Value for solidarity: a proxy for community understanding and acceptance of the basic principles of community-based health insurance in rural Ethiopia

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Abstract

Background Solidarity is an aspect of human association that gives emphasis to the cohesive social bond that holds a group together and is valued and understood by all members of the group. A lack of understanding of the solidarity principle is one of the main reasons for low population coverage in microhealth insurance schemes. This study aimed to examine the extent to which people value solidarity and the factors that explain the differences.

Methods A community-based cross-sectional study was carried out in two districts of northeast Ethiopia among 1232 randomly selected households which have ever been registered in a community-based health insurance scheme. Face-to-face interviews were conducted with household heads using a standardized questionnaire deployed to an electronic data collection platform. Solidarity was measured using three dimensions: income solidarity, risk solidarity, and cost coverage. Principal component analysis was used to construct composite variables, and the reliability of the tools was checked using Cronbach's alpha. A multivariable analysis was performed using the partial proportional odds model to determine the associations between variables. The degree of association was assessed using the odds ratio, and statistical significance was determined at 95% confidence interval.

Results Three-quarters (75%) of the respondents rated risk solidarity as high, while 70% and 63% rated income solidarity and cost coverage as high, respectively. Place of residence (AOR = 2.23; 95% CI: 1.68, 2.94), wealth index (AOR = 1.51; 95% CI: 1.07, 2.12), self-rated health status (AOR = 1.64; 95% CI: 1.12, 2.40), trust in insurance schemes (AOR = 1.68; 95% CI: 1.22, 2.30), perceived quality of care (AOR = 1.75; 95% CI: 1.33, 2.31) and frequency of outpatient visits (AOR = 2.05; 95% CI: 1.30, 3.24) were significant predictors of value for solidarity.

Conclusions The community placed greater value for solidarity, indicating community understanding and acceptance of the core principles of microhealth insurance. Administrators of the insurance scheme, health authorities, and other actors should strive to create a transparent management system and improve access to high-quality health care, which will facilitate community acceptance of the insurance scheme and its guiding principles.

Keywords Value, Solidarity, Understanding, Community-based health insurance, Ethiopia

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Background

In low- and middle-income countries, out-of-pocket payments are the primary source of health-care financing [1, 2]. Overreliance on out-of-pocket payments is a significant barrier to universal health coverage because people are either unable to access health care because it must be paid for at the time of use or are more likely to face financial hardship as a result of receiving health care [3–5]. To meet the goals of universal health coverage, financing mechanisms must shift away from out-of-pocket payments and towards prepayment, pooling models that increase access to essential health care while spreading financial risks across the population [3, 4]. In this regard, community-based health insurance (CBHI) has taken center stage in low- and middle-income countries. The CBHI is a type of microhealth insurance and is an umbrella term for health insurance aimed at meeting the health financing needs of disadvantaged people, particularly those living in rural settings, earn a subsistence from the informal sector, or are socially excluded [6, 7]. Ideally, all CBHI schemes share common characteristics such as social solidarity, community-based social dynamics, active participation of members in the scheme's design and management, nonprofit nature and voluntary subscription [8–10].

At the core of CBHI are the principles of mutual aid and community solidarity, both from the richer to the poorer and from the lower-risk groups to the higher-risk groups [11]. Solidarity is a multifaceted concept with no single definition. It is an aspect of human association that emphasizes the cohesive social bond that holds a group together and is valued and understood by all members of the group [12]. In the context of health insurance, solidarity is conceived as a redistributive arrangement in which risk sharing is as inclusive as possible and membership premiums are unrelated to individual health risks [10, 13].

Solidarity in community health insurance entails risk pooling, which embraces both coverage and contribution concepts. In terms of coverage, it ensures that all members of the pool have access to the same benefits, while contributions must be based on income level and independent of health risks [14]. It can be understood as a dimensional concept that includes income solidarity, risk solidarity, and scope of coverage. Income solidarity refers to the fact that the subscription fee for health insurance is determined by a policyholder's ability to pay, implying that the premium varies with income. Risk solidarity implies that the premiums that subscribers must pay for health insurance are unrelated to health risks [13, 15]. The scope of coverage includes population coverage (the percentage of the population covered by the insurance scheme), material coverage (the package of health care services covered), cost coverage (the percentage of medical bills covered), and conditional coverage (the conditions that must be met to qualify for coverage). Health insurance is considered more solidary when it covers a larger proportion of the population, has a broader range of health services, bears a larger portion of health-care costs, and has no coverage restrictions [15].

In recent decades, an increasing number of sub-Saharan African countries have implemented the CBHI as part of an effort to meet the health-care needs of low-income people, who constitute the majority of the population [1, 10]. The ability of key actors to attract and retain policyholders is critical to the success of any microhealth insurance scheme [16]. Community health insurance plans with lower enrollment and renewal rates will have a smaller pool size, making them vulnerable to the problem of adverse selection. In adverse selection, individuals with a high need for health care have a greater tendency to join an insurance scheme than their share of the general population (16). In health insurance with small pool sizes, it is more likely that the members who remain in the pool have greater health needs and health risks. A CBHI scheme with a small pool size and diversity will have little risk redistribution ability [17, 18]. In such contexts, health insurance schemes will be unable to improve access to health care and protect members from financial hardship [19].

Except for a few successful cases, CBHI programs in low- and middle-income countries suffer from persistently low population coverage due to their voluntary nature [10, 20]. A variety of issues have been documented in the literature that contribute to low membership coverage. The most significant concerns are a lack of understanding of the risk-sharing principle and the benefits of insurance plans [21–24], a lack of trust in the schemes' integrity [24, 25], poor health care quality [26, 27], and rejection of claims benefits [28].

In accordance with the global commitment to achieve universal health coverage, the Ethiopian government launched a voluntary CBHI scheme in June 2011, targeting rural households and urban informal sector workers, who account for an estimated 85% of the country's population [28]. However, the contribution of CBHI as a health financing source remains very low, accounting for only 1% of total health spending in 2020. Out-of-pocket payments continue to play a significant role, accounting for 30.5% of total financing. This highlights the importance of relevant stakeholders putting forth significant effort to advance CBHI and make it a significant source of financing that provides adequate risk protection [29].

People's understanding and acceptance of the basic principle of health insurance is an important factor in policyholders' decisions to join and remain in the scheme [30, 31]. It is vital to generate empirical evidence on people's values for solidarity, which can be used as a proxy for

people's understanding and acceptance of the core principles of community health insurance. Few studies have attempted to investigate people's willingness to accept risk- and income-related cross-subsidies in the context of microhealth insurance in sub-Saharan Africa [32, 33]. However, none of these studies examined people's perspectives on the coverage aspect of solidarity. Furthermore, the ordinal nature of the Likert scale responses was not taken into account in their regression analyses. Therefore, in this study we examined (a) the extent to which people value solidarity in their contributions to CBHI membership and (b) identified the factors that may explain differences in valuing solidarity. Ethiopia's current health financing strategy aims to establish a national unified pool system that will allow cross-subsidization between low-risk and high-risk areas of the country [34]. The findings of this study can help decision-makers and other stakeholders in designing interventions and overcoming barriers to establishing the desired higher-level insurance pools.

Methods
Study design and setting
A community-based, cross-sectional study was carried out from February 4 to March 21, 2021 in two rural districts of northeast Ethiopia, Tahulederie and Kalu. Tahulederie has one primary hospital and five health centers that provide health services for a population of more than 145,000 people, 88% of whom live in rural areas. The district is divided into seven urban and 20 rural *Kebeles* (subdistricts). Kalu, the most populous district in the zone, is divided into four urban and 36 rural *Kebeles* with a total population of approximately 235,000, of which 89% are rural dwellers [35]. There are nine health centers in the district that serve the surrounding community. Tahulederie was one of the 13 pilot districts in Ethiopia, where the CBHI scheme was first launched in 2011. After two years of enactment, membership coverage reached 91% [28]. However, population coverage declined to 60% as of April 2020 [36]. Based on the findings of the Ethiopian pilot project, the CBHI scheme was expanded to 161 districts, including Kalu, in July 2013 [28]. After seven years of implementation, 61% of the eligible households were covered by CBHI in 2020 [36].

Sample size and sampling
The data for this study came from a research project that examined the long-term viability of a CBHI scheme in two rural districts of northeast Ethiopia. A sample size of 1257 was calculated as part of this work for a companion article that examined membership adherence, of which 1232 eligible households participated and provided complete information relevant to the present study. The full detail of the sample size determination has been

documented in a previous work [37]. The study population of interest consisted of rural households that had been enrolled in the CBHI. This includes both active members and those who dropped out of the scheme at the time of the study. Fee waiver beneficiary indigent households were excluded from the study since they have no motivations to drop out of the scheme, and their inclusion may have a confounding effect on the association between membership adherence and its predictors. The unit of analysis for this study was the household, because CBHI membership is at the household level.

To recruit study participants, a three-level multistage sampling technique was used. First, 12 clusters of rural *Kebeles* were selected, each organized within the catchment area of a health center. Then, 14 *Kebeles* were drawn at random in proportion to the number of *Kebeles* in each cluster. As a result, the study included five *Kebeles* from Tahulederie and nine from Kalu. A list of households enrolled in the CBHI scheme was obtained from the membership registration logbook for each *Kebele*. The required sample was generated at random from each *Kebele* using a random number generator software package, proportional to the number of households enrolled in the scheme. The scheme has ever enrolled 13,281 households in the selected 14 *Kebeles*, including 5134 in Tahulederie and 8147 in Kalu. The number of enrollees in each *Kebele* ranges from 782 to 1109, while the allotted sample size was 74 to 105.

Variables and measurements
The data were collected through face-to-face interviews with household heads at their residences using a structured questionnaire via an electronic data collection platform. Data was collected on sociodemographic characteristics of the household, household economic status, CHI membership status, presence of chronic illness in the household, perceived health status, trust in the CBHI scheme, frequency of outpatient visits to the nearby health center, history of hospitalization, perception of the quality of health care received from the nearby health center, and value for solidarity (see Supplementary file). The membership registration book at each *kebele* (health post), which provides data on the annual renewal status since the scheme's inception, was used to obtain information on the CBHI membership status of the households. The data collectors submitted the completed forms to the online server on a daily basis, allowing us to actively follow the process and thus simplifying the supervision process. Health extension workers guided the data collectors in locating the sampled households because they are home-based health service providers in rural areas and are familiar with the site of each household.

The dependent variable of interest for this study is value for solidarity in CBHI contributions, which refers

to the value people place on the redistribution principle of community-based voluntary health insurance. It is an ordinal composite variable measured on a Likert scale with a 5-point response format with 1-strongly disagree, 2-disagree, 3-indifferent, 4-agree, and 5-strongly agree by asking respondents to rate the extent to which they agreed on three dimensions of solidarity adapted from van der Aa et al. [15]. The first dimension was income solidarity, which implies that membership contributions should be based on the principle of ability-to-pay, and participants were asked the question "membership contributions should be based on ability to pay, which means the poor will pay less." The second dimension was risk solidarity, which means that a subscriber's health status is not taken into account when determining premiums. It was measured by the question "membership contributions should be independent of individual health risks, which means premiums should not differ due to differences in disease conditions." The third dimension was cost coverage, which refers to the proportion of healthcare costs covered by the insurance pool. It was assessed by the question "membership contributions should be independent of health care costs, which means that members will not be asked to pay a portion of their medical bills for a higher cost of care."

The scores for the three items were translated to a factor score using Principal Component Analysis (PCA). A three-level ordinal variable was created using quantile classification and labeled as low, moderate, and high. The ratings for the three dimensions of solidarity were converted to a binary category to facilitate description and comparison. Accordingly, the lower three scales—strongly disagree, disagree, and indifferent—were recoded as low, and the higher two scales—agree and strongly agree—were recoded as high-level solidarity.

Wealth index was measured by household asset questions adapted from the 2016 Ethiopian Demographic and Health Survey (DHS) questionnaire and was constructed using the PCA method. The scores for 15 asset types were converted into latent factors, and a wealth score was created using the first component that explained most of the variations. The study households were classified into three groups based on the wealth score: lower, middle, and upper wealth tertiles.

The existence of a chronic illness denotes the presence of one or more members of the household who have a known chronic illness that necessitates ongoing medical attention and have been informed by a health care provider. The perceived health status of a household was rated as poor, moderate, or good based on the subjective assessment of the household's health status.

To measure people's trust in the scheme, a four-item measurement scale was developed based on a tool previously validated and used by Ozawa et al. [38]. It was

measured on a Likert scale using a 5-point response format (ranging from 1-strongly disagree to 5-strongly agree), and the four item scores were converted to a factor score using PCA. Using quantile classification, a three-level categorical variable labeled low, moderate, and high was generated.

Outpatient visits refer to the number of outpatient visits to a nearby health center by any member of the household in the previous 12 months prior to the study, while history of hospitalization was assessed by asking whether any member of one's household had received inpatient care through the coverage of the CBHI scheme.

The perceived quality of health care was assessed using a 10-item scale developed following a thorough review of validated tools [39–41]. It was measured using a Likert scale with a 5-point response format (ranging from 1-strongly disagree to 5-strongly agree) by asking respondents to rate the extent to which they agreed on a set of items relating to the health services they received from the outpatient units of a nearby CBHI-affiliated health center, which is thought to be the usual source of health care. The scores for the 10 items were converted into three components using PCA, and an overall health care quality index was created by summing the factor scores of the three components that explained 55.8% of the total variation. Finally, the health care quality index was classified as low, moderate, and high using quantile classification.

Data analysis

The data from the online data aggregator were downloaded into an Excel spreadsheet and analyzed using Stata Statistical Software, release 17. Principal Component Analysis (PCA) was used to construct composite variables. The tools measuring value for solidarity, trust in the scheme and perceived quality of care were checked for reliability using Cronbach's alpha internal consistency coefficient, and the alpha value was 0.62, 0.73 and 0.74, respectively.

Descriptive statistics were computed based on the different characteristics of the study participants. Owing to the ordinal nature of the outcome variable (low, moderate, or high value for solidarity), a typical approach to examining the association between the dependent and explanatory variables is to use the standard ordered logit or the proportional odds model [42]. However, for the use of the ordered logit model to be valid, the proportional odds or parallel lines assumption must hold. The Brant test indicated that the assumption of the parallel lines model is violated for some explanatory variables. In this regard, partial proportional odds models are often a superior alternative to the ordered logit model [43]. Therefore, generalized ordered logistic regression, also called the partial proportional odds model, was fitted

(with the gologit2 autofit command) to assess the association between value for solidarity and the explanatory variables. In the final model, a multivariable analysis was employed, and adjusted odds ratios (AORs) with 95% confidence intervals and *p*-values were reported for each of the explanatory variables. A statistically significant association between variables was declared at a *p*-value of 0.05.

Results

Characteristics of the study population

This study included a total of 1232 households, with a response rate of 98%. The study participants' average age was 49.5 years (SD = 12.25), with slightly more than half (50.7%) between the ages of 45 and 64 and 13.7% aged 65 and older. Males made up 1064 (86.4%) of the total household heads, with 1132 (91.9%) currently married. More than three-quarters of the study participants (78.9%) did not receive formal education, and 40.7% inhabit in semiurban areas. For health insurance status, 85.2% were active CBHI scheme members, while 14.8% were previous members who had cancelled their membership at the time of the study. One-third of respondents (30.8%) had a high level of trust in the CBHI scheme.

In terms of health status, nearly a quarter (23.7%) of households had one or more family members with a known chronic illness. Nearly half (45.9%) of the respondents rated their household health status as moderate, while 448 (36.4%) and 218 (17.7%) rated it as good and poor, respectively. A total of 151 households (12.3%) had no outpatient visits, while just over one-fifth (22.7%) had five or more outpatient visits to the nearest health center in the 12 months prior to the study. Furthermore, 490 households (39.8%) had ever received inpatient care through the CBHI scheme's coverage (Table 1).

Value for solidarity

The respondents' level of agreement on the three items measuring value for solidarity was rated on a scale ranging from 1 to 5, with 5 denoting a higher-level value. The mean score of the three dimensions of solidarity was determined to be 3.71 for income solidarity, 3.91 for risk solidarity, and 3.68 for cost coverage. The aggregate mean score of value for solidarity based on the three items was 3.77 (SD = 0.57).

Based on the binary category of the three dimensions of solidarity, most of the responses were on a scale of agree or strongly agree (high-level solidarity). Accordingly, 75% of respondents rated risk solidarity as high (95% CI: 72.4–77.3%). Likewise, 70% and 63% of respondents rated income solidarity and cost coverage as high (95% CI: 67.5%, 72.6% and 95% CI: 60.4%, 65.8%, respectively). The detailed responses for the three items in a five-point response format are displayed in Fig. 1. For instance, 157

(12.7%) of the respondents strongly agreed that contributions should be based on the ability to pay, while 241 (19.6%) and 112 (9.1%) strongly agreed that contributions should be independent of individual health risks and health care costs, respectively. The aggregate figure based on the three categories of value for solidarity showed that 417 (33.9%) of the respondents had a lower scale value for solidarity, while 525 (42.6%) and 290 (23.5%) of the respondents had a moderate and higher scale value for solidarity, respectively.

Factors associated with value for solidarity

The results of the partial proportional odds model show two contrasting panels. The first panel contrasts low categories with moderate and high categories, whereas the second panel contrasts low and moderate categories with high categories. The Wald test indicates that the final model does not violate the parallel lines assumption (Chi-square = 9.36, *p*-value = 0.951). The parallel lines assumption is violated by two variables, namely, trust in the CBHI scheme (high category) and annual outpatient visits (five or more visits). The model, therefore, permitted the odds ratio for these variables to differ between the two panels. For variables that do not violate the parallel lines assumption, the odds ratio does not vary between the two panels and is hence presented under the first panel (Table 2).

After controlling for all the explanatory variables, place of residence, wealth index, self-rated health status, frequency of outpatient visits, trust in the CBHI scheme, and perceived quality of health care were significantly associated with value for solidarity. For variables that did not violate the parallel lines assumption, a single odds ratio is reported under the first panel. Accordingly, households in semiurban areas were 2.23 times more likely to be in the higher category of value for solidarity than rural dwellers (AOR = 2.23; 95% CI: 1.68, 2.94). Households which belong to the upper and middle wealth classes were 1.51 and 1.70 times more likely to be in the higher category of value for solidarity compared to the lower class, respectively (AOR = 1.51; 95% CI: 1.07, 2.12 and AOR = 1.70; 95% CI: 1.29, 2.24). The odds of being in the higher category of value for solidarity was 1.64 times greater for households that rated their health status as good compared to those who rated it as poor (AOR = 1.64; 95% CI: 1.12, 2.40).

An increased number of outpatient visits via CBHI coverage was significantly associated with greater solidarity scores. Compared to households who had no outpatient visits in the previous 12 months, the odds of being in the higher category of value for solidarity was 1.77 times greater for households who had 1–2 outpatient visits (AOR = 1.77; 95% CI: 1.21, 2.59) and 1.63 times greater for households who had 3–4 outpatient visits

Table 1 Value for solidarity compared across respondent characteristics in two rural districts of northeast Ethiopia, 2021

Variables	Value for solidarity, frequency (percent)				*p*-value
	Low	**Moderate**	**High**	**Total**	
Age in years					
25–44	129 (30.9)	202 (38.5)	108 (37.2)	439 (35.6)	0.019
45–64	214 (51.3)	260 (49.5)	150 (51.7)	624 (50.7)	
65+	74 (17.7)	63 (12.0)	32 (11.0)	169 (13.7)	
Gender					
Male	359 (86.1)	452 (86.1)	253 (87.2)	1064 (86.4)	0.883
Female	58 (13.9)	73 (13.9)	37 (12.8)	168 (13.6)	
Marital status					
Unmarried	47 (11.3)	39 (7.4)	14 (4.8)	100 (8.1)	0.006
Married	370 (88.7)	486 (92.6)	276 (95.2)	1132(91.9)	
Attend formal education					
No	323 (77.5)	415 (79.0)	234 (80.7)	972 (78.9)	0.581
Yes	94 (22.5)	110 (21.0)	56 (19.3)	260 (21.1)	
Place of residence					
Rural	309 (74.1)	305 (58.1)	116 (40.0)	730 (59.3)	<0.001
Semiurban	108 (25.9)	220 (41.9)	174 (60.0)	502 (40.7)	
Wealth index					
Lower	195 (46.8)	169 (32.2)	48 (16.6)	412 (33.4)	<0.001
Middle	125 (30.0)	183 (34.9)	103 (35.5)	411 (33.4)	
Upper	97 (23.3)	173 (32.9)	139 (47.9)	409 (33.2)	
Insurance membership					
Previous	72 (17.3)	76 (14.5)	34 (11.7)	182 (14.8)	0.120
Current	345 (82.7)	449 (85.5)	256 (88.3)	1050 (85.2)	
Chronic illness					
No	294 (70.5)	417 (79.4)	229 (79.0)	940 (76.3)	0.003
Yes	123 (29.5)	108 (20.6)	61 (21.0)	292 (23.7)	
Self-rated health					
Poor	94 (22.5)	77 (14.7)	47 (16.2)	218 (17.7)	<0.001
Moderate	207 (49.6)	238 (45.3)	121 (41.7)	566 (45.9)	
Good	116 (27.8)	210 (40.0)	122 (42.1)	448 (36.4)	
Hospitalization history					
No	281 (67.4)	315 (60.0)	146 (50.3)	742 (60.2)	<0.001
Yes	136 (32.6)	210 (40.0)	144 (49.7)	490 (39.8)	
Annual outpatient visits					
No visits	72 (17.5	59 (14.3)	20 (4.9)	151 (12.3)	<0.001
1–2	111 (27.0)	186 (44.9)	100 (24.6)	397 (32.2)	
3–4	130 (31.6)	177 (42.8)	98 (24.1)	405 (32.9)	
5+	104 (25.3	103 (24.9)	72 (17.7)	279 (22.6)	
Trust in CBHI scheme					
Low	171 (41.0)	187 (35.6)	118 (40.7)	476 (38.6)	<0.001
Moderate	154 (36.9)	149 (28.4)	73 (25.2)	376 (30.5)	
High	92 (22.1)	189 (36.0)	99 (34.1)	380 (30.8)	
Quality of health care					
Low	170 (40.8)	163 (31.1)	78 (26.9)	411 (33.4)	<0.001
Moderate	152 (36.5)	175 (33.3)	84 (29.0)	411 (33.4)	
High	95 (22.8)	187 (35.6)	128 (44.1)	410 (33.3)	

(AOR=1.63; 95% CI: 1.11, 2.39). Moreover, the perception of the quality of health care provided at outpatient units of nearby health facilities is a positive predictor of value for solidarity. People who reported a high level of perceived quality of health care were 1.75 times more likely to be in the higher category of value for solidarity compared to those who reported a low level of perceived quality of care (AOR=1.75; 95% CI: 1.33, 2.31).

Meanwhile, for variables that violate the parallel lines assumption, a separate interpretation is required under
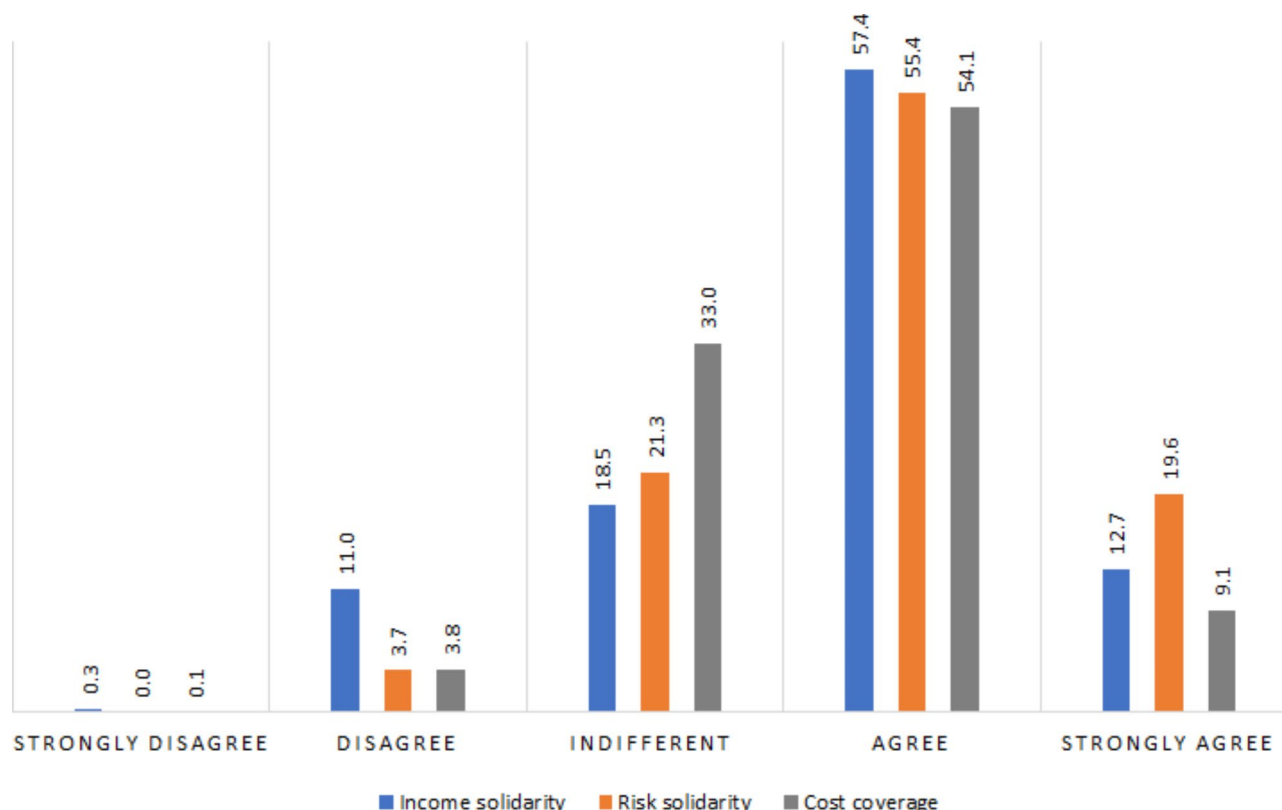
Fig. 1 Percentage distributions of dimensions of solidarity on a five-point response scale (*n*=1232)

each panel. In this regard, households that had a high level of trust in the CBHI scheme were 1.68 times more likely to be in the combined categories of moderate and high vs. low value for solidarity compared to those with a lower level of trust (AOR=1.68; 95% CI: 1.22, 2.30). However, it lost its statistical significance in the second panel.

The results also revealed that the odds of being in the combined categories of moderate and high vs. low value for solidarity was 2.05 greater for households with five or more outpatient visits than for households with no outpatient visits (AOR=2.05; 95% CI: 1.30, 3.24). Similarly, the odds of being in the high category vs. the combined low and moderate category of value for solidarity was 3.22 times greater for households with five or more outpatient visits than for households with no outpatient visits (AOR=3.22; 95% CI: 1.98, 5.23).

Discussion

The purpose of this study was to gain insight into the extent to which people place value for solidarity in their contributions to CBHI membership and to identify the factors that explain differences in valuing solidarity. The mean scores for the three dimensions of solidarity were 3.71 for income solidarity, 3.91 for risk solidarity, and 3.68 for cost coverage, with an overall mean score of 3.77 on a scale ranging from 1 to 5. Our findings showed

that people placed more favor on risk solidarity than on income solidarity and cost coverage. This finding is supported by the work of Maritim et al.., who discovered a greater willingness to tolerate risk cross-subsidization than income cross-subsidization, implying a preference for the sick over the poor [33].

Based on the binary category of the three dimensions of solidarity using the five-point response formants, 75% of the respondents tended to rate risk solidarity as high. Similarly, 70% and 63% of respondents rated income solidarity and cost coverage as high, respectively. These findings are consistent with a previous study showing that 74% of respondents are willing to contribute to the healthcare costs of others [44]. However, our findings are greater than those of a previous study, which reported that 54.9% of the respondents supported income cross-subsidies, while 60.7% were willing to tolerate risk cross-subsidization [33]. Our findings are also higher than those of a cross-nation study that found that income cross-subsidies are valued by 62% and 55% of respondents in South Africa and Ghana, respectively, while 53% of respondents in South Africa were supportive of the concept of risk cross-subsidies [32]. Differences in values for solidarity in different countries may be due to differences in the social context, which is shaped by social norms [44].

Table 2 Multivariate analysis using a partial proportional odds model on the association between value for solidarity and explanatory variables

Explanatory variables	Low vs. moderate and high		Low and moderate vs. high	
	AOR 1 (95% CI)	*p*-value	AOR 2 (95% CI)	*p*-value
Age in years				
45–64	0.98 (0.77, 1.25)	0.865		
65+	0.96 (0.66, 1.40)	0.847		
Gender				
Female	1.15 (0.78, 1.70)	0.484		
Current marital status				
Married	1.38 (0.83, 2.29)	0.218		
Attend formal education				
Yes	0.78 (0.59, 1.02)	0.071		
Place of residence				
Semiurban	2.23 (1.68, 2.94)	< 0.001		
Wealth index				
Middle	1.70 (1.29, 2.24)	< 0.001		
Upper	1.51 (1.07, 2.12)	0.018		
Insurance status				
Current member	0.89 (0.65, 1.23)	0.477		
Chronic illness				
Yes	0.76 (0.57, 1.02)	0.064		
Self-rated health				
Moderate	1.07 (0.75, 1.51)	0.718		
Good	1.64 (1.12, 2.40)	0.011		
Trust in CBHI scheme				
Moderate	0.92 (0.71, 1.20)	0.554		
High	1.68 (1.22, 2.30)	0.001	1.06 (0.77, 1.46)	0.707
Annual outpatient visits				
1–2	1.77 (1.21, 2.59)	0.003		
3–4	1.63 (1.11, 2.39)	0.013		
5+	2.05 (1.30, 3.24)	0.002	3.22 (1.98, 5.23)	< 0.001
History of hospitalization				
Yes	1.21 (0.96, 1.53)	0.104		
Perceived quality of care				
Moderate	1.14 (0.87, 1.50)	0.328		
High	1.75 (1.33, 2.31)	< 0.001		

AOR: Adjusted Odds Ratio; CI: Confidence Interval

Overall, a greater proportion of the responses on the three dimensions of solidarity are on the agree or strongly agree scale. This indicates that people placed a greater value for solidarity in their membership contributions, which could be attributed to ongoing awareness-raising efforts or preexisting social support practices [45]. In support of the latter assertion, people who perceive higher levels of social support are more willing to accept income cross-subsidization because people's views are consistent with those of their social context, which is shaped by social norms [44].

At the heart of CBHI is the redistributive principle, which involves cross-subsidization from the rich to the poor and from low-risk to high-risk populations [11]. This is an essential, but not the only, strategy for achieving effective risk pooling [18]. The observed level of solidarity might still be a key driving factor in cultivating the success of CBHI schemes by attracting more people and thus increasing both the size and diversity of pools. This is based on the view that in a community with strong solidarity, people will maintain their membership because they will not be concerned about whether the premiums will benefit them or others [46].

Despite a higher proportion of overall solidarity scores, variations exist among subgroups that merit further discussion. After controlling for explanatory variables, the multivariable analysis revealed a number of factors related to people's value for solidarity. Accordingly, value for solidarity varies across respondents' place of residence. Households in semiurban areas were more likely to report greater solidarity scores than rural dwellers. Households in semiurban areas may be easier for

community mobilizers and educators to reach, or they may have better access to media and other sources of information to learn and understand the fundamental principles of community health insurance.

This study also showed that the households' wealth status is an important factor influencing people's value for solidarity. Belonging to the higher wealth index was associated with greater solidarity score implying a better understanding of risk pooling principles among the higher socio-economic groups. This finding parallels an earlier study, which found that higher income groups reported stronger support for cross-subsidization than lower income groups [33]. Evidence showed that socio-economic status is strongly linked to social capital [47]. It is plausible that wealthier households are more likely to have stronger social networks, which might foster collaboration and learning on the concept of solidarity. They may participate in activities that promote strong community links and mutual support, which can increase their willingness to support solidarity [44].

The household head's subjective valuation of the health of the family was also significantly associated with value for solidarity. Those who rated their household's health as good were more likely to have a greater value for solidarity than those who rated it as poor. This finding is consistent with existing evidence showing that people who rate their health as very good or excellent are more willing to contribute to the health care costs of others than are those who rate their health as poor or fair [44]. This finding contradicts the assumption that people who perceive their health as poor may have a greater demand for health care and thus recognize the importance of having insurance coverage to mitigate the financial risks posed by ongoing medical bills.

This study also revealed that trust in the CBHI scheme is an important factor in valuing solidarity. Respondents with high levels of trust in the scheme were more likely to support solidarity than those with low levels of trust. This means that when people believe that the CBHI scheme is useful for the community, honest and reliable, financially dependable, and caring for its members, they are more likely to value and accept its guiding principles. In addition to valuing solidarity, prior studies have shown that trust in CBHI schemes is a key enabler of enrollment and renewal decisions [31, 48, 49]. This finding has important implications for scheme implementers and relevant stakeholders in terms of establishing a transparent system to minimize doubts and enhance people's trust in the scheme, thereby increasing its acceptance.

According to the findings, the more health care people receive as a result of their health insurance coverage, the more likely they are to value solidarity in their membership contributions. This is evidenced by the fact that more outpatient visits were significantly associated with greater solidarity scores. This is supported in part by the fact that in a voluntary microhealth insurance scheme, the frequency of service utilization and the amount of benefit received for healthcare expenditure were significant predictors of membership adherence [50]. These findings may be explained by the fact that those who received more ambulatory services as part of the scheme's entitlement may have appreciated health insurance benefits more than others. They could have received health services that would have cost them more money or were beyond their financial means. They may also have the opportunity to learn and understand the fundamental principles of community health insurance as a result of their interaction with the health care system.

The perception that health care is of good quality is an important factor linked to a higher level of value for solidarity. One of the primary goals of health insurance is to improve access to high-quality health care [10, 51]. If people believe that the health care provided by health insurance-affiliated health facilities is of poor quality, they may underestimate the fundamental principles of health insurance or health insurance in general. This is supported by the fact that if health care facilities fail to provide high-quality care, the insured will lose faith in the service provider and the insurance plan [52].

One intriguing finding in this study is the role of education, which showed no significant association with people's value for solidarity. This is counterintuitive to the notion that education plays an important role in shaping social solidarity by fostering shared values and critical thinking. Earlier studies demonstrated that respondents who attended more years of education were inclined to support cross-subsidization than their counterparts [33, 44]. It is possible that some unmeasured contextual factors, such as scheme governance, could overshadow the role of education. Individuals who received formal education may be more aware of their rights and critical of governance deficiencies on the part of scheme administrators and health authorities. As a result, they may not be in a better position to support solidarity than those uneducated.

The findings of this study can be used to design interventions and address challenges in efforts to establish higher-level insurance pools at various administrative levels in the country. Although the study provides valuable information to scheme administrators and other relevant stakeholders, it is not without limitations. One notable limitation of this study is that the items used to measure value for solidarity may be influenced by social desirability bias. Despite efforts to increase understanding of the study's purpose, respondents may rate the items higher than their true feelings, potentially overestimating the findings. Second, the study may be prone to recall bias in assessing some of the explanatory variables,

such as the number of annual outpatient visits, hospitalization history, and perception of health-care quality. Some respondents who had no recent visits to health centers may not be as critical in rating the quality of health care as those who had a recent visit experience.

Conclusions

The current study revealed that the community placed greater value for the solidarity principle of the CBHI. This implies people's understanding and acceptance of the core principles of community-based health insurance. Value for the solidarity varies based on a number of factors. Households belonging to the higher socio-economic groups showed a greater support for solidarity. Trust in the scheme is a significant predictor of value for solidarity. People show greater support for solidarity when they believe the scheme is beneficial to the community, financially dependable, and caring for its members. The utilization of ambulatory services under CBHI entitlement was a positive predictor of value for solidarity, implying that those who benefited from health insurance are more supportive of the principle of solidarity. Furthermore, people who believe that health care is of poor quality undervalue the principle of solidarity. If CBHI-affiliated health facilities provide poor-quality health care, people may distrust the integrity of the insurance scheme and underestimate its fundamental principles.

The findings of this study will have implications for addressing issues related to the aforementioned factors. Therefore, scheme administrators should work on establishing a transparent management system in the scheme to build people's trust. Health authorities, scheme administrators, and other relevant actors should collaborate to improve access to high-quality health care, which will enhance community acceptance of the insurance scheme and its guiding principles.

Abbreviations
AOR   Adjusted Odds Ratio
CBHI   Community-based Health Insurance
DHS   Demographic and Health Survey
PCA   Principal Component Analysis

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s13561-024-00565-9.

Supplementary Material 1

Declarations

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