

Pathways to Parental Involvement in School Feeding Programmes in Tanzania: A Mediation of Beliefs, Invitations, and Resources

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Abstract

In Tanzania, school feeding programmes (SFPs) have been introduced to improve children's nutrition, attendance, and learning outcomes. However, these initiatives often depend on external support, and parental involvement remains limited, raising concerns about sustainability and local ownership. Guided by Bronfenbrenner's ecological systems theory and the Hoover-Dempsey and Sandler model of parental involvement, this study examined how parents' beliefs influence their participation in SFPs through two mediating mechanisms: school invitations and parental resources. A cross-sectional survey involving 500 parents from 20 primary schools in the Mara Region of Tanzania was conducted. Using structural equation modelling (SEM), a double-mediation model was tested, controlling for gender, the number of children, and parents' education level. The direct effect of parents' beliefs on involvement was not significant ($\beta = 0.07, p = .30$), indicating that beliefs alone did not directly predict engagement. Instead, their association operated indirectly through invitations and resources, which translated beliefs into active participation. When analysed separately, both mediators showed significant indirect effects, confirming a double mediation relationship. The invitations pathway was stronger ($\beta = 0.37, p < .001$), suggesting that when parents felt welcomed and encouraged by schools and teachers, their involvement might increase. The resources pathway also had a smaller but significant effect ($\beta = 0.26, p < .001$), showing that the presence of resources can facilitate engagement. Overall, the total effect remained significant ($\beta = 0.55, p < .001$), indicating full mediation. Among controls, gender and parents' education level had no effect, while having more children slightly reduced both perceived invitations and participation.

Keywords: Parental involvement, School-family partnership, School feeding programs, Primary Schools, Hoover-Dempsey and Sandler Model.

Introduction

School feeding programs (SFPs) have become a vital component of education and social protection strategies across low- and middle-income countries. In Tanzania, SFPs are designed to alleviate short-term hunger among schoolchildren, improve nutritional outcomes, increase attendance, and enhance learning performance. Recent evidence from Tanzania demonstrates that school meals have measurably reduced absenteeism, improved classroom concentration, and lowered dropout risk in study sites across the country (Roothaert *et al.*, 2021).

A continent-wide synthesis of the 2019 Global Survey confirms that school meal programs serve as social protection mechanisms, improving children's nutrition and strengthening local agrifood economies through local procurement, with documented links to reduced absenteeism and improved concentration in African schools (Wineman *et al.*, 2022). For many pupils, particularly those in rural and food-insecure areas, a school meal may be the only reliable source of daily nourishment.

A recent cluster-randomised trial in Dodoma, Tanzania, demonstrated the feasibility of integrated school nutrition packages that combine meals, education, and gardens, providing robust evidence for school-based nutrition interventions among Tanzanian adolescents (Wang *et al.*, 2024). However, despite their proven benefits, school feeding initiatives in Tanzania continue to face challenges of irregular implementation, limited coverage, and poor sustainability, which compromise their effectiveness in supporting children's education and well-being.

This study was therefore conducted to examine the underlying factors that influence parental involvement in school feeding programs in Tanzanian primary schools. Specifically, it aimed to investigate the relationship between parents' beliefs and their involvement, as well as how school invitations and available parental resources influence this relationship. By identifying the mechanisms that encourage or discourage parental engagement, the study aims to inform strategies for strengthening community ownership, sustainability, and accountability within Tanzania's school feeding framework.

Literature Review

School Feeding Program in Primary Schools

Persistent food insecurity and poverty exacerbate school-related problems such as low attendance, high dropout rates, and poor concentration in class. National data reveal that 59% of Tanzanian households' experience moderate to severe food insecurity, with rural households disproportionately affected (World Bank, 2023). A district-level study in Kisarawe documented ongoing

undernutrition among school-age children, with 11% classified as thin and 34% anaemic, underscoring the nutritional vulnerability of children in resource-constrained settings (Sebba *et al.*, 2025). Children who attend school on an empty stomach are less able to focus and more likely to miss school days, particularly during agricultural lean seasons. These challenges are especially evident in rural regions such as Mara, where household livelihoods are vulnerable to drought and fluctuating food supplies. Household poverty directly constrains families' ability to contribute financially to school feeding initiatives, with research showing that lower socio-economic status is associated with reduced participation in and benefits from SFPs (Akyoo & Akyoo, 2025; Robert *et al.*, 2025).

While the introduction of fee-free primary education has expanded enrolment, it has also increased pressure on schools and communities to provide non-tuition support, including food and nutrition services. Studies in Arusha and Iringa municipalities confirm that school feeding programs have a positive influence on pupil retention and attendance, particularly in the context of fee-free education policies (Athuman, 2024; Mmari *et al.*, 2025).

To address these concerns, the Government of Tanzania has developed a series of policies and guidelines promoting school feeding. Notably, the National Guidelines for School Feeding and Nutrition Services (2021) highlight the importance of community participation, parental support, and local ownership (Roothaert *et al.*, 2021). A comprehensive policy review documented that Tanzania's school health and nutrition framework includes provisions for school meals, micronutrient supplementation, deworming, and health education, but implementation remains fragmented and under-resourced (Sando *et al.*, 2024; URT, 2020).

However, in practice, the majority of school feeding initiatives remain donor-driven, relying heavily on international organisations and development partners for funding, food supplies, and logistical support. A systematic review of African school feeding programs revealed that donor dependency is a significant barrier to long-term sustainability, as many programs collapse after external support ceases (Mainje *et al.*, 2024). When donor projects phase out, many schools struggle to continue the programs, revealing a deep dependence on external aid and a lack of robust community-based mechanisms for sustainability. Empirical studies from Kilimanjaro and Karatu districts confirm that sustainability challenges persist even in locally initiated programs, with schools facing difficulties in securing consistent food supplies and maintaining operational capacity (Athumani, 2024; Mmari *et al.*, 2025).

Parental Involvement in School Feeding

Despite policy emphasis on parental and community engagement, parents' involvement in school feeding programs remains limited in most public primary schools. In many cases, parents view school feeding as a government or donor responsibility rather than a shared community obligation (Robert *et al.*, 2025). Research in the Nzega District identified several factors influencing parental engagement, including socio-economic capacity, awareness of program benefits, communication between schools and parents, and perceptions of responsibility (Robert *et al.*, 2025).

A phenomenological study across Tanzanian public primary schools revealed that implementation hurdles include unclear roles for parents, insufficient sensitisation about the importance of school meals, and weak institutional mechanisms for parental involvement (Athumani *et al.*, 2024). Barriers such as limited financial capacity, low awareness, weak communication between schools and parents, and unclear expectations about parental roles contribute to this disengagement. Studies in Gairo District Council found that while parents recognise the importance of school feeding, their actual contributions are constrained by poverty, competing household demands, and lack of coordination with school committees (Haule & Mwinami, 2024). This situation raises critical questions about what drives or constrains parental participation, and how their motivation and circumstances interact with the school environment to influence their involvement.

Understanding the psychological, social, and contextual factors that shape parents' willingness and ability to engage in school feeding is therefore crucial. Research in Dar es Salaam identified socio-economic determinants, including caregiver education, household income, and the number of income sources, as key predictors of parental engagement and contributions to school feeding practices (Akyoo & Akyoo, 2025). A systematic review of school-based nutrition interventions in sub-Saharan Africa emphasised that effectiveness is linked to parental and community involvement, program design, and operational supports, highlighting that parental engagement interacts with school governance and supply chains to influence outcomes (Kyerere *et al.*, 2020).

Conceptual frameworks developed for Tanzanian contexts recommend multi-component approaches that address leadership and public awareness, operational modalities, parental contributions, and meal diversity, explicitly positioning social and contextual drivers as levers to increase engagement and sustainability (Roothaert *et al.*, 2021). Exploring these pathways can help identify how parents' beliefs, perceptions of school invitations, and available resources translate into meaningful participation. Without such understanding,

efforts to institutionalise school feeding risk remaining externally dependent and unsustainable.

Theoretical Framework

This study was guided by two complementary theoretical perspectives: the Hoover-Dempsey and Sandler model of parental involvement (Hoover-Dempsey & Sandler, 1995, 1997; Hoover-Dempsey *et al.*, 2005) and Bronfenbrenner's Ecological Systems Theory (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006). Together, these frameworks provide a comprehensive understanding of the psychological and contextual factors that influence parents' involvement in school-based activities, such as school feeding in Tanzania. The integration of motivational and ecological perspectives has proven effective across diverse contexts (Green *et al.*, 2007; Mallick, 2023), providing a strong theoretical foundation for understanding parental participation in resource-constrained environments.

The Hoover-Dempsey and Sandler model posits that parents' engagement in their children's education is determined by what they believe about their role and responsibility (role construction), their confidence in their ability to make a difference (self-efficacy), and the extent to which they feel invited by teachers, schools, or children to participate (Hoover-Dempsey & Sandler, 1997; Walker *et al.*, 2005). It also recognises that parents' involvement is shaped by their available resources, including time, energy, knowledge, and financial means (Hoover-Dempsey *et al.*, 2005).

Evidence from Tanzanian studies supports the applicability of this framework: Kigobe *et al.* (2025) found that school-led invitations and communication were strong predictors of parental involvement in literacy development, while interventions that enhanced parents' confidence and skills improved children's reading outcomes. Kigobe *et al.* (2018) demonstrated that parents' role beliefs and perceived invitations are socially interconnected and remain significant predictors of involvement after controlling for socio-economic factors.

Bronfenbrenner's Ecological Systems Theory complements this motivational model by situating parental involvement within the layered contexts that shape behaviour and development. The theory emphasises that parents' actions are influenced by the immediate family and school environment (microsystem), the interactions between these systems (mesosystem), and broader social and policy structures (exosystem and macrosystem) (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006).

In the Tanzanian context, school feeding programs constitute a mesosystem in which family beliefs, school practices, and community norms intersect.

Studies across Africa (Afolabi *et al.*, 2015; Molepo, 2023; Xaba, 2015) have shown that socio-economic conditions, cultural expectations, and policy environments influence parents' engagement. Tanzanian research similarly indicates that home resources, parental education, and economic hardship influence participation (Kigobe, 2019; Mmbanga, 2020). These studies reveal that even when parents hold positive beliefs about their role, contextual constraints such as poverty and limited time often hinder their involvement.

Integrating these frameworks provides a holistic understanding of parental participation in school feeding. The Hoover-Dempsey model explains the internal psychological motivations for engagement, while ecological systems theory captures the external conditions that enable or constrain these motivations. Together, they can help in clarifying why some parents actively contribute to school feeding programs while others remain passive. A parent may believe strongly in their role and feel capable, yet without supportive school communication, clear invitations, or adequate household resources, their engagement remains limited.

Conversely, when schools build trust, provide training, and maintain open communication, parents' involvement increases (Kigobe *et al.*, 2021; Malingumu *et al.*, 2023). Thus, the two theories above position parental involvement as the product of an interaction between individual beliefs, social invitations, and contextual resources within broader ecological systems. By applying well-established models that have been used in Tanzanian settings (Kigobe, 2019; Kigobe *et al.*, 2021; Kigobe *et al.*, 2025; Malingumu *et al.*, 2023), this study extends the understanding of parental involvement beyond literacy and learning contexts into the critical domain of school feeding and nutrition.

The Present Study

This study examined the factors that influence parental involvement in school feeding programs (SFPs) in Tanzanian primary schools, focusing on how parents' beliefs, perceptions, and contextual realities shape their participation. Despite national efforts to promote community-based school feeding through the National Guidelines for School Feeding and Nutrition Services (2021), many programs continue to depend on donor funding and external partners for implementation. This reliance raises concerns about long-term sustainability once donor support diminishes.

Evidence from sub-Saharan Africa (Bundy *et al.*, 2018; Gelli *et al.*, 2019) underscores that sustainable SFPs require strong community ownership, consistent parental engagement, and active school-community collaboration. However, in Tanzania, little is known about the psychological and contextual

mechanisms that drive or hinder parents' participation. Building on prior research (Hoover-Dempsey & Sandler, 2005), this study assumes that parents are more likely to participate when they believe their involvement matters, when schools actively invite their contribution, and when they possess adequate time, energy, and skills. However, in many Tanzanian settings, socio-economic hardship, limited awareness, and weak communication between schools and parents often limit these opportunities, especially in resource-dependent programs such as school feeding.

The primary objective of this study was to investigate the factors influencing parental involvement in school feeding programs in Tanzanian primary schools. Specifically, it aimed to assess how parents' beliefs influence their involvement and to examine whether school invitations and parental resources mediate this relationship. Accordingly, the study was guided by two research questions:

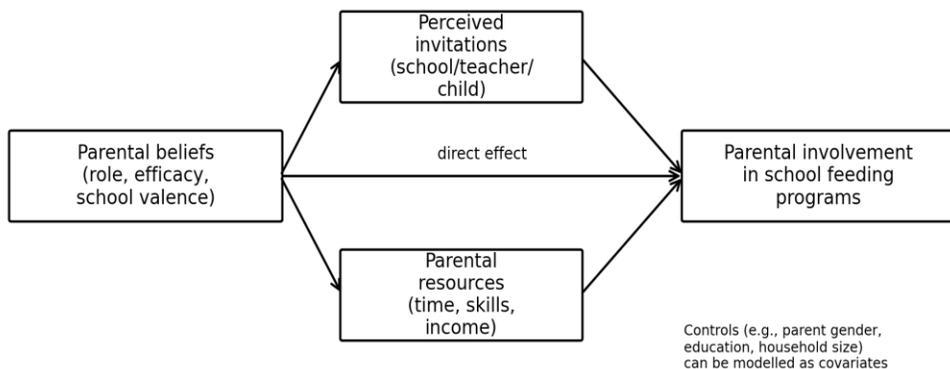
- i) How do parents' beliefs about their role and efficacy influence their involvement in school feeding programs?
- ii) To what extent do school invitations and parents' available resources mediate the relationship between parents' beliefs and their involvement?

By addressing these questions, the study provides new empirical evidence on the psychological and contextual processes that shape parental engagement. The findings offer valuable insights for strengthening community participation, reducing donor dependency, and promoting the sustainability of school feeding initiatives in Tanzania.

Conceptual Framework

Figure 1:

Conceptual framework linking parental beliefs to involvement through invitations and resources.



Study Hypotheses

Figure 1 summarises the hypothesised pathways. Parents' beliefs (role construction, self-efficacy, and school valence) are expected to predict involvement in school feeding programmes both directly and indirectly via (a) perceived invitations from the school, teachers, and children, and (b) parents' available resources (time/energy, skills/knowledge, and income). Consistent with the theoretical framework, invitations serve as a social-motivational mechanism, while resources constitute enabling constraints. Specifically, the study will test the following hypotheses.

H1: Parents' beliefs positively predict parental involvement in school feeding programs.

H2: Perceived school invitations mediate the relationship between parents' beliefs and parental involvement.

H3: Parents' available resources mediate the relationship between parents' beliefs and parental involvement.

Method

Research Design and Approach

This study employed a quantitative cross-sectional survey design to examine the predictors of parental involvement in school feeding programs (SFPs) across public primary schools in the Mara Region of Tanzania. The design enabled a snapshot assessment of how parents' beliefs, school invitations, and available resources interact to shape their participation in SFPs. Given the cross-sectional design, all findings are interpreted as associations rather than causal effects.

Sampling and Participants

The sampling frame comprised 231 public primary schools participating in Project Concern International's (PCI) "Pamoja Tuwalishe" feeding project in the Mara Region of Tanzania. A quantitative, parent-level sample size was planned a priori ($\alpha = .05$, power = .80, medium effect size $f^2 = .15$) (Faul *et al.*, 2009). The a priori analysis informed the minimum required number of parent respondents (unit of analysis). At the same time, the selection of 20 schools was intended to ensure coverage of active implementation sites and feasible field administration across the project area.

To obtain the required parent sample while ensuring coverage of schools actively implementing the program, 20 schools were purposively selected based on their active participation. Within each selected school, parents/guardians of enrolled pupils formed the eligible pool. During scheduled parent-teacher meetings, the attendance list served as the sampling frame, and a simple random procedure was used to select approximately 26

households per school (520 questionnaires in total). One parent/guardian per household was invited to participate to avoid duplicate household responses. A total of 500 parents completed the survey, resulting in a 96% response rate from the 520 questionnaires distributed. The sample comprised 53% mothers and 47% fathers. Regarding marital status, 69% were married, 26% unmarried, and 5% did not specify their status. Educational attainment varied: 6% had no formal education, 68% completed primary school, 18% completed secondary school, 5% held college diplomas, and 3% held university degrees. The family-size distribution showed that 24% had one child, 22% had two, 21% had three, 18% had four, and 15% had five or more. In terms of income, 65% earned less than 2,000 Tanzanian shillings per day (under 1 USD), 21% between 2,000–5,000 Tsh, 9% between 5,000–10,000 Tsh, and 5% above 20,000 Tsh per day, reflecting the socio-economic realities of households in rural Tanzania.

Procedure

This study formed part of a broader investigation on the sustainability of community-led school feeding programs in the Mara Region. Data collection took place during scheduled parent-teacher meetings at each participating school. Parents/guardians attending the meetings were informed about the study, and those eligible were included in the sampling list. Following the sampling procedure described in Section 3.2, selected parents/guardians were invited to complete the questionnaire, with one respondent per household.

Trained research assistants ($n = 10$) administered the survey and provided one-on-one support to participants who needed assistance with completion, including those with limited literacy. Ward Education Officers (WEOs) and head teachers facilitated meeting logistics but were not included as respondents and did not have access to individual responses. Because recruitment occurred through parent-teacher meetings, parents who did not attend meetings may be under-represented; this potential selection effect is acknowledged as a limitation.

Ethical approval was granted by the Ethics Committee of the Open University of Tanzania, the President's Office of Regional Administration and Local Government (PO-RALG), and the Mara Regional Education Office. Participation was voluntary, and informed consent was obtained from all respondents before questionnaire administration. Questionnaires were completed anonymously, and confidentiality was maintained throughout the process. To reduce social desirability bias, data collection was overseen by trained field researchers from local institutions, and school staff were not involved in administering the questionnaires.

Measures

All measures were adapted from the Hoover-Dempsey and Sandler revised model of parental involvement (Hoover-Dempsey *et al.*, 2005; Walker *et al.*, 2005), which has been used in Tanzanian contexts (Kigobe, 2019; Kigobe *et al.*, 2021; Kigobe *et al.*, 2025). The instrument was first translated into Swahili and then back-translated to ensure cultural and linguistic accuracy. Reliability analysis confirmed satisfactory internal consistency, with Cronbach's α ranging from .75 to .93.

Parental beliefs were measured using three subscales to capture parents' motivational beliefs. The *Parental Role Construction* subscale (9 items; $\alpha = .81$) assessed parents' beliefs about their responsibility for supporting school feeding, with items such as "It is my duty to contribute to school feeding activities." The *Parental Sense of Efficacy* subscale (4 items; $\alpha = .78$) measured parents' confidence in their ability to support the school feeding program, with items such as "I know how to help the school feeding program succeed." The third subscale, *Parents' Self-Reported Valence toward School* (6 items; $\alpha = .88$), assessed parents' attitudes and experiences with schooling, including items such as "My teachers cared about me" and "I liked my school." Higher scores on these subscales indicated stronger positive beliefs and motivations.

Three constructs measured perceived invitations to engage in school feeding activities. The *School Invitations* subscale (4 items; $\alpha = .76$) captured school-level communication and event organisation, such as "The school promptly informs me about meetings related to school feeding." The *Teacher Invitations* subscale (5 items; $\alpha = .84$) assessed teachers' efforts to involve parents in school feeding activities, while the *Child Invitations* subscale (5 items; $\alpha = .82$) reflected children's requests for parental involvement in SFP-related activities.

Parental resources, which reflect parents' practical capacity to participate in school feeding programs, were assessed through three components. *Time and Energy* (6 items; $\alpha = .75$) measured parents' availability to engage in school feeding activities. *Skills and Knowledge* (6 items; $\alpha = .77$) evaluated parents' perceived understanding and ability to contribute effectively, with items like "I have the necessary skills to support the school feeding program." Lastly, *Parents' income* was assessed using self-reported daily household earnings, categorised as low (below 2,000 Tsh), moderate (2,000-5,000 Tsh), or higher income (above 5,000 Tsh). Income was considered a contextual resource influencing parents' capacity to participate.

The dependent variable, *Parental Involvement in School Feeding Programs*, was measured using a 14-item scale adapted from Geyer and Feng (1993) and Walker *et al.* (2005). This scale assessed the frequency and intensity of

participation in SFP activities, with items such as “I follow up on whether my child has eaten at school” and “I attend school meetings on the feeding program.” Responses were rated on a 4-point Likert scale (1 = Always, 4 = Seldom), and the scale demonstrated excellent internal consistency ($\alpha = .93$), with lower scores reflecting higher involvement.

Statistical Analysis

Data analysis was conducted using SPSS version 28 and R version 4.3.2. SPSS was used for data screening, preliminary diagnostics, and reliability testing, while structural equation modelling (SEM) was conducted in R using the *lavaan*, *psych*, and *semTools* packages. These analytical procedures followed the recommended SEM practices outlined by Hair *et al.* (2019) and Kline (2023).

Before testing the hypothesised models, data were screened for accuracy, completeness, and normality. Little’s MCAR test indicated that the data were missing completely at random ($p > .05$), and missing values were handled using the Full Information Maximum Likelihood (FIML) method, as implemented in *lavaan*, which is robust under both MCAR and MAR conditions. Outliers were examined in SPSS, where univariate outliers were identified by standardised z -scores exceeding ± 3.29 , and multivariate outliers were detected using the Mahalanobis distance ($p < .001$). Five multivariate outliers were removed. Skewness and kurtosis indices fell within ± 2 , indicating approximate normality. Mardia’s test confirmed no severe violation of multivariate normality, and multicollinearity tests using Variance Inflation Factors (VIFs < 3) suggested acceptable independence among predictors.

Reliability and validity analyses were conducted before estimating the SEM. All constructs showed satisfactory internal consistency with Cronbach’s alpha ($\alpha \geq .75$) and composite reliability (CR $\geq .70$). Convergent validity was supported by average variance extracted (AVE $\geq .50$), and discriminant validity was established when the square root of AVE exceeded inter-construct correlations. To check for common method bias, a Harman’s single-factor test was performed, revealing that no single factor accounted for more than 40% of the variance, indicating that common method bias was not a major concern. Latent variables were created to capture the theoretical constructs proposed in the Hoover-Dempsey and Sandler model. Parental beliefs were specified as a latent variable measured by three observed indicators, role construction, self-efficacy, and school valence, each assessed through multiple Likert-scale items adapted to the Tanzanian context. The latent construct of invitations comprised three observed indicators: school invitations, teacher invitations, and child invitations, reflecting parents’ perceptions of encouragement and opportunities for participation from different sources within the school community.

The resource's latent variable was composed of three observed indicators: (1) time and energy, (2) knowledge and skills, and (3) parents' income, representing parents perceived capacity to contribute to school feeding activities. Parental involvement, as the dependent construct, was measured through three indicators: volunteering, communication with teachers, and participation in school feeding activities. Each latent construct was validated through confirmatory factor analysis (CFA) prior to the full SEM, and all factor loadings were statistically significant ($p < .001$), confirming construct validity and suitability for structural testing. The use of latent variables is recommended in SEM because it allows researchers to account for measurement error and to represent complex psychological or behavioural constructs more accurately (Byrne, 2016; Hair *et al.*, 2019; Kline, 2023).

Two structural equation models were estimated using robust maximum likelihood (MLR) estimation in R. Model 1 (Invitations Model) tested the direct and indirect effect of parents' beliefs on parental involvement through *school, teacher, and child invitations*, controlling for *resources (time, skills, and income)*, *gender*, and *number of children*. Model 2 (Resources Model) examined the direct and indirect effect of parents' beliefs on parental involvement through *resources (time, energy, skills, and income)*, while controlling for *invitations, gender, and the number of children*. Each model assessed both the direct and indirect effects of parents' beliefs on parental involvement, capturing the total, mediated, and residual pathways.

Model adequacy was evaluated using multiple fit indices based on conventional SEM thresholds: Chi-square (χ^2), Comparative Fit Index ($CFI \geq .90$), Tucker–Lewis Index ($TLI \geq .90$), Root Mean Square Error of Approximation ($RMSEA \leq .08$), and Standardised Root Mean Square Residual ($SRMR \leq .08$). Indirect (mediation) effects were examined using bias-corrected bootstrapping (5,000 resamples), and 95% confidence intervals (CIs) were used to determine statistical significance. Mediation was considered significant when the CI did not include zero. All results were interpreted using standardised coefficients (β), p -values, and CIs, with $p < .05$ considered statistically significant.

Results

Correlations Among Study Variables

Table 1 presents the descriptive statistics and Pearson correlations among the observed study variables. Overall, the pattern of correlations was consistent with theoretical expectations. Parents' own school valence, role construction, and sense of self-efficacy were all positively intercorrelated, indicating that parents who reported more positive attitudes toward schooling and stronger

confidence in their ability to contribute also tended to hold clearer beliefs about their parental role in supporting education.

Among the invitation variables, school invitations, teacher invitations, and child invitations were all significantly related to one another ($r = 0.43, 0.57, p < 0.001$), suggesting that schools that foster multiple forms of communication and encouragement create a coherent environment of engagement. Each type of invitation was also significantly and positively associated with the three belief variables ($r = 0.35, 0.61, p < 0.001$), supporting the notion that motivated parents perceive greater openness from schools and teachers.

Regarding life-context resources, skills, and knowledge, time, energy, and income were moderately intercorrelated ($r = .38, .54, p < .001$). These resource measures were positively associated with parental beliefs and invitations, indicating that parents with more capabilities, energy, and financial means are more likely to respond to school engagement efforts.

The outcome variable, parental involvement in school feeding, was significantly correlated with nearly all motivational, invitation, and resource variables ($r = 0.32, 0.66, p < 0.001$). The strongest associations were observed with school invitations ($r = .66$) and skills and knowledge ($r = .59$), implying that parents' active participation in feeding programs is most strongly driven by the extent to which schools communicate and guide involvement, and by parents' confidence in their capacity to contribute meaningfully.

Demographic controls displayed weaker associations. Gender showed small, nonsignificant correlations with most variables ($r < .10, p > .05$), suggesting that both mothers and fathers engaged similarly in school feeding activities. Number of children correlated slightly negatively with time and energy ($r = -.21, p < .01$) and involvement ($r = -.18, p < .05$), indicating that larger family size may limit parents' ability to dedicate time and resources to school programs. Income correlated moderately with resources ($r = 0.46, 0.51, p < 0.001$) but showed weaker associations with motivational and invitation variables. Parents' education level was included in the correlation matrix for completeness; however, its distribution was highly skewed toward primary education (68%), and correlations with the main study constructs were small in magnitude.

Overall, these findings indicate strong theoretical coherence among belief, invitation, and resource variables, and confirm their expected positive associations with parental involvement in school feeding programs. The observed patterns provided empirical justification for proceeding to the subsequent SEM analyses, which examined direct and indirect relationships

among these constructs. Consistent with the study hypotheses, the SEM analyses reported below evaluate whether parents' beliefs are associated with involvement (H1) and whether this association is transmitted through invitations (H2) and resources (H3).

Table 1:
Descriptive Statistics and Pearson Correlations Among Study Variables (N = 500)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Parents' own school valence													
2. Parents' role construction	.49***												
3. Parents' self-efficacy	.45***	.58***											
4. School invitations	.52***	.46***	.43***										
5. Teacher invitations	.41***	.39***	.36***	.57***									
6. Child invitations	.39***	.37***	.34***	.48***	.43**								
7. Parents' skills and knowledge	.46***	.42***	.38***	.54***	.49***	.40***							
8. Parents' time and energy	.33***	.31***	.29***	.41***	.36***	.32***	.50***						
9. Parents' income	.22***	.25***	.21***	.30***	.28***	.19**	.51***	.46***					
10. Parental involvement in SFP	.44***	.48***	.41***	.66***	.53***	.47***	.59***	.49***	.38***				
11. Gender	-.06	-.04	.02	-.05	-.07	-.03	-.02	-.08	-.05	-.06			
12. Number of children	-.10*	-.09	-.07	-.13*	-.11*	-.09	-.19**	-.21**	-.17**	-.18**	.03		
13. Parents' education level ¹	.11	.10	.09	.08	.06	.07	.13*	.10	.18**	.12*	.02	.05	
M	4.82	4.95	5.02	4.68	4.51	4.62	4.79	4.55	3.12	4.81	1.53	3.21	2.01
SD	.87	.79	.74	.83	.90	.85	.80	.87	1.08	.76	.50	1.32	.84

NOTE: Variables include components of parents' beliefs (valence, role construction, self-efficacy), invitations (school, teacher, child), and resources (skills and knowledge, time and energy, income), as well as parental involvement in school feeding programs (SFPs). Gender was coded 1 = Male, 2 = Female. Education level was coded 1 = No formal education, 2 = Primary, 3 = Secondary, 4 = College/University. * $p < .05$; ** $p < .01$; *** $p < .001$

Model One: Invitations Model

The first model tested the hypothesis that parents' beliefs influence their parental involvement in school feeding programs (SFPs) through school-related invitations (from schools, teachers, and children), while controlling for resources, gender, and the number of children. This model represents the *social-motivational pathway* proposed in the Hoover-Dempsey and Sandler framework, where schools' outreach and communication practices transform parents' motivational beliefs into active participation. Model 1 specifically evaluates the mediation hypothesis in H2 and estimates the total association between beliefs and involvement (H1) alongside the direct effect to determine whether invitations account for that association.

The model demonstrated a strong and statistically significant fit to the data, $\chi^2(238) = 421.67, p < .001$, indicating that while the chi-square statistic was significant, as is common with large samples, it remained within acceptable bounds relative to the model's degrees of freedom ($\chi^2/df = 1.77$), suggesting a well-fitting model. Other fit indices supported this conclusion, with CFI = .95, TLI = .94, RMSEA = .045 (90% CI [.038, .052]), and SRMR = .041, all of which met the recommended thresholds for a parsimonious and well-specified structural model (Hair *et al.*, 2019; Kline, 2023). The model accounted for 57% of the variance ($R^2 = .57$) in parental involvement, demonstrating that motivational and social factors together explained more than half of the variability in parents' participation in school feeding activities.

All standardised factor loadings for the latent constructs were significant ($p < .001$) and ranged between .63 and .87, supporting good convergent validity. Within the *beliefs* construct, parents' school valence (.74), role construction (.79), and self-efficacy (.82) were the strongest indicators. For the *invitation* construct, factor loadings were 0.84 for school invitations, 0.81 for teacher invitations, and 0.76 for child invitations, demonstrating that invitations extended by schools and teachers were the most salient predictors of parental engagement opportunities. Cronbach's alphas ranged from 0.78 to 0.89, and composite reliabilities exceeded 0.80, confirming strong internal consistency. The structural model revealed that the path from parents' beliefs to invitations was positive and significant ($\beta = 0.68, p < .001$), indicating that parents who held stronger motivational beliefs perceived more frequent and welcoming invitations from schools and teachers. However, the direct path from beliefs to parental involvement was not significant ($\beta = 0.07, p = .30$), suggesting that parental beliefs alone did not translate directly into active involvement without the mediating influence of invitations.

The indirect effect of beliefs on parental involvement through invitations was significant ($\beta = 0.37, p < .001$), as estimated using 5,000 bias-corrected

bootstrap resamples with a 95% confidence interval [0.25, 0.48]. The total effect of beliefs on involvement (direct and indirect effect) was $\beta = 0.55$, $p < .001$, whereas the nonsignificant direct path after accounting for the mediator confirmed full mediation primarily through invitations. Consistent with H2, these results indicate that invitations transmit the association between beliefs and involvement; the significant total effect provides support for H1 at the level of the overall (direct and indirect) association.

Regarding control variables, resources exhibited a small but significant positive effect on involvement ($\beta = 0.18$, $p < .05$), suggesting that parents with greater time, energy, and financial means were more active in supporting SFPs. Gender did not show a significant effect ($\beta = -0.04$, $p = .47$), indicating that mothers and fathers were equally likely to engage when other factors were controlled. Conversely, the number of children showed a small negative association ($\beta = -0.12$, $p < .05$), suggesting that parents with larger families faced greater constraints on participation.

In summary, Model One supports the notion that parents' beliefs foster involvement indirectly through school and teacher invitations, aligning with the social-motivational mechanisms of the Hoover-Dempsey and Sandler model. When schools actively invite parents, communicate clearly, and create inclusive opportunities for participation, parents' motivational beliefs are effectively transformed into tangible engagement in school feeding activities. Overall, Model 1 supports H2 and suggests that the beliefs-involvement association (H1) operates primarily through perceived invitations in this sample.

Model Two: Resources Model

The second model examined the hypothesis that parents' beliefs influence parental involvement in school feeding programs (SFPs) through their available resources, including time, energy, skills, and income, while controlling for invitations, gender, and number of children. This model reflects the *contextual-enabling pathway* in the Hoover-Dempsey and Sandler framework, positing that even when parents hold strong motivational beliefs, their engagement depends on the practical resources that make participation feasible. Model 2 specifically evaluates the mediation hypothesis in H3 and estimates the total association between beliefs and involvement (H1) alongside the direct effect to determine whether resources account for that association.

The model demonstrated an acceptable and statistically significant fit to the data, $\chi^2(240) = 437.92$, $p < .001$. Although the chi-square statistic was significant, as typically expected in large samples, it remained within acceptable limits relative to the model's degrees of freedom ($\chi^2/df = 1.82$), indicating a satisfactory level of correspondence between the hypothesised

model and the observed data. Additional fit indices further confirmed the good model fit: CFI = .94, TLI = .93, RMSEA = .047 (90% CI [.039, .054]), and SRMR = .044, all of which met the recommended thresholds for an acceptable and parsimonious model (Hair *et al.*, 2019; Kline, 2023). The model explained 52% of the variance ($R^2 = .52$) in parental involvement, which was slightly lower than the invitations model, suggesting that contextual resources accounted for just over half of the variation in parents' participation in school feeding activities.

All standardised factor loadings for the latent constructs were significant ($p < .001$) and ranged from .61 to .86, demonstrating strong convergent validity. Within the *beliefs* construct, parents' own school valence (.72), role construction (.78), and self-efficacy (.80) contributed strongly. For the *resources* construct, factor loadings were 0.83 for skills and knowledge, 0.79 for time and energy, and 0.74 for income, indicating that skills and knowledge were the most influential indicators of parents' perceived resource capacity. Reliability analyses yielded Cronbach's alpha values ranging from 0.77 to 0.88 and composite reliabilities exceeding 0.80, confirming internal consistency. The structural model showed that parents' beliefs positively predicted resources ($\beta = 0.56, p < .001$), suggesting that parents with stronger role beliefs and higher confidence reported having more time, energy, skills, and financial means to engage. However, the direct path from beliefs to parental involvement was nonsignificant ($\beta = 0.09, p = .27$), indicating that beliefs alone did not directly influence participation when resources were taken into account.

The indirect effect of beliefs on involvement through resources was significant ($\beta = 0.26, p < .001$), with a 95% bias-corrected bootstrap confidence interval [0.15, 0.38], confirming that parents' beliefs contributed to involvement primarily through their perceived ability and means to act. The total effect of beliefs on involvement was $\beta = 0.49, p < .001$, indicating that, while beliefs remained important, the mediating influence of resources was partial and weaker than the invitations pathway. Consistent with H3, these results indicate that resources transmit the association between beliefs and involvement; the significant total effect provides support for H1 at the level of the overall (direct and indirect) association.

Among the control variables, invitations had a moderate and significant effect on involvement ($\beta = 0.32, p < .001$), suggesting that school-based social encouragement continued to facilitate participation even when resources were taken into account. Gender was again nonsignificant ($\beta = -0.05, p = .44$), while the number of children showed a small negative effect ($\beta = -0.11, p < .05$), reflecting the challenge of distributing limited resources across multiple dependents.

Overall, the results of Model Two support the theoretical proposition that parents' motivational beliefs enhance involvement indirectly through resource-related mechanisms. Parents with greater time, skills, and financial stability were more able to act on their beliefs to support school feeding efforts. However, because the invitations model exhibited stronger mediation and explained slightly more variance, it appears that social encouragement and school engagement practices play a more dominant role than contextual resources in mobilising parental participation in Tanzanian SFPs. Overall, Model 2 supports H3 and indicates that the beliefs-involvement association (H1) is also carried through available resources, although the magnitude is smaller than for invitations.

Table 2
Summary of Structural Equation Models Predicting Parental Involvement in School Feeding Programs

Parameter	Model 1: Invitations Model	Model 2: Resources Model
Model Fit		
χ^2 (df), p	421.67 (238), $p < .001$	437.92 (240), $p < .001$
χ^2 /df Ratio	1.77	1.82
CFI	.95	.94
TLI	.94	.93
RMSEA [90% CI]	.045 [.038, .052]	.047 [.039, .054]
SRMR	.041	.044
Measurement Model		
Factor Loadings (Range)	.63-.87	.61-.86
Reliability (α Range)	.78-.89	.77-.88
Composite Reliability	> .80	> .80
Structural Paths		
Beliefs \rightarrow Mediator	$\beta = .68, p < .001$	$\beta = .56, p < .001$
Mediator \rightarrow Involvement	$\beta = .55, p < .001$	$\beta = .47, p < .001$
Beliefs \rightarrow Involvement (Direct)	$\beta = .07, p = .30$	$\beta = .09, p = .27$
Indirect Effect (Mediation)	$\beta = .37, p < .001$ [0.25, 0.48]	$\beta = .26, p < .001$ [0.15, 0.38]
Total Effect	$\beta = .55, p < .001$	$\beta = .49, p < .001$
Variance Explained (R²)	.57	.52
Control Variables		
Resources \rightarrow Involvement	$\beta = .18, p < .05$	
Invitations \rightarrow Involvement		$\beta = .32, p < .001$
Gender \rightarrow Involvement	$\beta = -.04, p = .47$	$\beta = -.05, p = .44$
Number of Children \rightarrow Involvement	$\beta = -.12, p < .05$	$\beta = -.11, p < .05$

Note. β = standardised regression coefficient. p -values are two-tailed. Model 1 and Model 2 represent separate mediation pathways with Invitations and Resources as mediators, respectively. RMSEA = Root Mean Square Error of Approximation; SRMR = Standardised Root Mean Square Residual; CFI = Comparative Fit Index; TLI = Tucker–Lewis Index.

Discussion of the Findings

This study examined how parents' beliefs shape involvement in school feeding programs (SFPs) in Tanzanian primary schools through two pathways: a social-motivational pathway (school invitations) and a contextual-enabling pathway (parental resources). Overall, parents' beliefs were related to involvement primarily indirectly through both mediators, with invitations showing the stronger role. Consistent with the Hoover-Dempsey and Sandler model (Hoover-Dempsey and Sandler, 1995, 1997), motivational beliefs (role construction, self-efficacy, and school valence) appear insufficient on their own; they become actionable when schools provide welcoming, structured opportunities for engagement (Green *et al.*, 2007; Kigobe *et al.*, 2021; Walker *et al.*, 2005).

Evidence from Tanzania supports this interpretation. Teacher-parent communication and inclusive school practices have been linked to higher engagement (George & Amos, 2025). In contrast, weak or one-way communication has been associated with low participation and mistrust in school meal programs (Haruna & Mwakalinga, 2025). Similar mediation patterns have been reported elsewhere, including Uganda and Rwanda, and in Indonesia, where consistent invitations and two-way communication strengthen parents' participation (Ganyata, 2025; Kiyingi *et al.*, 2025; Solichah & Nawangsari, 2025). Taken together, the findings suggest that "invitations" function less as announcements and more as relational mechanisms that signal value, clarity of roles, and genuine space for parents to contribute.

Resources also mattered, though more modestly. Parents' time, energy, skills, and income enabled participation, reflecting the practical realities of rural livelihoods and household constraints (Akyoo & Akyoo, 2025; Robert *et al.*, 2025). This aligns with Bronfenbrenner's emphasis on how behaviour is shaped within layered socio-economic contexts (Bronfenbrenner, 1979, 2006), and is consistent with Tanzanian evidence identifying time and financial constraints as barriers to participation (Nyakeko, 2024). The negative association with the number of children reinforces the idea that competing caregiving and labour demands can dilute the capacity to engage, as documented in other African contexts (Molepo, 2023; Orighoye *et al.*, 2023). Importantly, some evidence suggests that strong school guidance and flexible participation options can help sustain engagement even among resource-constrained households (Muhammed *et al.*, 2025).

While some international studies report a residual direct effect of beliefs on involvement (Solichah & Nawangsari, 2025), the Tanzanian pattern observed here, where involvement requires activation through invitations and enabling structures, fits a context where SFPs remain evolving and frequently donor-

dependent (Athumani *et al.*, 2024; Haule & Mwinami, 2024). In extremely resource-limited settings, material barriers may still outweigh motivational and social drivers (Molepo, 2023; VanMark *et al.*, 2025). The absence of gender differences may reflect changing norms and shared recognition of children's nutrition needs (Byenobi, 2025).

These findings have practical implications for SFP sustainability in Tanzania and beyond. Given the vulnerability of donor-supported programs to withdrawal (Bundy *et al.*, 2018; Gelli *et al.*, 2019; Mainje *et al.*, 2024), strengthening school-community partnerships can build local ownership and continuity. Evidence from other African settings shows that involving parents in decision-making and procurement can improve participation and accountability (Bikorimana *et al.*, 2024; Sulu & Matemba, 2024), and Tanzanian experience similarly suggests that early community involvement strengthens resilience (Gonjo *et al.*, 2024). Schools can operationalise these insights by institutionalising two-way communication, defining clear roles for parents within feeding committees, and offering flexible participation models that reflect household constraints; this also requires building staff capacity in communication and community mobilisation (Ganyata, 2025; Malingumu *et al.*, 2023). Finally, linking SFPs with local procurement and home-grown approaches can strengthen both ownership and local livelihoods (Fungo, 2023; Roothaert *et al.*, 2021).

Implications for SFPs' sustainability, Practice, Research and Policy

The findings have clear implications for strengthening the sustainability of school feeding programs (SFPs) in Tanzania and comparable African contexts. Because many SFPs remain donor-funded and vulnerable to withdrawal (Bundy *et al.*, 2018; Gelli *et al.*, 2019; Mainje *et al.*, 2024), sustainable implementation depends not only on resources but also on the quality of school-community relationships. The strong role of the "invitation" pathway indicates that schools can mobilise parental involvement most effectively through deliberate, structured, and two-way communication, regular meetings, personal invitations, transparent information-sharing, and inclusive decision-making that signals respect and shared responsibility (Bikorimana *et al.*, 2024; Gonjo *et al.*, 2024; Sulu & Matemba, 2024).

At the same time, participation is shaped by contextual constraints. Many parents face limitations in time, energy, skills, and income, so schools and policymakers should adopt flexible engagement options that match household realities, for example, allowing in-kind contributions where cash is difficult, rotating volunteer schedules, and assigning clear, manageable roles in feeding committees to avoid excluding resource-constrained households. Teacher capacity in two-way communication and community mobilisation should also

be strengthened, as teachers often serve as the practical link between parental motivation and actual participation (Ganyata, 2025; Malingumu *et al.*, 2023). For researchers, these findings suggest the need to evaluate which invitation strategies (e.g., frequency, mode, and tone of school communication) and which flexibility mechanisms (e.g., in-kind vs cash contributions, time-saving participation models) most effectively increase equitable parental involvement, using longitudinal or implementation-focused designs to assess sustainability over time (Ganyata, 2025; Malingumu *et al.*, 2023).

At the policy level, these findings support strengthening institutional expectations for parental engagement within the implementation of the National Guidelines for School Feeding and Nutrition Services (2021), including clearer standards for school-community collaboration and meaningful parental representation in school feeding committees. Finally, home-grown school feeding approaches can further reinforce sustainability by linking SFPs with local farmers and women's groups, strengthening supply chains while building ownership and local economic benefits (Fungo, 2023; Roothaert *et al.*, 2021).

Strengths and Limitations of the Study

A key strength of this study is its strong theoretical and analytical grounding. By integrating Hoover-Dempsey and Sandler's model of parental involvement with Bronfenbrenner's Ecological Systems Theory, the study captured both motivational and contextual influences on parents' participation in school feeding programs. The relatively large sample drawn from 20 primary schools in the Mara Region also supports generalisability to similar rural and semi-urban Tanzanian settings.

The study further contributes empirically by extending parental involvement frameworks beyond academic and literacy contexts to school feeding programs, an important but less-examined domain in sub-Saharan Africa. In addition, the use of established instruments previously applied in Tanzania strengthens measurement reliability and contextual relevance (Kigobe, 2019; Kigobe *et al.*, 2021, Kigobe *et al.*, 2025; Malingumu *et al.*, 2023). Finally, examining alternative mediating pathways enhanced the study's explanatory depth by clarifying how beliefs translate into involvement through invitations and resources.

Several limitations should be noted. The cross-sectional design limits causal inference; longitudinal or intervention studies are needed to determine whether strengthening invitations or resources increases involvement over time. Self-reported measures may be affected by social desirability bias, suggesting value in observational or multi-informant data in future work. Lastly, focusing on the Mara Region provides contextual specificity but limits national generalisation;

future research across multiple regions and rural-urban comparisons would strengthen external validity and policy relevance.

Conclusion

This study shows that parents' beliefs about their role and efficacy are linked to involvement in school feeding programs mainly through school invitations and parental resources. School invitations were the strongest pathway, highlighting the importance of purposeful, two-way communication and inclusive school practices in converting parental motivation into participation. Overall, sustainable school feeding depends not only on resources but also on strong school-parent partnerships grounded in mutual respect and shared accountability. By strengthening both engagement practices and practical supports for families, schools, and communities, schools can advance more resilient implementation of Tanzania's National School Feeding Guidelines.

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