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SPECIALTY SECTION

This article was submitted to
Nutrition and Sustainable Diets,
a section of the journal
Frontiers in Sustainable Food Systems

RECEIVED 28 June 2022

ACCEPTED 25 November 2022

PUBLISHED 12 January 2023

CITATION

Engidaw MT, Gebremariam AD,
Kefale B, Tesfa D, Tiruneh SA and
Shiferaw YF (2023) Impact of the
Productive SafetyNet Program on the
minimum acceptable diet in the rural
community of South Gondar Zone,
Northwest Ethiopia.
Front. Sustain. Food Syst. 6:977727.
doi: 10.3389/fsufs.2022.977727

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Impact of the Productive SafetyNet Program on the minimum acceptable diet in the rural community of South Gondar Zone, Northwest Ethiopia

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Background: Even though numerous factors contribute to undernutrition, it can happen immediately due to poor intake and illness. A minimum acceptable diet is one of the proxy measures for adequate consumption, which is an impact indicator for the Productive SafetyNet Program (PSNP). As a result, this study aimed to assess the impact of PSNP on the minimum acceptable diet among rural infants in the South Gondar Zone, Northwest Ethiopia.

Methods: A community-based cross-sectional study design was employed in the selected woredas (districts) of South Gondar Zone, Northwest Ethiopia, from 1 December 2017 to 30 January 2017. A total of 442 participants' data were collected during this time period through interviews with their mothers or caregivers. A multistage sampling technique was employed to select study subjects and interviewees using a structured questionnaire. Stata version 16 (MP) was employed to carry out a statistical analysis. A binary logistic regression model was employed to identify significant variables. The statistical significance was declared at a *p*-value of more than 0.05.

Results: The highest proportion of adequate diet diversity scores (261 [59.05%]) was from households who graduated (not part of it) from PSNPs. In this study, the magnitude of adequate dietary diversity, meal frequency, and minimum acceptable diet was 79.86, 82.58, and 66.52%, respectively. Marital status (AOR = 3.98, 95% CI: 1.39, 11.40), child age (AOR = 2.82, 95% CI: 1.78, 4.47), the educational status of the father (AOR = 0.56, 95% CI: 0.35, 0.89), the wealth index (AOR = 0.27, 95% CI: 0.12, 0.64), and the place of delivery (AOR = 3.14, 95% CI: 1.47, 6.73) were significant predictors for minimum acceptable diet uptake by children.

Conclusion: In this study, two-thirds of the infants had/received a minimum acceptable diet. Furthermore, infants from households with Productive SafetyNet users had a low minimum acceptable diet. Marital status, the educational status of the father, child age, the wealth index, and the place of delivery were

associated factors with having an adequate intake of minimum acceptable diet by the children. Therefore, efforts to address sociodemographic and child-related factors during routine care are crucial.

KEYWORDS

impact, Productive SafetyNet program, minimum acceptable diet, children, Ethiopia

Background

Even though Ethiopia has achieved success in various areas related to the millennium development goals (Horton and Lo, 2013), it currently faces significant challenges with regard to poverty and food insecurity due to high population growth (World Bank, 2015) and poor economic growth (Alderman, 2010; IFAD, 2016). Due to chronic food insecurity and low agricultural productivity, the Productive SafetyNet Program (PSNP) was implemented in Ethiopia in 2005 to tackle this problem. After 4 years, PSNP+ was introduced to include additional small income-generating activities among households to increase household income (Devereux et al., 2006; Gilligan et al., 2009; Berhane et al., 2012).

Despite the implementation of various interventions, food insecurity and hunger continue to be rampant and critical issues in Ethiopia, which have a significant impact on children's overall health [Devereux, 2000; CSA, 2011, 2014; Central Statistical Agency (Ethiopia) ICF International, 2016]. One of the main contributing factors to these issues is the inadequate intake of a variety of foods due to insufficient quantities and frequencies, particularly in the Amhara regional state [Central Statistical Agency (Ethiopia) ICF International, 2011, 2014]. Overall, food insecurity has an impact on educational attainment and attendance in Ethiopia (Belachew et al., 2011). The ultimate goal of PNSP is to ensure households build on-farm and off-farm activities to have a variety of procurement strategies for food and cash (Drinkwater and McEwan, 1992).

Livelihoods will be secured when households have secure ownership or access to resources and income-earning activities. It helps to reserve and build an asset, offset risks, ease shocks, and meet contingencies (Chambers, 1989; Frankenberger and McCaston, 1998) to mitigate the vulnerability risk of a household to income, food, health, and nutritional insecurity, which directly or indirectly affect the consumption behaviors of the families.

Abbreviations: AOR, adjusted odds ratio; COR, crude odds ratio; HEWs, health extension workers; MAD, minimum acceptable diet; MDDS, minimum dietary diversity score; MMF, minimum meal frequency; PSNP, Productive SafetyNet program; SD, standard deviation; WEPLAUO: Libo Kemkem Word Environmental Protection, Land Administration; SWEPLAUO: Simada Worda Environmental Protection, Land Administration and Use Office; WHO, World Health Organization.

The Phase 4 PSNPs were launched in Ethiopia to achieve the goal of “enhancing resilience to shocks and livelihoods, improving food security and nutrition, for rural households vulnerable to food insecurity.” Thus, the PSNP's contribution to this goal was assessed through program impact assessments by using the percentage of infants aged 6 to 23 months who receive a minimum acceptable diet, household dietary diversity, the average value of asset holdings, and the number of different income sources. For this study, we intended to use the minimum acceptable diet among infants aged 6–23 months as an indicator of the impact assessment (MoALR, 2014).

In Ethiopia, the magnitude of the Minimum Acceptable Diet (MAD) is the lowest, which ranges from 4.2 to 13.3% (Abeshu et al., 2016; Gizaw and Tesfaye, 2019; Mulat et al., 2019; Tassew et al., 2019). The levels of the Minimum Dietary Diversity Score (MDDS) and Minimum Meal Frequency (MMF) are 45 and 33%, respectively, which are high as compared to the findings of the study in North Showa (Gizaw and Tesfaye, 2019). This might be due to household food insecurity, which mainly affects low-income populations, particularly in developing economies undergoing the demographic transition; hence, low socioeconomic status leads to poor diet, food insecurity, and ill health among infants (FAO, 2003; Popkin, 2004; Conforti NWCCNTP, 2014). In addition, demographic and other maternal and child-related predictors affect children's MAD through dietary diversity and meal frequency (Laraia et al., 2006). As mentioned above, even though there are studies on the general population and each independent indicator of MAD, there are none on PSNP beneficiaries on this topic. Thus, this study aimed to assess the impact of PSNP on a minimum acceptable diet of infants aged 6–23 months in the selected rural community of South Gondar Zone, Northwest Ethiopia.

Materials and methods

Study design, period, and setting

The data were collected through a community-based cross-sectional study design from 1 December 2017 to 30 January 2017. Then, we compared these data based on the household's Productive SafetyNet enrollment status.

If the number of woredas (districts) in South Gondar with PSNP was five (Libo Kemkem, Simada, Lay Gayint, Tach Gayint,

and Ebnat), the data were collected at the rural kebeles of Libo Kemkem and Simada woredas in South Gondar Zone, Northwest Ethiopia. The topography of these woredas (districts) belongs to highlands with plain and mountainous features, and both woredas (districts) are found at 1,800 m above the sea level (SWEPLAUO, 2020; WEPLAUO, 2020).

If these people are chronically food insecure, agricultural cultivation includes maize, barley, and millet, which are the main food crops, while rice and chickpeas are the main cash crops. The total number of households with the Productive SafetyNet program in Libo Kemkem and Simada woredas was more than 9,000, participating either in public works or direct support. At the time of data collection, nearly 4,500 infants aged 6–23 months were found in these woredas.

Sample size determination

The first study included a total of 769 participants. Of these, data from 442 infants aged 6–23 months were retrieved for this study after removing incomplete data and data from infants under the age of 23 months.

Eligibility criteria

We included data of all children aged 6 to 23 months of complete dietary diversity and meal frequency variables; if either of them were incomplete, we excluded them from this study.

Patient and public involvement

During this study, no patients or members of the general public were involved in the development of the research question, data collection, or analysis.

Sampling procedure

During the primary data collection, a multistage sampling method was employed by allocating the calculated sample size to each designated Kebeles of selected woredas, and the data were collected at the household level. Then, the refined data were analyzed.

Data collection methods and tools

During the primary data collection phase, the pretested Amharic version questionnaire was employed after being translated from the English language, which consists of socioeconomic and consumption-related variables. The dietary

intake and minimum meal frequency data were collected using seven food groups through a 24-h dietary recall. Ten BSc nurse enumerators collected the data.

Data quality

Prior to the original data collection, a pretest was conducted on 5% of the total sample size. The data collectors received 1 day of training with a pretest, and the questionnaire was administered in Amharic (the local language). During the primary data collection period, regular communication was maintained to discuss the progress and any issues that arose. The collected data were checked for completeness and consistency by the investigators and supervisors. All data collectors were recruited outside the study area to minimize bias.

Term definitions

- **Households with PNSPs:** These households are identified as chronically food insecure and are currently a part of cash transfer or asset-building programs.
- **Households without PNSPs:** These households are not identified as chronically food insecure because they graduated from PNSPs and are not currently part of cash transfer or asset-building programs.
- **Kebele:** It is the smallest administrative division or village in Ethiopia.
- **Minimum dietary diversity:** It is the proportion of infants aged 6–23 months who received ≥ 4 food groups from the seven through a 24-h dietary recall; it is categorized as inadequate if dietary diversity has ≤ 4 food groups and good if the individual dietary diversity has ≥ 5 food groups according to FAO.
- **Minimum meal frequency:** It is the proportion of breastfed and non-breastfed infants aged 6–23 months who received solid, semisolid, or soft foods (also including milk for non-breastfed infants). Minimum meal frequency was defined as at least two times for breastfed infants aged 6–8 months, at least three times for breastfed infants aged 9–23 months, and at least two feedings of milk products for non-breastfed infants during the previous 24 h.
- **Minimum Acceptable diet:** Proportion of infants aged 6–23 months who receive a minimum acceptable diet (both minimum dietary diversity and minimum meal frequency) during the previous 24 h.

Data processing and analysis

These secondary data were imported from SPSS into the Stata file version. The data were then cleaned, categorized,

and tabulated using Stata 16.0/MP software for Windows. The wealth index data were gathered by utilizing household assets such as land, materials, and utilities (electricity and water sources). After checking the assumptions, the index was built using principal component analysis (PCA). The outcome was ranked into five categories: poorest, poorer, middle, richer, and richest.

Finally, both descriptive and analytical analyses of variables were employed. In addition, univariable and multivariable binary logistic analyses were used to evaluate the independent and multiple effects of each variable on the dependent variable. In the univariable binary logistic regression analysis, a *p*-value of ≤ 0.25 was employed to select candidate variables for multivariable analysis.

Furthermore, the co-linearity between variables was determined using variance inflation factors (VIF). A *p*-value of ≤ 0.05 was used to declare statistical significance during multivariable analysis. For each odd ratio (ORs; adjusted and crude), the 95% CI was computed. During the final analysis, the model's fitness was checked (*p*-value ≥ 0.05).

Results

Sociodemographic characteristics

The average age (\pm SD) of infants was 14.04 (± 4.59) months. Moreover, nearly one-third of the children were found between the ages of 11 and 23 months. The mean age \pm SD of the mother/caregiver was 29.40 \pm 5.29 years. The majority of the mothers/caregivers (173 [39.14%]) were found between the ages of 25 and 29 years. All of them were Orthodox by religion. The mean \pm SD of family size among participants was 4.54 \pm 1.51. Here, nearly three-fourths (328 or 74.21%) of the households were not enrolled in the Productive SafetyNet Program during data collection (either because they graduated from the program or were not enrolled initially) (Table 1).

Index child-related characteristics

The average \pm SD of the birth interval between the two-consecutive infants from the index was 3.33 \pm 1.66 years. The majority of index infants have been breastfed (427 or 96.61%). In this study, three-fourths of the mothers/caregivers started complementary foods at the age of 6 months for their child. Still, the rate of institutional delivery is very low (68 [15.38%]). Approximately 6% (25) of the mother gives extra food/beverages after delivery instead of colostrum (Table 2).

TABLE 1 Socioeconomic characteristics of the mother/caregiver of infants aged 6–23 months in South Gondar Zone, Northwest Ethiopia, 2017 (*n* = 442).

Variable	Categories	Frequency	Percent
Current maternal age (completed years)	15–19	11	2.49
	20–24	52	11.76
	25–29	173	39.14
	30–34	136	30.77
	35–39	36	8.14
	40–44	27	6.11
	45–49	7	1.58
Age of the child	06–11 months	142	32.13
	12–23 months	300	67.87
Household head	Husband/brother*	420	95.02
	Wife/sister*	22	4.98
PSNP status	Current users	114	25.79
	Not user and graduate	328	74.21
Marital status	Married	357	80.77
	Single	37	8.37
	Divorced and separated	48	10.86
Respondent's educational status	Unable to read and write	335	75.79
	Able to read and write	107	24.21
Husband's educational status	Unable to read and write	237	53.62
	Able to read and write	184	41.63
	Primary education and above	21	4.75
Respondent's occupation	Housewife	219	49.55
	Daily laborer	24	5.43
	Farmer	199	45.02
Husband's occupation	Daily laborer	26	5.88
	Farmer	416	94.12
Family size	≤ 4	247	55.88
	≥ 4	195	44.12
Wealth index	Very poor	88	19.91
	Poor	104	23.53
	Middle	70	15.84
	Rich	129	29.19
	Very rich	51	11.54

*This brother or sister is for orphanage children; these children's caregivers will be married or not.

TABLE 2 Obstetrics-related characteristics of the mother for infants aged 6–23 months in South Gondar Zone, Northwest Ethiopia, 2017 ($n = 442$).

Variable	Categories	Frequency	%
The age difference between the last two children	<2 years	157	35.52
	≥2 years	285	64.48
Breastfeeding status	Yes	427	96.61
	No	15	3.39
Age at starting of complementary feeding	At birth	34	7.69
	01–06 months	79	17.87
	At 6 months or later	329	74.43
Giving additional/other foods or beverages after delivery	Yes	25	5.66
	No	417	94.34
Bottle feeding	Yes	47	10.63
	No	395	89.37
History of ANC visit for the index child	Yes	397	89.82
	No	45	10.18
Place of delivery for the index child	Health facilities	68	15.38
	At home	374	84.62
Any illness in the last 2 weeks	Yes	125	28.28
	No	317	71.72
Hand washing practice	Good	367	83.03
	Poor	75	16.97

Level of a minimum acceptable diet among children

The mean (\pm SD) minimum dietary diversity score (MDDS) was 5.38 ± 1.04 . The overall MDDS and minimum meal frequency (MMF) magnitudes were 79.86 (95% CI: 75.82, 83.50) and 82.58% (95% CI: 78.71, 86.00), respectively. The consumption of vitamin-A-rich fruits and vegetables was found to be zero, which could be due to a lack of awareness about these types of food, difficulty accessing them, or the belief that other fruits and vegetables provide sufficient quantity of vitamin A. The magnitude of the minimum acceptable diet (MAD) score was 66.52% (95% CI: 61.90, 70.90) (Table 3).

The highest proportion of adequate diet diversity scores (261 [59.05%]) was from households that either

TABLE 3 Level of a minimum acceptable diet intake percentage by 6–23-month-old infants in South Gondar Zone, Northwest Ethiopia, 2017 ($n = 442$).

Intake related variables	Frequency	Percentage	
Cereals and roots (number of foods the infants consumed)	392	88.69	
Legumes and nuts (number of foods the infants consumed)	111	25.11	
Other fruits and vegetables (number of foods infants consumed)	79	17.87	
Eggs (number of foods the infants consumed)	17	3.85	
Milk and its products (number of foods the infants consumed)	115	26.02	
Flesh food (number of foods infants consumed)	1	0.23	
Minimum dietary diversity	Non-adequate	89	20.14
	Adequate	353	79.86
Minimum meal frequency	Non-adequate	77	17.42
	Adequate	365	82.58
Minimum acceptable diet	Non-adequate	148	33.48
	Adequate	294	66.52

TABLE 4 Children's practice of the minimum acceptable dietary intake parameter with Productive SafetyNet enrolment status in the South Gondar Zone, Northwest Ethiopia, 2017 ($n = 442$).

Intake category		Currently enrolled in PSNPs	
		Yes	No
Minimum dietary diversity	Non-adequate	22	67
	Adequate	92	261
Minimum meal frequency	Non-adequate	17	60
	Adequate	97	268
Minimum acceptable diet	Non-adequate	35	113
	Adequate	79	215

graduated from PSNP or that were not enrolled in this program. Besides, the level of an adequate minimum acceptable diet score among the current PSNP users was low (79 [26.87%]) among all adequate MAD scores (Table 4).

Factors associated with a minimum acceptable diet among children

During the independent assessment, all other factors were assumed to be constant; being a part of a PSNP household was not associated with a minimum acceptable diet during factor assessment. In addition to this, we assessed the combined effect of the other variables, which were assessed by doing univariable and multivariable binary logistic regression models. In the univariable binary logistic regression analysis, caregiver/maternal, marital status, the age of the child, family size, the educational status of the father, the occupational status of the father, breastfeeding, extra food before 6 months, wealth index, and the place of delivery were the significant variables.

Finally, in multivariable binary logistic regression, marital status, the educational status of the father, child age, and places of delivery were the associated factors for the uptake of a minimum acceptable diet among infants aged 6–23 months (Table 5).

Here, infants of single women were 3.98 times (AOR = 3.98, 95% CI: 1.39, 11.40) more likely to have/receive MAD as compared to infants of married women. Infants aged 11–23 months were 2.82 times (AOR = 2.82, 95% CI: 1.78, 4.47) more likely to have/receive MAD. In addition, while we compared children's fathers who could not read and write, children's fathers who could read and write were 44% less likely (AOR = 0.56, 95% CI: 0.35, 0.89) to receive an inadequate minimum acceptable diet. In addition, infants born in health institutions were 3.14 times (AOR = 3.14, 95% CI: 1.47, 6.73) more likely to have MAD. Furthermore, infants from the wealthiest families are 73% (AOR = 0.27, 95% CI: 0.12, 0.64) less likely to have an insufficient MAD intake than their peers.

Discussion

Despite enormous intervention by stakeholders, in Ethiopia, chronic food insecurity and undernutrition remain significant public health problems that affect the nutritional status of infants (Central Statistical Agency (Ethiopia) ICF International, 2014; Haile et al., 2016). In Ethiopia, PSNP was implemented to prevent existing household asset reduction and increase consumption by poorer/poorest household members. Being a part of this program may help to avoid the risk of food self-insufficiency or acute shortage and to build assets. Socioeconomic status is a necessary factor for optimal health (Fotso and Kuate-Defo, 2005; Gwatkin et al., 2007), which is determined using the wealth status or possession score from selected household items (Houweling et al., 2003; Mohsena et al., 2010), which influences the proportion of a minimum dietary diversity, meal frequency, and minimum acceptable diet directly or indirectly.

The magnitudes of the overall minimum dietary diversity score, minimum meal frequency, and overall minimum acceptable diet were 79.86, 82.58, and 66.52%, respectively. In this study, the proportion of MAD is higher than that shown in the research conducted in Ethiopia, which ranges from 4.2 to 13.3% (Abeshu et al., 2016; Gizaw and Tesfaye, 2019; Mulat et al., 2019; Tassew et al., 2019). Similarly, the magnitude of MDDS and MMF is also high when we compared it with the study findings in North Showa, Ethiopia, which are 45 and 33%, respectively (Gizaw and Tesfaye, 2019). The possible reasons may be due to the difference in the data collection period and residential differences, household socioeconomic status, cultural differences, child feeding knowledge of the mother, existing interventions by stakeholders, and dietary habits.

Here, infants of single women were 3.98 times more likely to have/receive MAD when we compared them to infants of married women. This could be because single women might have a high decision-making capacity (Mulat et al., 2019), a small family size, and increased care.

Infants aged 11–23 months were 2.82 times more likely to have/receive MAD, which is consistent with EDHS data analysis findings (Tassew et al., 2019). The study findings are similar in Ghana and Uganda (Ng et al., 2012; Na et al., 2018). However, according to the study findings in Wolita Sodo, Ethiopia (Mekonnen et al., 2017), infants age and infants receiving MAD are inversely related. The possible cause might be the change in mothers'/caregivers' knowledge, behavior, and meal frequency due to the diminishing breast milk production. In addition, as infants grow and develop, their bodies may demand more nutrients, leading to an increase in food cravings.

When compared to infants whose fathers could not read or write, those whose fathers could read and write were 44% less likely to receive a minimum acceptable diet. The result of this study is invariant with the research done in Oromia, Ethiopia (Mulat et al., 2019), Enemay District, Northwest Ethiopia (Gessese et al., 2014) and is consistent with EDHS data analysis findings (Tassew et al., 2019). Additionally, it is a strong predictor similarly in South Asia, Bangladesh, and Nepal (Kabir et al., 2012; Senarath and Dibley, 2012; Khanal et al., 2013). The possible reason might be the link between educational status, income, exposure to mass media, and knowledge about healthy dietary habits.

Furthermore, infants born in hospitals were 3.14 times more likely to have MAD than those born at home. The study finding is similar to the study conducted in Oromia, Ethiopia (Mulat et al., 2019). This might be due to appropriate counseling by healthcare providers on proper IYCF practices, their importance, and their effect on optimal health.

Furthermore, infants from the wealthiest families are 73% less likely to have insufficient MAD than their peers. This finding

TABLE 5 Factors associated with MAD uptake among infants aged 6–23 months in South Gondar Zone, Northwest Ethiopia, 2017 ($n = 442$).

Variable	MA		COR (95% CI)	AOR (95% CI)	
	Adequate	Inadequate			
Marital status	Married	228	129	1	1
	Single	32	5	3.62 (1.38, 9.52)	3.98 (1.39, 11.40)*
	Divorced and separated	34	14	1.37 (0.71, 2.65)	1.22 (0.56, 2.64)
Child Age	6–11 months	73	69	1	1
	12–23 months	221	79	2.64 (1.74, 4.01)	2.82 (1.78, 4.47)*
Family size (mean)	≤4	74	173	1	1
	>4	74	121	0.69 (0.47, 1.04)	0.96 (0.60, 1.52)
Father educational status	Unable to read or write	170	67	1	1
	Able to read and write	110	74	0.58 (0.39, 0.88)	0.56 (0.35, 0.89)*
	Above primary school	14	7	0.79 (0.30, 2.03)	0.59 (0.20, 1.71)
Father occupational status	Daily laborer	20	6	1	1
	Farmer	274	142	0.58 (0.22, 1.47)	0.67 (0.23, 1.91)
Breastfeeding	Yes	281	146	1	1
	No	13	2	3.38 (0.75, 15.16)	3.30 (0.66, 16.41)
Extra food before six months	Yes	21	4	1	1
	No	273	144	0.36 (0.12, 1.07)	0.97 (0.27, 3.47)
Place of delivery	Health facilities	58	10	3.39 (1.68, 6.85)	3.14 (1.47, 6.73)*
	At home	236	138	1	1
Wealth index	Very poor	70	18	1	1
	Poor	78	26	0.77 (0.38, 1.52)	0.96 (0.45, 2.06)
	Middle	46	24	0.49 (0.24, 1.01)	0.50 (0.23, 1.09)
	Rich	80	49	0.41 (0.22, 0.78)	0.57 (0.28, 1.18)
	Very rich	20	31	0.16 (0.07, 0.35)	0.27 (0.12, 0.64)*

*Significant during multivariable analysis ($p < 0.05$), 1 = Reference, AOR, adjusted odd ratio; COR, crude odd ratio; MDA, minimum acceptable diet.

is consistent with other studies that showed that infants in high-income households consume a more diverse diet than those in low-income households (Gessese et al., 2014; Solomon et al., 2017). This could be due to household purchasing power for a variety of foods. Similarly, a high income may be associated with a higher level of education, which may increase knowledge about proper child feeding.

Limitations of the study

One of the limitations of this study is that it could not link MAD to specific causes; it was difficult to establish a possible causality, and it was unable to include knowledge, attitude, and practice of caregivers/mothers related to infant and young child feeding (IYCF) due to the nature of the data (secondary data), and recall-related problems. Finally, the IYCF program indicators were not a part of this study.

Conclusions

Nearly two-thirds of the infants had/received a minimum acceptable diet. Moreover, households' Productive SafetyNet status has no statistical impact, and the proportion of the minimum acceptable diet was low in the study area. There were program phases or stages implemented in the past before phase 4 (productive SafetyNet program) was launched. So, this is the comparison of phase 4 (the current) with the past (phase 3 and before it). Here, marital status, the educational status of the father, the child's age, and the place of delivery were the associated factors for the uptake of a minimum acceptable diet among infants aged 6–23 months.

Based on this, stakeholders should have to strengthen the PSNPs through the integration of current nutrition and other health-related strategies/programs to increase MAD uptake. Moreover, health professionals shall have to provide health and nutrition education and counseling based on the child's age,

the father's educational status, the marital status of the woman or caregiver, and the place of delivery through other child and reproductive healthcare services.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Ethical Review Committee of Debre Tabor University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

ME and AG made the draft of the proposal for data collection. ME, AG, BK, DT, ST, and YS contributed to the

acquisition and analysis of data and to the interpretation or discussion, the results of the manuscript, the analysis, interpretation, discussion and results, and revised the manuscript. All the authors read and approved the final manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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