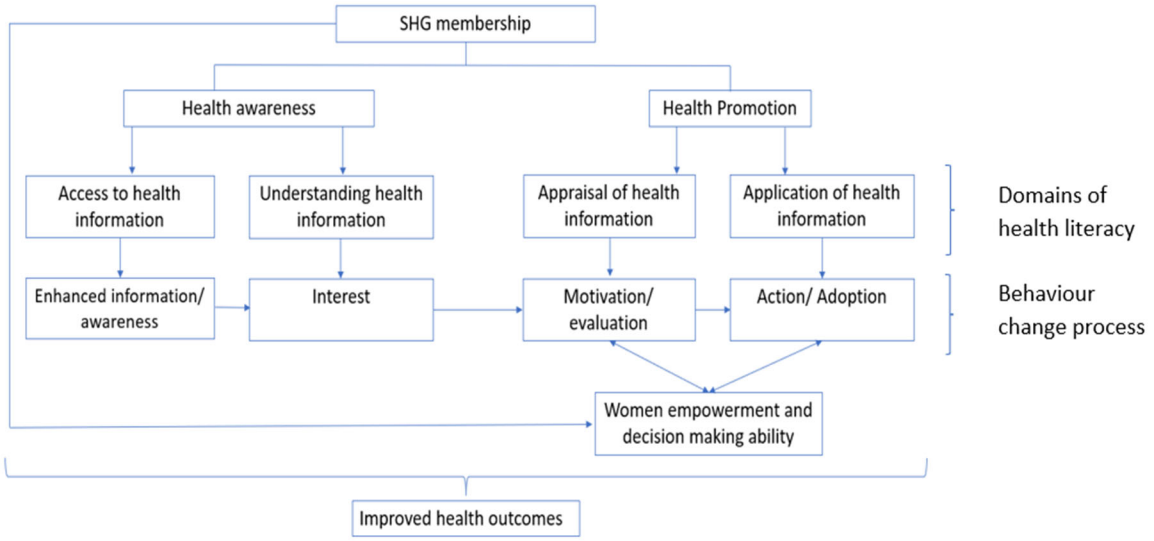


Figure 1. Conceptual framework showing the relation between SHG membership, health literacy, behavior change, women empowerment and health outcomes

## Data collection

In the current study we utilized quantitative methods in the form of survey questionnaire to assess the empowerment, health literacy and standard of living, as well as Participatory Learning and Action (PLA) tools to assess the gender autonomy. The data was collected from January-September 2022.

## Quantitative data

Data collection was done through a survey involving personal interviews using a semi-structured tool. The socio-economic status was measured using the standard of living index (SLI). The SLI assesses the household ownership of durable goods, housing conditions, occupation, livestock's etc. and scores the availability of each item as per a predefined criterion. The scores of each item are then added and the SLI class of each household is categorized as SLI Class 1 (0-14), class 2 (15-24), class 3 (25-67). The SLI scores can range from 0 to 67 (21). Health literacy was measured using the HLS-EU-Q47 questionnaire, which is a 47-item tool with questions about access, understanding, appraisal, and application of information about three domains of health viz. health care, disease prevention, and health promotion. The responses were coded on a scale of 1 to 4 where 1 corresponds to very difficult and 4 corresponds to very easy. The scores from each of the subdomain were transformed to a scale of 0 to 50, where 0 represents the worst and 50 represents the best possible score. The scores were then divided into 4 levels of health literacy 'inadequate' (0–25), 'problematic' (>25–33), 'sufficient' (>33–42) and 'excellent' (>42–50) (22, 23). Women empowerment and gender-related autonomy were measured by using a women empowerment index tool which was developed and validated in India and adapted as per the local need of the study area (24). The tool has 20 questions, the response to which were recorded dichotomously (0 or 1) where 1 represented the better scenario. To calculate the women empowerment, the scores of each domain was calculated by taking average of all responses and overall

score was calculated taking average of all responses. The overall Women Empowerment Index (WEI) was calculated using the following formula (24).

WEI = We +Wn (Da)

where,

We=% of women with adequate empowerment;

Wn=% of women without adequate empowerment = (1- We)

Da= % of domains in which disempowered women have adequate empowerment.

## PLA activity: Gender resource mapping

A gender resource mapping exercise was conducted with three SHG and non-SHG groups each to understand the situation of access and control over the resources between men and women. The exercise was split into two parts. The first part was about listing the resources and the second part focused on determining the access to and control over those resources. Prior to the exercise, the purpose was explained to the participants and after that they were asked to list/draw different types of resources. They were given bindis and matchsticks and were asked to arrange them based on who had more or less access and control to the resource, or "tick" who has access to and control over the resource. Here the participants were clarified that i) access implies ability to utilize, but not the right to own or sell the asset — which implies control, and ii) resources include basic needs and assets of day-to-day living.

## Data entry and analysis

Quantitative data was collected directly on android phones using the survey solutions application developed by World Bank. The data was then exported as excel sheet and analysed using SPSS version 20 and R software. Categorical data are represented as frequency and percentage and continuous data as mean (SD). They were compared using the chi-square test and student's t-test respectively. To study the association between women empowerment and other socio demographic variables we performed logistic regression and to study the association between health literacy and other socio demographic variables we performed ordinal regression. Data from gender resource mapping was analyzed by calculating the median value for each of the resources.

## Results

The mean age for SHG women (42.4 years) differed significantly from the non-SHG women (36.2 years). The majority of respondents in both the groups, belonged to the OBC category and had a primary or higher level of education. Higher proportion of SHG women were living in families with less than four members (61% vs 52%). A significantly higher proportion of SHG members belonged to SLI class 3 (98.4% vs 90.9%). Although the proportion of those with normal BMI was higher among the non-SHG groups, the proportion of overweight and obese women was higher in SHG group (Table 1).

The proportion of SHG women having sufficient and excellent literacy pertaining to all the three domains of health literacy was significantly better as compared to non-SHG women, and those with problematic or inadequate literacy was consistently higher among non-SHG women. Also, the SHG members had significantly higher overall health literacy, with about two-third having sufficient or better literacy as compared to

only about one-fifth of non-SHG members (p<0.001). Although the proportion of women with excellent scores were higher in SHG women, it was still lower than desired (1.1%) (Table 2).

Table 1. Socio-demographic characteristics of SHG and non-SHG women

| Characteristics | | Frequency (%) | | P value |
|---|---|---|---|---|
| | | SHG women (n=184) | Non SHG women (n=187) | |
| Mean Age (SD) | | 42.4 (10.3) | 36.2 (13.1) | <0.001* |
| Caste | Open | 9 (4.9) | 4 (2.1) | 0.097 |
| | OBC | 139 (75.5) | 135 (72.2) | |
| | Scheduled caste | 23 (12.5) | 22 (11.8) | |
| | Scheduled tribe | 13 (7.1) | 26 (13.9) | |
| Education | Primary education or above | 171 (92.9) | 171 (91.4) | 0.593 |
| | Illiterate | 13(7.1) | 16(8.6) | |
| Family size | 4 or less members | 113 (61.4) | 99 (52.9) | 0.099 |
| | More than 4 members | 71 (38.6) | 88 (47.1) | |
| SLI class | 1 and 2 | 3 (1.6%) | 17 (9.1) | 0.001* |
| | 3 | 181 (98.4) | 170 (90.9) | |
| BMI | Underweight | 29 (15.8) | 34 (18.2) | 0.023* |
| | Normal | 83 (45.1) | 101 (54.0) | |
| | Overweight | 51 (27.7) | 45 (24.1) | |
| | Obese | 21 (11.4) | 7 (3.7) | |

SHG – Self Help Group, SD – Standard deviation, OBC – Other Backward Class, SLI – Standard of Living index, BMI – Body mass index

Table 2. Comparison of health literacy among SHG and Non-SHG women

| Health literacy domains and sub domains | | Health Literacy class | Frequency (%) | | P value |
|---|---|---|---|---|---|
| | | | SHG women (n=184) | Non SHG women (n=187) | |
| Health care | Access | Inadequate | 13 (7.1) | 61 (32.6) | <0.001* |
| | | Problematic | 32 (17.4) | 65 (34.8) | |
| | | Sufficient | 119 (64.7) | 61 (32.6) | |
| | | Excellent | 20 (10.9) | 0 (0) | |
| | Understand | Inadequate | 8 (4.3) | 19 (10.2) | <0.001* |
| | | Problematic | 40 (21.7) | 71 (38.0) | |
| | | Sufficient | 121 (65.8) | 92 (49.2) | |
| | | Excellent | 15 (8.2) | 5 (2.7) | |
| | Appraise | Inadequate | 13 (7.1) | 71 (38.0) | <0.001* |
| | | Problematic | 34 (18.5) | 50 (26.7) | |
| | | Sufficient | 127 (69.0) | 63 (33.7) | |
| | | Excellent | 10 (5.4) | 3 (1.6) | |
| | Apply | Inadequate | 5 (2.7) | 31 (16.6) | <0.001* |
| | | Problematic | 31 (16.8) | 54 (28.9) | |
| | | Sufficient | 128 (69.6) | 93 (49.7) | |
| | | Excellent | 20 (10.9) | 9 (4.8) | |
| | Health care literacy | Inadequate | 4 (2.2) | 14 (7.5) | <0.001* |
| | | Problematic | 42 (22.8) | 113 (60.4) | |
| | | Sufficient | 125 (67.9) | 60 (32.1) | |
| | | Excellent | 13 (7.1) | 0 (0) | |
| Disease prevention | Access | Inadequate | 21 (11.4) | 71 (38.0) | <0.001* |
| | | Problematic | 46 (25.0) | 68 (36.4) | |
| | | Sufficient | 112 (60.9) | 48 (25.7) | |

| Health literacy domains and sub domains | | Health Literacy class | Frequency (%) | | P value |
|---|---|---|---|---|---|
| | | | SHG women (n=184) | Non SHG women (n=187) | |
| | | Excellent | 5 (2.7) | 0 (0) | |
| | Understand | Inadequate | 25 (13.6) | 50 (26.7) | 0.002* |
| | | Problematic | 23 (12.5) | 19 (10.2) | |
| | | Sufficient | 131 (71.2) | 118 (63.1) | |
| | | Excellent | 5 (2.7) | 0 (0) | |
| | Appraise | Inadequate | 8 (4.3) | 37 (19.8) | <0.001* |
| | | Problematic | 60 (32.6) | 99 (52.9) | |
| | | Sufficient | 110 (59.8) | 51 (27.3) | |
| | | Excellent | 6 (3.3) | 0 (0) | |
| | Apply | Inadequate | 12 (6.5) | 69 (36.9) | <0.001* |
| | | Problematic | 60 (32.6) | 52 (27.8) | |
| | | Sufficient | 112 (60.9) | 65 (34.8) | |
| | | Excellent | 0 (0) | 1 (0.5) | |
| | Disease prevention literacy | Inadequate | 6 (3.3) | 27 (14.4) | <0.001* |
| | | Problematic | 58 (31.5) | 113 (60.4) | |
| | | Sufficient | 119 (64.7) | 47 (25.1) | |
| | | Excellent | 1 (0.5) | 0 (0) | |
| Health Promotion | Access | Inadequate | 25 (13.6) | 101 (54.0) | <0.001* |
| | | Problematic | 69 (37.5) | 53 (28.3) | |
| | | Sufficient | 89 (48.4) | 33 (17.6) | |
| | | Excellent | 1 (0.5) | 0 (0) | |
| | Understand | Inadequate | 18 (9.8) | 38 (20.3) | 0.029* |
| | | Problematic | 52 (28.3) | 47 (25.1) | |
| | | Sufficient | 106 (57.6) | 98 (52.4) | |
| | | Excellent | 8 (4.3) | 4 (2.1) | |
| | Appraise | Inadequate | 9 (4.9) | 78 (41.7) | <0.001* |
| | | Problematic | 30 (16.3) | 43 (23.0) | |
| | | Sufficient | 142 (77.2) | 64 (34.2) | |
| | | Excellent | 3 (1.6) | 2 (1.1) | |
| | Apply | Inadequate | 26 (14.1) | 93 (49.7) | <0.001* |
| | | Problematic | 68 (37.0) | 61 (32.6) | |
| | | Sufficient | 85 (46.2) | 33 (17.6) | |
| | | Excellent | 5 (2.7) | 0 (0) | |
| | Health promotion literacy | Inadequate | 7 (3.8) | 43 (23.0) | <0.001* |
| | | Problematic | 76 (41.3) | 106 (56.7) | |
| | | Sufficient | 100 (54.3) | 38 (20.3) | |
| | | Excellent | 1 (0.5) | 0 (0) | |
| Overall health literacy score | | Inadequate | 3 (1.6) | 24 (12.8) | <0.001* |
| | | Problematic | 59 (32.1) | 124 (66.3) | |
| | | Sufficient | 120 (65.2) | 39 (20.9) | |
| | | Excellent | 2 (1.1) | 0 (0) | |

SHG – Self Help Group

In comparison to non-SHG members, a significant proportion of SHG members were empowered in all domains, particularly autonomy, knowledge, and activity. Individual women's empowerment was also significantly higher among SHG members. The proportion of women empowered in all domains was around 4 times in SHG members

as compared to non-SHG members (28.8% vs 7.5%, p<0.001). Among SHG women, the maximum empowerment was seen in the domain of autonomy with almost 80% women being empowered and among non-SHG women the maximum empowerment was seen in health domain with around 30% women being empowered. The calculated overall women empowerment index was 0.376, which was higher among SHG members as compared to non-SHG members (0.548 vs 0.208) (Table 3).

Table 3. Comparison of women empowerment between SHG and non-SHG members

| Domains of women empowerment | Frequency (%) of empowered women | | P value |
|---|---|---|---|
| | SHG women (n=184) | Non SHG women (n=187) | |
| Activity domain | 84 (45.7) | 31 (16.6) | <0.001* |
| Knowledge domain | 113 (61.4) | 40 (21.4) | <0.001* |
| Health domain | 87 (47.3) | 55 (29.4) | <0.001* |
| Autonomy | 147 (79.9) | 49 (26.2) | <0.001* |
| Social | 12 (6.5) | 3 (1.6) | 0.016* |
| All domains | 53 (28.8) | 14 (7.5) | <0.001* |
| Women empowerment index | 0.548 | 0.208 | |
| Overall women empowerment index | 0.376 | | |

SHG – Self Help Group

The association between socio-demographic variables and women empowerment was explored using logistic regression. It was found that SHG membership, caste, and health literacy were significant predictors of women empowerment. In the present study, women who were members of SHG had around 18% higher odds (OR=1.18; CI – 1.09-1.30; p<0.001) of being empowered when compared to non-SHG members. Women from open caste had an odds of 0.81 (CI – 0.66-0.99; p=0.038) and those from scheduled caste had an odds of 1.19 (CI – 1.07-1.34; p=0.002) of being empowered as compared to women from other backward classes (OBC). Women from scheduled tribe had an odds of 0.93 of being empowered as compared to those from OBC, however, this association was not significant (p=0.284). It was found that the women who had sufficient/excellent health literacy had significantly higher odds of 1.20 (CI – 1.02-1.42; p=0.026) of being empowered as compared to those with inadequate health literacy. Those with problematic health literacy had a slightly higher but insignificant odds (1.16, p=0.056) of being empowered in comparison to those with inadequate health literacy. Age did not appear to influence the empowerment status among women. Women belonging to SLI class 3 had an insignificantly lower odds of being empowered as compared to those from SLI class 1 or 2. The final model fitted to find association between socio-demographic variables and women empowerment had Nagelkerke's pseudo R2 of 0.230 (Table 4).

The association between socio-demographic variables and health literacy was explored using ordinal logistic regression.

It was found that SHG membership, age, caste, and socio-economic status were significantly associated with health literacy. In the present study, as compared to non-SHG women, SHG women had 8.7 times higher

odds (OR=8.71; CI – 5.24-14.86; p<0.001) of being in the higher categories of health literacy (sufficient/ excellent) than being in the lower categories of health literacy (problematic/ inadequate).

Table 4. Logistic regression to study the association between women empowerment and socio-demographic variables#

| Characteristics | aOR | 95% CI | P value |
|---|---|---|---|
| SHG member | 1.18 | 1.09 – 1.30 | <0.001* |
| Age | 1.00 | 0.99 - 1.00 | 0.055 |
| Caste-Open | 0.81 | 0.66 - 0.99 | 0.038* |
| Caste-SC | 1.19 | 1.07 - 1.34 | 0.002* |
| Caste-ST | 0.93 | 0.82 - 1.06 | 0.284 |
| SLI class 3 | 0.85 | 0.72 - 1.01 | 0.067 |
| Health literacy (problematic) | 1.16 | 0.99 - 1.35 | 0.056 |
| Health literacy (Sufficient/Excellent) | 1.20 | 1.02 – 1.42 | 0.026* |

# Nagelkerke's pseudo R2 = 0.230

aOR – adjusted Odds Ratio, CI – confidence intervals, SHG – Self Help Group, SC – Scheduled caste, ST – Scheduled tribe, SLI – Standard of Living index

It was found that each year increase in age lowers the odds of better health literacy by 4% (OR=0.96; CI – 0.94-0.98; p<0.001). Women from the scheduled tribes had a significantly lower odds of better health literacy (OR=0.47; CI – 0.22-0.97; p=0.040) as compared to those from OBC. Open caste women had 3.5 times the odds whereas those from Scheduled caste had 0.85 times odds of having excellent or sufficient health literacy than having inadequate or problematic health literacy. These associations were however not significant (p=0.090 and 0.644 respectively). Women from households belonging to SLI class 3 had 3.4 times odds (OR=3.42; CI – 1.29-9.11; p=0.013) of having excellent or sufficient health literacy than having inadequate or problematic health literacy. Women living in bigger families (family size >4) had 1.18 times higher odds of having better health literacy and those women with better empowerment had 0.58 times odds of excellent or sufficient health literacy than having inadequate or problematic health literacy. The association of family size and empowerment with health literacy was not significant statistically. The final model had a Nagelkerke's pseudo R2 of 0.233 (Table 5).

## Gender resource mapping

The mapping among the SHG women revealed that women had lesser access to, vehicle, livestock, health-services, insurance when compared to men. The control was also less in terms of farming, banking, house, livestock's, health services and insurance. They exercised equal or more control over mobile, television, kitchen stuffs, electrical appliances, education, clothes and jewellery, water-supply, food, daily wages/job as well as their own and men's earning. The mapping among the non-SHG women revealed they had less access to vehicles, business, livestock's, daily wage/job, earnings by men. They had lesser control in most of the resources except for clothes and jewellery, their own earnings (Table 6).

Table 5. Ordinal logistic regression to study the association between health literacy and socio-demographic variables#

| Characteristics | aOR | 95% CI | P value |
|---|---|---|---|
| SHG women | 8.71 | 5.24 - 14.80 | <0.001* |
| Age | 0.96 | 0.94 - 0.98 | <0.001* |
| Caste-open | 3.52 | 0.91 – 17.87 | 0.090 |
| Caste-SC | 0.85 | 0.43 – 1.69 | 0.644 |
| Caste-ST | 0.47 | 0.22 – 0.97 | 0.040* |
| Family size > 4 members | 1.18 | 0.75 - 1.87 | 0.475 |
| SLI class 3 | 3.42 | 1.29 - 9.11 | 0.013* |
| Women empowerment | 0.58 | 0.31 – 1.08 | 0.089 |

# Nagelkerke's pseudo R2 = 0.233

aOR – adjusted Odds Ratio, CI – confidence intervals, SHG – Self Help Group, SC – Scheduled caste, ST – scheduled tribe, SLI – Standard of Living index

Table 6. Access and control of resources among SHG and Non-SHG women using Gender resource mapping

| Resources | SHG women | | | | Non-SHG women | | | |
|---|---|---|---|---|---|---|---|---|
| | Access | | Control | | Access | | Control | |
| | Women | Men | Women | Men | Women | Men | Women | Men |
| Furniture | ***** | ***** | **** | ***** | ***** | ***** | ** | ***** |
| Mobile phone | ***** | ***** | ***** | ***** | ***** | ***** | **** | ***** |
| Television | ***** | ***** | ***** | ***** | ***** | ***** | **** | ***** |
| Gas/kitchen stuff | ***** | *** | ***** | ***** | ***** | ** | *** | ***** |
| Electric appliances | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** |
| Farming | ***** | ***** | ** | ***** | ***** | ***** | * | ***** |
| Business | ***** | ***** | **** | ***** | *** | ***** | *** | ***** |
| Education | ***** | ***** | ***** | ***** | ***** | ***** | **** | ***** |
| Money | ***** | ***** | **** | ***** | ***** | ***** | *** | ***** |
| Clothes | ***** | ***** | ***** | **** | ***** | ***** | ***** | ***** |
| Jewellery/cosmetics | ***** | ***** | ***** | ***** | ***** | ** | ***** | ***** |
| Bank | ***** | ***** | *** | ***** | ***** | ***** | *** | ***** |
| Water supply | ***** | *** | ***** | *** | ***** | *** | *** | ***** |
| House | ***** | ***** | *** | ***** | ***** | ***** | *** | ***** |
| Vehicle | ** | ***** | - | ***** | *** | ***** | - | ***** |
| Daily wages /Job | ***** | ***** | ***** | ***** | **** | ***** | **** | ***** |
| Live-stocks | *** | ***** | ** | ***** | **** | ***** | *** | ***** |
| Earned by men | ***** | ***** | ***** | ***** | *** | ***** | **** | ***** |
| Earned by women | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** |
| Food/grocery | ***** | ***** | ***** | ***** | ***** | ***** | **** | ***** |
| Women's self-help groups | ***** | ** | ***** | * | - | - | - | - |
| Health service | ** | *** | *** | ***** | - | - | - | - |
| Insurance | *** | ***** | *** | ***** | - | - | - | - |

SHG – Self Help Group

*The number of stars represent the median score

## Discussion

The purpose of our study was to assess the impact of community mobilization through women's SHGs on health literacy and women empowerment. Our findings are in line with the proposed conceptual framework and indicate that women empowerment and health literacy are significantly better among SHG women as compared to non-SHG women. The proportion of women with better health literacy was higher among the SHG women across all its domains as was the case for overall health literacy. The proportion of women with sufficient or excellent literacy levels was lowest for health promotion domain in both the groups. SHG women fared better in terms of being empowered. On regression analysis, it was found that women empowerment was associated with SHG membership, caste and health literacy. Health literacy was also associated with SHG membership and caste in addition to age, and SLI. The gender resource mapping revealed that men still have better or equal access and control over most of the resources in both the groups. However, the situation of women controlling these resources was better among SHG women

SHGs follow a group/collective approach to improve the lives of their members rather than an individual one. Although SHGs were established to increase economic empowerment through microcredit, their scope has since expanded to address non-financial social issues, primarily for rural women. Social network and collective action seem to be critical facilitators for this (25–29). In this study, SHG members had 18% higher odds of being empowered as compared to non-SHG women. Empowerment is a multi-dimensional concept involving social, political, financial aspects and decision-making power among many others. We tried to assess the empowerment in 5 such domains and found that the proportion of empowered women was more among the SHG group in all these domains. A study from Kenya suggests that SHGs also facilitate overall development and welfare apart from women empowerment (28). A study from Tanzania suggests that social empowerment is one of the major advantages of group memberships (29). Another study from India also revealed that SHG membership improved the empowerment scores by 16% as compared to non-SHG members (30). A systematic review concludes that this empowerment is visible at the family level as well as community level, where the group members share their experiences and knowledge and thereby may become a force to further improve community knowledge and practices.(8) These beneficial effects may be mediated by being able in money management and ability to take financial decisions, solidarity, strengthening social networks, and respect from household and other community members (10). The quantitative findings in our study are also corroborated by gender resource mapping, indicating that higher levels of empowerment for SHG members are driven by greater control and decision-making over resources. SHG membership can have an impact on a woman's ability to manage her financial circumstances and potentially shift gender-based decision-making in the home to become more equitable, ultimately benefiting herself and her family (27). Although the empowerment was better

among SHG women, we reckon there is much more yet to be achieved for further expanding their influence in matters other than household chores and improving their empowerment status in the community.

We did not find any association between age and women empowerment. However, there are evidences that empowerment increases with age among women (31). Women empowerment was also found to be associated with caste in our analysis with schedule caste women being the most empowered, open caste women having lesser empowerment as compared to those from other backward classes. However, the number of women in open caste category were very few in our study and this may have affected this association. In another study it was found to be associated with religion and social capital. Religion and caste bind us to social norms which is a critical component of social capital which, in turn is known to improve through group memberships and enhanced collective actions (31, 32). Therefore, we hypothesize that social capital could play a mediator role in bettering the empowerment among SHG women (8). Further research on this aspect may consolidate the evidence in this regard. Our study suggests that empowerment was better among women having sufficient or excellent levels of health literacy. An Iranian study also suggests that empowerment is improved with health literacy. Health literacy provides women with necessary information and enhances their understanding about this information, thereby helping them take informed decision regarding their health behaviours (33, 34).

In the present study it was observed that SHG women had over 8 times the odds of having better health literacy as compared to non-SHG women. There is a paucity of evidence on effect of SHG membership on health literacy and we were unable to find the same from literature. However, there are evidences which state that such group membership improves the health-related knowledge and practices which goes with our initial conceptual framework (16, 27, 35, 36). Women attend SHG meetings, not only with group members but sometimes with external agents also who mobilize these groups for adopting healthy practices. In our setting, we follow a similar approach and engage with these SHGs during their monthly meetings. We have been working with SHGs over the years to widen the scope by adding health agenda to their activities (16). Women's self-esteem can be boosted by being in a group and interacting with other women. People with varying levels of knowledge and literacy can benefit from the information and training provided at group meetings, which promotes health literacy (30).

With increasing age, the odds of better health literacy reduced in our study. Another study from Turkey also found that the mean health literacy scores were less among women aged 40 years or more as compared to younger adult women (37). An Iranian study however, found no association of health literacy and age (38). This may be due to the wide difference in the cultural context pertaining to women in India and Iran as well as due to the difference in the assessment tools. We found that the odds of having better health literacy was higher among those with better SLI scores. A Spanish study

also found that low socio-economic levels are associated with 2 times odds of having problematic or inadequate health literacy (39). Caste was a significant predictor of health literacy in this study with women from open caste having an odds of 3.4 whereas those from scheduled tribes having an odds of only 0.46 for having better health literacy. Caste is an age-old structure of the society in India which imposes many norms and conditions on its members. There are known disparities among the members of different caste in India. Scheduled tribes and scheduled caste are considered one of the most backward castes and hence bear the brunt of this inequality in terms of literacy, poverty, accessibility of services etc (40–42).

The current study was a community-based study utilizing random sampling which adds to the methodological richness. Use of PLA tools corroborated our findings and give us an in-depth understanding of the community processes. Due to lack of readily available information on non-SHG women we acquiring this information through other measures which could have resulted in missing out on potential non-SHG women respondents, however, we have tried to minimize it by contacting reliable and credible sources in the villages. Although we were able to establish an association between SHG membership and health literacy, women empowerment, the current study being a cross sectional one, we cannot comment on the causality of this association. A longitudinal study design would have been ideal to study causation, it was not feasible since these SHGs have been functional since many years and we did not have the relevant baseline information. There were some baseline differences among the two groups such as age, socio-economic status. This could have resulted due as a few women who were recently married and thus in-migrated were part of respondents from the non-SHG group. There is a possibility that these women may become members of SHG in due course of time as part of a natural and dynamic process. Socio-economic status may affect SHG membership as SHGs gather funds through individual contribution from members and those unable to contribute may not become member or continue membership for long. However, we have tried to eliminate any bias due to these baseline differences by using regression analysis. The responses to some of the questions requiring self-reported data may have been influenced by social desirability considering sensitive nature of those questions. We however, tried to minimize this by ensuring privacy during interviews and being non-judgemental towards the responses. Lastly, we were able to prove that the proposed framework in fact, did hold true to a great extent. We however, did not measure some parts of the framework such as the behaviour change and any concrete health outcomes. BMI assessment was done as part of the women empowerment index. We considered BMI as proxy indicators for health outcome and tried to examine its relationship with SHG membership through linear regression but the associations were not significant. (Supplementary Table 1)

## Conclusion

Women's Self-help groups are effective in improving the women empowerment and health literacy. However, inspite of being associated with SHGs, the proportion of empowered women and those with health

literacy was quite low. The relatively lower proportion of women with better health literacy for health promotion indicates that such activities need to be tailored to the needs of the community and delivered in a way easy for them to understand and apply in their day-to-day life. SHGs and other community-based organizations should be promoted in an attempt to further improve these outcomes in community. Further studies to understand the group dynamics and acting on potential areas of improvement may be beneficial in this regard.

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**Consent for publication:** Written informed consent for publication of their details was obtained from the study participants

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