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Research Article

Age as a Moderator and Socioeconomic Correlates of Cash Transfers-linked Empowerment Among Pastoralist Women: Evidence from Turkana Central Sub-County, Kenya

Stephen Kimotho*, Peter Koome, Wanjugu Wachira

Department of Social Sciences, St Paul's University, Limuru, Kenya

Abstract

Cash transfers programmes are frequently used to improve the socioeconomic status of vulnerable women, yet there is still little data on whether the beneficiaries' own socioeconomic characteristics influence these outcomes, especially in populations of nomadic pastoralists. In Turkana Central Sub-County, Kenya, this study investigated how age moderates the relationship between Hunger Safety Net Programme (HSNP) cash transfers and three measures of pastoralist women's socioeconomic empowerment: savings, household decision-making, and meal frequency with education and marital status as direct predictors. Based on Kabeer empowerment theory, the study used an explanatory sequential mixed-methods design and a pragmatic mindset. It included two focus groups, three key informant interviews, and a structured survey of 342 HSNP beneficiaries. While qualitative data were studied thematically to contextualise statistical findings, quantitative data were analysed descriptively using chi-square and ordinary least squares regression with interaction terms connecting programme design features to beneficiary age. The findings demonstrated that rather than moderating empowerment effects equally, socioeconomic characteristics did so selectively. Savings were significantly associated with education and marital status, with married beneficiaries and those with only a primary education reporting the greatest percentages. The associations of payment frequency and payment modality on savings were strongly moderated by age; older beneficiaries gained disproportionately from more frequent and accessible payment modalities, partially offsetting an otherwise negative direct effect of age on saves. Although there was no statistically significant moderation, household decision-making was consistently high (above 96%) across age, education, and marital categories; yet qualitative reports indicated underlying contestation over control of transfers within married and polygamous households. Food security among older beneficiaries necessitates measures beyond payment logistics, as evidenced by the considerable drop in meal frequency with age that was not significantly regulated by payment mechanism. These results suggest that significant subgroups of pastoralist women may experience differential outcomes under a uniformly planned cash transfers with socioeconomic characteristics acting as indicator-specific rather than general mediators of empowerment. Based on the associations identified, the findings suggest several programme implications: first, age-targeted nutritional support to address the age-related decline in meal frequency observed among. Second, complementary social-norms interventions to address contested household bargaining power and finally, targeted financial literacy support for beneficiaries with no or only secondary education and differentiated payment scheduling and delivery methods for older beneficiaries. The results provide a methodological guide for designing cash transfers programmes that are gender-responsive in various pastoral contexts.

*Correspondence: Stephen Kimotho (kimotho.kibira@gmail.com)

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Keywords

Cash Transfers, Socioeconomic Attributes, Women's Socioeconomic Empowerment, Pastoralist Women

1. Introduction

Women's empowerment occupies a central place in development discourse, anchored formally in Sustainable Development Goal 5's commitment to equal access to economic resources. [1] empowerment framework remains the field's most durable conceptual lens, defining empowerment as the interaction of resources, agency, and achievements, a formulation that becomes analytically important once attention shifts from whether cash transfers are received to how their effects are conditioned by who receives it. Cash transfers programmes rank among the most extensively implemented resource-based strategies targeting women; however, the evidence regarding their empowerment outcomes is inconclusive: while there are consistent improvements in consumption and everyday household choices, the observed associations on wider social and political agency are less robust and variable [2]. This discourse has shifted from whether cash transfers can empower women to the conditions under which they do so, with outcomes more dependent on programme design and the socio-cultural context than just the availability of a transfer [3]. Socioeconomic attributes which comprise age, educational attainment, and marital status are becoming recognised as important moderators of this process, not just simple contextual indicators, as education enhances women's capacity to convert resources into negotiated choices, even within patriarchal context [4], while domestic and social processes can either undermine or support agency [5, 6].

Underexplored, particularly in Sub-Saharan Africa, is whether this pathway is conditioned by beneficiaries' own socioeconomic profile. This divide is greatest for pastoralist women: male clan leaders oversee customary land and livestock governance, restricting women's power to translate income into durable agency [7, 8]. Turkana County, where 79.4% of the population lives in extreme poverty, 64.2% of households depend on cash transfers and Turkana Central Sub-County has the highest proportion of widows (13.7%) and female-headed households (52.1%) in the country, with 79.5% of women lacking formal education [9, 10]. Despite this profile of compounding vulnerability, gender-disaggregated evidence on cash transfers in Africa remains limited [11], and despite more than a decade of HSNP implementation in Turkana, no study to date has examined whether age moderates the relationship between HSNP cash transfers and socioeconomic empowerment among pastoralist women in Turkana, net of education and marital status as direct correlates of that empowerment. This creates a policy-relevant blind spot where a uniformly designed transfer may empower some subgroups of beneficiaries while leaving others largely unaffected, yet programme design decisions are rarely informed by evidence on this differential effect.

This study addresses the gap, applying [1] framework, to test age as a moderator of the programme feature to savings relationship, while education and marital status are tested as direct correlates of savings among beneficiaries in Turkana central sub-county. Specifically, the study sought to test whether age moderates the relationship between HSNP programme features (payment frequency and payment modality) and pastoralist women's socioeconomic empowerment indicators, while examining education and marital status as direct correlates of these indicators rather than as moderators. Correspondingly, the study tested various hypotheses regarding the moderating role of age and pastoralist women's socioeconomic empowerment indicators. Specifically, the study sought to establish whether age significantly moderates the relationship between HSNP payment frequency and savings, and between payment modality and savings, as well as the relationship between payment modality and meal frequency. It further examined whether education and marital status are significantly associated with savings, independent of age. Considering this profile of increased widowhood, female headship and low literacy rates, a standardised cash transfers scheme is improbable to impact beneficiaries uniformly: the utilisation of a transfer by women is contingent upon age, education, and marital status, rather than solely on receipt. However, limited research delineates how these qualities influence empowerment results, a significant deficiency, as the targeting criteria and payment methods are mechanisms that policymakers may modify once the moderating influence of beneficiary traits is understood.

1.1. Theoretical Framework: Kabeer's Empowerment Model

This study is anchored in [1] conceptualisation of empowerment as the process by which people who have been denied the ability to make strategic life choices acquire that ability. The model comprises three interrelated dimensions: resources, material, human, and social preconditions for choice; agency, the capacity to define and act on one's own goals; and achievements, the realised outcomes of exercised agency. In this study, savings accumulated from HSNP cash transfers represent the resource dimension; household decision-making represents agency; and household meal frequency represents achievement. Critically, the framework treats the pathway from resources to agency to achievements as neither automatic nor uniform, For instance, resources expand a woman's choice set only when they can be converted into real opportunities, and this conversion is shaped by intrahousehold dynamics and social structure [12]. Kabeer's empowerment framework was selected over alternative models, including [13] Women's Empowerment Framework, because its tripartite structure allows an explicit distinction between "welfare agency" and "feminist agency," rather than relying on a single composite proxy. It is not without limitations: critics note that it underspecifies the mechanisms and timeframes through which resources translate into agency and achievements and has been faulted for insufficient attention to intersectionality [14, 15]. This study addresses that limitation directly by treating socioeconomic attributes namely age, education, and marital status, as explicit conditioning factors of the resource-to-agency-to-achievement pathway (age operationalised as a statistical moderator of programme-feature effects, and education and marital status operationalised as direct correlates of the resource dimension), rather than assuming the pathway operates identically for all beneficiaries. More specifically, this provides the conceptual pathway of the study: HSNP cash transfers accumulate into savings, the resource dimension, which shape household decision-making, the agency dimension, which in turn shape household meal frequency, the achievement dimension, the strength of each link in this chain is conditioned by the beneficiary's age, marital status and level of education, attributes that can strengthen, weaken or leave unchanged the relationship between programme design features and these empowerment outcomes.

1.2. Empirical Review: Socioeconomic Attributes as Correlates

Socioeconomic attributes operate at multiple levels namely individual, household, and community, and interact to either facilitate or constrain empowerment outcomes [12, 16]. At the individual level, education is a consistently significant determinant of a woman's capacity to leverage a cash transfer for empowerment; even where enduring gender norms restrict participation in economic decision-making, education has been found to help women negotiate and take part in decisions over resource use [4]. At the household level, composition and spousal dynamics matter: co-residence with in-laws has been associated with inferior decision-making power, while living with an adult ally strengthens it [6], and marital status interacts with cash transfers in complex ways, with widowed and divorced female heads of households in some settings facing community stigma after enrolment [17]. At the level of social context, gender norms produce paradoxical dynamics: as household income rises and men move into higher-status employment, women's involvement in economic decision-making has, in some contexts, initially decreased rather than increased [5], while in Bangladesh, women's direct income contributions increased husbands' economic dependence on them without necessarily transforming deeply held beliefs about authority [18].

A systematic review of 56 studies on cash transfers and adult women found that impacts depend more on programme features, mainly frequency and size, than on beneficiary age, with age receiving comparatively little emphasis in targeting research despite the emphasis placed on gender [3]. The same review found that transfers have a stronger association with women's outcomes with more gender-equal social norms, and that societal-level marital norms, such as early marriage, may constrain women more than individual marital status per se [3]. This is supplemented by findings that married women receiving cash transfers report more reproductive agency [19], in line with transfers developing agency among married beneficiaries more broadly. Education might also be associated with how recipients accept transfers. Cash transfers through mobile money have been shown to improve women's decision-making and economic autonomy, suggesting that those with higher levels of digital and financial literacy, which are frequently linked to education, could benefit more from particular payment methods [20].

Taken together, the literature confirms that socioeconomic attributes are not passive descriptors but active moderators in the empowerment process. However, existing studies are largely quantitative and focused on isolated variables, and have not adequately captured how attributes such as age, marital status, and education interact simultaneously to shape distinct empowerment pathways, a gap that is particularly salient in a context such as Turkana Central, where pastoralist livelihoods and specific cultural norms create a distinct environment. This study addresses that gap by testing age as a moderator of the relationship between HSNP cash transfers and pastoralist women's empowerment indicators (savings and meal frequency), while treating marital status and education as direct correlates of empowerment rather than moderators.

2. Materials and Methods

The study adopted a pragmatic research philosophy and an explanatory sequential mixed-methods design, in which quantitative data collection and analysis preceded, and were subsequently explained and enriched by, qualitative data collection and analysis. The sample size of the study was 342 beneficiaries realised from cluster sampling technique for the quantitative survey representing 70.2% response rate. This was complemented by three key informant interviews with programme stakeholders and two focus group discussions with beneficiaries, used to contextualise and explain the statistical findings.

2.1. Measurement

Quantitative data were collected using structured questionnaires capturing beneficiaries' socioeconomic attributes namely age, level of education and marital status, HSNP cash transfers frequency and mode of payment, and three empowerment indicators: household savings behaviour, household decision-making, and household meal frequency operationalised as follows; Savings behaviour was measured as a binary variable (0 = no, 1 = yes), household decision-making was measured using a composite binary indicator derived from six items assessing women's participation in decisions over: (i) purchase of household food, (ii) children's education, (iii) healthcare expenses, (iv) purchase of livestock, (v) sale of household assets, and (vi) use of cash transfers funds and meal frequency was measured as an ordinal variable with three categories: (1) one meal per day, (2) two meals per day, or (3) three or more meals per day, all based on their respective questions. Qualitative data were collected through key informant interviews and focus group discussions, audio-recorded, transcribed, and translated from Turkana to English. The qualitative instruments explored beneficiary experiences with the cash transfers programme and perceptions of their empowerment, with a particular focus on the mechanisms through which socioeconomic attributes might shape transfer utilisation and empowerment outcomes.

2.2. Data Analysis

Quantitative analysis proceeded in three stages. Descriptive analysis characterised the distribution of respondents by age, education, and marital status. Bivariate analysis used chi-square tests and cross-tabulation to examine associations between each socioeconomic attribute and each empowerment indicator. Multivariate analysis used ordinary least squares regression to test the moderating effect of socioeconomic attributes on the relationship between HSNP transfer characteristics and empowerment indicators, using interaction terms between programme features and characteristics namely frequency and mode of payment, and age group. This approach directly operationalises the conceptual pathway of the study: instead of assuming a uniform relationship between cash transfers characteristics and empowerment outcomes, socioeconomic attributes are included as interaction terms with programme features (timing, frequency and mode of payment), such that a statistically significant interaction term indicates that the attribute reinforces, weakens or otherwise modifies the transfer's effect on the outcome.

The general form of the model was specified as:

$$Y = \beta_0 + \beta_1\,(\text{Marital status}) + \beta_2\,(\text{Education level}) + \beta_3\,(\text{Age group}) + \beta_4\,(\text{Programme features and characteristics} \times \text{Age group}) + \varepsilon$$

where Y represents the empowerment indicator (savings or meal frequency); β_0 is the intercept; β_1, β_2, and β_3 are coefficients for the direct effects of the socioeconomic attributes; and β_4 is the coefficient of the interaction term, representing the moderating effect of age on the relationship between the programme feature and characteristics and the outcome. A statistically significant β_4 indicates that the strength of the relationship between the cash transfers feature and the empowerment outcome varies according to the level of the moderating variable. Qualitative data were analysed thematically to contextualise and triangulate the quantitative findings. All analyses used a significance threshold of $p < 0.05$, and variance inflation factors were examined to rule out problematic multicollinearity.

2.3. Ethical Considerations

The study obtained informed consent from St Paul's University, Kenya and National Commission for Science Technology and Innovation (NACOSTI), assured confidentiality and anonymity of responses, and obtained the requisite institutional and county-level research approvals prior to data collection.

3. Results and Discussion

Table 1. *Profile of beneficiaries.*

Characteristic	Sub-group	Percentage
Age-groups	18 - 35 years	6.3
	36 - 45 years	27.4
	46 - 55 years	32.1
	56 - 65 years	31.7
	Above 66 years	2.5
Education levels	No formal education	30
	Primary education	42.5

Characteristic	Sub-group	Percentage
	Secondary education	27.5
Marital status	Married	47.9
	Single/divorced/separated/widowed	52.1

The beneficiaries' profile by age, marital status, and level of education is shown in Table 1. Primary education accounted for 42.5% of recipients, compared to secondary education (27.5%) and no formal education (30%). Women were more likely to be single (52.1%) than married (47.9%). The greatest age group of women was 46-55 years old (32.1%), followed by 56-65 years old (31.7%) and 36-45 years old (27.4%).

Table 2. *Distribution of Empowerment Indicators by Age Group Among HSNP Beneficiaries (n = 342).*

Empowerment indicator	Age group	(% Reporting Affirmative)	χ^2	df	p-value	Significance
Savings	46 -55 years	68.8% (peak)	5.166	4	0.271	NS
	>66years	33.3% (Lowest)				
Decision making	All ages combined	96.1%-100%	4.082	4	0.395	NS
	<55 years (combined)	92-93%				
Meal frequency	56-65 years	71.1%	19.985[1]	4	< 0.001	**
	>66 years	66.7% (lowest)				

The distribution of the three socioeconomic empowerment measures by age is shown in Table 2. The association between savings and age was not statistically significant ($\chi^2 = 5.166$, $p = 0.271$). Savings rose with age, peaking at 46-55 years (68.8%) and steeply declining among those over 66 (33.3%). All age groups (96.1%-100%) exhibited a ceiling effect in decision-making, and there was no statistically significant correlation ($\chi^2 = 4.082$, $p = 0.395$). There was a large, statistically significant age gradient ($\chi^2 = 19.985$, $p < 0.001$) in the frequency of meals: 92-93% among respondents under 55, 71.1% among those between 56 and 65, and 66.7% among those beyond 66.

Table 3. *Distribution of Empowerment Indicators by Education Level Among HSNP Beneficiaries (n = 342).*

Empowerment indicator	Education level	(% Reporting Affirmative)	χ^2	df	p-value	Significance
	No formal education	-				
Savings	Primary education	75.8% (highest)	6.991	2	0.030	*
	Secondary education	50% (lowest)				
	No formal education					
Decision making	Primary education	98.1% - 100%	0.377	2	0.828	NS
	Secondary education					
Meal frequency	No formal education	87.2% (highest)	5.327	2	0.070	NS

[1]NS means not significant (p > 0.05); *p < 0.05; **p < 0.01; ***p< 0.001

The distribution of the three indicators according to levels of education is shown in Table 3. Affirmative savings were largest among respondents with primary education (75.8%) and lowest among those with secondary education (50%), exhibiting a significant, non-linear relationship between savings and education level (χ^2 = 6.991, p = 0.030). Education was coded as an ordinal variable with three categories: (1) No formal education, (2) Primary education, and (3) Secondary education. The regression analysis used 'No formal education' as the reference category, meaning that the negative coefficient for education (β = −0.122, p = 0.002) indicates that compared to respondents with no formal education, those with secondary education had lower savings, while those with primary education had higher savings. However, this non-linear association requires cautious interpretation because it may reflect several contextual factors. First, formal education in this pastoralist setting does not necessarily equate to financial literacy, and women with primary education may have acquired practical economic skills through livelihood activities that secondary-educated respondents may not possess and secondly, secondary education may be associated with higher expectations or consumption needs that reduce savings propensity. Further a key informant noted, "Some women access loans, run hotels. because they understand the system". There was no statistically significant correlation between decision-making and education level (98.1%-100% across subgroups; χ^2 = 0.377, p = 0.828). Meal frequency did not achieve statistical significance (χ^2 = 5.327, p = 0.070), but it was highest among those with no formal education (87.2%) and lowest among those with secondary education and beyond.

Table 4. Distribution of Empowerment Indicators by Marital Status Among HSNP Beneficiaries (n = 342).

Empowerment indicator	Marital status	(% Reporting Affirmative)	χ^2	df	p-value	Significance
Savings	Married	73.0%	9.705	1	0.002	*
	Single/divorced/ separated/ widowed	53.6%				
Decision making	Married	97.6%	0.856	1	0.355	NS
	Single/divorced/ separated/ widowed	99.1%				
Meal frequency	Married	87.0%	0.663	1	0.416	NS
	Single/divorced/ separated/ widowed	83.2%				

The three indicators' distribution of marital status is illustrated in Table 4. Married respondents had significantly larger savings (73.0%) than those who were single, divorced, separated or widowed (53.6%) (χ^2 = 9.705, p = 0.002). Marital status (married 97.6%; unmarried 99.1%; χ^2 = 0.856, p = 0.355) did not significantly impact decision-making. There was no significant correlation between marital status and meal frequency (married: 87.0%; unmarried: 83.2%; χ^2 = 0.663, p = 0.416). "“Now when the husband gets the money the wife does not get it. the cash transfers is shared by everyone including the children of other wives" (FGD, 2025) and "Leave this money. the day the child goes to school he will come and take it" (FGD, 2025) are two examples [2]of focus group narratives that showed different experiences of control over transfers within marriage. Qualitative reports, in contrast, revealed that widower respondents had full control over their transfers.

Table 5. Ordinary Least Squares Regression Results - Moderating Effect of Payment Frequency on Savings by Age.

Empowerment indicators	Standardised coefficient (β)	Std error	t-value	p-value	95% CI Lower	95% CI Upper	Significance
Marital status	+0.157	0.062	2.53	0.012	0.035	0.279	*
Education level	-0.122	0.039	-3.13	0.002	-0.199	-0.045	**
Age group	-0.093	0.035	-2.66	0.008	-0.162	-0.024	**
Interaction effect							

[2]NS means not significant (p > 0.05); *p < 0.05; **p < 0.01; ***p< 0.001

Empowerment indicators	Standardised coefficient (β)	Std error	t-value	p-value	95% CI Lower	95% CI Upper	Significance
Frequency of payment X age	+0.028	0.011	2.55	0.008	0.006	0.050	**
R-Squared = 0.109 F-test = 7.183 df = 4 p-value = 0.000 N=342							

The regression findings examining whether age mitigates the impact of payment frequency on savings are shown in Table 5. The results show that savings were positively and strongly correlated with marital status (β = +0.157, p = 0.012). Further, savings were significantly and adversely correlated with education level (β = −0.122, p = 0.002). Finally, savings were significantly and adversely correlated with age group (β = −0.093, p = 0.008). Age and payment frequency had a positive and statistically significant interaction (β = +0.028, p = 0.008).

Table 6. *Ordinary Least Squares Regression Results - Moderating Effect of Payment modality on Savings by Age.*

Empowerment indicator	Standardised coefficient (β)	Std error	t-value	p-value	95% CI Lower	95% CI upper	Significance
Marital status	+0.012	0.070	0.17	0.459	-0.126	0.150	NS
Education level	-0.020	0.042	-0.48	0.061	-0.102	0.062	NS
Age group	-0.052	0.037	-1.41	0.002	-0.125	0.021	**
Interaction effect							
Payment modality X age	+0.026	0.008	3.25	0.001	0.010	0.042	**
R-Squared = 0.062 F-test = 3.893 df = 4 p-value = 0.04 N=342							

The model findings examining whether age moderates the impact of payment modality on savings are shown in Table 6. Education level (β = −0.020, p = 0.061) and marital status (β = +0.012, p = 0.459) were not statistically significant. Savings were significantly and inversely correlated with age group (β = −0.052, p = 0.002). Age and payment modality had a favourable and statistically significant interaction (β = +0.026, p = 0.001).

Table 7. *Ordinary Least Squares Regression Results - Moderating Effect of Payment Modality on Meal Frequency by Age (n = 342).*

Empowerment indicators	Standardised coefficient (β)	Std error	t-value	p-value	95% CI Lower	95% CI Upper	Significance
Marital status	+0.020	0.072	0.28	0.783	-0.122	0.166	NS
Education level	-0.033	0.043	-0.77	0.494	-0.118	0.052	NS
Age group	-0.092	0.026	-3.54	<0.001	-0.143	-0.041	***
Interaction effect							

Empowerment indicators	Standardised coefficient (β)	Std error	t-value	p-value	95% CI Lower	95% CI Upper	Significance
Payment modality X age	-0.008	0.026	-0.31	0.756	-0.059	0.043	NS
R-Squared = 0.071 F-test = 3.551 df = 4 p-value = 0.04 N=342							

The regression findings examining whether age moderates the impact of payment modality on meal frequency are shown in Table 7. Education level (β = −0.033, p = 0.494) and marital status (β = +0.020, p = 0.783) were not statistically significant. Meal frequency was significantly negatively associated with age group (β = −0.092, p < 0.001). Age and payment modality did not interact in a way that was statistically significant (β = −0.008, p = 0.756).

3.1. Synopsis of Results

Age and socioeconomic characteristics were substantially correlated with savings and (for age) meal frequency across the three empowerment indicators, but not with decision-making, which remained consistently high across all categories. Age did not significantly moderate the relationship between payment modality and meal frequency, but it did significantly moderate the relationship between payment frequency and savings and between payment modality and savings.

3.2. Triangulation of Key Findings-Integration of Quantitative and Qualitative Results

The mixed-methods design allows for triangulation of quantitative findings with qualitative data. The quantitative finding that married women had significantly higher savings than unmarried women (73.0% vs 53.6%, p=0.002; Table 4) is partially supported by qualitative data. A key informant explained that 'married women are more likely to have support networks and shared household responsibilities that allow them to save,' suggesting that marital status may provide structural advantages for resource accumulation. However, this convergence must be interpreted cautiously, as the qualitative data also revealed instances where married women had transfers withheld by husbands, indicating that the apparent savings advantage may be more complex than marital status alone suggests. Also, the strong negative association between age and meal frequency (β = −0.092, p < 0.001; Table 7) is corroborated by qualitative data. Key informants noted that older beneficiaries face distinct challenges: 'Older women have mobility issues that make it difficult to access payment points, and they often have fewer household members to share the burden of household tasks' (KII, 2025). This convergence reinforces the conclusion that age-related food security vulnerability is a genuine and pressing concern requiring targeted intervention beyond the cash transfers itself.

4. Discussion

4.1. Age as a Selective Moderator Rather than a Uniform One

Age alone does not accurately predict saving behaviour or decision-making ability in this cohort, as evidenced by the finding that age was strongly and significantly associated with meal frequency but not with savings or decision-making. The considerable reduction in meal frequency among respondents 56 years and older relative to the other two empowerment metrics indicates a likely food security issue among older age groups. This asymmetry fits with [1] theory, as one beneficiary attribute can influence one facet of empowerment (performance) but not another (resources, agency), showing the importance of assessing moderation indicator by indicator.

4.2. The Savings Paradox and Education

The simplistic assumption of "higher education, more savings" would not capture the non-linear association between education and savings which demonstrates that respondents with secondary education saved less than those with little education only. The key informant’s remark that some women run businesses and acquire loans “because they understand the system” shows that savings behaviour may be more directly associated with financial literacy learned via real-world economic experience rather than formal schooling. This is inconsistent with previous studies, which found that recipients with higher financial literacy (often associated with education) gain from mobile money and digital payment channels [20]. Financial literacy is not always synonymous with formal schooling in this pastoralist setting.

4.3. Marital Status: A Disparity Between Lived and Reported Autonomy

A straightforward interpretation of marriage as empowering is complicated by the qualitative accounts, which show that married beneficiaries reported significantly higher savings. While widowed respondents described having unrestricted control over their own transfers, some women described having their husbands receive and redistribute transfers or withhold them for future needs. Previous research suggests that women’s bargaining power is affected by co-residence and spousal dynamics, not marital status per se [6] and bereaved beneficiaries may follow divergent but not necessarily negative trajectories [17]. This suggests that the lack of a male partner does not necessarily equate to disempowerment and may in some circumstances enhance autonomy. The survey's ceiling effect on decision-making (96-100% across all subgroups, Table 2) conceals underlying contestation over control of transfers, particularly within married and polygamous households, rather than reflecting truly undifferentiated autonomy. These qualitative findings, when combined with the consistently high, statistically indistinguishable decision-making rates across marital subgroups (Table 4), suggest that marital status shapes empowerment outcomes unevenly, mediated by household-specific power dynamics rather than by marital status alone. This is in line with research that finds that rather than enhancing women's economic decision-making capacity in a seamless manner, increases in household resources can in some situations lead to new contestation over it [5, 18].

4.4. Using Payment Design to Close Age-Related Savings Gaps

In both cases, the otherwise negative direct effect of age on savings is offset by the significant, positive interaction terms in Tables 5 and 6 which show that older beneficiaries benefit more from frequent payments and that more convenient payment methods disproportionately increased older beneficiaries’ savings. This, along with the large positive association of education and marital status and the negative direct relationship of age on savings, suggests that programme features, particularly payment frequency and modality, can be changed to reduce age-related savings differences even when individual characteristics are working in the opposite direction of older beneficiaries. This suggests that age is a particular moderator of which design aspects are important for savings in a pastoralist setting.

4.5. Payment Design Limitations: Meal Frequency

Unlike the savings models, the non-significant interaction between payment modality and age in Table 7, indicates that more convenient payment mechanisms do not alleviate the age-related drop in meal frequency. This means that although payment design can help improve savings behaviour, it cannot solve the fundamental resource restrictions that underlie food security amongst older populations. It indicates that there is a limit to what can be achieved by making logistical adjustments to a cash transfers and implies the need for measures beyond payment logistics to promote food security among older beneficiaries, such as targeted nutritional or health-linked support.

4.6. Kabeer's Empowerment Framework for Theoretical Interpretation

These results imply that socioeconomic characteristics moderate the resource-to-agency-to-achievement pathway selectively rather than consistently when interpreted using [1] empowerment framework. Age considerably moderates how programme elements transfer into savings at the resource stage (savings), but marital status and education have an association. The consistently high reported levels across subgroups in the agency stage (decision-making) without notable moderation point to either true uniformity or, as the qualitative data suggests, a ceiling effect that hides contested bargaining power. There is a clear, logistically independent vulnerability among older beneficiaries at the attainment stage (meal frequency), where age has a strong direct influence that is not mitigated by any other attribute or payment arrangement. When combined, these findings suggest a partial rejection of the null hypothesis: age and socioeconomic characteristics significantly moderate savings outcomes, but the data does not support significant moderation for meal frequency or decision-making beyond the direct effect of age. This pattern suggests that socioeconomic characteristics serve as indicator-specific rather than general moderators of empowerment and that a uniformly designed cash transfers may leave significant subgroups of pastoralist women behind. This refines Kabeer's framework that is in line with criticisms of its scant attention to intersectionality [14, 15].

5. Limitations of the Study

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design does not permit causal inference; the associations reported between socioeconomic attributes, programme features and empowerment outcomes should be read as associations rather than causal effects, and a longitudinal or experimental design would be needed to establish temporal precedence and rule out reverse causality or confounding. Second, all three empowerment indicators were derived from self-reported data, which may be subject to recall bias and social-desirability bias, particularly for sensitive items such as household decision-making and control over cash transfers. Third, the qualitative component, comprising two focus group discussions and three key informant interviews, was relatively small and was designed primarily to contextualise the quantitative findings rather than to achieve thematic saturation in its own right; the qualitative themes should therefore be treated as illustrative rather than generalisable. Fourth, the household decision-making indicator showed a pronounced ceiling effect (96.1%-100% affirmative responses across almost every subgroup, Tables 2 and 4), which likely restricted the variance available to the chi-square and regression analyses and may partly explain why no statistically significant moderation was detected for this indicator; this raises the possibility that the measurement instrument did not fully capture meaningful variation in household bargaining power, an interpretation reinforced by qualitative reports of continued contestation over transfer control within households. Finally, the sample was drawn exclusively from HSNP beneficiaries in Turkana Central Sub-County, so the findings may not generalise to other pastoralist populations, to non-beneficiaries, or to cash transfers programmes with different design features.

6. Conclusions

This study set out to determine whether socioeconomic attributes moderate the relationship between HSNP cash transfers and indicators of pastoralist women's socioeconomic empowerment in Turkana Central Sub-County. The evidence suggests four key associations; First, socioeconomic attributes are significantly associated with the resource dimension of empowerment: married beneficiaries and those with primary-level education reported significantly higher savings than their unmarried and more- or less-educated counterparts, respectively. Second, age significantly moderates the relationship between programme features specifically payment frequency and mode of payment and savings, such that more frequent and more accessible payment modalities disproportionately benefit older beneficiaries and partially offset age-related declines in saving capacity. Third, household decision-making was uniformly high across all socioeconomic subgroups and was not significantly moderated by any attribute tested, although qualitative evidence suggests this apparent uniformity may mask underlying, gender-normed contestation over control of funds, particularly within married and polygamous households. Fourth, meal frequency was significantly and negatively associated with age directly, but this relationship was not significantly moderated by mode of payment, indicating that food security among older beneficiaries requires interventions beyond payment logistics alone. Overall, socioeconomic attributes function as selective, indicator-specific moderators of empowerment rather than as uniform amplifiers or dampeners across all dimensions of empowerment.

Abbreviations

HSNP	Hunger Safety Net Programme

Author Contributions

Stephen Kimotho: Conceptualization, Writing – original draft, Writing – review & editing
Peter Koome: Supervision
Wanjugu Wachira: Supervision

Data Availability Statement

The data that support the findings of this study are available upon request with the permission of the corresponding author.

Conflicts of Interest

The authors declare no conflicts of interest.

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Biography

Stephen Kimotho is a post graduate student pursuing a Doctor of Philosophy in Development studies at St Paul's University, Limuru, Kenya. He completed his Master of Development Studies in the same university and a Bachelor's in Education (Economics and Maths), Moi University. The research field for the author is development studies in the areas of social protection (cash transfers) and women socioeconomic empowerment.