

Effectiveness and Preferences on Mainstreaming Early Childhood Stimulation Services in Tanzania: A Case Study of Community-based Early Childhood Development Initiative

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ABSTRACT

Early childhood stimulation (ECS) services are globally championed due to their proven ability to help children at risk of developmental delay attain their developmental potential. This study explored the effect of different ways of mainstreaming ECS services on child development. A mixed research approach was employed, involving quantitative and qualitative collection methods. Quantitative data was collected using the adopted ZamCAT tool administered to 334 children sampled from the benefited households. Qualitative data was collected through focus group discussions with the parents ($n=4$) and in-depth interviews with the key informants ($n=14$), respectively. The collected quantitative data were coded and analysed using Statistical Package for Social Sciences (25), and the collected qualitative data were analysed through content analysis. The binary logistic regression model was employed where the results showed a significant effect on child development from home visiting ($p = 0.01$) and Early childhood development centres ($p = 0.016$) compared to clinic outreaches. Children's nutritional status was also an influencing factor for a child to attain optimal developmental status. Furthermore, both community members and ECS services providers highly preferred ECD centres and home visiting services as opposed to a preference for clinic outreaches. The study concludes that when children are subjected to ECS services, attaining optimal development potential regardless of the household background characteristics is the forecasted result. Therefore, the study underscores the capacitation of communities on ECS practices utilising the available enabling environment and increased budget allocation for developing specific ECD policies and deploying experts.

Keywords: Clinic outreaches, early childhood development centres, early childhood stimulation, home visit.

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I. INTRODUCTION

Early childhood stimulation (ECS), like any other early childhood intervention, plays a vital role in creating a good nurturing environment for children to attain their full developmental potential (McCoy *et al.*, 2016). This study uses the term ECS services synonymously with early childhood interventions delivered via parenting programs, health facilities, and crèches to stimulate child development (World Bank, 2018a). Globally, the population younger than five years of age is estimated to be around 250 million, where 43% of the population is susceptible to unattaining full developmental potential. In Sub-Saharan Africa, 66% of children younger than five years of age are at risk of poor development (Black *et al.*, 2017; Grantham-McGregor *et al.*, 2017). Tanzania is among the countries that fall in the region; for example, the severity of poor child development is still high, with an estimated 70% of children being at risk of not

attaining their full developmental potential (EGPAF, 2018). In Tanzania, children enrolled in standard one were observed to have not mastered school readiness skills, with an average score of less than 50% on cognitive and socio-emotional development assessments (UNICEF, 2017).

ECS services have proven to play a vital role in helping children attain school readiness and higher productivity at later stages of life (Xiong *et al.*, 2020). According to Marini *et al.* (2017), ECS services started at the end of the 20th century and were initially designed to help children with medical conditions and developmental delays. This was delivered through home visits by a paraprofessional or a specialised social worker. Despite being implemented for years, ECS services have profoundly been regarded as social work challenged by a lack of implementation tools and relied on the abilities of a social worker to moderate the sessions (Ferguson, 2018). As such, different child developmental packages were developed to address childhood-associated developmental problems for disadvantaged children

worldwide. This enhanced social workers to offer appropriate ECD services through tailored counselling sessions to meet children's needs (Peacock *et al.*, 2013). The developed early childhood stimulation service packages were designed to integrate the intervention with the available enabling structures at the community level. Such structures include household environment, community groups, healthcare services, and early childhood development (ECD) centres (Berry *et al.*, 2013; Walker *et al.*, 2018; WHO, 2012).

Regardless of the collective efforts put forth at the global stance on improving the delivery of ECD services as stipulated in Sustainable Development Goals (SDGs), there is a great variation in the implementation of the agenda at regional and national levels (Tekin, 2019). This is observed through low budget allocation in the ECD-related sector, where developing countries allocate less than 2% of their overall education budget contributed by donor aid to ECD (Neuman & Powers, 2021). Furthermore, limited access to pre-primary education, with less than 50% of preschool-aged children accessing pre-primary education, is experienced in developing countries (Black *et al.*, 2017).

As a strategy to address the early childhood development (ECD) problems in Tanzania, different ECS programs have been implemented by the government in collaboration with Non-governmental Organizations (NGOs) (World Bank, 2018a). Most of the programs adopted the Care for Child Development (CCD) package, which allows social workers to conduct counselling sessions at home, in community centres, and in health facilities (Gertler *et al.*, 2014). Community-based early childhood development initiatives were among the ECD initiatives with an ECS component, which was funded and implemented by the Firelight Foundation through local NGO partners (Hapunda *et al.*, 2021). Sawa Wanawake Tanzania (SAWA) and Tanzania Home Economics Association (TAHEA) were part of the consortium ECD initiative. A four-year program (2017–2020) was introduced to capacitate parents on early stimulation services through home visiting, clinic outreaches, and ECD centres.

Assessment of effective ECS services mainstreamed through available community structures requires proper context-based child assessment tools, which are missing in the Tanzanian context. Present studies highly focus on caregivers' awareness and capacity to conduct and implement ECS services utilising adults' opinion-based tools (Antelman *et al.*, 2022; Jukes *et al.*, 2021; Russell *et al.*, 2022; World Bank, 2018b). Jukes *et al.* (2021), for instance, assessed the social-emotional competencies of children where the parents and teachers rated children's status. Likewise, the study conducted by the World Bank (2018b) in the Katavi region utilised the Caregiver Reported Early Development Index (CREDI), and Home Observation Measurement of the Environment (Home) tools. The CREDI and HOME tool relies on the adult's opinion and observation to determine children's status. Similarly, the study conducted by Russell *et al.* (2022) in Zanzibar, Tanzania, utilised the CREDI tool to assess the association between parenting practices and child development. Further, Antelman *et al.* (2022) assessed caregivers' knowledge using the customised questionnaire set to determine the effectiveness of integrated media, community, and facility-based ECD intervention.

Understanding that children are the main target of all parenting programs, effective delivery of early stimulation programs assessments should be directed to children, a gap yet to be filled. To address this gap, the study utilised children-based assessment tools to assess the effectiveness of ECS services on child development status.

This study is in line with sustainable development goal 4.2, which aims to improve access to quality ECD services (Sightsavers, 2015). Establishing an enabling environment for promoting early childhood stimulation services at a community level is among the key steps to achieving this goal. Furthermore, the study is in line with the current National Early Childhood Multi-Sectoral Program (NM-ECDP) 2021/22 – 2025/26, highlighting the importance of ECS on child development (URT, 2021). The NM-ECDP focuses on strengthening parents' and communities' capacity for ECS services through collective efforts from different sectors, which contributes to advancing ECD in Tanzania. Therefore, mainstreaming ECS services through the available community structures such as health facilities, ECD centres, and home visiting is critical for ensuring optimal childhood development.

II. COMPOSITE INDEX OF ANTHROPOMETRIC FAILURE

Most nutritional surveys that have been conducted in Tanzania have been evaluating the nutritional statuses of the studied population using the three standard anthropometric indices, which are wasting (low weight-for-height), stunting (low height-for-age), and underweight (low weight-for-age) as stipulated on WHO guidelines (URT, 2014, 2018). From this basis of evaluation, they have regarded stunting as the worst form of malnutrition, followed by the other two indices. However, they do not consider the children who possess more than one form of malnutrition (URT, 2018; WHO, 2018). Considering children with more than one form of malnutrition, a composite index of anthropometric failure (CIAF) has been recommended as an alternative indicator for measuring the malnutrition burden on children. The CIAF considers all three aforementioned indicators of malnutrition, which are commonly used, and gives a comprehensive picture of malnourished and ill-health children (Nandy & Svedberg, 2012).

III. CONCEPTUAL FRAMEWORK

The study was conceptualised as presented in Fig. 1, which illustrates the relationship between early childhood stimulation services and the means to attaining optimal childhood development. The study focuses on child development through the provision of early childhood stimulation services mainstreamed through home visits, ECD centres, and clinic outreaches. This is measured by evaluating the contribution of each mainstreaming channel as an independent factor to overall child development. From the framework, effective childhood development is the dependent variable which is characterised by literacy-numeracy, physical, social-emotional, and learning domains. Independent factor in the framework includes external enabling factors that involve good health, the child's nutrition,

and a safe playing environment. Other independent factors include counsellors, who facilitate early stimulation services through home visits, community health workers for regular clinic outreaches, and playing grounds and materials for children to play and interact with.

All these independent factors, in conjunction with the effect, provided comprehensive early childhood stimulation services to the child, which led to effective childhood development. However, the independent variables depend on existing supportive structures and household background characteristics. The former includes health facilities and workers' availability, social welfare engagement, and social community engagements, while the latter includes age, sex, education, source of income, marital status, and household size. The explanatory variables involve the inputs made by the intervention and perspectives, which influence the mainstreaming of early childhood stimulation services. These inputs include training to parents and volunteer counsellors, established mobile health services, and daycare centres. However, the background variables set a stepping stone and determine the influence level of explanatory variables.

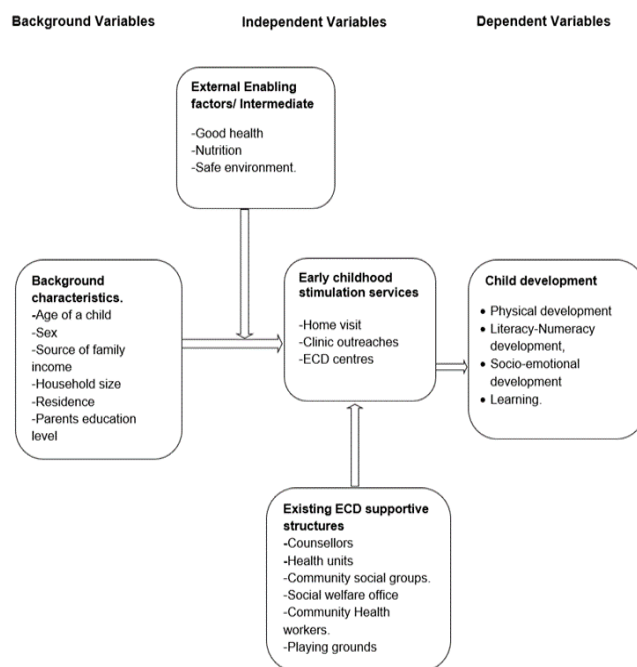


Fig. 1. Conceptual framework of the study.

IV. METHODOLOGY

A. The Study Area

The study was conducted between December 2021 and February 2022 in Mvomero Districts and Ilemela Municipalities in Morogoro and Mwanza Regions, respectively. According to the population census report of 2012, Ilemela municipal is composed of 19 wards with 343,001 population, 4.8 average household size, and 92 sex ratios. Mvomero district, on the other hand, has 17 wards with a population size of 312,109 people, a 4.3 average household size, and a sex ratio of 98 (NBS, 2013). The wards involved were Msongozi, Doma, and Mvomero wards from Mvomero district and Shibula and Bugogwa wards from Ilemela municipal. These are the wards which provided samples for

home visiting, ECD centre, and clinic outreaches. These wards were purposively selected because they benefited from the community-based early childhood development initiative, an initiative that mainstreamed the provision of early childhood stimulation services. The initiative was funded by the Firelight Foundation and implemented by SAWA and TAHEA between 2017 and 2020 in the Mvomero district and Ilemela Municipals, respectively (Hapunda *et al.*, 2021).

B. Research Design

The study employed a cross-sectional research design for an efficient collection of information that involved children falling into different age groups and developmental stages within a given time frame (Balakrishnan *et al.*, 2014). The design has the advantage of being cheap and easy to use in conducting such kinds of studies, which involve the collection of both qualitative and quantitative data from different points (Bailey, 1998).

C. Sampling Procedures and Sample Size

The study employed a purposive sampling technique to select the regions, districts, wards, and villages as they benefited from the Community-based ECD intervention. From the five selected wards, a total of ten villages were selected, two from each ward. The selection of villages was based on obtaining an adequate sample representation of children who benefited from different types of ECS services. Afterwards, the total number of children benefited from the initiative was 2017. Utilising Yamen's formula for calculating sample size, a total of 334 respondents was obtained for this study. Furthermore, a sub-sample of 75 children from clinic services, 106 from ECD centres, and 153 from home visiting constituted the total sample size. The aforementioned sub-samples were obtained through proportionality methods from 453, 640, and 924 children who benefited from stimulation services through Clinic services, ECD centres, and home visits, respectively.

Yamane's formula is

$$n = \frac{N}{(1 + N(e)^2)} \quad (1)$$

where n is the sample size, N is the sampling frame, and e is the sampling error at 0.05.

A total of 4 focus group discussions, two from each district, with an average of 8-12 participants, and 13 key informant interviews were conducted involving parents and key stakeholders on ECS services. The selection criterion for FGD participants included i) sex, as the time invested in child rearing differs between men and women; ii) age because child-rearing experience also differs with age and number of children; and iii) education and occupation because parents' ability to understand and time to spend with children is affected by education and type of occupation. To capture parents' perceptions and missing aspects from the quantitative data, the parents who participated in FGD were from households whose children were not involved in a survey through the ZamCAT tool. Thirteen key informants were involved in this study. The list of interviewees included officials from different government departments responsible

for social welfare-related ECD services and from the study area based on their roles in the Community-based ECD initiative.

D. Data Collection

The study employed a mixed research approach in the gathering of both quantitative and qualitative data. The data collection methods employed were household surveys, FGDs, and KIIs, where the tools used include the Zambian Child Assessment Test (ZamCAT) and the checklists of questions.

1) Quantitative Data Collection

To capture quantitative data on the developmental status of young children, the study adopted and modified the Zambian Child Assessment Test (ZamCAT). The tool was purposely selected as the developing countries' context-based tool and its capacity to assess multiple child developmental domains among the UNICEF-approved tools of African Origin (Matafwali & Serpell, 2014). The tool combines a set of existing as well as newly-developed child development measures to provide a broad, multiple-domain-based assessment of children (Fink *et al.*, 2012). The household survey was conducted where the trained research assistants administered the adopted ZamCAT tool to measure children's non-verbal cognition, receptive and expressive language, fine motor skills, information processing, executive function, and anthropometric measurements. Furthermore, the tool is child-friendly as it offers an example and instructional guidance for establishing a rapport with children prior to the assessment set of questions. Moreover, the questions on household background characteristics from the modified ZamCat questionnaires were responded to by the parents.

2) Qualitative Data Collection

The qualitative data were collected through focus group discussions (FGD) and key informant interviews (KIIs) conducted. Four focus group discussions, two from each study site, each comprised of 8-12 participants, were conducted to explore parents' perceptions of ECS services in relation to other findings from the literature. Also, a total of thirteen in-depth interviews with key informants were conducted. Of the thirteen interviewed key informants, six were government officials from the district social welfare office, health centres, and teachers from the ECD centres. Other interviewed key informants were project officers, community leaders, and counsellors who were facilitating ECS through home visits. The in-depth interviews focused on assessing their perception of the mainstreaming of ECS services in relation to policies and operational guidelines. The researcher facilitated all KII and FGDs sessions guided by the checklist of questions while the trained research assistant was taking notes.

E. Ethical Considerations

The research clearance was obtained from the Sokoine University of Agriculture, which facilitated the securing of permission to conduct research in the Morogoro and Mwanza regions. Furthermore, the data collection exercise for children was consented to by their parents as they were under 18 years of age. Ensuring confidentiality of the participants' pseudonyms were used, and access to collected data was limited only to the authorised persons.

F. Data Processing and Analysis

The obtained quantitative data were coded and analysed using a Statistical Package for Social Science (SPSS) v.25 to obtain descriptive and inferential statistics. To attain the most acceptable level of child development status, obtained results from the ZamCAT assessment were contextualised with the Early Childhood Development Index (ECDI) domains. According to Loizillon *et al.* (2017), a child is considered developmentally on track if she performs well in at least three out of four domains indicated in the ECDI tool. The ECDI is the only child assessment tool with the highest reach, which was tested in more than 80 middle and low-income countries (LMIC), measuring child development status across the literacy-numeracy, physical, social-emotional, and learning domains (UNICEF, 2014).

The Chi-square (χ^2) analysis was performed to assess the difference in child development status across the explanatory variables, stimulation services, CIAF status, residence, source of family income, education level, and child sex. The binary logistic regression model analysis was employed to determine the effect of early stimulation services on child development, where the independent variables were interpreted by comparing the obtained odds ratio to its reference categories at a 95% confidence interval. The variable on the statistical model was dummy variables where a child's development status was a response variable that coded 1 for children who are developmentally on track and 0 for the children who are developmentally not on track.

Furthermore, the validity of the established model was evaluated using receiver operating characteristic curve (ROC) analysis. The Hosmer and Lemeshow tests were not significant ($p = 0.561$), which showed that the overall model was well predicting the outcome. Overall, the Wald statistic was significant ($p = 0.000$). Hence, the model predicted the outcome. Furthermore, the results of ROC curve analysis on measuring the goodness of fit showed that the area under the curve was 0.706 (70.6%) Fig. 1. The area under the curve (AUC) is used to assess the quality of the employed model of analysis whose measurement ranges from 0 to 1 where the bigger the area under the curve employs the better the predictor (Bowers & Zhou, 2019). From the observed AUC (95% CI; 0.706), it implies that the utilised model showed better sensitivity and specificity.

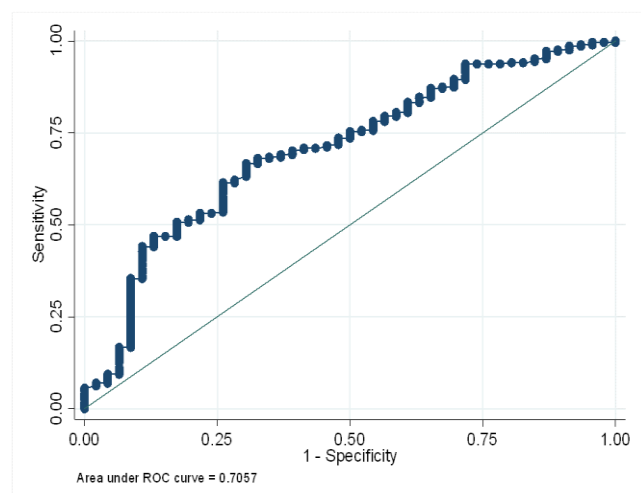


Fig. 2. Receiver operating characteristic (ROC) curve.

V. RESULTS

TABLE I: CHILD DEVELOPMENT STATUS ACROSS STIMULATION SERVICES AND HOUSEHOLD DEMOGRAPHIC CHARACTERISTICS

	Child Development Status		Total (n=334)	Chi-square	P-value
	Not Ontrack (n=46)	On Track (n=288)			
Stimulation services					
Home visiting	19(12.4)*	134(87.6)	153(45.8)	9.3325	0.009
ECD Centre	9(8.5)	97(91.5)	106(31.7)		
Clinic outreach	18(24)	57(76)	75(22.5)		
CIAF					
No failure	32(11.4)	248(88.6)	280(83.8)	8.0117	0.005
Failure	14(25.9)	40(74.1)	54(16.2)		
Residence					
Rural	19(9.5)	182(90.5)	201(60)	7.9313	0.005
Urban	27(20.3)	106(79.7)	133(40)		
Source of family income					
Agriculture	34(16.3)	174(83.7)	208(62.3)	3.1924	0.203
Employed	1(6.3)	14(93.7)	15(4.5)		
Informal sector	11(9.9)	100(90.1)	111(33.2)		
Education Level					
Primary	2(13.3)	13(86.7)	15(4.5)	4.1918	0.241
Secondary	28(11.6)	214(88.4)	242(72.5)		
Tertiary	2(22.2)	7(87.8)	9(2.7)		
No formal education	14(20.6)	54(79.4)	68(20.3)		
Child Sex					
Female	19(14)	116(86)	135(40)	0.0174	0.895
Male	27(13.6)	172(86.4)	199(60)		
			Mean	T-test	P-value
Average Household size	4.4	4.3	4.31	0.4746	0.6354
Average Parent age	33.80435	33.80208	33.8	0.0012	0.9990

Note. The numbers in brackets represent percentages. ** $p < 0.05$.

A. Household Socioeconomic Characteristics

The current study examined the influence of household socioeconomic characteristics as they are the background variables that determined the provision of ECS services and child development status (Table I). The results from binary logistic regression indicated that the source of household income, education level, household size, and child sex were not significantly (i.e., their p -values > 0.05) influenced the child development (Table II). Concerning residence, the majority (91.3%) of children from rural settings were developmentally on the track than children from urban (79.7%) settings (Table I). Further investigation exploiting the χ^2 analysis showed that the difference in child development status was statistically significant $p < 0.05$ (Table II). The results from binary logistic regression showed that the residence of a child significantly influenced child development status $p < 0.05$.

The results from descriptive statistics in Table I show that the average parent age and household size were 33.8 and 4.31, respectively. According to NBS (2017), the age group between 15 60 years is an active age group, which indicates that the observed average parent age is an active age with enough energy to raise children. Furthermore, age is among the predominant factors contributing to parents fostering their children's development through their matured socioemotional and personal skills (Duncan *et al.*, 2018). On the income-generating activity, the study found that most

households from the study area rely on agriculture (62.3%) as their primary source of family income. The remaining 33.2% are engaged in the informal sector, while 4.5% are formally employed.

B. Nutritional Status and Child Development

The study findings indicated a direct association between nutritional status measured in CIAF and child development status ($\chi^2 = 8.0117$, $p = 0.005$). Based on their nutritional status, children from the studied areas are likely to attain their full developmental potential. The results indicated a significant difference among children with no anthropometric failure ($p < 0.05$). The odds of attaining child development potential among children with no anthropometric failure was 2.596 higher than the odds of children with anthropometric failures attaining child development potential (Table II). The findings further show that 83.8% of children were observed to have no failure on CIAF aspects.

C. Early Childhood Stimulation Services and Child Development Status

The study findings show that 13.8% of children were not developmentally on track. The prevalence of children who are not developmentally on track across the three types of early stimulation services was 8.5%, 12.4%, and 24% for ECD centre, Home-visiting, and Clinic outreaches, respectively. Utilising the χ^2 analysis, the difference was observed to be statistically significant ($p < 0.05$) as the majority of children (86.2%) who have received the stimulation services were developmentally on track. Furthermore, results from Table I show that the majority (91.3%) of children from rural settings were developmentally on the track more than children from urban (79.7%) settings. Further investigation exploiting the χ^2 analysis showed that the difference in child development was statistically significant ($p = 0.005$; see Table I). Furthermore, a binary logistic regression model was conducted against ECDI status to determine the variables that influence child development status.

The results showed that home visiting services had a significant ($p = 0.01$) and positive influence on child development with an Exp(B) value of 2.746 (Table II). This implies that the odds of children from home visiting groups being developmentally on track were 2.746 times the odds of children from clinic outreach services being developmentally on track. Furthermore, the study found that ECD centres had a significant ($p = 0.016$) and positive influence on child development and an Exp (B) value of 3.047 (Table II). This explains that a unit increase in ECD centres increased the odds of attaining child development potential by 3.047 units.

D. Community Perception of Early Childhood Stimulation Services

The study examined community perception of early childhood stimulation services in which children have been benefiting from the implemented community-based ECD initiative. The studied areas had different perceptions regarding the ECS services mainstreamed through home visiting, clinic outreaches, and ECD centres where four different themes emerged. The themes are Improved school readiness among children, Child Safety and Care, low male parents' engagement, and Community preference for ECS services.

TABLE II: ECS SERVICES AND CHILD DEVELOPMENT STATUS

ECDI	B	Standard Error	t-value	P-value	Exp(B)	Sig
Stimulation services						
Home visiting	1.01	0.394	2.56	0.01	2.746	**
ECD Centre	1.114	0.461	2.42	0.016	3.047	**
Clinic (Base)	0					
Composite Index of Anthropometric Failure (CIAF)						
No failure	0.954	0.383	2.49	0.013	2.596	**
Failure (Base)	0					
Residence						
Urban	-0.782	0.382	-2.05	0.041	0.457	**
Rural	0					
Household demographic characteristics						
Household size	-0.071	0.113	-0.63	0.53	0.931	
Parent age	-0.008	0.015	-0.55	0.582	0.992	
Agricultural	-0.129	0.416	-0.31	0.756	0.879	
Employed	1.144	1.137	1.01	0.314	3.139	
No Labor	0					
Education Level						
Primary	0.576	0.873	0.66	0.509	1.779	
Secondary	0.482	0.386	1.25	0.212	1.619	
Tertiary	-0.22	0.923	-0.24	0.811	0.803	
No formal education (base)	0					
Child Sex						
Male	-0.062	0.345	-0.18	0.858	0.940	
Female	0					
Constant	1.039	1.046	0.99	0.32	2.826	

Note. Overall Wald statistic = 133.461 (p -value = 0.000); Omnibus tests of model coefficients chi-square=25.942 (p -value = 0.01); Hosmer and Lemeshow test chi-square=6.771 (p -value = 0.561); Cox & Snell R^2 = 0.075; Nagelkerke R^2 = 0.136; ** p < 0.05.

E. Improved School Readiness among Children

Results from the FGDs revealed that parents acknowledged the contribution of ECD centres on equipping children with school readiness skills. Parents were generally of the view that ECD centres were established to prepare children for primary school education. Their argument is based on the availability of age-appropriate learning and teaching materials, play-based approaches employed at the centres and regular monitoring from the implementors of CBECD initiatives. Concerning the contribution of the centres on child development, participants in one of the FGDs pointed out that:

“...ECD centres help children to gain school readiness during their early years, and when they are transitioned to pre-primary schools, they do well.” (FGD, Msongozi ward, December 2021)

When comparing children's school readiness among children from ECD centres who are under the CBECD initiative versus other ECD centres across the area of implementation, one of the key informants from the education department commented that:

“... Children from Malezi ECD centre have been applauded for their higher understanding by pre-primary teachers compared to others...this is mainly due to their play-based learning approach.” (Key informant from Education Office, Bugogwa ward, December 2021)

F. Child Safety and Care

The current study found that ECD centres were the most preferred stimulation service by the parents and communities in scope as they perceived it to be an alternative child-rearing option in case of their absence. Parents felt that the presence

of ECD centres offered a room for parents to leave their children while they are undertaking other livelihood responsibilities. This was also explained by parents during FGD regarding the role of ECD centres in providing care and protection. On this, the parents argued that:

“...ECD centres are close to peoples' settlements, which makes it easier for children to attend ...and parents can work at the lake knowing their children are in safe hands.” (FGD, Shibula ward, December 2021)

G. Low Male-Parent Engagement

Although the findings from the key informants and FGD participants implied that parents' participation in early childhood stimulation activities influenced childhood development, low male-parent engagement was declared. The study found that male parents perceived that early stimulation initiatives are for strengthening childcare skills for mothers so that they can take good care of their children. Underscoring the reasons for low fathers' engagement, parents during FGD participants claimed that:

“...Male parents are aware of the visiting program for child stimulation... however, it is perceived that when counsellors visit, it is purposely for discussing with their wives childcare matters... whereby their responsibility as fathers is to provide for children's basic needs.” (FGD, Doma ward, January 2022)

H. Community Preference for ECS Services

The presence of clinic outreaches increased access to reproductive and child health (RCH) services to communities. This resulted in improved health and nutrition status of children, as the majority of children (83.8%) had no CIAF failure (Table I). However, compared to other ECS

services, it was found that clinic outreach was the least preferred ECS service. Further investigation found that mainstreaming of early childhood stimulation programs through clinic outreach programs was not supported by both parents and healthcare providers. This was due to overcrowding and limited time, which posed a challenge to facilitate early childhood stimulation practices during clinic outreach sessions. In one of the FGDs, participants pointed out that:

“...The working atmosphere at the clinic is a busy and crowded place that is not fair to add a burden on nurses other than the provision of health services... like demonstrating to parents how to play with children...” (FGD, Msongozi ward, January 2022)

Also, a key informant with a healthcare provider at Bugogwa ward exposed that.

“...Limited time to administer RCH services and facilitate early stimulation sessions at the same time... Parents' attendance to clinic outreach services is not consistent which makes them miss some of the ECS sessions...” (Key Informant, Bugogwa ward, November 2021)

VI. DISCUSSION

The findings indicated that the majority of children from rural (79.7%) and urban (90.5%) settings were developmentally on track. The performance is significantly higher compared to the current rate (34%) of attaining optimal childhood development in sub-Saharan Africa (Grantham-McGregor *et al.*, 2017). This implies that the mainstreamed ECS services have significantly contributed to optimal childhood development. The observed performance is underscored by the provision of improved ECD services, which increased the exposure of children to essential ECD services. Such services include clinic outreaches, home visits, and ECD centres, which are positively associated with observed early childhood development. Research from elsewhere has indicated that the presence of ECD centres, healthcare and clinic services, and parental engagement programs is associated with higher odds of child development status (Minh *et al.*, 2017; Prado-Galbarro *et al.*, 2021). Similar findings were found in an American study that the majority of children were developmentally on track as a result of early childhood stimulation intervention (Rosenberg *et al.*, 2008). Concurring with this, Urke *et al.* (2018) found that early childhood stimulation was significantly associated with child development among rural children in Honduras.

The National Multi-Sectoral ECD Programme (NM-ECDP) acknowledges the importance of providing an enabling environment and capacity strengthening to families, caregivers, and community on child development (URT, 2021). The study further explored the contribution of each ECS service on child development. The findings indicated that ECD centres and home visiting services significantly increased the odds of children attaining optimal child development potential compared to clinic outreach. This means children who benefited from ECD centres and home visiting services were more likely to develop compared to

children who benefited from clinic outreach services. Aina and Bipath (2022) argued that ECD centres with attractive and safe classrooms and outdoor spaces increase children's engagement in play-based learning activities, which facilitates early childhood development and growth. The case for home visiting stimulation services when parents are positively responding to child cues, engaging in making playing materials and reading picture books for their children contributes to child development significantly (Knauer *et al.*, 2019). The findings align with the recent studies on ECS services that reported early positive child growth and child development by children from ECD centres and home-visiting interventions (Brentani *et al.*, 2021; Da Silva *et al.*, 2022; Felfe & Lalive, 2018). The observed lower odds for clinic outreach services compared to home visiting services conflict with the findings reported by Hamadani *et al.* (2019) in Bangladesh. The study reported significantly higher improvement in child development for children in the clinic group than in the home visiting group. However, the observed variance was due to the higher education level of health workers involved in the provision of ECS services compared to home visitors, which is not the case in the current study.

The authors found that the nutritional status of a child was another key factor that significantly influenced child development. Findings in the current study indicate that the overall prevalence of malnutrition among children was 16.2%, which is below the national chronic malnutrition status (31.8%) (URT, 2018). This implies that the majority of children from the studied population have good nutritional status. Ruel *et al.* (2013) reported a higher potential for improving the nutrition status of children when childhood development initiatives are integrated with healthcare services. According to UNICEF and WHO (2018) malnutrition estimates, a population is considered to be at risk if $\geq 30\%$ of children are stunted. The findings are in line with the Tanzania National Nutrition Survey, which highlighted the significant improvement in children's nutritional status (URT, 2018). According to Jimoh *et al.* (2018), nutrition status is a good predictor of child development status as it influences multiple domains of child development. Deoni *et al.* (2018) also reported a higher level of cognitive abilities among children with good nutritional status as a result of early childhood programs.

Considering that childcare provision is a function of time, affection, and support to meet the physical, social, and cognitive needs of the child. Household demographic characteristics and SES factors were examined by the study as they are associated with childhood development status (Britto *et al.*, 2017). The study found that the source of household income, education level, household size, and child sex were not statistically significant on child development ($p > 0.05$). This implies that household demographic characteristics did not influence child development status. Thus, the observed child development status was influenced by the stimulation services provided by the community-based ECD initiative, which led to increased exposure of children to basic ECD services. According to Redding (2000), a child can withstand the odds of socioeconomic factors which affect their development when early childhood stimulation is practised effectively in a safe and quality home environment.

The study further explored the community's perception of

the importance of mainstreamed ECS services. The findings indicated that the presence of ECS services was associated with improved school readiness among children in the studied population. This may be attributed to the parent belief that ECD centres expose children to basic school skills which build a foundation for the children. Parents from other areas have been reported to have positive perceptions of play-based stimulation services offered at ECD centres as the best way of helping children to learn better in their early years (Qadiri & Manhas, 2009; Sang, 2016). Also, from the caregiver's perspective, mainstreaming early childhood stimulation services through ECD centres was important for a child to attain optimal development and achieve school readiness. Evidence from the famous Jamaican intervention on the impact of early childhood stimulation interventions for children from economically disadvantaged families has shown significant improvement in school performance and income gained at later stages of life (Gertler *et al.*, 2021).

The presence of well-established facilities with enough playing materials, trained caregivers, and parental support makes ECD centres to be a safe and reliable place for children to stay and learn. The authors found that parents have limited time to spend with their children due to the nature of their livelihood activities, which makes them spend most of the time away from their children during the daytime. For this reason, parents preferred to leave their children at the ECD centres under the care of ECD caregivers. This was also reported by McAlpine *et al.* (2018) in a study conducted in Dar es Salaam, a commercial city in Tanzania where parents rely on ECD centres as secured places for taking care of their children when they are away for work. The findings suggest that it is common for parents to find a caretaker for their children to stay with as they are engaging in their daily livelihood activities. Parents from other areas have been reported to leave their children with family members, home help, or neighbours to help take care of the children in case of their absence (Shukia & Messo, 2018).

We also find low participation of male parents in ECS activities. This is rooted in the community belief that taking care of children is a primary responsibility of a woman. The perception is influenced mainly by the traditional point of view that fathers are the breadwinners of the family, and they have to be excluded from childcare roles at home (Nešporová & Janurová, 2018). The findings are similar to those reported by Nair *et al.* (2020) in India that fathers have low participation in early childhood care as they perceive them to be female roles.

Additionally, the study found that clinic outreach services were the least preferred ECS service as they increased the workload of healthcare providers. Research from elsewhere reported negative perceptions from healthcare providers on mainstreaming other ECD initiatives into healthcare services (Ndugwa, 2019). And some would prefer the presence of external social workers as part of the initiative rather than the utilisation of healthcare providers due to the overcrowding and busy schedule of healthcare providers. Dovel *et al.* (2021) reported that parents demanded increased frequency and time of ECS sessions for effective learning on the aspects of parent-to-child engagement in play-based stimulation activities.

VII. CONCLUSIONS AND RECOMMENDATIONS

Mainstreaming of ECS services through home visiting and ECD centres were pointed out by the community members as the most preferred means of delivery and significantly contributes to child development compared to clinic outreaches. The results from binary logistic regression showed that the nutritional status of children is a key factor in child development. Furthermore, household demographic characteristics did not affect child development. The study concludes that when early childhood stimulation services are effectively administered at the household and community level, a child can attain optimal childhood growth and development despite the challenges posed by demographic and socioeconomic factors.

In light of the above findings, the study recommends that the Ministry of Social Development, Gender, Elderly, and Children, in coordination with ministries responsible for health and education as well as other development stakeholders in the child development sector, should direct their efforts on developing a national early childhood development policy. Government policies and programmes should be geared toward capacity building and awareness raising to communities on home and centre-based early childhood stimulation services, which significantly influence childhood development. Furthermore, the government should review the current policies to ensure the deployment of early childhood development experts at the community level for the effective delivery of early childhood stimulation programmes.

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CONFLICT OF INTEREST

The authors declare that they do not have any conflict of interest.

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