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Mediating role of social capital in the association between socioeconomic status and childcare practices in rural Malawi: a cross-sectional study

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ABSTRACT

Objectives Childcare practices determine the child nutritional outcomes, but resources for good practices are unequally distributed across socioeconomic status (SES). This study first examined the associations between social capital and childcare practices separately across SES groups. It then investigated the mediation effect of social capital between SES and childcare practices.

Design This cross-sectional study used the Short Version of the Adapted Social Capital Assessment Tool to measure structural social capital (group membership, social support and citizenship activities) and cognitive social capital of mothers. Data were analysed using multilevel logistic regressions with random intercepts and mediation modellings.

Setting Rural Lilongwe, Malawi.

Participants A total of 320 mothers with a child aged between 12 months and 23 months.

Primary outcome measures Childcare practice outcomes included were minimum dietary diversity, handwashing and complete vaccination.

Results Among structural social capital dimensions, social support was found to be positively associated with minimum dietary diversity (adjusted OR (AOR)=1.44, 95% CI 1.22 to 1.71; p<0.001) and handwashing for all mothers (AOR=1.42, 95% CI 1.23 to 1.64; p<0.001). In the subgroup analysis, the higher SES group had higher odds of meeting the minimum dietary diversity (AOR=1.63, 95% CI 1.18 to 2.26; p=0.01) and handwashing with increased social support (AOR=1.53, 95% CI 1.13 to 2.08; p=0.01) than the lower SES. The mediation effect of social support accounted for 27.3% of the total effect between SES and minimum dietary diversity. Cognitive social capital was negatively associated with vaccination for the lower SES group (AOR=0.07, 95% CI 0.01 to 0.68; p=0.03).

Conclusions To improve feeding and handwashing practices and to reduce health inequalities in rural Malawi, governments and organisations should consider promoting the value of social support and health. Future research is needed to explain the negative association between cognitive social capital and vaccination among the lower SES group.

Strengths and limitations of this study

⇒ This study comprehensively examined the mediating role of social capital in the relation between socioeconomic status (SES) and feeding practice in rural Malawi.
⇒ A validated social capital tool was used to reduce measurement bias.
⇒ A cross-sectional design limits explaining causal inference between SES, social capital and childcare practices.
⇒ Self-reported outcome assessment may be subject to response bias by social desirability.

INTRODUCTION

Child undernutrition is a global problem with significant consequences for children's health and development.[1–3] Globally, nearly 45% of the deaths among under-5 children were attributable to undernutrition, and this figure is translated into more than 3.1 million child deaths annually.[4] The aetiology of child undernutrition is complex, consisting of the basic, underlying and immediate causes.[1] Childcare practices determine the child nutritional outcomes, but resources for good practices are unequally distributed across socioeconomic status (SES).[5–7] Health inequalities are evident in the proportions of children who received good childcare practices and stunted in most countries.[1]

Social capital has been posited as a predictor of health as well as a protective factor against the impact of poverty.[8 9] It is often defined as 'the features of social organisation such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit'.[10] Social capital is conceptualised into two dimensions: structural and cognitive.[11] The structural component includes resources available through a social network, objectively measured by individuals' membership or activity. The cognitive social capital encompasses social trust, reciprocity and social cohesion, which

is subjectively measured by individuals' attitudes and perceptions.

Social capital is further conceptualised into three categories: bonding, bridging and linking social capital.[11 12] Bonding social capital refers to relationships between people with a similar identity, such as friends, family members and neighbours. Bridging social capital explains the interactions between different groups who are typically not alike regarding their social identity. Linking social capital represents the relationships between people across institutionalised power or authority gradients in society.[12]

Considerable evidence shows a positive relationship between social capital and health.[13 14] Different components of social capital explained a significant proportion of physical and mental health, health-related behaviour and life expectancy when controlled for income.[14 15] However, the effect of social capital on health varies by subgroups of different SES.[16] First, the buffer hypothesis proposes that social capital promotes better health gain for individuals with a low SES and limited health benefits for those with a higher SES.[16] A second hypothesis suggests a dependency between social capital and SES.[16] Low SES individuals might benefit from bonding social capital but miss out on the beneficial effects of linking social capital.

In Malawi, child undernutrition rates and poor nutrition practices persist and bear a large potential negative impact on children's health.[17 18] Furthermore, social inequalities exacerbate child undernutrition.[19] Children in urban areas (43%) are twice as likely as children in rural areas (22%) to have an adequately diversified diet.[19] The percentage of children who met the minimum acceptable diet increases with the mother's wealth and education. Only 4% of children whose mothers have no education have met the minimum acceptable diet compared with 24% of children whose mothers have more than secondary education.[19]

Research gaps exist within the studies on social capital and childcare practices. First, limited studies have examined the association between social capital and childcare practices while considering SES group differences. Second, the mediating effect of social capital on the relationship between SES and childcare practices has not been comprehensively investigated in low- and middle-income countries (LMICs), including Malawi. The rural aspect of social structure and social capital must be examined to promote healthy behaviours within the given structure. Thus, understanding the basic and underlying causes of child undernutrition in rural Malawi is necessary to deliver effective and sustainable measures to reduce health inequalities and promote the better health of the most vulnerable people.

The objectives of this study were

- To examine the associations between social capital and childcare practices separately across SES groups.
- To investigate the mediation effect of social capital between SES and childcare practices.

METHODS

Study design and participants

This study used a two-stage cluster sampling, cross-sectional design in traditional authority (TA) Chimutu, the rural district in Lilongwe of Malawi.[17] Approximately 110 000 inhabitants occupy 51 group villages, including 3078 children less than 1 year old and 11 794 children aged between 1 year and 4 years.[17] The district is divided into 56 catchment areas for health surveillance assistants (HSAs), which were used as the primary sampling unit. First, 15 catchment areas were randomly selected. Based on the size of selected areas, the potential participants (the second-sampling unit) were randomly selected from the list provided by HSAs.

To be eligible for the study, mothers had to be 18 years old or above with a child aged between 12 months and 23 months living in TA Chimutu for more than 12 months and should possess a child health passport. A minimum required sample size of 320 (160 in each group) was estimated to conduct subgroup analysis. The sample size was calculated using the mean difference of minimum dietary diversity between equal-sized groups of children with a relative desired precision of 4.0% and a significance level set at 5% from Epitools software.[17] To account for the heterogeneity between clusters, the design effect of 1.8 was used based on the pilot study conducted in the study district. Data were collected from early August to mid-September 2020.

Variables

Outcome variables: childcare practices

Three outcome variables of this study were minimum dietary diversity, handwashing and complete vaccination. These measures were selected to represent childcare practices because of their positive associations with improved child's nutritional outcomes.[1]

Infant and young child feeding practice

This study considered the child minimum dietary diversity as a proxy for adequate feeding practice.[20] The WHO and UNICEF define minimum dietary diversity as children 6–23 months of age who received foods and beverages from at least five out of eight food groups in the last 24 hours.[20] Food items were categorised into eight food groups as follows: (1) breast milk; (2) grains, roots, tubers and plantains; (3) pulses (beans, peas and lentils), nuts and seeds; (4) dairy products (milk, infant formula, yoghurt and cheese); (5) flesh foods (meat, fish, poultry and organ meats); (6) eggs; (7) vitamin A-rich fruits and vegetables; and (8) other fruits and vegetables. Minimum dietary diversity was recoded into a binary with '1' indicating the child received foods from five or more food groups and '0' indicating less than five food groups.

Sanitation practice

Handwashing was self-reported from mothers whether they usually wash their hands with soap: (1) before cooking, (2) before feeding the child, (3) after cleaning a

child's bottom, and (4) after defecation or urination. The 'yes' responses were summed up with the score ranging from 0 to 4. The handwashing variable was recoded into a binary with '1' for good handwashing (score=4) and '0' for poor handwashing (score <4). Cronbach's alpha confirmed high internal consistency with a value of 0.92.

Complete vaccination

Complete vaccination variable was measured with questions asking whether the mother's child had received all recommended immunisations by age 12 months: (1) one dose of BCG against tuberculosis, (2) three doses of diphtheria–pertussis–tetanus vaccine, (3) three doses of polio vaccine and (4) one dose of measles vaccine.[19] Research assistants confirmed the child immunisation records from the health passport. This outcome variable was coded as '1' for complete vaccination (received four vaccinations) and '0' for incomplete vaccination.

Exposure variable and potential mediator: social capital

The Short Version of the Adapted Social Capital Assessment Tool (SASCAT) was used to quantitatively assess structural and cognitive dimensions of social capital at individual level.[11 21] Cultural adaptation of the SASCAT was employed by local research assistants to ensure the validity of the tool. Translation and back-translation to local language (Chichewa) underwent pretesting to appropriate the SASCAT for rural Malawi setting.

Structural social capital questions in the SASCAT covered group membership, social support from individuals and citizenship activities. The total number of group membership was scored from the seven questions about the mother's social group participation in the last 12 months (range 0–7). The total number of social support (emotional, financial or informational support) received from individuals in the past 12 months was summed from eight individuals (range 0–8). Citizenship activity was assessed based on two questions about the mother's actions to community problems in the past 12 months. The yes responses were summed to calculate a score (range 0–2) and was categorised as '0', no involvement in citizenship; '1', talked or joined in community matters; and '2', talked and joined in community matters.

Cognitive social capital was measured based on answers to four questions about if mothers had the trust, social harmony, sense of belonging and sense of fairness in the community. Community is defined as a group of people living in a definite geographical area, characterised by sharing common lifestyles and various social interactions. The yes responses were summed up with the range of the score from 0 to 4. Cognitive social capital was categorised as 'low' if the score was less than three and 'high' if the score was greater than or equal to three.

Cronbach's alpha suggested reasonable and moderate reliability for the social capital variables. The reliability coefficients were 0.62 for group membership, 0.63 for social support, 0.73 for citizenship activities and 0.72 for cognitive social capital. These variables have been used in earlier research in a context similar to that of Malawi.[22 23]

Socioeconomic status

The household wealth index was constructed from items derived from the Malawi Demographic and Health Survey (MDHS) using a principal component analysis (PCA).[19 24 25] The items were durable assets (eg, refrigerator and television), housing characteristics (eg, the material of the floor, main cooking fuel and number of rooms), number of livestock and access to basic services (eg, electricity supply, source of drinking water and sanitation facilities). The median of the composite scores from the PCA was used as a cut-off point to stratify mothers into lower and higher SES groups. The composite score of the wealth index is a measure of relative rather than absolute SES, which can be used to assess SES ranking within a hierarchy across the study district.[24]

Confounders

Potential confounders of the association between social capital and childcare practices were considered based on previous studies.[23] Demographic factors included were mother's age, marital status, child's age in months, child's sex, child's birth order and total number of household members. Socioeconomic factors, such as mother's education level, mother's employment status and household food security,[26] were also considered.

Data analysis

Mother's social capital and sociodemographic characteristics are presented with mean and SD for continuous variables and percentage distribution for categorical variables. To test the SES group differences, Rao-Scott adjusted χ^2 tests were performed for categorical variables[27] and t-tests for continuous variables using the svyttest function in the R survey package. These approaches account for the complex survey design.[27]

In this study, mothers (the second-stage samples) were nested within the HSAs' catchment communities (the primary sampling units). To account for the cluster effect, multilevel logistic regressions with random intercept models were applied.[28–30] Multilevel logistic analysis was performed in two steps. The first step involved fitting a null model (ie, a random intercept model). In this model, the probability of outcomes (minimum dietary diversity, handwashing and vaccination) was solely a function of communities, detecting the possible variance between communities. The second model included individual-level social capital variables as fixed effects and confounders to examine the extent to which community-level differences were explained by the individual factors. Variations in the outcomes due to cluster effects were quantified by calculating the intraclass correlation coefficient (ICC).[28 29] ORs with 95% CIs were calculated. The models were tested separately for total participants and each SES group to identify independent predictors of childcare practice outcomes.

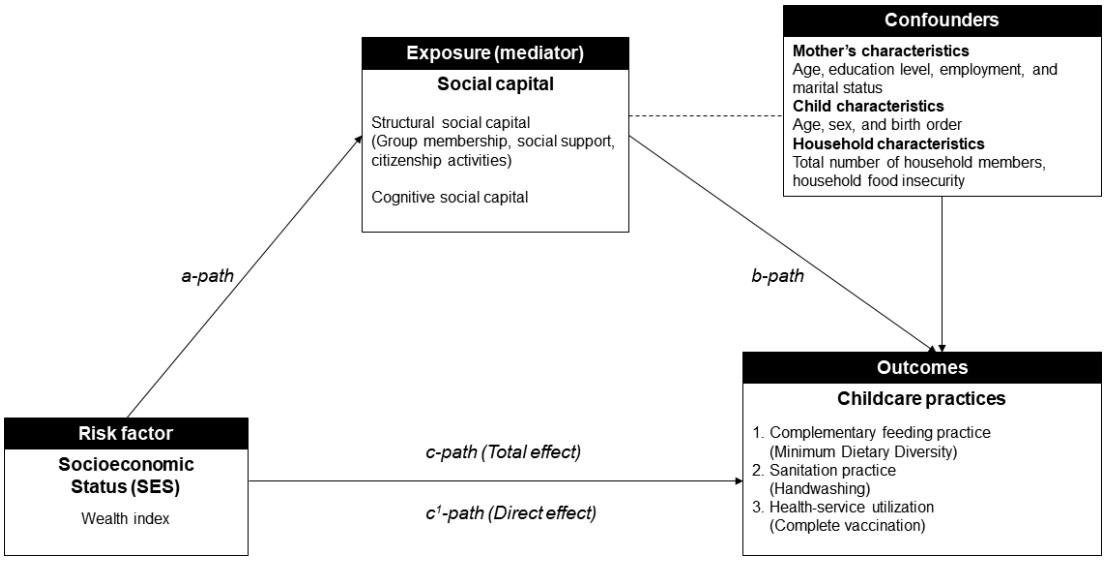

Figure 1 Hypothesised conceptual framework on the association between mother's socioeconomic status, social capital and childcare practices.

Model-based causal mediation analysis was performed using the R mediation package to examine the hypothesised mediating role of the social capital between SES and childcare practice outcomes.[31 32] The mediation analysis needs to meet the following conditions (figure 1):

- SES was significantly associated with childcare practice outcomes (total effect, path *c*).
- SES was significantly associated with social capital (path *a*).
- Social capital was significantly associated with childcare practice outcomes, controlling for SES (path *b*).
- The effect of SES on childcare practice outcome was reduced (direct effect, path c^1 after controlling for social capital (indirect effect, $a \times b$).

Mediation analysis was conducted using a two-step process, including mediator and outcome models.[31 32] First, the mediator model included social capital as a function of the SES and other confounders. Next, the outcome model included the childcare practice outcomes, social capital (mediator) and the same set of confounders used in the mediator model. The linear regression fit with the least squares and the logit regression for the mediator and outcome models were employed, respectively. The R mediation package employed a path analytical framework and a non-parametric bootstrapping technique to calculate estimates for the average direct, indirect and total effects.[31] The bootstrapping allows inferences about indirect effects to be made. Statistical significance was set at 0.05. All statistical analyses were performed in RStudio V.1.4.1 using the survey package, adjusting for the complex sampling design.

Patient and public involvement

The authors acknowledge the assistance from the community members and HSAs of TA Chimutu. Patients or the public were not involved in the design, conduct, reporting or dissemination of this research.

RESULTS

Table 1 presents the basic characteristics of the mothers (N=320). The mean age was 26.7 years and 89.7% were married. The average age of their child was 16.1 months; 50.9% were girls; and 86.8% were being breast fed. Almost all households have access to an improved source of water (99.7%) and sanitation facility (99.1%). Only the mother's education level and employment status were significantly different between lower and higher SES groups. Significant disparities were found in the proportion of mothers meeting the minimum dietary diversity and handwashing between mothers with higher SES and lower SES. In contrast, vaccination outcome showed no significant difference between the two groups.

The proportions of a mother's social capital by SES (n=160 for each) are presented in table 2. Almost half of the mothers (47.2%) were members of a religious group, followed by a village bank or funeral group (40.0%). Overall, the mothers with higher SES had higher levels of structural social capitals, including group membership and social support. On average, mothers with lower SES had memberships to 1.7 groups, and those with higher SES had memberships to 2.3 groups (range 0–7, p<0.01). The mothers with lower SES received social support from three individuals, whereas mothers with higher SES received social support from four individuals (range 0–8, p=0.01). The higher SES group had significantly higher levels of social support from government officials, non-governmental organisations (NGOs), community leaders and political leaders, which are categorised as linking social capital. No distinguishable difference was found for bonding social capital, including support from neighbours, family, religious leaders and friends between the two groups. Almost half of mothers were involved in citizenship activity and had high levels of cognitive social capital for both groups.

Table 1 Basic characteristics of mothers by SES

	Total			Lower SES			Higher SES		
Variables	**% or mean**	**SD**	**Range**	**% or mean**	**SD**	**Range**	**% or mean**	**SD**	**Range**
Childcare practice outcomes									
Minimum dietary diversity	53.8			38.1			69.4***		
Handwashing	65.3			55.6			75.0**		
Complete vaccination	85.9			86.9			85.0		
Mother's characteristics									
Age (years)	26.7	6.3	18–49	26.5	6.4	18–46	26.8	6.2	
Married (vs single)	89.7			88.1			91.3		
Education									
None	5.6			7.5			3.7		
Primary education	69.7			75.6			63.8		
Secondary school or above	24.7			16.9			32.5*		
Employed	24.4			15.6			33.1**		
Religion									
No religion	1.3			1.9			0.6		
Catholic and Christian	95.9			95			96.9		
Muslim	2.8			3.1			2.5		
Ethnic group									
Chewas	90.9			93.8			88.1		
Ngoni	4.1			3.1			5.0		
Others	5.0			3.1			6.9		
Child characteristics									
Age (month)	16.1	3.8	12–23	15.2	3.8	12–23	16.3	3.8	
Sex (girl)	50.9			51.3			50.6		
Birth order	2.4	1.5	1–8	2.4	1.5	1–7	2.3	1.5	
Breast fed	86.6			86.3			86.9		
Household characteristics									
Total number of HH members	4.2	1.5	2–10	4.1	1.4	2–9	4.4	1.5	
HH food insecurity									
Severely food insecure	32.5			29.4			35.6		
Moderately food insecure	10.9			15.0			6.9		
Mild food insecure	14.4			15.6			13.1		
Food secure	42.2			40.0			44.4		
Improved sanitation facility	99.7			99.4			100		
Improved source of water	99.1			98.8			99.4		

Total (N=320), lower SES (n=160), higher SES (n=160).
*P<0.05, **P<0.01, ***P<0.001.
HH, household; SES, socioeconomic status.

Table 3 shows the multilevel logistic regression analyses with random intercepts. These results predict childcare practice outcomes, including minimum dietary diversity, handwashing and complete vaccination, from social capital variables separately by different SES groups, after adjusting for confounders and clusters. The community-level variations in childcare outcomes were quantified using ICCs from the null models and full models. The ICCs from the null models show 0.14 for minimum dietary diversity, 0.18 for handwashing and 0.13 for complete vaccination for all mothers. A higher number of social support was associated with 44% and 42% increased odds of meeting the minimum dietary diversity and handwashing among all mothers, respectively. No other social capital variables presented significant associations with childcare practice outcomes.

Table 2 Distribution of mother's social capital by SES

	Total		Lower SES		Higher SES	
Social capital variables	% or mean	SD	% or mean	SD	% or mean	SD
Group membership						
Religious group	47.2		41.3		53.1*	
Village bank or funeral group	40.0		30.0		50.0***	
Women's group	32.8		29.4		36.3	
Work-related or trade union	32.5		29.4		35.6	
Sports group	22.2		20.0		24.4	
Community association	13.4		13.8		13.1	
Political group	12.2		10.0		14.4	
Total number of group membership	2.0	1.7	1.7	1.6	2.3**	1.7
Social support						
Neighbours	58.4		55.0		61.9	
Family	58.1		54.4		61.9	
Government officials/civil service	47.5		35.0		60.0***	
Religious leaders	45.0		40.0		50.0	
Charitable organisations/NGOs	42.2		35.0		49.4**	
Community leaders	41.9		33.1		50.6*	
Friends who are not neighbours	35.9		32.5		39.4	
Political leaders	13.8		9.4		18.1**	
Total number of social support	3.4	2	2.9	1.9	3.9**	1.9
Citizenship activity						
No involvement in citizenship	40.3		45.0		35.6	
Talked or joined in community matters	21.3		20.6		21.9	
Talked and joined in community matters	38.4		34.4		42.5	
Cognitive social capital						
Majority of people can be trusted	79.4		78.8		80.0	
Majority of people get along	82.2		78.8		85.6	
Really feel part of the community	89.7		88.1		91.3	
Community taking advantage of you	7.5		7.5		7.5	
Low cognitive social capital (0–2)	28.4		31.9		25.0	
High cognitive social capital (3-4)	71.6		68.1		75.0	

Total (N=320), lower SES (n=160), higher SES (n=160).
Cognitive social capital was defined as 'low' if the score was less than 3 and 'high' if the score was greater than or equal to 3.
*P<0.05, **P<0.01, ***P<0.001.
NGO, non-governmental organisation; SES, socioeconomic status.

Subgroup analyses by SES are presented in table 3. Receiving one more social support was associated with 33% and 63% higher odds of meeting the minimum dietary diversity in lower and higher SES groups, respectively. An increase in the number of social support was positively associated with mothers washing hands for both lower SES group (adjusted OR (AOR)=1.40, 95% CI 1.04 to 1.90; p=0.03) and higher SES group (AOR=1.53, 95% CI 1.13 to 2.08; p=0.01). However, having more group membership, involvement in citizenship activity and higher cognitive social capital were not significantly associated with meeting the minimum dietary diversity and washing hands. A child having complete vaccination was not associated with any social capital variables among the higher SES group. However, mothers in the lower SES group with high cognitive social capital were 93% less likely to complete vaccination (AOR=0.07, 95% CI 0.01 to 0.68; p=0.03).

Table 4 presents the mediating effect of social capital between SES and minimum dietary diversity after adjustment for other factors. Only social support and minimum dietary diversity met the conditions to conduct the mediation analysis. Mediation analysis with bootstrapping approach showed that the effect of SES on the minimum

Table 3 Multilevel logistic regression models of the association between social capital and childcare practice outcomes by SES

	Null model	AOR (95% CI)	P value	Null model	AOR (95% CI)	P value	Null model	AOR (95% CI)	P value
Outcome: minimum dietary diversity	**Total**			**Lower SES**			**Higher SES**		
Fixed effects									
Group membership		1.16 (0.93 to 1.45)	0.16		1.14 (0.81 to 1.62)	0.42		1.19 (0.88 to 1.60)	0.25
Social support		1.44 (1.22 to 1.71)	<0.001		1.33 (1.03 to 1.78)	0.05		1.63 (1.18 to 2.26)	0.01
Citizenship activity (ref. no involvement)									
Talked or joined in community matters		1.95 (0.89 to 4.27)	0.09		1.25 (0.41 to 3.86)	0.68		3.49 (0.98 to 12.42)	0.06
Talked and joined in community matters		1.64 (0.64 to 4.19)	0.28		1.32 (0.36 to 4.78)	0.66		2.28 (0.70 to 7.38)	0.16
Cognitive social capital		1.00 (0.48 to 2.10)	0.99		1.26 (0.34 to 4.59)	0.71		0.94 (0.32 to 2.75)	0.90
Random effects									
Community level variance (SE)	0.54 (0.25)	0.51 (0.26)		0.25 (0.20)	0.29 (0.24)		0.31 (0.29)	0.28 (0.43)	
ICC	0.14	0.13		0.08	0.08		0.09	0.08	
Outcome: handwashing	**Total**			**Lower SES**			**Higher SES**		
Fixed effects									
Group membership		1.05 (0.81 to 1.36)	0.72		1.08 (0.83 to 1.41)	0.54		1.05 (0.73 to 1.50)	0.78
Social support		1.42 (1.23 to 1.64)	<0.001		1.40 (1.04 to 1.90)	0.03		1.53 (1.13 to 2.08)	0.01
Citizenship activity (ref. no involvement)									
Talked or joined in community matters		1.68 (0.60 to 4.69)	0.30		1.89 (0.58 to 6.16)	0.27		1.61 (0.37 to 6.98)	0.49
Talked and joined in community matters		1.55 (0.59 to 4.10)	0.35		2.00 (0.45 to 8.94)	0.34		1.14 (0.56 to 2.31)	0.69
Cognitive social capital		1.25 (0.52 to 3.00)	0.60		1.66 (0.54 to 5.08)	0.27		1.27 (0.43 to 3.77)	0.65
Random effects									
Community level variance (SE)	0.73 (0.38)	0.48 (0.34)		0.41 (0.29)	0.01 (0.01)		0.92 (0.52)	1.22 (0.70)	
ICC	0.18	0.13		0.11	0.01		0.22	0.22	
Outcome: complete vaccination	**Total**			**Lower SES**			**Higher SES**		
Fixed effects									
Group membership		1.14 (0.77 to 1.68)	0.50		1.06 (0.64 to 1.74)	0.82		1.14 (0.62 to 2.11)	0.66

Continued

Table 3 Continued

	Null model	AOR (95% CI)	P value	Null model	AOR (95% CI)	P value	Null model	AOR (95% CI)	P value
Social support		0.97 (0.77 to 1.23)	0.81		0.84 (0.52 to 1.35)	0.44		0.97 (0.79 to 1.19)	0.75
Citizenship activity (ref. no involvement)									
Talked or joined in community matters		0.53 (0.10 to 2.78)	0.43		1.22 (0.15 to 9.90)	0.84		0.30 (0.02 to 5.99)	0.40
Talked and joined in community matters		0.41 (0.10 to 1.67)	0.20		0.34 (0.02 to 6.36)	0.44		0.34 (0.11 to 1.05)	0.06
Cognitive social capital		0.40 (0.11 to 1.46)	0.15		0.07 (0.01 to 0.68)	0.03		0.91 (0.13 to 6.33)	0.92
Random effects									
Community level variance (SE)	0.50 (0.41)	0.36 (0.54)		0.80 (0.70)	0.48 (1.69)		0.00 (0.00)	0.00 (0.00)	
ICC	0.13	0.10		0.19	0.13		0.00	0.00	

Total (N=320), lower SES (n=160), higher SES (n=160).
Models were adjusted for mother's characteristics (age, education level, employment and marital status), child characteristics (age, sex and birth order), household characteristics (total number of household members and household food insecurity) and complex survey design.
AOR, adjusted OR; ICC, intraclass correlation coefficient; SES, socioeconomic status.

dietary diversity was reduced after controlling for social capital (indirect effect, a×b). This implies that receiving higher number of social support partially mediated the association of SES and minimum dietary diversity. The mediation effect of social support accounted for 27.3% of the total effect between SES and minimum dietary diversity.

DISCUSSION

The present study has four main findings. First, it highlighted that the levels of social capital and childcare practice outcomes were socially patterned across SES groups. Moreover, the higher SES group was estimated to have higher odds of better feeding and handwashing with increased social support than the lower SES group in the subgroup analysis. Second, the mediating role of social support was found in the relation between SES and feeding practice, partially explaining health inequalities. Third, not all forms of social capital may be equally relevant for childcare practices. In this study, only social support was positively associated with feeding and handwashing for all mothers. Finally, a negative association was detected between cognitive social capital and complete vaccination among mothers with lower SES.

Socioeconomic inequalities in social capital and childcare practices

The distribution of structural social capital was socially patterned across SES in this study. Overall, mothers with higher SES were shown to have more group memberships and social support than mothers with lower SES. A significant difference was found in the source of social support between the two groups. Mothers with higher SES had significantly higher levels of social support received from linking social capital, including government officials, NGOs, community leaders and political leaders. Socioeconomically advantaged individuals often have high levels of linking social capital, a contention that has been confirmed by other countries.[33 34] Social support from these heterogeneous groups provide wider access to diverse resources such as information, tangible assets, economic and cultural capitals that may be more effective and beneficial to childcare.[23 34] Hence, mothers with higher SES were more likely to use existing or potential resources available via social capital, leading to better childcare practices.

In the subgroup analysis, social support was positively associated with childcare practices for both lower and higher SES groups. However, socioeconomic disparities were found as the odds of adequate feeding and handwashing with receiving one more social support were larger for mothers with higher SES than for mothers with lower SES. These results corroborated with former studies that analysed the associations between SES, social capital and health.[35 36] Both groups benefited from social support, yet mothers with higher SES benefited more within the same community. This finding suggests that

Table 4 Mediation effect of social support between socioeconomic status and minimum dietary diversity (N=320)

	Total effect (*c*)		Direct effect (c^1)		Indirect effect (*a*×*b*)*		
	β	95% CI	β	95% CI	β	95% CI	Proportion mediated (%)
Minimum dietary diversity	0.23†	0.17 to 0.27	0.17*	0.09 to 0.22	0.06†	0.04 to 0.10	27.3

Model was adjusted for mother's characteristics (age, education level, employment and marital status), child characteristics (age, sex and birth order) and household characteristics (total number of household members and household food insecurity).
*P<0.05
†P< 0.001
β, coefficient.

social capital may explain inequalities in childcare practices, while posing a possible solution to overcome such inequalities and improve childcare practices.

In the present study, a potential mediating role of social capital was quantified in the relations between SES and childcare practices. Social support was found as a partial mediator between SES and feeding practice after controlling for other sociodemographic factors. This result suggests that social support can partly explain social inequalities in feeding practice in rural Malawi, confirming the mediating role of social capital concerning health inequalities.[35 36] Further, this finding supports the fundamental cause theory of health disparities.[33] Mothers with higher SES were more likely to have greater social supports and that greater support provided wider and frequent access to resources promoting good childcare practice. This study extended to the protective role of social capital amid SES inequalities, posing an important implication for interventions aimed to improve feeding practice and reduce health inequalities in LMICs.

Structural social capital and childcare practices

Not all dimensions of structural social capital predict better childcare practices. Only social support was shown to be positively associated with meeting the minimum dietary diversity and handwashing practices for mothers in rural Malawi. The results were consistent with previous studies on social capital predicting better childcare practices.[22 37–39] For example, social support was associated with improving infant feeding practice in sub-Saharan African countries.[22 38] Similarly, social support was identified as a determinant of healthy feeding practices for children in high-income countries.[37 39] Moreover, the role of social support was validated in improving handwashing practices in LMICs.[40–42] This finding suggests that social support is positively associated with healthy feeding and handwashing across countries.

Several mechanisms can hypothetically explain the link between structural social capital and childcare practices.[15] First, social support may diffuse the information on childcare practices through the personal network, particularly from bridging and linking social capital, influencing healthy feeding[33 43] and handwashing practices.[44] Second, social support may exert psychosocial influence by maintaining healthy behavioural norms.[15] Social interaction and context were shown to shape an individual's health behaviour by providing an acceptable or appropriate course of action.[43] Third, social support may promote access to tangible services and sources related to feeding and handwashing practices.[44] Further studies are necessary to examine the mechanisms on how different types of social support influence childcare practices.

Complete vaccination was not associated with a higher number of social support, unlike feeding and handwashing practices. This finding suggests that social support might operate differently, depending on the nature of childcare practices. The characteristics of childcare practices may provide insight into how each type of social support plays a significant or otherwise role to influence the healthy behaviours of mothers in rural Malawi. Feeding and handwashing practices are daily routine that demands substantial informational, emotional and instrumental support with higher frequency. In contrast, vaccination is an occasional routine following the recommended immunisation schedule supported by the government.[19 45] In Malawi, the Universal Childhood Immunisation programme delivers the vaccines through static and outreach clinics free of charge.[46] Further study is required to explore how specific dimensions of social support influence childcare practices.

Adequate resources alone are not sufficient to improve childcare practices. After stratifying the mothers by SES, social support was significantly associated with better feeding and handwashing practices for both groups. This finding suggests that what is health promoting for mothers with higher SES is also the same for mothers with lower SES. Almost all households have access to improved sanitation facilities and sources of water in this study. Mothers will feed the child better and wash hands appropriately with social support.

Cognitive social capital and childcare practices

High levels of cognitive social capital were found to be negatively associated with the vaccination among mothers with lower SES. This finding is conflicting with previous literature on the associations between cognitive social capital and vaccination. Many studies have shown that cognitive social capital, such as social trust,[47] social ties[48] and social cohesion,[49] is positively associated with a child's immunisation status. Moreover,

systematic reviews on vaccine hesitancy identified high trust in the health system and healthcare providers as a facilitator for vaccination.[50 51] It should be noted that these studies have used different indicators of cognitive social capital. Thus, conclusive statements on the association between cognitive social capital and vaccination cannot be made.

The negative association between cognitive social capital and vaccination among mothers with lower SES highlights two important points. First, cognitive social capital does not uniformly harm or benefit good childcare practices of mothers who are part of the same community. Second, cognitive social capital may have a negative influence on childcare practice outcomes, which is often overlooked in the literature on social capital and health.[52] The literature on social contagion and the negative consequences of social capital may explain this finding.[52 53] Cognitive social capital tends to generate the dominant social norms and platforms to diffuse the information that can be health damaging.[53] In addition, cognitive social capital can demand conformity.[53] Religious beliefs and rumours influenced vaccine hesitancy.[51] Informal control may be so strong that mothers were likely to refuse immunisation in combination with economic disadvantage. Further study is needed to examine these alternative explanations on the negative side of social capital.

This present study benefits from several strengths. First, this is one of the first studies investigating the associations of social capital and childcare practices while considering SES differences simultaneously in the LMIC context. It also is the first to examine the mediating role of social support in the relation between SES and feeding practice in Malawi. Last, a validated social capital tool was applied to reduce measurement bias.

This study has a few limitations. First, it was a cross-sectional study, which limits explaining causal inference between SES, social capital and childcare practices. Still, the associations of the variables are in line with the social causation hypothesis[54] and the UNICEF's framework on child undernutrition.[1] Second, this study focused on received social support and not specific types of social support. Other types of social support may have different effects on childcare practice outcomes. Furthermore, perceived social support is known to be consistently associated with health outcomes than the received social support.[55] Third, the childcare practice outcomes were self-reported, subject to response bias by social desirability.[56] However, the research assistants recorded the child immunisation status from health passports to minimise the bias in the outcome assessment. Last, ICCs estimated the unexplained heterogeneity between communities. However, community-level variables were not available to further investigate the contextual effect on the childcare practice outcomes. Future studies should consider including community-level social capital variables and other covariates.

CONCLUSIONS

Structural social capital, particularly social support, was associated with feeding and handwashing practices irrespective of SES, but it was unequally distributed by SES in rural Malawi. Socioeconomic inequalities in feeding practices were partially explained by social support. Cognitive social capital was negatively associated with vaccination among mothers with lower SES. These findings are significant in LMIC context where other forms of capital (ie, financial, human, physical or natural capital) are lacking. To improve feeding and handwashing practices and to reduce health inequalities, policies and interventions must not be limited to providing instrumental resources. Rather, government and organisations should consider promoting the value of social support and health. Future research is needed to explain the negative association between cognitive social capital and vaccination among the lower SES group.

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