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Examining breastfeeding self-efficacy as a mediator between maternal food insecurity and breastfeeding practices in Soweto, South Africa

Claire Hart^{a*} , Rachana Desai^a, Lauren Stuart^a, Shane A Norris^{a,b} and Alessandra Prioreschi^a

^aSA MRC/Wits Developmental Pathways for Health Research Unit, Department of Paediatrics, University of the Witwatersrand, Johannesburg, South Africa

^bSchool of Health and Human Development, University of Southampton, Southampton, UK

*Correspondence: claire.hart@wits.ac.za



Objectives: This study examined the potential mediating effect of breastfeeding self-efficacy on the relationship between maternal food insecurity and breastfeeding status.

Design: A community-based, cross-sectional study was conducted.

Subjects and setting: The study included 197 mothers from Soweto, South Africa, with infants under one month old, enrolled in the PLAY Love And You (PLAY) Study.

Outcome measures: Data were collected via self-report questionnaires post-delivery, including maternal sociodemographic characteristics, breastfeeding status, food insecurity, and breastfeeding self-efficacy. Generalised Structural Equation Modelling assessed whether maternal food insecurity was associated with breastfeeding status and whether this was mediated by breastfeeding self-efficacy, adjusting for sociodemographic confounders.

Results: Notably, 74% of mothers initiated breastfeeding within the first hour, and 87% were currently breastfeeding. No significant associations were found between maternal food insecurity and breastfeeding status, nor did breastfeeding self-efficacy mediate these relationships. However, early initiation of breastfeeding ($\beta = 1.14$, $p = 0.03$) and relationship status ($\beta = -0.53$, $p = 0.002$) emerged as critical factors associated with breastfeeding status and self-efficacy. Mothers who initiated breastfeeding within the first hour were significantly more likely to continue breastfeeding ($p = 0.01$), and currently breastfeeding mothers had higher self-efficacy scores ($p = 0.01$).

Conclusions: The study found no significant mediating effect of breastfeeding self-efficacy on the relationship between maternal food insecurity and breastfeeding status among urban Black South African mothers. These findings underscore the need to address broader determinants of food security and maternal confidence, while future research should explore additional psychological and social factors for effective interventions.

Trial registration: Pan African Clinical Trial Registry identifier: PACTR202202747620052.

Keywords: infant feeding practices, maternal health, breastfeeding support, food insecurity, South Africa

Introduction

The fulfilment of an infant's nutritional needs is a pivotal aspect of the early infant caregiving environment.¹ In low- and middle-income countries (LMICs), 43% of children under the age of five – approximately 250 million – are at risk of not reaching their developmental potential.² Factors such as poverty, poor health and nutrition, and insufficient care have been shown to significantly affect the sensory-motor, cognitive, and social-emotional development of children in these regions.³ This highlights the importance of adequate nurturance, stimulation, and especially nutrition to improve developmental outcomes for children in these contexts.

The nutrition provided to an infant early in life sets the foundation for physical and cognitive development. According to the World Health Organization's guidelines for enhancing early childhood development, exclusive breastfeeding is recommended as the most comprehensive and optimal form of nutrition for the initial six months of an infant's life.¹ While exclusive breastfeeding is considered ideal, any form of breastfeeding has both immediate and lifelong developmental benefits, including lowering infectious morbidity and mortality, enhancing cognitive functioning, and decreasing the risk of diabetes, cardiometabolic disease, and obesity later in life.^{4–7}

In sub-Saharan Africa, breastfeeding practices are among the poorest on the continent, with only 25% of infants exclusively breastfed for the first six months.⁶ In South Africa, while 67% of infants are breastfed within the first hour of birth, only 32% of infants younger than six months were exclusively breastfed.⁸ The average duration of exclusive breastfeeding in South Africa is 2.9 months⁸, after which many mothers introduce solids and other liquids.^{9–12} Although many South African mothers initiate breastfeeding, the early introduction of solids and the shorter duration of exclusive breastfeeding do not align with the WHO's recommendation to exclusively breastfeed for the first six months of the infant's life.¹ Various factors may impede a mother's ability to breastfeed, such as the need to return to work or studies, illness, lactation problems, perceived inadequate breastmilk, external advice or pressure, and a lack of support and education.^{12–13} Despite the affordability and demonstrated benefits of breastfeeding, numerous factors that complicate optimal breastfeeding practices must be understood to support mothers to improve breastfeeding practices, which will in turn enhance the health of their children.^{6,10}

Food insecurity is a unique challenge that affects how mothers meet the nutritional needs of their children in sub-Saharan Africa. Estimates show that 12% of sub-Saharan Africa's population lack physical, social, and economic access to sufficient,

safe, and nutritious foods.¹⁴ A study conducted in Soweto, an urban township in South Africa, showed that one-third of households experienced inconsistent access to high-quality, nutritious food, while an additional 21% were at risk of food insecurity.¹⁵ Common concerns associated with food insecurity include the affordability of food, reliance on low-cost, low-nutrient meals, meal skipping, and experiencing hunger.¹⁶ Inadequate feeding practices are common in poor households experiencing food insecurity in this context,⁷ and women with children disproportionately bear the burden of food insecurity and malnutrition.¹⁵

Mothers of infants who are experiencing food insecurity often worry about the quality and adequacy of their breast milk, believing that their own inadequate nutrition affects their ability to produce sufficient and nutritious breast milk.^{6,17} Due to concerns about milk quality and the challenges associated with food insecurity, mothers may terminate breastfeeding prematurely, switching to formula or introducing other foods earlier than recommended if they cannot afford formula, which can have negative consequences for both the mother and the child.^{11,12,18} While the belief that breastmilk quality is affected by the mother's poor nutrition is unfounded, the associated anxiety and lack of confidence can reduce a mother's breastfeeding self-efficacy – defined as a mother's confidence in ability to breastfeed¹⁹. The psychological burden of food insecurity can undermine a mother's confidence and capacity to breastfeed effectively^{20–22} as higher levels of stress and anxiety significantly interfere with a mother's ability to initiate and sustain breastfeeding, especially in the first few months of the infant's life.¹⁹

There is an established link between inadequate food access in households and infant feeding practices,^{16, 23} as well as between food insecurity and worsened perceptions concerning one's ability to feed their infant properly.²⁴ However, to our knowledge, no study has examined the mediating effect of breastfeeding self-efficacy on the association between maternal food insecurity and current breastfeeding status in sub-Saharan Africa. This study used general structural equation models (GSEMs) to examine the association between maternal food insecurity and current breastfeeding status, and to determine whether these associations are mediated by breastfeeding self-efficacy in the first month post-partum among urban-dwelling Black South African women. We hypothesised that higher breastfeeding self-efficacy would be associated with increased breastfeeding and would potentially moderate the relationship between maternal food insecurity and infant feeding practices.

Methods

This study is part of the larger The PLAY Love And You (PLAY) community-based randomised controlled trial aimed at increasing maternal self-efficacy by providing behavioural feedback and health literacy content in the first year post-partum, which is hypothesised to ultimately enhance infant development.²⁵ This study reports on baseline data from the PLAY trial, which is designed to assess the effects of the intervention. No intervention was administered at the time of data collection, and the data presented in this manuscript reflect the pre-intervention measurements. A total of 210 mothers were recruited shortly after delivery from two community clinics in Soweto, an urban-poor township in Johannesburg, South Africa. All participants resided in Soweto, were over the age of 18, and were the primary caregivers of their infants. For this study, participants with infants older than one month at the time of data

collection were excluded from this analysis, as were any participants with missing data on current breastfeeding status. The included sample for this analysis was therefore 197 mothers.

Ethical approval was granted for the trial (M220217) from the Human Ethics Research Committee of the University of the Witwatersrand, and approval to recruit participants from community clinics in Soweto was granted by the Research Committee of Johannesburg Health District (GP_202202_021). Participants provided written consent for the inclusion of material, including the use of their data (such as demographic and survey data) and any other relevant study materials (such as audio and video recordings) that were collected as part of the study. They were informed that their information would be fully anonymized, ensuring that they cannot be identified from the data.

Measures

Outcome variable

Breastfeeding practices within the first month post-delivery were assessed by asking mothers if they were currently breastfeeding (yes/no). This created a binary outcome variable: currently breastfeeding/not currently breastfeeding.

Exposure variable

Food insecurity was assessed using an adapted Community Childhood Hunger Identification Project (CCHIP) index, validated for household-level food insecurity assessment.²⁶ Specific questions from the CCHIP index, presented in Table 1, focused on maternal food insecurity, perceived food insufficiency, and altered food intake due to resource constraints.

A score of one or more, i.e. one affirmative/positive (Yes) response out of a maximum possible of three, indicated which mothers were ever at risk of food insecurity. Two follow-up questions for each item were asked in order to assess the extent of such food insecurity over the past 30 days. A score of one or more, i.e. one affirmative/positive (Yes) response out of a maximum possible of six indicated current risk of maternal food insecurity. The CCHIP has been used in several South African studies to estimate food insecurity prevalence,^{15,27–28} and the reliability in this population was confirmed by Cronbach's alpha ($\alpha = 0.84$).

Table 1: CCHIP items used in this study to assess maternal food insecurity

Dimension	Item (ever)	Item (currently)
Household-level food uncertainty	Does your household ever run out of money to buy food?	(a) In the past 30 days? (b) 5 or more days in the past 30 days?
Individual-level food insecurity	Do you ever cut the size of meals or skip because there is not enough money for food?	(a) In the past 30 days? (b) 5 or more days in the past 30 days?
Individual-level food insecurity	Do you ever eat less than you should because there is not enough money for food?	(a) In the past 30 days? (b) 5 or more days in the past 30 days?

Mediator variable

Maternal breastfeeding self-efficacy was assessed using the Breastfeeding Self-Efficacy Short Form²⁹ within the first month post-delivery. The 14-item 5-point Likert scale consists of statements preceded by the phrase 'I can always ...' with responses ranging from not at all confident¹ to very confident.⁵ Statements apply to different aspects of breastfeeding, such as whether the infant is perceived to be getting enough milk and latching on correctly and how the mother is feeling about and coping with breastfeeding. Higher aggregate scores indicated higher levels of self-efficacy for breastfeeding. This measure has been used to identify women who were at risk of discontinuing breastfeeding prematurely.³⁰ Scale reliability of the Breastfeeding Self-Efficacy Short Form for this study population showed excellent internal consistency ($\alpha = 0.98$), confirming that it is an appropriate measure for assessing breastfeeding self-efficacy in this population.

Confounders

The model was adjusted for the potential effects of confounders that have been established in the literature to have a relationship with maternal food insecurity and breastfeeding self-efficacy.^{17,20–22,31} Maternal sociodemographic factors, including the mother's age, education level, and relationship status, were assessed using a self-report questionnaire. The mother's age was classified as a continuous variable, educational level was categorised as Not completed matric/Completed matric (Grade 12), and relationship status was categorised as Single/Married/In a relationship/Co-habiting. Whether the infant was put to the breast within the first hour post-delivery was assessed by asking mothers if their baby was put to the breast within the first hour of giving birth (yes/no).

Statistical analysis

Data were cleaned and analysed using Stata® (Version 17.0, StataCorp, College Station, TX, USA). Continuous variables were presented as means and standard deviations (SD), while categorical variables (maternal food insecurity, education level, relationship status, current breastfeeding status) were presented as frequencies (%). The distribution of the continuous variables (age, breastfeeding self-efficacy) was assessed using the Shapiro–Wilk test. As the data for these variables were found to be non-normally distributed (p -values < 0.05), the

Wilcoxon rank-sum test (Mann–Whitney U test) was used to examine the differences between the two breastfeeding groups (currently breastfeeding vs. not currently breastfeeding). For categorical variables, χ^2 tests were used to assess differences between groups.

GSEM was used to determine whether maternal food insecurity (exposure variable – first current food insecurity was assessed, followed by ever experiencing food insecurity) was associated with the current breastfeeding status (outcome variable), and whether these associations were mediated by breastfeeding self-efficacy (mediator variable) (Figure 1). This approach allowed for the simultaneous analysis of multiple pathways, including both continuous and categorical variables, to determine estimates of direct, indirect, and total effects. As the outcome variable was binary, binomial family with logit link was used.

To ensure sufficient power for detecting mediation effects, a sample size of at least 100–200 participants is generally recommended.³² The sample size of 197 participants in this study is appropriate for ensuring adequate power and reliable results in the mediation analysis. In the proposed mediation model, path 'c' shows the direct effect of the exposure variable (maternal food insecurity) on the outcome variable (currently breastfeeding), without adjusting for the mediator variable (breastfeeding self-efficacy). Path 'a' shows the regression coefficient between the exposure (maternal food insecurity) and the mediator variable (breastfeeding self-efficacy). Path 'b' shows the effect of the mediator (breastfeeding self-efficacy) on the outcome variable (currently breastfeeding). The mediated (indirect) effect of maternal food insecurity on currently breastfeeding through breastfeeding self-efficacy is shown by the product of regression coefficients α and β ($\alpha\beta$). The total effect is represented by the sum of the direct effect (path c) and the indirect effect ($\alpha\beta$). The model was adjusted for the potential effects of confounders.

Results

Sample characteristics

Table 2 presents the characteristics of the 197 mothers with infants under 1 month of age who participated in the study. The mean age of infants was 6.1 days (SD = 4.4) and the mean

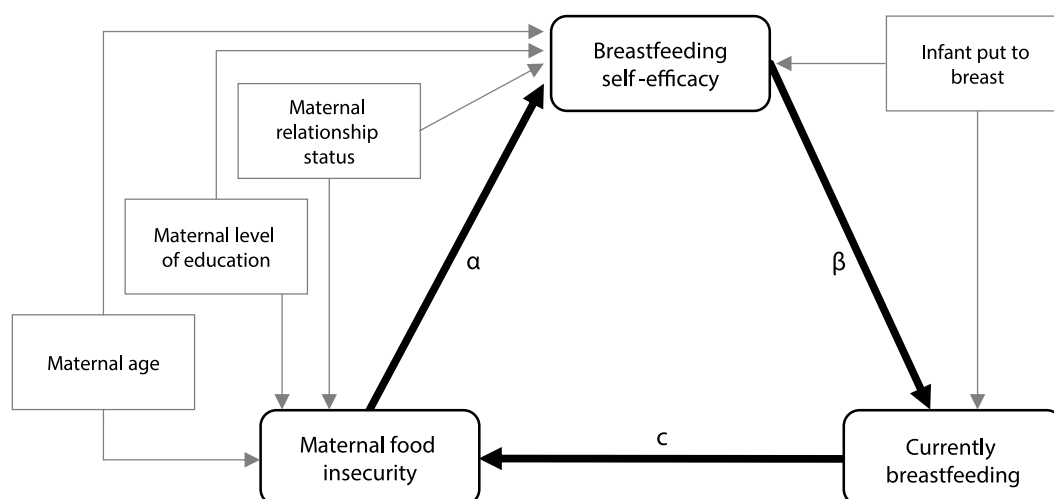


Figure 1: Proposed mediation model.

Table 2: Characteristics of the sample

Factor	Total		Currently breastfeeding		Not currently breastfeeding		p-value
	n	% Mean (SD)	n	% Mean (SD)	n	% Mean (SD)	
Infant's age (days)	197	6.1 (4.4)	171	5.9 (4.2)	26	7.0 (5.7)	0.33
Infant put to breast within the first hour of giving birth	197		171		26		0.01
Yes	146	74.1	132	77.2	14	53.9	
No	51	25.9	39	22.8	12	46.2	
Mother's age (years)	197	28.4 (6.2)	171	28.2 (6.2)	26	29.7 (6.2)	0.24
Level of education	197		171		26		0.25
Not completed matric	71	36.0	59	34.5	12	46.2	
Completed matric	126	63.9	112	65.5	14	53.9	
Relationship status	197		171		26		0.52
Single	74	37.6	62	36.3	12	46.2	
Married	16	8.1	14	8.2	2	7.7	
In a relationship	62	31.5	57	33.3	5	19.2	
Co-habiting	45	22.8	38	22.2	7	26.9	
Maternal food insecurity (ever)	168		150		18		0.81
Yes	61	36.3	54	36.0	7	38.9	
No	107	63.7	96	64.0	11	61.1	
Maternal food insecurity (current)	168		150		18		0.59
Yes	47	28.0	41	27.3	6	33.3	
No	121	72.0	109	72.7	12	66.7	
Maternal breastfeeding self-efficacy	197	64.2 (8.0)	171	65.0 (7.0)	26	59.2 (11.7)	0.01

age of mothers was 28.4 years (SD = 6.2). The majority of mothers had completed matric education (63.9%) and were married, cohabiting, or in committed relationships (62.4%). A high percentage of mothers had initiated breastfeeding within the first hour of birth (74.1%) and 86.8% of the mothers were currently breastfeeding. Most mothers displayed high breastfeeding self-efficacy (mean = 64.2, SD = 8.0). Based on their CCHIP index scores, 28% of mothers were currently at risk of food insecurity, while 36.3% were ever at risk of food insecurity.

In comparing maternal characteristics by breastfeeding status, few differences between currently breastfeeding and not currently breastfeeding mothers were observed. Mothers who did not put their infants to the breast within the first hour after birth, including those who never initiated breastfeeding, were less likely to be currently breastfeeding ($p = 0.01$). A significant difference was also observed for maternal breastfeeding self-efficacy, with currently breastfeeding mothers having higher self-efficacy ($p = 0.01$).

Mediation model

Table 3 presents the results of the analysis of maternal food insecurity's effect on breastfeeding status, with breastfeeding

self-efficacy as a mediator. Neither the total nor the direct effects of ever experiencing food insecurity on breastfeeding status were significant (Total effect: estimate = -0.17 , $p = 0.52$; Direct effect: estimate = -0.14 , $p = 0.55$). The indirect effect through breastfeeding self-efficacy was also non-significant (estimate = -0.03 , $p = 0.81$). Similarly, for current food insecurity, both the total effect (estimate = -0.22 , $p = 0.15$) and direct effect (estimate = -0.15 , $p = 0.75$) were non-significant, and the indirect effect was negligible (estimate = -0.07 , $p = 0.42$). These findings suggest that maternal food insecurity, whether experienced historically or currently, was not significantly associated with breastfeeding status, either directly or through breastfeeding self-efficacy.

Figure 2 shows the model for mothers who have ever experienced food insecurity. Ever experiencing food insecurity had a non-significant negative effect on current breastfeeding status ($\beta = -0.14$, $p = 0.55$), suggesting a decreased likelihood of breastfeeding. Breastfeeding self-efficacy had a positive but non-significant effect on breastfeeding status ($\beta = 0.92$, $p = 0.08$), indicating a trend towards higher breastfeeding likelihood with greater self-efficacy. Food insecurity also had a non-significant negative effect on breastfeeding self-efficacy ($\beta = -0.03$, $p = 0.81$).

Figure 3 shows the model for mothers currently experiencing food insecurity. Current food insecurity had a non-significant negative effect on breastfeeding status ($\beta = -0.15$, $p = 0.23$), indicating a decreased likelihood of breastfeeding. Breastfeeding self-efficacy had a non-significant positive effect on breastfeeding status ($\beta = 0.88$, $p = 0.10$), suggesting higher self-efficacy was associated with breastfeeding. Current food insecurity also had a non-significant negative effect on breastfeeding self-efficacy ($\beta = -0.08$, $p = 0.36$).

Although not the primary focus, several confounders were significantly related to the exposure, mediator, and outcome variables. Lower education levels were associated with a higher risk of food insecurity, both historically ($\beta = -0.81$, $p = 0.02$) and

Table 3: Effect of maternal food insecurity on breastfeeding status considering breastfeeding self-efficacy as a mediator

Factor	Estimate	SE	95% CI	p-value
Ever experienced food insecurity				
Total effect	-0.17	0.26	-0.68–0.35	0.52
Direct effect	-0.14	0.23	-0.58–0.31	0.55
Indirect effect	-0.03	0.13	-0.29–0.23	0.81
Currently experiencing food insecurity				
Total effect	-0.22	0.15	-0.51–0.08	0.15
Direct effect	-0.15	0.12	-0.11–0.09	0.75
Indirect effect	-0.07	0.09	-0.24–0.10	0.42

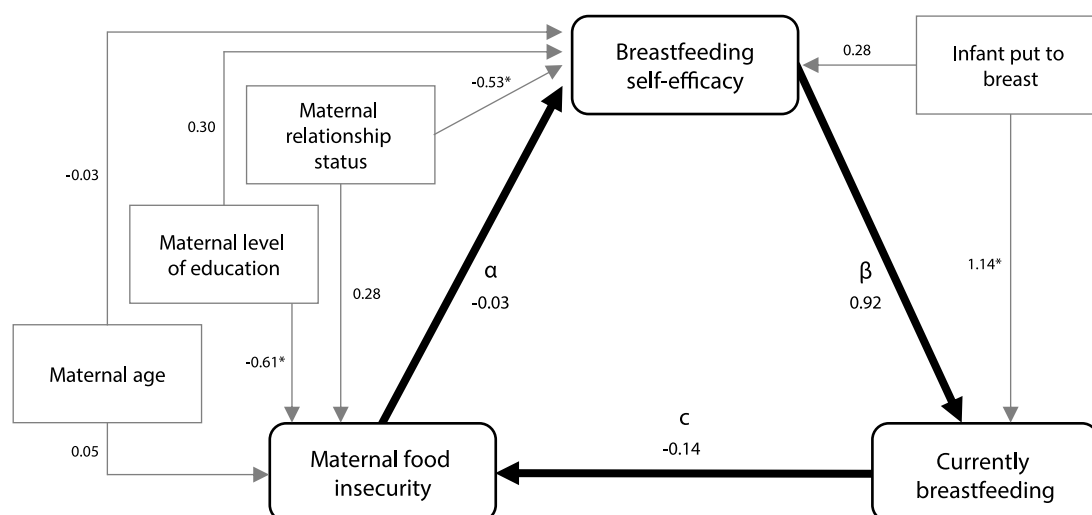


Figure 2: Mediation path model for the relationship between ever experienced food insecurity and current breastfeeding status. Standardised regression coefficients (β) are presented for the direct paths. The model is adjusted for infant put to breast, age, level of education, and relationship status. * $p < 0.05$.

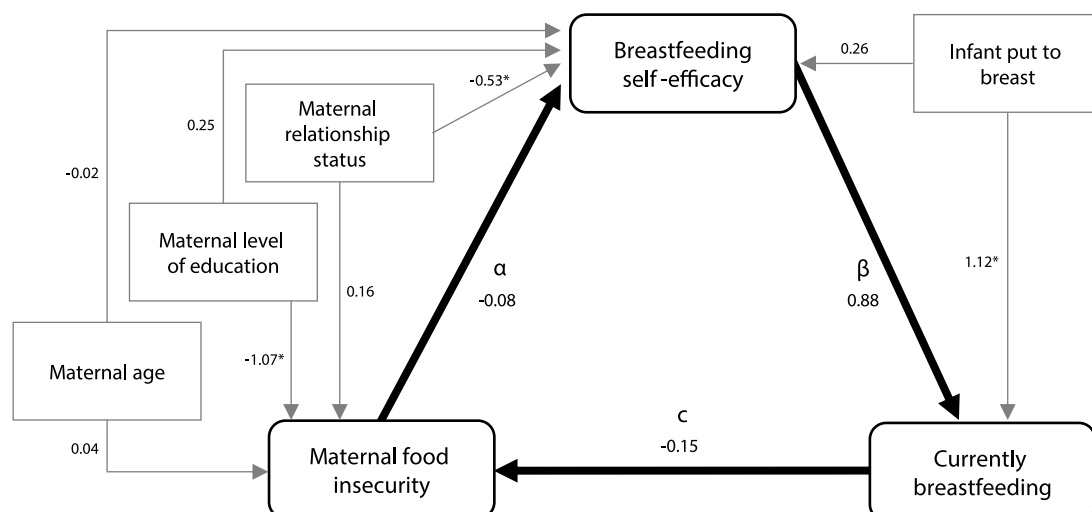


Figure 3: Mediation path model for the relationship between currently experiencing food insecurity and current breast feeding status. Standardised regression coefficients (β) are presented for the direct paths. The model is adjusted for infant put to breast, age, level of education, and relationship status. * $p < 0.05$.

currently ($\beta = -1.07$, $p = 0.03$). Not being in a relationship was linked to lower breastfeeding self-efficacy ($\beta = -0.53$, $p = 0.002$). While maternal food insecurity did not significantly affect breastfeeding status, early initiation of breastfeeding (putting the baby to the breast within the first hour) was significantly associated with an increased likelihood of currently breastfeeding ($\beta = 1.14$, $p = 0.03$).

Discussion

This study explored the relationship between maternal food insecurity and breastfeeding practices among urban-dwelling Black South African mothers with infants under one month old, examining the potential mediating effect of breastfeeding self-efficacy on the relationship. The findings revealed no statistically significant associations between the exposure-mediator, mediator-outcome, and exposure-outcome variables. The results of the mediation analysis indicated that maternal food insecurity, whether experienced historically or currently, was not statistically significantly associated with breastfeeding status, either directly or indirectly through breastfeeding self-efficacy. The lack of a significant total effect suggested that

food insecurity alone may not be a decisive factor in determining whether mothers breastfeed. The direct effects were also non-significant, implying that breastfeeding self-efficacy did not serve as a meaningful mediator in this context. This could indicate that maternal perceptions and beliefs regarding breastfeeding, while important, do not sufficiently buffer the effects of food insecurity on actual breastfeeding practices. The negligible indirect effect further supported this, showing that self-efficacy did not significantly mediate the relationship between food insecurity and breastfeeding status.

In our study, 36% of mothers had a history of food insecurity, and 28% were currently experiencing food insecurity. These prevalence rates are consistent with findings from a similar study conducted on women in Soweto.¹⁵ Previous research on the relationship between food security and breastfeeding practices has yielded mixed results, highlighting the complexity of this relationship.^{7,11–12,16–24} Our study contributes to this body of literature, suggesting that while maternal perceptions of breastfeeding may play a role, they do not fully buffer the effects of food insecurity on breastfeeding behaviours, such as

delayed initiation, premature cessation, or early transition to formula. This indicates that other factors may be more strongly associated with breastfeeding outcomes for the mothers in this study.

Although food insecurity was not associated with breastfeeding in this study, notable findings related to education emerged. Lower educational levels were associated with a higher risk of experiencing food insecurity, consistent with existing literature that highlights the socioeconomic determinants of health.^{23–24,33–37} Although this finding is not unexpected, it underscores the importance of educational initiatives that could help reduce food insecurity among vulnerable populations, potentially improving overall maternal and child health outcomes.

Measuring breastfeeding at one month postpartum is crucial as it serves as an early indicator of the sustainability of breastfeeding practices.^{24,34} Early initiation and consistent breastfeeding are associated with significant benefits for infant health and development, making the one-month mark a critical milestone for assessing these benefits.^{3–7} In this study, 74% of mothers initiated breastfeeding within the first hour of birth, surpassing the national average of 67%.⁸ Mothers who initiated breastfeeding within the first hour of birth were significantly more likely to be breastfeeding at one month postpartum ($p = 0.01$), reinforcing the importance of immediate postpartum practices in the hospital setting. In this context, healthcare providers have a critical role to play by actively promoting and supporting early breastfeeding initiation, as recommended in previous studies.^{1,5,6–7,10–13}

While longitudinal studies are needed to fully understand the sustainability of these early breastfeeding practices, the findings of this study suggest that these mothers have made a strong initial start in their breastfeeding practices. Monitoring breastfeeding during the one-month postpartum period allows researchers to evaluate the effectiveness of interventions aimed at promoting early breastfeeding and to identify potential barriers to ongoing breastfeeding.^{12–13,24,34} Furthermore, understanding breastfeeding rates during this period can help identify trends and inform public health strategies to support mothers in maintaining breastfeeding longer. Overall, tracking breastfeeding at this one-month mark provides valuable insights into the initial success of breastfeeding practices and the potential for continued breastfeeding, which is essential for optimising infant health outcomes.³⁵

The study confirmed the association between breastfeeding self-efficacy and breastfeeding practices, which has previously been observed in qualitative research exploring maternal perceptions, experiences, and self-efficacy through interviews and focus groups.^{37–38} In this study, mothers who breastfed reported higher self-efficacy, feeling confident in their ability to provide adequate milk and effectively latch their infants on. Additionally, the findings revealed a strong association between relationship status and breastfeeding self-efficacy, with single mothers reporting significantly lower levels of self-efficacy. This indicates that social support structures are crucial for promoting breastfeeding practices during the early postpartum period. While this finding aligns with existing research,^{6,37} this study emphasises the critical role of significant partners in the early postpartum period. Partners can offer positive reinforcement and practical help, boosting mothers' confidence and self-efficacy, which encourages continued

breastfeeding and adherence to recommended guidelines. Furthermore, this study highlights that single mothers may require additional support, such as peer support networks and educational resources, to enhance self-efficacy and improve breastfeeding rates.^{10–13}

While the results indicated that maternal food insecurity was not significantly associated with breastfeeding status or self-efficacy among urban Black South African mothers, the findings from this study highlight important areas for future research and intervention. Understanding the factors that contribute to high self-efficacy in this sample can inform strategies to enhance breastfeeding confidence among a broader range of mothers. Notably, the study found that early initiation of breastfeeding – putting the baby to the breast within the first hour of birth – and maternal relationship status were positively associated with higher breastfeeding self-efficacy. Furthermore, breastfeeding self-efficacy was linked to current breastfeeding status. Addressing educational disparities and enhancing social support for mothers, particularly single mothers, may be crucial in promoting breastfeeding. Reinforcing the practice of early breastfeeding initiation could also be a vital component of maternal and infant health programmes aimed at improving breastfeeding rates. Interventions should involve healthcare providers to support early breastfeeding initiation and engage partners to foster breastfeeding self-efficacy. By building confidence and support networks, these strategies could help sustain breastfeeding practices across diverse maternal populations.

Limitations

This study focused exclusively on urban-dwelling Black South African mothers with infants under one month old, which may limit the generalizability of the findings to other populations or geographic areas. The unique context of this specific sample may influence the relationship between food insecurity and breastfeeding practices differently than in other settings.

While this study examined both historical and current food insecurity, it did not explore the specific reasons behind food insecurity among this sample of mothers. Understanding the nuances of how food insecurity is associated with breastfeeding practices would provide deeper insights into this relationship. Additionally, the reliance on self-reported measures for breastfeeding practices and food insecurity may introduce bias, as mothers might underreport their experiences due to social desirability or recall issues.

The mediation analysis indicated that breastfeeding self-efficacy did not serve as a meaningful mediator in this context. However, other psychological and social factors that may be associated with breastfeeding practices, such as maternal mental health, cultural beliefs regarding breastfeeding, and perceptions of support systems, were not examined.³³ Including these variables in future studies could provide a more comprehensive understanding of the factors associated with breastfeeding practices during the early postpartum period.

This study did not focus on exclusive breastfeeding, which is a critical aspect of breastfeeding practices. Exclusive breastfeeding is defined as feeding an infant only breast milk, without any supplemental food or drink, for the first six months of life.¹ By not specifically examining rates of exclusive breastfeeding, the study may overlook important nuances in breastfeeding practices that are significantly associated with infant health outcomes. Understanding whether mothers maintained exclusive

breastfeeding, or transitioned to mixed feeding practices, could provide deeper insights into the relationship between food insecurity, self-efficacy, and breastfeeding success. Future research should consider this dimension to better assess the overall effectiveness of breastfeeding practices and their implications for maternal and child health.

Conclusion

This study aimed to explore the relationship between maternal food insecurity and current breastfeeding status, with a specific focus on the mediating role of breastfeeding self-efficacy among urban-dwelling Black South African mothers. While the findings indicated that maternal food insecurity, both historical and current, was not statistically significantly associated with breastfeeding status, the anticipated mediating role of breastfeeding self-efficacy was also not supported. These results suggest that, contrary to previous literature, food insecurity may not be a significant factor associated with breastfeeding practices in this sample. The lack of significant associations emphasises the complexity of the factors linked to breastfeeding, indicating that other factors, such as cultural beliefs and access to support, may play more critical roles. Despite the high rates of early initiation and breastfeeding prevalence observed in this study, there remains a need for interventions that address the broader determinants of food security and maternal confidence in breastfeeding. Future studies should consider the nuances of exclusive breastfeeding, examine additional psychological and social factors, and adopt longitudinal designs to better understand the long-term implications of these issues. Addressing the gaps identified in this research could ultimately inform more effective interventions to support mothers in their breastfeeding journeys, thereby enhancing infant health outcomes in the region.

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Ethics – The PLAY Study received ethical approval from the Human Research Ethics Committee of the University of the Witwatersrand (M220217) and was registered with the Pan African Clinical Trials Registry (<https://pactr.samrc.ac.za>) on 10 February 2022 (identifier: PACTR202202747620052).

Author contributions – AP is the principal investigator for the PLAY Study. CH, SAN, and AP contributed to the conception and design of the study. CH and AP organised the database and performed the formal data analysis. CH wrote the first draft of the manuscript. CH, RD, LS, SAN, and AP contributed to manuscript revision, and read and approved the submitted version.

Submission declaration – This manuscript has not been published previously, is not under consideration for publication elsewhere, and its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out. If accepted, this manuscript will not be published elsewhere in the same form, in English or in any other language, including electronically, without the written consent of the copyright holder.

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Data availability statement – The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

ORCID

Claire Hart  <http://orcid.org/0000-0002-2072-0588>

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