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Associations between a cash voucher intervention, food consumption, and coping strategies in Somali food-insecure populations

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Abstract

Background This cross-sectional study aimed to explore the association between cash voucher assistance on building community resiliency and improving food security among 1371 households (HH) living in northern and southern regions of Somalia. The secondary data analysis used endline data from participants in World Vision's Emergency Food Security Program from May 2018 to May 2019. The participants received unconditional cash vouchers, conditional cash for work vouchers, and nutrition and livelihood trainings. Logistic regression analysis was conducted to explore the association between program interventions and food consumption score (FCS, borderline/poor: 0–35, acceptable: > 35) and reduced coping strategy index (rCSI, acceptable: 0–3, emergency/crisis: 4–56).

Results A total of 41.5% of all HH that received cash vouchers reported borderline/poor FCS and 71.1% had emergency/crisis rCSI. Utilization of vouchers for food purchase (0.34; 0.23, 0.51) and purchase of more types of food for greater dietary diversity (0.70; 0.55, 0.89) were negatively associated with acceptable FCS. Participants who redeemed cash vouchers were less likely to have an emergency/crisis rCSI (0.68; 0.61, 0.76). Utilization of cash vouchers had a positive association with increased conflict within the HH (2.90; 1.29, 6.48). Participants reporting benefits from improved community rehabilitation through increased check dams were more likely to have acceptable rCSI (2.37; 1.45, 3.89).

Conclusions Our findings suggest that interventions utilizing cash vouchers have to consider contextual factors in calculations of voucher entitlements, increase investment in water management and livelihood skills training, and expand nutrition and livelihood trainings to men and boys to foster women empowerment and improve food security outcomes.

Keywords Food security, Coping strategy, Internally displaced persons (IDP), Conflict, Unconditional cash vouchers, Conditional cash for work vouchers, Community resiliency, Climate change, Somalia

Background

International food security is becoming increasingly fragile due to global warming, rising sea levels, variability in rainfall, and drought [1]. The combined effects of climate change pose a significant threat to global food security and create challenges in feeding a growing population of eight billion people [2, 3].

The Horn of Africa is currently experiencing the worst drought in over 40 years due to reduced rainfall and rising climate temperatures. In Somalia, in

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particular, drought-like conditions are recurring and have severely impacted refugees, internally displaced persons (IDPs), and host communities alike [4]. The Somali economy and diet rely heavily on livestock production, and increasing temperatures, severe flooding, variable rainfall, and drought increasingly disrupt food supplies needed to meet population demand amidst shifting diet patterns, urbanization, price shocks, and population growth [5]. In addition, conflict has raged within Somalia's borders for the last 30 years, resulting in a protracted refugee crisis [6]. In total, over one million people are internally displaced in Somalia, creating a complex humanitarian crisis in which violence and climate-related disasters has made Somali populations especially vulnerable [4]. Previous interventions to aid populations vulnerable to climate change have centered on in-kind food aid, cash transfer programs, or cash vouchers [7]. Existing research provides evidence that unconditional cash food voucher interventions are effective in improving both food access and dietary diversity [8], and disaster preparedness strategies are essential for communities to adapt to climate change, and importantly, build resilience to increasingly severe bouts of drought and flooding [9].

In 2018, the United States Agency for International Development Food for Peace (USAID/FFP) program funded an emergency food security program (EFSP) with program objectives to meet the immediate needs of the most vulnerable households (HH) across seven districts in five regions of Somalia [10]. Implemented by World Vision, the EFSP provided cash-based voucher assistance to increase household capacity to purchase and access diverse, nutritious foods at local markets and to rehabilitate community assets. The project distributed unconditional cash vouchers for food purchase (value of approx. \$68 USD per household), and conditional cash-for-work vouchers over a period of 11 months (May 2018–March 2019). Unconditional voucher distributions took place monthly for a total of 6 months (May–October 2018) and were used to redeem food items at pre-approved vendors at local markets. Select participants were enrolled in conditional cash for work (CFW) programs for 8 months (August 2018–March 2019), by which participants helped to create or rehabilitate community assets in exchange for cash vouchers [10].

The project distributed unconditional cash vouchers for food purchase (value of approx. \$68 USD per household), and conditional cash-for-work vouchers over a period of 11 months, from May 2018 through March 2019.

Nutrition education sessions and market monitoring sessions were led by World Vision and conducted for the entire duration of the cash voucher program. Women from registered HHs were trained on various

components of nutrition and hygiene and selected to act as community nutrition volunteers (CNVs) [10].

This study explores the impact of cash vouchers on addressing food insecurity among IDPs in Somalia as a result of severe drought and flooding, price shocks, and disruption of livelihoods.

Methods

Participants and data collection

Data were retrieved from a USAID Food for Progress project implemented by World Vision, Emergency Food Security Program in Somalia (EFSP—Somalia), with an objective to meet the immediate food needs of the most vulnerable households in Bakool, Bay, Gedo, Toghdeer, and Woqooyi Galbeed/Saxil regions.

This secondary data analysis study used endline data, collected in June–July 2019, through a structured questionnaire following implementation of the Emergency Food Security Program—Somalia from May 2018 to May 2019. The EFSP—Somalia questionnaire included data on sociodemographic characteristics, food consumption scores (FCS), coping strategy use (rCSI), cash voucher use, and household and community benefit. The study population consisted of households from eight districts across five regions of Somalia that were identified through Multi-Stage Probability Proportional to Size (PPS) cluster sampling at the district level to ensure households had the same probability of selection into the cash voucher program. Random sampling was used to select registered program households/participants for interview to ensure results appropriately reflected the target population.

Sociodemographic factors

Household sociodemographic data were collected through the World Vision structured questionnaire to analyze the effects of gender (male versus female), marital status (married versus single), age of the head of household (<25 years, 26–35 years, 36–45 years, and >45 years), household size (<6 members versus ≥6 members), level of education (never attended school versus primary/secondary school versus non-formal schooling—Quaranic), type of residence (resident versus IDP), and region (Bakool, Bay, Gedo, Toghdeer, and Woqooyi Galbeed/Saxil).

Outcomes

Food consumption score FCS is a proxy indicator for assessing a household's dietary diversity and nutrient intake. Participants were asked to report consumption of foods from nine food groups (cereals and tubers, pulses, vegetables, fruit, meat and fish, milk, oil, sugar, and condiments/spices). FCS was calculated based on consumption

from different food groups during a 7-day reference period using standardized weighed food group scores [11]. The thresholds for food consumption are Poor (range: 0–21), Borderline (21.5–35), and Acceptable (> 35).

Reduced coping strategy index rCSI is a proxy indicator for household food insecurity, measured by assessing the frequency and severity of food consumption behaviours a household engages in amidst shortages in foods. rCSI is calculated using frequency of five pre-selected coping strategies (and their standardized weighted scores) used over a 7-day period [12]. The thresholds for reduced coping strategy index are Acceptable (range: 0–3), Emergency (4–18), and Crisis (19–56).

The impact of cash vouchers on the market refers to the ability for traders and vendors to increase food availability, adjust food pricing, and the ability of traders to increase stock, quality, and capacity for business operations (see Table 5, Additional File 1). “No significant impact on the family” refers to whether participants felt using cash vouchers did or did not have an impact on the family’s food consumption scores/dietary diversity.

Analysis

First, we examined the socioeconomic determinants of poor food consumption and coping strategy use. Second, we examined the association between (1) receiving cash vouchers, (2) perceived impact of the cash voucher program on food consumption (FCS) and coping strategy use (rCSI), and (3) perceived impact of community assets created using vouchers for work on food consumption and coping strategy use.

The final analytic samples used in the secondary data analysis consisted of 1371 households after excluding seven households due to lack of responses and/or data entry error. Descriptive data analysis was conducted to calculate the mean (SD) for continuous variables and proportions for categorical variables including independent and dependent outcome variables.

Linear and logistic regression was conducted to investigate the associations between (1) socioeconomic determinants of poor food consumption coping strategy use, (2) receiving cash vouchers and poor food consumption and coping strategy use, (3) perceived impact of the cash voucher program and poor food consumption and coping strategy use, and (4) community assets created using vouchers for work on food consumption and coping strategy use. Regression analysis was adjusted for gender, age, education, and region. The data analysis was conducted using STATA 17.0.

Ethical approval

Participation in the endline survey was voluntary, and informed consent was obtained by the interviewers for all participants prior to administration of the questionnaire. This study was exempt from ethical review by the Johns Hopkins Bloomberg School of Public Health.

Results

General characteristics

The study population consisted of households predominantly led by females (65.4%) (Table 1). 86.7% of respondents were married, with the largest proportion being over the age of 45 years, followed by those aged 36–45, 26–35, and about 5% being respondents under 25 years of age. About 80% of households consisted of six or more members, and 63.6% of respondents never received any form of schooling with only 12.2% having attended primary or secondary school, and 24.22% receiving Quaranic schooling. The majority of respondents were residents in the area (83.6%), with 16.4% of respondents identifying as internally-displaced persons (IDPs).

Outcomes

41.5% of the population reported borderline or poor FCS indicating poor food quantity, dietary diversity, and

Table 1 Household characteristics ($n = 1371$)

Characteristics	n (%)
HHH gender	$n = 1371$
Male	474 (34.6)
Female	897 (65.4)
HHH marital status	$n = 1371$
Married	1188 (86.6)
Single	183 (13.4)
Age of HHH	$n = 1370$
< 25 y	76 (5.5)
26–35 y	278 (20.3)
36–45 y	438 (32.0)
> 45 y	578 (42.2)
HH size	$n = 1367$
< 6	280 (20.5)
≥ 6	1087 (79.5)
Highest level of education of HHH	
Never attended school	872 (63.6)
Attended primary or secondary school	167 (12.2)
Other (Quaranic) ^a	332 (24.2)
Type of residence	$n = 1371$
Resident in this area	1146 (83.6)
Internally displaced person (IDP)	225 (16.4)

^a Other schooling refers to non-formal Quaranic education

HHH Head of Household, HH Household

nutrient density with a mean (SD) of 2.32 (0.87) (Table 2). 71.1% of the study population reported emergency/crisis levels of negative coping strategies (rCSI) amidst food shortages with a mean (SD) of 1.87 (0.64).

Cash voucher use and FCS

Food consumption scores did not vary between males and females ($p = 0.535$) (Table 3). Non-formal schooling through Quaranic education was positively associated with lower FCS while primary and secondary school

education showed no association with FCS. Based on geographical region, all five regions showed negative associations with improved FCS.

The cash voucher intervention showed a negative association between cash voucher benefit and improved food consumption scores (0.78; 95% CI 0.65, 0.92) (Table 4). The impact of cash voucher use had a negative association with increased quantity of foods (0.41; 0.27, 0.63) and increased varieties of food for consumption in the HH (0.62; 0.48, 0.80). The data show children were less likely to be eating more than before (0.69; 0.53, 0.90), but did show a positive association between use of cash vouchers and the ability for orphans to stay in school (1.98; 1.08, 3.64). The data also show a positive association between use of cash vouchers and increased conflict within the household (2.90; 1.29, 6.48). The use of vouchers was not associated with having a perceived, significant impact on family FCS (2.02; 1.08, 3.80), and the conditional, cash for work vouchers to create community assets did not have a statistically significant effect on food consumption scores.

Table 2 Food Security Indicators

	Mean (SD) or n (%)
Food consumption score (FCS)	2.3 (0.9)
Acceptable	675 (58.5)
Borderline	173 (15.0)
Poor	306 (26.5)
Reduced coping strategy index (rCSI)	1.87 (0.6)
Acceptable	316 (28.9)
Emergency	618 (56.5)
Crisis	159 (14.5)

Table 3 Association between sociodemographic factors on FCS and rCSI

	OR	p-value	Adjusted aOR	p-value	OR	p-value	aOR	p-value
Gender of HH (ref: male)	1.00				1.00			
Female	1.33 (1.04, 1.70)	0.025	1.09 (0.83, 1.42)	0.535	1.75 (1.33, 2.30)	0.000	1.36 (0.99, 1.87)	0.062
Marital status (ref: married)	1.00				1.00			
Single	0.87 (0.62, 1.24)	0.448			0.81 (0.55, 1.18)	0.264		
Age of household head								
< 25 y	0.71 (0.39, 1.30)	0.267			1.38 (0.75, 2.57)	0.305	1.65 (0.79, 3.44)	0.185
26–35 y (REF)	1.00				1.00			
36–45 y	1.18 (0.85, 1.65)	0.329			1.32 (0.92, 1.88)	0.127	1.27 (0.84, 1.93)	0.25
> 45 y	(0.87, 1.64)	0.284			1.43 (1.02, 2.01)	0.038	1.62 (1.09, 2.41)	0.017
Household size (REF: < 6)	1.00				1.00			
≥ 6	1.13 (0.85, 1.51)	0.408			1.64 (1.20, 2.23)	0.002	0.97 (0.67, 1.41)	0.878
Highest level of education of HH head								
Never attended school (REF)	1.00				1.00			
Attended primary or secondary school	0.86 (0.58, 1.27)	0.439	0.69 (0.46, 1.05)	0.083	2.04 (1.33, 3.14)	0.001	1.50 (0.92, 2.45)	0.107
Other (quaranic)	1.81 (1.37, 2.40)	0.000	1.44 (1.01, 2.06)	0.044	4.74 (3.18, 7.07)	0.000	2.26 (1.37, 3.71)	0.001
Resident type (REF: resident in area)	1.00				1.00			
IDP	1.18 (0.85, 1.63)	0.317			1.09 (0.76, 1.55)	0.646		
Region								
Bakool (REF)	1.00				1.00			
Bay	0.53 (0.35, 0.80)	0.003	0.51 (0.34, 0.80)	0.003	0.42 (0.25, 0.72)	0.001	0.43 (0.24, 0.74)	0.003
Gedo	0.40 (0.24, 0.66)	0.000	0.33 (0.19, 0.56)	0.000	2.81 (0.97, 8.12)	0.056	1.98 (0.67, 5.87)	0.218
Toghdeer	0.42 (0.30, 0.57)	0.000	0.47 (0.33, 0.66)	0.000	0.36 (0.24, 0.56)	0.000	0.51 (0.32, 0.81)	0.004
Woqooyi Galbeed/Saxil	0.28 (0.20, 0.39)	0.000	0.31 (0.21, 0.45)	0.000	0.07 (0.04, 0.10)	0.000	0.09 (0.06, 0.14)	0.000

Adjusted for gender, age, HH size, education, region

Table 4 Associations between cash voucher impacts on FCS and rCSI¹

Voucher impact	Cash voucher impact on FCS (REF: acceptable)				Cash voucher impact on rCSI (REF: acceptable)			
	OR	p-value	aOR	p-value	OR	p-value	aOR	p-value
Benefit from CV	0.79 (0.68, 0.92)	0.002	0.78 (0.65, 0.92)	0.003	0.89 (0.73, 1.09)	0.268	0.70 (0.58, 0.86)	0.001
Redemption of CV	1.02 (0.95, 1.10)	0.526	1.02 (0.94, 1.11)	0.607	0.84 (0.76, 0.93)	0.001	0.68 (0.61, 0.76)	0.000
More quantity of food to eat in the HH	0.34 (0.23, 0.51)	0.000	0.41 (0.27, 0.63)	0.000	3.20 (2.13, 4.82)	0.000	8.61 (4.99, 14.9)	0.000
More types of food in the HH (Variety)	0.70 (0.55, 0.89)	0.004	0.62 (0.48, 0.80)	0.000	2.09 (1.60, 2.73)	0.000	2.07 (1.51, 2.83)	0.000
Children are eating more often than before	1.39 (1.09, 1.78)	0.008	0.69 (0.53, 0.90)	0.006	1.28 (0.97, 1.68)	0.075	1.66 (1.19, 2.30)	0.003
Adults are eating more often than before	1.14 (0.90, 1.43)	0.290	0.83 (0.65, 1.07)	0.147	1.33 (1.02, 1.73)	0.034	1.56 (1.14, 2.12)	0.005
Household able to buy different assets	1.68 (1.28, 2.21)	0.000	0.66 (0.50, 0.88)	0.005	0.77 (0.58, 1.02)	0.065	0.84 (0.60, 1.16)	0.283
Reduced expenditure on food	1.59 (1.24, 2.05)	0.000	0.77 (0.59, 1.00)	0.052	0.67 (0.51, 0.88)	0.004	0.81 (0.58, 1.12)	0.194
Market voucher impact	0.86 (0.59, 1.25)	0.429	1.05 (0.71, 1.58)	0.776	2.31 (1.41, 3.80)	0.001	1.90 (1.10, 3.28)	0.021
Orphans can go to school instead of working	0.35 (0.19, 0.62)	0.000	1.98 (1.08, 3.64)	0.027	5.36 (1.92, 14.99)	0.001	2.37 (0.81, 6.93)	0.116
There is conflict within the household	0.27 (0.12, 0.58)	0.001	2.90 (1.29, 6.48)	0.010	10.04 (1.35, 74.53)	0.024	5.24 (0.69, 39.51)	0.108
HH is able to pay debt	0.95 (0.58, 1.56)	0.844	0.91 (0.54, 1.53)	0.731	2.48 (1.16, 5.31)	0.019	1.76 (0.79, 3.96)	0.170
Able to save	0.93 (0.45, 1.93)	0.837	1.31 (0.61, 2.79)		1.09 (0.29, 4.12)	0.904	0.87 (0.21, 3.62)	0.844
No significant impact on the family	0.32 (0.18, 0.57)	0.000	2.02 (1.08, 3.80)	0.489	0.18 (0.09, 0.33)	0.000	0.02 (0.01, 0.06)	0.000

Cash voucher use and rCSI

There was no difference in rCSI scores or use of negative coping strategies between males and females (1.36; 0.99, 1.87) (Table 3). Individuals over the age of 45 (1.62; 1.09, 2.41) and those who received non-formal Quranic schooling (2.26; 1.37, 3.71) were also more likely to have higher rCSI scores (Table 3).

The cash voucher intervention showed a positive association between increased quantity of food to eat in the HH and reduced use of negative coping strategies (8.61; 4.99, 14.9), and a positive association between more types of food in the HH and improved rCSI scores (2.07; 1.51, 2.83). The impact of cash vouchers on the markets was positively associated with improved rCSI scores (1.90; 1.10, 2.38) (Table 4). Utilization of cash for work

vouchers showed a positive association between creation of check dams and improved rCSI scores (2.06; 1.27, 3.33) (Table 5), and a positive association between perceived benefits of check dams and reduction of negative coping strategy use (2.37; 1.45, 3.89) (Table 6).

Discussion

Cash vouchers did not have a direct, statistically significant effect on improving food consumption scores or dietary diversity

Previous research on the effectiveness of cash voucher programs in other low- and middle-income countries (LMICs) showed positive impact of utilization of cash vouchers for food purchase on improving FCS when paired with nutrition education sessions [8]. However,

Table 5 Cash voucher impact on community asset creation

REF: acceptable Community asset	Impact of community asset creation on FCS				Impact of community asset creation on rCSI			
	OR	p-value	aOR	p-value	OR	p-value	aOR	p-value
Feeder roads	1.09 (0.84, 1.41)	0.513	0.86 (0.64, 1.16)	0.333	1.28 (0.96, 1.71)	0.088	1.01 (0.71, 1.43)	0.951
Water catchments/sources	1.54 (1.20, 1.96)	0.001	1.04 (0.78, 1.38)	0.786	2.06 (1.56, 2.74)	0.000	0.83 (0.58, 1.19)	0.309
Check dams	0.57 (0.39, 0.82)	0.002	0.68 (0.45, 1.01)	0.059	1.68 (1.09, 2.59)	0.019	2.06 (1.27, 3.33)	0.003
Soil bunds	1.02 (0.73, 1.43)	0.892	1.37 (0.93, 2.00)	0.107	1.36 (0.91, 2.05)	0.135	1.08 (0.66, 1.76)	0.754
Clearing of pastureland and farmland	0.43 (0.30, 0.60)	0.000	0.25 (0.17, 0.38)	0.000	1.18 (0.84, 1.66)	0.332	0.91 (0.58, 1.44)	0.689

Table 6 Cash voucher impact on community asset benefits¹

REF: acceptable Community asset	Impact of community asset benefit on FCS				Impact of community asset benefit on rCSI			
	OR	p-value	aOR	p-value	OR	p-value	aOR	p-value
Feeder roads	1.05 (0.81, 1.35)	0.708	0.89 (0.66, 1.18)	0.411	1.05 (0.79, 1.40)	0.75	0.83 (0.59, 1.17)	0.294
Water catchments/sources	1.28 (1.00, 1.65)	0.048	0.95 (0.72, 1.26)	0.714	2.11 (1.57, 2.82)	0.000	0.93 (0.65, 1.33)	0.682
Check dams	0.60 (0.42, 0.86)	0.006	0.70 (0.47, 1.05)	0.084	2.02 (1.29, 3.16)	0.002	2.37 (1.45, 3.89)	0.001
Soil bunds	0.96 (0.68, 1.36)	0.82	1.25 (0.85, 1.86)	0.257	1.29 (0.86, 1.93)	0.213	1.03 (0.63, 1.67)	0.917
Clearing of pastureland and farm-land	0.44 (0.31, 0.62)	0.000	0.24 (0.16, 0.37)	0.000	1.45 (1.01, 2.07)	0.043	1.17 (0.73, 1.87)	0.515
Waste management pits	2.82 (0.52, 15.49)	0.232	3.17 (0.57, 17.73)	0.189	2.51 (0.30, 20.94)	0.395	2.22 (0.26, 19.06)	0.469

¹ Adjusted for gender, age, education, region

the EFSP—Somalia cash voucher intervention did not show a positive association with increasing dietary diversity. The conditional and unconditional cash voucher assistance aimed to provide recipients the means to purchase more diverse and greater quantities of food, however, numerous households expressed concerns around the low values of the cash voucher entitlements throughout the program [10]. The study findings also show an association between low formal education levels and worse food consumption scores, suggesting that households with relatively low literacy levels may also be some of the poorest, with less discretionary income and ability to purchase staple food items.

Cash voucher use had a positive association with increased conflict in the household

At the same time, increased cash food voucher entitlements in the household also led to increased conflict, alluding to disagreements surrounding the decision-making between spouses and household members. Globally, men typically take on the role of providing for the household and generating income whereas women are responsible for domestic work and provisioning, cooking, and providing food for their families [13]. Somalia has a largely male-dominated clan system in which women are systematically excluded from certain rights, economic activities, decision-making, and political processes [14], and is ranked fourth-last in the world for gender equality [15]. While our study found no difference between FCS and rCSI scores between men and women, in displaced populations, loss of livelihoods caused by drought and conflict have left many men unable to find work and provide for their families as their agropastoral backgrounds are inapplicable in urban settings and any day labor they are able to find is often a far distance from the home [16]. Simultaneously, there have been increasing rates of women leaving domestic work and engaging in income-generation activities (IGA) outside the home to supplement income [16]. As a result, women are increasingly

becoming heads of household, explaining why the majority of households within the analytic sample were led primarily by women.

Household size and FCS

In the context of civil wars and climatic events, some households may have taken in displaced relatives due to drought, floods, or conflict [17]. Of note, 84% of the respondents reported they were residents of the area, with only 16% identifying as IDPs. Of the 1371 households, 79.5% had a household size greater than or equal to 6. Based on United Nations Population Fund's 2014 estimate, the average household size in Somalia is 5.9 [18]. With most respondents reporting household size greater than 6, larger than expected household sizes in the priority intervention regions suggest that provisions prepared by USAID and World Vision were insufficient and, therefore, international actors must budget vouchers accordingly to see improved FCS.

Utilization and impact of cash vouchers on rCSI

The relationship between cash voucher impacts on the market and rCSI scores was statistically significant, indicating the cash voucher intervention was associated with reduced use of negative coping strategies due to the ability for recipients to purchase greater quantities and greater diversity of foods, as well as the increased capacity of vendors to run their businesses.

Impact and benefit of conditional cash for work vouchers on rCSI

Water management and storage is key to preparing populations for flash floods and seasons of reduced rainfall [19]. Somalia experiences four seasons with recurring, yet irregular, periods of monsoons and drought [20]. Climate conditions in Somalia are affected by numerous factors including changing ocean temperatures and El Niño Southern Oscillation (ENSO), making the country's climate-sensitive agricultural sector increasingly vulnerable

as projections indicate even greater rainfall and intense flash flooding in future years [20]. The EFSP—Somalia program utilized conditional cash for work vouchers to build or rehabilitate community assets to increase ease of transportation, creation of check dams, and clearing of lands for pasture or farming. Based on our findings, creation of check dams proved most beneficial to respondents. These findings provide good insight for future periods of flooding showcasing the potential for improved water control to protect infrastructure and livelihoods as well as improved water storage during seasons of drought.

Recommendations

To improve the impact of EFSP, we suggest a few things as follows. First, international actors must consider contextual factors in calculations of voucher entitlements to see improved food consumption scores and dietary diversity. Greater attention must be given to assess unique contexts for deviations from average household size and population composition to ensure voucher entitlements are appropriate and aligned to community and household needs. Second, increased investment into community infrastructure and water management is key to building community resilience and preparing populations for flash floods and seasons of reduced rainfall [19]. Third, as women and mothers are often leaders in influencing food consumption changes due to the roles they play in sourcing and cooking food for the household [21], needs assessments and design of interventions must apply a gender lens to ensure women are provided opportunities to build financial literacy and purchasing power, and are empowered to make change within their communities. Future programming should continue delivering nutrition and livelihood training to women, but also offer separate sessions to include men, boys, and adolescents to facilitate discussions surrounding gender roles and expectations of masculinity, foster environments in which women can be supported and empowered, and to build consensus on improving well-being and food consumption in the household overall. Lastly, increased provision of technical assistance and cash for work vouchers will enable populations to better understand diverse diets, equip individuals to engage in income-generating activities, and build community resilience.

Limitations

The food consumption score and reduced coping strategy index are both proxy indicators for dietary diversity and household food insecurity, respectively, and have significant limitations in terms of accurately reporting food security status. The nature of this cross-sectional study analyzed only endline data, thus, we were

not able to track changes over time and the results of this study informed assumptions representative of the Somali food security context.

Conclusion

This study explored the impact of a cash voucher intervention on food insecure populations in the northern and southern regions of Somalia through analysis of voucher utilization impact on food consumption scores, perceived impact of cash vouchers on negative coping strategy use, and perceived impact of improved community assets. For future interventions, greater consideration of contextual factors for calculation of voucher entitlements is essential to increase impact utilization on improving dietary diversity and food consumption score. Greater investment in water management and storage infrastructure should be prioritized to build resilience in communities increasingly vulnerable to flooding and drought. To foster community support, delivery of nutrition and livelihood trainings for women should be expanded to include men and boys to empower women and their decision-making power. The results of this research will inform how best to improve future emergency food security programs to increase local capacity, build community resilience, and ensure food and nutrition security (Additional file 1).

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s40066-023-00458-w>.

Additional file 1: Table S1. Impact of Cash Vouchers on Markets (FCS).
Table S2. Impact of Cash Vouchers on Markets (rCSI).

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Author contributions

TF, YK: study conception and design. TF, YK: analysis. TF, YK: interpretation of results. TF, YK, AT: draft manuscript preparation. TF, YK, AT, BO, RK: review of final manuscript.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Participation in the endline survey was voluntary, and informed consent was obtained by the interviewers for all participants prior to administration of the questionnaire. This study was exempt from ethical review by the Johns Hopkins Bloomberg School of Public Health.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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References

1. United Nations Climate Action. What is Climate Change? 2023. <https://www.un.org/en/climatechange/what-is-climate-change>
2. FAO. Global food security challenges and its drivers: conflicts and wars in Ukraine and other countries, slowdowns and downturns, and climate change. Council, Hundred and Seventy-second Session, Rome, 24–28 April 2023. CL 172/5. Rome; 2023. www.fao.org/3/nl652en/nl652en.pdf
3. UN Department of Economic and Social Affairs. UN DESA Policy Brief No. 140: a world of 8 Billion; 2022. <https://www.un.org/development/dpad/publication/un-desa-policy-brief-no-140-a-world-of-8-billion/#:~:text=As%20the%20global%20population%20grew,per%20cent%20of%20global%20growth>. Accessed 27 Nov 2023.
4. UNHCR. Somalia refugee crisis explained; 2022. <https://www.unrefugees.org/news/somalia-refugee-crisis-explained/>. Accessed 14 Mar 2023.
5. Warsame AA, Sheik-Ali IA, Hassan AA. Extreme climatic effects hamper livestock production in Somalia. *Environ Sci Pollut Res*. 2022;29:40755–67. <https://doi.org/10.1007/s11356-021-18114-w>.
6. UNHCR. Protracted refugee situations explained; 2020. <https://www.unrefugees.org/news/protracted-refugee-situations-explained/>. Accessed 14 Mar 2023.
7. USAID. Types of emergency food assistance | Food Assistance. U.S. Agency for International Development. <https://www.usaid.gov/food-assistance/what-we-do/emergency-activities/types-emergency>. Accessed 14 Mar 2023.
8. Hidrobo M, Hoddinott J, Peterman A, Margolies A, Moreira V. Cash, food, or vouchers? Evidence from a randomized experiment in northern Ecuador. *J Dev Econ*. 2014;107:144–56. <https://doi.org/10.1016/j.jdeveco.2013.11.009>.
9. Kreibich H, Van Loon AF, Schröter K, et al. The challenge of unprecedented floods and droughts in risk management. *Nature*. 2022;608:80–6. <https://doi.org/10.1038/s41586-022-04917-5>.
10. World Vision. (2018). *WORLD VISION US - 72DFPP18GR00026 FY18 Annual Results Report*.
11. United Nations World Food Programme, VAM. Food consumption analysis, FCS technical guidance sheet; 2008. p. 8–9.
12. IndiKit. IndiKit Reduced Coping Strategy Index. IndiKit; 2023. <https://www.indikit.net/indicator/3950-reduced-coping-strategy-index-rcsi>. Accessed 14 Mar 2023.
13. UN Women. Explainer: How gender inequality and climate change are interconnected. UN Women Headquarters; 2022. <https://www.unwomen.org/en/news-stories/explainer/2022/02/explainer-how-gender-inequality-and-climate-change-are-interconnected>. Accessed 19 Apr 2023.
14. UN Women, UNFPA. Case Study: Somalia Funding for Gender Equality and The Empowerment of Women and Girls in Humanitarian Programming; 2020. <https://www.unfpa.org>
15. USA for UNHCR: The UN Refugee Agency. Gender equality and social inclusion—Somalia; 2022. <https://www.undp.org/somalia/genderequality>
16. Fanning E. Drought, displacement and livelihoods in Somalia/Somaliland. Time for gender-sensitive and protection-focused approaches. Oxford: Oxfam GB; 2018. <https://doi.org/10.21201/2018.2845>.
17. World Vision, ResearchCare Africa. World Vision Inc—Somalia—72DFPP18GR00026—annual result report—FY18—October 2017 to September—2018; 2018.
18. UNFPA. Population estimation survey 2014—for the 18 pre-war regions of Somalia. Nairobi: United Nations Population Fund, Somalia Country Office; 2014.
19. Ministry of Energy and Water Resources of Somalia and the United Nations Environment Programme. Sustainable flood management and

- risk reduction action for flood and drought management in Somalia. United Nations Environment Programme; 2022.
20. Red Cross Red Crescent Climate Centre. Country-level climate fact sheet Somalia. International Committee of the Red Cross; 2021.
 21. Victora CG, Christian P, Vdaletti LP, Gatica-Domínguez G, Menon P, Black RE. Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda. *Lancet*. 2021;397(10282):1388–99. [https://doi.org/10.1016/S0140-6736\(21\)00394-9](https://doi.org/10.1016/S0140-6736(21)00394-9).

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