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Review Article

# Dietary Practices among Deviant Pregnant and Locating Women (PLW) in Productive Safety Net Settings of Ethiopia

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**Abstract**

**Background:** In Ethiopia, the dietary diversity score, minimum dietary diversity, and dietary practices of Pregnant and Lactating Women (PLW) were found suboptimal. Food insecurity and socio-economic factors are the common barriers to maternal feeding practices. This study was designed to identify dietary barriers and explore how positive deviant PLW could overcome those barriers while negative deviants are struggling with malnutrition both sharing similar settings which can help in showing a different perspective on nutrition programming.

**Methods:** A qualitative study was conducted in two purposely selected productive safety net program-supported districts in Oromia and Amhara regions. Sixteen positive deviant PLWs (not acutely malnourished and living in food-insecure households (HHs); and sixteen negative deviant PLWs (acutely malnourished and living in food-secured HHs) were interviewed, observed their HHs and identified feeding barriers at demand and supply sides. We also conducted an in-depth interview with health service providers, traditional healers, and district nutrition program managers. Additionally, seven focus group discussions (FGD) were made with community leaders, grandmothers and mothers-in-laws, and religious leaders. The findings were organized and coded using Atlas.ti qualitative software and thematically analyzed.

**Result:** Positive deviants have increased awareness and value of the importance of nutrition to themselves and their kids, practice preventative medical services for themselves and their child (ANC, Delivery, PNC, and vaccination), supported by their family culture and members on a balanced diet, motivated for the translation of nutritional knowledge into practice, they tend to have no or less influence by food taboos, understand better the effect of fasting on themselves and their kids and have a flexible attitude toward fasting, tend to consume more locally cheaper but more nutritious food items and take part in diversified small business income-generating activities to be a food subsistent household. Negative deviants are unhappy with the health service experiences they received from health centers and health posts, tend to have poor feeding routines, are not flexible in fasting practices, not have a good understanding of the frequency of feeding practices and type of food for pregnant and lactating mothers recommended to eat, less visited by agriculture and health service government sectors at the household level.

**Conclusion:** Pregnant and lactating mothers' nutrition program design and implementation needs to consider understanding the deviant mothers' dietary unique behaviors. Particularly, it is important to capture and customize the positive deviants' unique behaviors that helped them to overcome local barriers to their feeding practices and nutritional behaviors while negative deviant mothers' specific dietary barriers also need to be explored and addressed.

## INTRODUCTION

In Ethiopia, malnutrition has been mostly associated with dietary diversity (DD) practices, particularly among children under five, and pregnant and lactating mothers. While this topic has been widely studied, existing research has explored the potential barriers to maternal DD practices [1-4]. Poor structural readiness, gaps in delivering integrated nutrition services with significant missed opportunities in nutrition screening and counseling, socio-economic factors of the women and the deep routed cultural beliefs, and suboptimal maternal feeding practices are the broad categories of maternal dietary barriers to the demand, supply, and community sides.

A study conducted recently applying a mixed method landscape analysis concluded that there is poor structural readiness and gaps in delivering integrated nutrition services with significant missed opportunities in nutrition screening and counseling at health facilities in Ethiopia [5]. Some evaluative studies that focused on nutrition policies, program implementation experiences and governance on maternal nutrition in Ethiopia indicated key policy implementation gaps in areas such as low prioritization and weak technical capacity to deliver context-sensitive maternal nutrition interventions at all levels [6] and challenges related to nutrition program leadership, coordination, collaboration, advocacy, and budget [7,8].

Studies have shown the demand side maternal nutrition

barriers, such as maternal heavy workloads, low husband support and low educational level of women; lack of nutritional resources and awareness of use; poor dietary habits, food taboos, and avoidances; increased expenditure for cultural and religious festivities [9]. UNICEF also indicated maternal nutrition barriers that include gender inequality, social and cultural norms constraints, and women's ability to make decisions about their nutrition and care [10]. Some existing studies have focused on social and cultural barriers related to food taboos, restrictions, and myths affecting maternal dietary practices [11-14]. However, no one study explored what was differently practiced among deviant mothers both positive and negative deviants who have shared similar settings, e.g. PSNP supporting community and residing somehow in common socio-economic, cultural, and structural barriers including gender-related issues. Hence, this study was designed to explore how positive deviant PLW could overcome identified dietary barriers differently in PSNP Woreda.

## METHODS

A qualitative study conducted in two purposely-selected productive safety net program (PSNP5) supported districts in Oromia and Amhara regions. Focus Group Discussion (FGD) and Key informant interviews (KII) were conducted with pregnant, lactating, influential people, health program managers, and health professionals. Sixteen positive deviant PLW and sixteen negative deviant PLW purposely identified and interviewed, observed their HHs and explore their feeding barriers at demand and supply sides using semi-structured questionnaires. Two experienced qualitative research experts who can speak the native language of Affan Oromo and Amharic conducted the data collection from November 15-30, 2022 in Habro and Meket Woreda. After the Pregnant and Lactating mothers in food-secured and None-Secured HHs were identified in both Woredas, they were screened to whether their acute nutritional status using mid-upper circumference (MUAC) made them the candidate to be deviant and selected for the in-depth interview. PLW with their MUAC <230mm (i.e. acutely malnourished) and living in food-secured HHs (i.e. none PSNP5 supporting HHs) were classified as negative deviant whereas PLW with MUAC >230mm (i.e. not acutely malnourished) but living in food insecure (PSNP5 supported HH) as positive deviant. The food secure and insecure HHs and MUAC screening were made by SPIR II program staff and HEWs, respectively, and then the MUAC measurement was verified by the primary data collector/interviewer.

Participants for seven FGD were purposively sampled and engaged from grand and mothers-in-law, women development Groups (WDGs), Community leaders, and religious leaders. We prepared different interview discussion guides customized to each key informant category and FGD groups. Eight Health service providers, traditional healers, and nutrition program managers in the woredas participated as key informants to enrich further barriers to maternal nutrition from their perspectives.

The interviews and FGD discussions were conducted both in Amharic and Afan Oromo languages which are widely spoken in the study set-ups. We conduct 40 KII (20 per region comprised of pregnant and lactating women, health professionals, traditional healers, and health program managers in PSNP5 program area) and 7 FGDs with targeted participants in each region (3 in Oromia and 4 in Amhara region with 10-12 participants per FGD).

Throughout the data collection process, the primary investigator and research director were closely following and giving feedbacks on the quality and procedure of the data collection and submission status in a daily bases. After the quality assurance, the collected 47 KII audio data was translated from local language to English by professional translators, and then the data was entered and coded using Atlas.ti qualitative software in every other days during the data collection period.

We conducted adding, editing, categorizing, and merging codes as we read more interviews and find new recurrent constructs. We also kept memos for variations observed between the deviant PLW living in food-secured and non-secured areas as we read the interviews. The research team thematically analyzed the output-coded file.

## RESULTS

Two thematic areas identified to explore the positive and negative deviant PLWs dietary practices. Under each thematic area there are multiple key findings narrated from each interviewee answers and quotations. Accordingly, from the first theme, positively deviated pregnant and lactating mothers in food-insecure households have peculiar nutrition behaviors that could interconnected with their acute nutritional status; whereas in second theme how the inter-related factors in food-secure households contributed on the negatively deviated PLW's acute nutritional status.

## THEME 1

Peculiar nutrition behaviors help positively deviated pregnant and lactating mothers in food-insecure households.

### Key finding

Non-food-secured site positive deviants have multiple sources of information of which the common source of information was health service providers.

Positive deviants have increased awareness and value of the importance of nutrition to themselves and their kids through the information they get from health service providers, commonly Health Extension Workers (HEW).

**Example 1**

"...I get good feeding practice from my neighbors when they share food that they prepare during delivery...the women's affairs officer who gathers us in the vicinity also shares the information; I get information when I visit the health facility for medication. The radio airs such information too... health facility is the best and the radio transmits good info. Sometimes the radio

has regular programs for airing such health info and we listen to it" Positive deviant lactating mother, NFS-P4, Oromia.

**Example 2**

"She [The HEW] told us about the meal, for instance, during our lactating times. She advised us that we need to include blends of grains, cabbages, flours stuff, maize, chickpea, wheat, and the like and feed on them to better access vitamins and if so that it is good for us and the baby. The HEW of ours is teaching that to us. And we can practice that accordingly unless our lack of resources hinders us from doing it" Positive deviant Lactating Mother, NFS-P3, Oromia.

## Key finding 1.2

Positive deviant PLWs practiced preventative medical services for themselves and their child (ANC, Delivery, PNC, and vaccination).

They have a common habit of attending ANC service, health facility delivery, and post-natal follow-up; they seem to be satisfied with the service they received from health service facilities.

**Example 1**

"During the gestation, I started the vaccination from the 3rd month [first trimester] and I finished taking the vaccinations required. After the delivery, I made the baby get all the vaccinations and I get the vaccination completion certificate issued for me accordingly. I didn't experience any problem with them and am happy with their service. They provided us with family planning too in addition to providing the vaccines to the baby. The health facility is important to us already. Those people who visit the facilities experienced the importance accordingly." Positive deviant Lactating mothers, NFS-P3, Oromia region.

**Example 2**

**''**About my pregnancy, I did have checkups when I got pregnant and gave birth in Hospital where they cared for me well during my appointments. And I didn't have any problem during childbirth" Positive lactating deviant mother, NFS-27, Amhara.

## Key finding 1.3

Family members of positively deviant PLW were supporting them on having a balanced diet.

Particularly, husbands, mothers, sisters, and grandmothers provide information on a balanced diet and support positively their diet. Positive deviant mothers tell the contribution of their husband, mothers, and grandmothers' support to their healthy feeding.

**Example 1**

"My grandma used to advise me the same thing and that I should feed on anything that I could access and that produces more breast milk for the baby". Positive deviant lactating mother, NFS-P1, Oromia Example 2: "my husband, mom and my sister have influenced my feeding…. my husband tells me to eat more when I want so that I won't get hurt". Positive deviant pregnant mother, P-9, Oromia region.

**Example 2**

"Because we are mother and daughter, my mother doesn't want me to get harmed. She wants to see good situation, good things, and place for me so she advices me and I listen to her well…My mother helps me out and when I must prepare cereals for grinding, I just sit and pick the bad ones, my mother does most of the work. So, I don't do much because of my mother" Positive deviant pregnant mother, P-34, Amhara region.

**Key finding 1.4**

Positive deviant PLWs were motivated to translate optimum nutritional knowledge into practice.

They have undergone food demonstration training on a balanced diet, which was provided by health professionals, perceived as it helps for themselves, and their children and they practice at home. They tend to translate their nutritional knowledge into practice for better feeding their children and themselves. Diversify food with locally available resource and tries not to make their diet repetitive.

**Example 1**

"When I gave birth, they gathered us and educated us about it at kebele and health post. Personnel from the Woreda and zone educated the gathered people about it including how to deal with nutrition deficiency in children. They made expectant mothers and mothers of children suffering from nutrition deficiency participate. They told us to bring a glass of milk, cabbage, and any kind of flour we got at home like flour of wheat, millet, sorghum, barley, and the like and we did the same. They told us that if we manage to feed such blends to our children for about 2-3 days then the children could win the deficiency as it enhances a balanced diet, and those good vitamins are available in such blends. That was how I learned about a balanced diet to avoid nutrition deficiency. Positive deviant Lactating mother-P1, NFS, Oromia.

**Example 2**

"I feed on the meal that is a blend of all grains that I have. If I eat injera stuff in the morning then I eat something different for lunch and again something else for dinner" Pregnant mother, Positive deviant, NFS-17, Oromia.

Lessons from HEWs particularly on how to prepare blended food for children are highly valued by positive deviant lactating mothers and could be useful for their family diet as well.

**Example 1**

"we demonstrate it to them during the training, but we didn't

sustain it for inclusion into regular activities. We prepare the food and feed it to them at the training; but what could bring further change is demonstrating to them about producing the foods in their backyards, collecting, and adding such foods into meals, and cascading such practices across communities. Nevertheless, we didn't demonstrate them such stuff yet". Health service provider, Oromia region.

**Example 2**

"HEWs provided us with such advice when we visited the health post with our children. I learned about the importance of balanced food from their lessons. I just learned from the HEWs about it and I proved that the lessons are true because I practiced the lessons at home for my family. That is how I learned about preparing a blend of flour of various grains to access a balanced diet". Positive deviant lactating mother, NFS-P6, Oromia.

## Key finding 1.5

Positive deviants have supportive household family culture and feeding habits.

Positive deviant lactating mothers have encouraging household family culture on nutritious food including the use of vegetables and animal products.

**Example 1**

"As per our household custom, we slay rooster and eat it, if money is available meat is bought and stored. There is also soup and porridge" Positive deviant lactating mother, NFS-P11, Amhara region.

**Example 2**

"I am eating very differently; there is a good vegetable this year. It is pleasant. I buy egg and meat from the market…if I want porridge, I buy 3 cereal items. I clean and prepare it so that I can have it when I want and if I crave something else, I go out and buy it… my husband fetches water and brings firewood... My mother helps me out and when I have to prepare cereals for grinding, I just sit and pick the bad ones as my mother does most of the work. So, I don't do much because of my mother… this year the government has helped us as we have never seen before with Carrot, potato, banana, onion, and chili" Positive deviant pregnant mother, NFS-34, Amhara region.

## Key finding 1.6

Positively deviated mothers tend to have no or less influence by food taboos.

Counter the taboo food by eating and growing it in their backyard

**Example 1**

"Yes, I do disregard it even if they rumor those such foods make the fetus grow bigger in the womb. I feed on bananas at home when I rest. I even feel whimsical about bananas when I am pregnant. I grow bananas in my backyard, and I do not sell the produce to the market. Instead, I use it for consumption" Positive deviant lactating mother, NFS-16, Oromia region.

**Example 2**

"Now I am 7 months pregnant. I feed on such restricted foods like banana and eggs when I access it and I am not apprehensive about it. I believe that God safeguards me. I feed on such foods; I swear!" Positive deviant pregnant mother, NFS-P18, Oromia region.

## Key finding 1.7

Positively deviated mothers understand better the effect of fasting on themselves and their kids and have a flexible attitude toward fasting period duration and intensity.

They tend to compromise with fasting practice and are less intense. Some positive deviant Muslim and Christian religion following PLW has showed flexibility reasons toward fasting during pregnancy and lactating mothers.

**Example 1**

"Community believes that lactating mother should practice fasting just like the rest of the members of the community. Nevertheless, the mom could break the fasting if she felt very hungry and thirsty and eat food for the sake of the baby. She can break the fast if she couldn't patiently withstand the fasting and hurting her, this is according to the Sharia of Islam that allows a lactating mother could break the fasting if the feeling of hunger and thirst seemed a burden on her and until her baby grows stronger and then she can be reinitiated on the fasting thereafter". Positive deviant lactating mothers, NFS-P6, Oromia.

**Example 2**

"I wait until I get hungry that's what the book allows… If I am working, I get hungry so from 10:00-11:00 am… I fast twice a week (Wednesday and Friday) for four hours… I fast till I am unable any longer then I eat even if it's not time yet there is no problem." Positive deviant lactating mother, NFS-11, Amhara region.

**Example 3**

"I think she should eat during her pregnancy and after delivery, till she gets baptized, and she can repent later" An Orthodox Christian religious leader, FGD, Amhara region.

## Key finding 1.8

Positively deviated mothers tend to consume more locally cheaper but more nutritious food items (sometimes from their own farmland) like cabbage, which considered, as it is a poor family food.

This could have helped them with positive deviation.

**Example 1**

"I feed on cabbage and lettuce when I have access including collecting it from my farmland." Positive deviant pregnant mother, NFS-9, Oromia.

**Example 2**

"We farm tomatoes, carrots, and the like for household consumption." Positive deviant pregnant mother, NFS-18, Oromia.

### Key finding 1.9

Nutritionally thoughtful of what they eat to nourish their child during pregnancy and lactation.

**Example 1**

"The other times I just feed on what is available in my reach but during my lactation, I eat injera stuff and porridge stuff in the morning and for lunch respectively thinking about producing more breast milk for the baby. And before the delivery/during prenatal, thinking to promote the growth of the fetus in my womb, I feed on good and attractive foods" Positive deviant lactating mother, NFS-P4, Oromia.

**Example 2**

"I have been on checkups before the delivery and when I was about to give birth, I was taken to the health facility. I stayed there until delivery and until the day, they checked me out. I then kept breastfeeding my baby at home for the first 6 months. Moreover, after the 6 months, I started feeding the baby with gruel and boiled potatoes in addition to breastfeeding." Positive deviant lactating mother, P-1, Oromia region.

### Key finding 1.10

Aspire to participate in diversified small business income-generating activities to be a food subsistent household.

**Example 1**

"…But if this information were to reach the government so that the support given by the government could be a different thing; this can be on chicken production and sheep production from which others could also learn from us; through such bigger perspective support, our life could change". Positive deviant pregnant mother, NFS-33, Amhara.

**Example 2**

"… If there is some side benefit enabling me to purchase some asset and keep it to increase its value over time then it could be a way towards some improvement…. for instance, purchasing poultry, goats and the like and raising them" Positive Deviant lactating mother, NFS-4, Oromia region.

### Key findings 1.11

Utilizes the support through PSNP for relieving household shortcomings.

**Example 1**

"We get monetary support from PSNP. Like once in 6 months. Until then we manage stuff by arranging loan. It is like more than ETB 1000 per month… but currently they increased the amount for family of eight and now they give us like more than ETB 4000 at once for the 6 months. If we took a loan from someone already then, we partly use the money to pay back the loan and that is how PSNP serves us. It is about 2 years since I joined PSNP". Positive deviant lactating mother, NFS-P1, Oromia.

**Example 2**

"…They assessed our household situation, labeled us as poor household, and made us PSNP beneficiaries from which we receive money of about ETB 3200 once in two months. They also bought us a heifer that grew into a cow and calved. We again managed to keep the calf, but the cow became aggressive towards me and my children, so we had to sell it and replace it with another heifer." Positive deviant lactating mother, NFS-P3, Oromia.

### Key findings 1.12

Integration between household level screening, health facility and PSNP seemed to have helped for positive deviation.

Some positive deviation of PSNP Woredas mothers seems to have been created by the integrated support of the household level screening, health facility diagnosis of nutrition deficiency and provision of nutritional supplements and linking with PSNP support.

**Example 1**

'They [health workers] are the one who tells us about the food deficiency…for instance, last time they diagnosed me with nutrition deficiency and provided me with blended flour and I fed on that during my lactation. A person from the kebele paid me visit at home and screened me. They referred me to the nutrition support point, and I visit them to collect the stuffs when it is arrived. The other time they extended an invitation to us from the office to go there and get nutrition deficiency screening. If they referred us for nutrition supplementation, then we go there and collect it accordingly. They also told us that the children should get the diagnosis for the same service as when they are four or five months". Positive deviant lactating mother, NFS-P3, Oromia.

**Example 2**

"We tell them that pregnant mothers need to take vaccines and avoid working and that they need to practice institutional delivery. We advise them to eat more and that they need to produce the food in their backyards and that they could prepare food just from what they got at home. We also tell them that the rumor in the community about the restriction of foods is misinformation. They shouldn't be involved in working that much and if a pregnant woman who is a beneficiary of PSNP pays us a visit then we provide her with counseling and exempt her from PSNP works". Health service provider, P-22, Oromia region.

A maternal support system was created and maintained in PSNP households through the integration of health services with agriculture and the hello-cash support mechanism (WFP). This might have put positive deviants in a better position to have more nutrition-related access, education, skill, and use.

**Example 1**

"There is a support initiative via Hello-Cash, supported by WFP in which mothers and children are screened and then join the support. They get text messages when the support arrived and they go there and collect the diversified foods without paying for them. It is controlled by the agriculture office at the woreda level. with the agriculture sector involving the natural resource preservation activity of the PSNP... lactating and pregnant mothers are exempted from the work and they require her information from the HC including whether she received ANC, PNC, vaccination, and the like and it is continued that way…they are prioritized at the kebele level". Health service provider, P-36, Amhara region.

**Example 2**

"There are some lactating and pregnant mothers who access support from WFP in some selected 8 Kebeles temporarily like for about 10 months via providing them Food Voucher meaning they get financial support directly to purchase food items. WFP supports TSFP intervention that is available to selected Woredas meaning we have that intervention in all Kebeles of ours. There is also Seqota Declaration's interventional support on dairy, meat goats and poultry provision to the mothers" Nutrition program manager, P-37, Amhara region.

## THEME 2

Inter-related factors contribute to the negatively deviated maternal poor nutrition in food-secure households.

### Key finding 2.1

Negative experience in the health service provided at their kebele.

Some food secured site negative deviants are unhappy with health service experiences they received from health centers and health posts and disappointed about quality of health service they received on nutrition counseling.

**Example 1**

" I am not happy with the service of the health center, for instance, it could be better if they tell me what kinds of food items I should consider feeding on. That could make me happy but they didn't say anything about that" Negative deviant pregnant mother, FS-P7, Oromia region.

**Example 2**

"I am not always happy with the services of the health post when I visited sometimes the personnel isn't available. Sometimes they tell us that the time is up once they serve other visitors who arrived there before us. Sometimes they procrastinate things by giving us another appointment". Negative deviant lactating mother, FS-P2, Oromia region.

**Example 3**

I visited the health center about 4 times, but they got me no medicine during those. Finally, they prescribed me medicine and told me to purchase it from a private provider for which I wasn't ready financially the provider required me to pay about ETB 270, but I postponed the purchase as I didn't have money and I didn't go back there to purchase it. Thus, I wasn't happy with the health center service, so I avoided visiting them thereafter" Negative deviant pregnant mother, FS-19, Oromia region.

### Key finding 2.2

Negatively deviated mothers in food-secured areas tend to have poor feeding routines, not flexible in fasting practices.

More negative deviant PLW have a tendency to consider fasting as compulsory during pregnancy and lactation and show less flexibility in fasting hours and frequencies

**Example 1**

"I heard about its [fasting] effects in such regards [to the mother and baby] but I never disregarded the fasting practice. It is compulsory. Religiously, I couldn't go easy on the fasting practice though I heard that it has negative effects on expectant and lactating mothers". Negative deviant lactating mother, FS-P5, Oromia region.

**Example 2**

"During the fasting we refrain from feeding on all foods/drinks from break of dawn to evening. For instance, we eat at about 3:00AM and we are expected to refrain from taking in anything during the entire day until the evening of breaking the fasting. A pregnant mother gets highly hungry and lethargic, and she sticks to fasting because it is compulsory….it is compulsory as fasting is put in place by Sharia law of God and all Muslims are expected to observe it accordingly. If the pregnant mother felt sick and forced to break the fasting, then she will make it up [compensate] with Qaeda. Even when the mom passed some days in the childbed she is expected to make up [compensate] it with Qaeda after the delivery. Negative deviant lactating mother, FS-15, Oromia region.

**Example 3**

"It is known that fasting is compulsory including during pregnancy…we avoid all foods from break of dawn to late evening". Negative deviant lactating mother, FS-P8, Oromia region.

Negative deviants have less knowledge of the effect of fasting on their health and the baby's growth

**Example 1**

"I don't know prolonged fasting like lent affects health wise… because though animal products like egg and milk isn't eaten, I can eat other food items like vegetable based on the accessibility. And I only stay till 11:00 am so I don't think it has any effect". Negative deviant lactating mother, FS-P44, Amhara region.

**Example 2**

"I don't know [the effect of fasting on health], I gave birth while fasting, so I don't think it does, but I don't know". Negative deviant lactating mother, FS-P29, Amhara region.

Negative deviant mothers tend to have poor routine feeding practices sometimes complicated by the loss of appetite caused by pregnancy and chewing 'Khat' and fasting.

**Example 1**

"My food appetite is low before about the first 5th months of the pregnancy. My appetite got better after that, and I eat what I can access thereafter. We just eat normally and we use what we can access at home in the morning and evening and during midday… if I pass the day at home, I chew 'Khat' a lot too… Fasting is mandatory even during pregnancy and we only break the fasting if we are so lethargic and we can break the rest of the fasting likewise after delivery". Negative deviant pregnant mother, FS-15, Oromia region.

**Example 2**

There is nothing to feed on differently; I just eat with the children I suffer from heartburn after having food ...If I eat something once then I feel a bad appetite for the next meal. Negative pregnant mother, FS-P7, Oromia region.

**Example 3**

"When I was pregnant, I didn't have much appetite. If I ate lunch, I did not eat much for dinner. You could say I was eating once per day". Negative deviant lactating mother, FS-45, Amhara region.

## Key finding 2.3

Not have a good understanding on the frequency of feeding practices and type of food for pregnant and lactating mothers.

Food-secured household negative deviants tend to have less deep knowledge and a superficial understanding on the type of food and frequency of eating during pregnancy and lactating but pretend to have the knowledge about it.

**Example 1**

I do think lactating mother needs additional food, but we eat more when we do have access and leave it when we do not. Supplemented lactating mother should eat like twice a day with millet, sorghum, and the like" Negative deviant lactating mother, FS-P2, Oromia region.

**Example 2**

"If they [lactating mothers] eat injera stuff in the morning then they need to feed on something else for the lunch. For instance, they could feed on maize or barley at different times. No one thought to me about this. I have learned about such stuff from science already though. I am grade 4th-grade graduate, so I do have the basic information in such cases already if shortage isn't the problem" Negative deviant lactating mother, FS-P5, Oromia region.

Some pregnant and lactating mothers have distorted or no knowledge on the frequency and variety of foods need for PLW.

**Example 1**

"During my current pregnancy I just eat about two times a day, in the morning and after midday. I eat injera of millet, sorghum or maize, and porridge." Negative deviant pregnant mother, FS-P7, Oromia region.

**Example 2**

"I didn't hear such information about what foods are recommended for pregnant mother" Negative deviant pregnant mother, FS-P8, Oromia.

Negative deviant pregnant and lactating mothers tend to occupy in household chores and prioritize feeding more to their children and less for themselves.

**Example 1**

"Sometimes we even don't remember the lunch unless we prepare Shiro stuff for children when they are back from school; nevertheless, due to my lethargy I am not much interested to eat at the time kids are back home from school". Negative deviant pregnant mother, FS-19, Oromia region.

**Example 2**

"After 6 months additional food could be prepared for the baby from a blend of flour of barley, oats, nuts, and other grains by cooking it into a gruel and the baby drinks the gruel. Some other times when it is necessary, I also cook eggs for the baby. Other times again based on the want of the baby I cook potatoes and feed them to the baby….if I provide that to the baby, I can feed on injera of millet and sorghum. The baby shouldn't face deficiency even if the mom isn't eating well means we need to manage to get the baby more varieties of food just from what we have." Negative deviant lactating mother, FS-14, Oromia region.

Negative deviant mothers tend to use less ANC, delivery and PNC at health facilities due to various reasons that include disappointment by service, not counseled by health service providers.

**Example 1-Delivery**

"I delivered it just at home; I didn't go to the health center for that" Negative deviant lactating mother, FS-P2, Oromia region.

**Example 2-Delivery**

"I delivered at home." Negative deviant lactating mother, FS-P5, Oromia region.

**Example 3-PNC**

"I gave birth in the health facility… it hasn't been long since I gave birth… They did not tell me to visit health facility after birth. They told me to come to them when I feel unwell." Negative deviant lactating mother, FS45, Amhara region.

Food secured Negative deviant pregnant and lactating mothers tend to engage in household income-generating business or keep busy in household roles, and care for children, and support at farmland activities, etc. and tend to skip their meals.

**Example 1**

"One thing is that in the context of the vicinity mostly the women are involved in trading activities meaning they keep up with the trading almost until 6 or 7 months of their pregnancy. In other words, they do not mostly stay at home as they leave home in the morning and go back home in the evening. That way it is somewhat difficult for them to access food frequently to the science standard. They spend more time in the town. Mostly the nutrition they use here is carbohydrates from maize, rice, and pasta and it needs awareness creation to lure them into more varieties of foods". Woreda Nutrition Program Manager, Oromia region.

**Example 2**

"I am fine except for the feeling of lethargy maybe I was not working as much in the previous. Now I am making 'Tela' and I do not simply sit around. I also knit, that must be why my body has weakened that is why it seemed different to me… I look after the animals, I cut grass for them, I was weeding the whole winter, I make Tela, I Knit to sell, I don't even take a break and I don't even have time to eat even when I want to that is how I live". Negative deviant pregnant mother, FS-29, Amhara region.

**Example 3**

"I have been visiting the health facility for prenatal service for my previous pregnancies, but I couldn't do the same for my current pregnancy. Our farmland is far away up there. I am putting my children through school. I have a small kid that needs my care at home so I could not visit the health facility for such a service. It was not suitable for me to be able to visit the health facility, so I disregarded it. For instance, I have to safeguard our farmland from wild animals like monkeys as they attack the crops. I and my husband need to stay at different positions around the farmland to keep it safe from them. My first two children are going to school. The rest of my children are young. I have to take the young children with me too when I go to the farmland. Due to all such hindrances, I couldn't go for the prenatal service….I am having some sort of vertigo when I stand up from my seat and I feel difficulty walking around when it is sunny if I feel such stuff I quickly need to sit" Negative deviant pregnant mother, FS-15, Oromia region.

Negatively deviated mothers infrequently use or do not utilize animal-sourced foods linked to their household food practices or have low access to such foods.

**Example 1**

"There is nothing I can talk about animal-based foods inclusion to my feeding practice meaning we didn't slaughter an animal for meat since my last delivery. We do not access milk either. We just feed on what we have here at home" Negative deviant lactating mothers, FS-P5, Oromia region.

**Example 2**

"We do desire to include more of such foods [Animal sourced foods] but we couldn't access much... I desire to have it through a" Negative deviant pregnant mother, FSP8, Oromia region.

## Key finding 2.4

**Less visited by agriculture and health service government sectors at the household level.**

Agriculture and health service providers do not visit Food-secured sites since pregnancy and lactation.

**Example 1**

"No personnel from agricultural office visited me to discuss about backyard farming…we don't have irrigation access here for the fruits and vegetables growing and we practice conventional farming with the rainfall and we practice growing tomatoes, beans and the like normally" Negative deviant lactating mother, FS-P5, Oromia region.

**Example 2**

No one paid me a visit at home to provide me advice on backyard vegetable or fruits farming". Negative deviant lactating mother, FS-P14, Oromia region.

## Key finding 2.5

Screening of maternal nutrition might have missed food insecure households.

There are PLW living in Food secured kebele but could be a candidate for PSNP and not getting the service. Some complained screened several times but not getting the support. There is could be an exclusion error in which the PSNP screening system might not identify some negative deviant mothers considered as food-secured households.

**Example 1**

"As a majorly I feed on injera stuff…I couldn't afford to feed on everything they recommended me to. I know such foodstuffs are good, but I am short on finance. I feed on food items that I

can access...I feed on injera made of millet, sorghum, and teff also based on availability…I expected the provision of the blended flour from them, but they told me that my name isn't available in the list of beneficiaries of the blended flour. I grew whimsical for the blended flour so that I managed to access it from a beneficiary who got the blended flour from the facility, and she shared part of her blended flour with me". Negative deviant lactating mother, FS-P10, Oromia region.

**Example 2**

"My household was included about 3 times in the screening process that was supposed to include us to the entitlement of support, but we were never considered for the support grant. They did not get us the nutritional supplement in the form of blended flour either even when we visit them. We never received any support though our HH's details were reported and assessed". Negative deviant Pregnant mother, FS-8, Oromia region.

Some mothers pointed to the lack of a transparent system for food support to pregnant and lactating mothers and also suggested the use of additional criteria for screening mothers at health facilities.

**Example 1**

"The health facilities give support based on the measurement [MUAC] but instead of that, it would be better if they were to use the economic status as a base for the aid… There is a problem with the community because if there is any help from the government, they [Kebele officials] give priority to their own people. For example, a person with a better title let's say the Kebele leader if he was told to register a pregnant woman with a specific issue, he will give priority to his person irrespective of the problem, so he provides the name he wants whether a woman deserves help or not". Negative deviant lactating mother, FS-P25, Amhara region.

**Example 2**

"They never provided my HH with the nutrition supplement either though they collect our names regularly for the screening. My HH has been included into the assessment/screening for the entitlement of support, but they never considered us for the support provision". Negative deviant pregnant mother, P-8, Oromia region.

**Example 3**

"Once some children and mothers are screened with malnutrition, they need to provide them with the supplemental nutrition as promised during mobilization. The health personnel came and did the screening many rounds, but no woman or children received the support or solution promised" Women development groups FGD, P-40, Oromia region.

## DISCUSSION

Pregnant and lactating Women (PLW) who have been sharing similar settings and community risks in PSNP5 Woredas are able to overcome maternal dietary practices barriers. Barriers are articulated well in different studies and deep-rooted socio-cultural norms in Ethiopia. According to recent studies conducted in Ethiopia, poor structural readiness, gaps in delivering integrated nutrition services with significant missed opportunities in nutrition screening and counseling, socio-economic factors of the women and the deep routed cultural beliefs, and the suboptimal maternal feeding practices are the broad categories of maternal dietary barriers on the demand, supply, and community sides. However, there were no study-explored practices in different ways to learn from deviant counterparts of the most affected groups who went in different ways to overcome barriers without being dominated by larger groups, socio-economic, cultures, and norms in a defined community.

In this study, pregnant and Lactating women (PLW) who have lived in similar settings and shared similar risks and benefits have been found to experience different maternal dietary practices though facing similar socio-economic, food security, and cultural beliefs in PSNP5 Woredas. Positive and negative deviant PLW were subjected to similar dietary in-depth interview questions. The assumption of the study was there would have peculiar deviant practices on material dietary practices used to develop messages and recommend for further study, policy and program advocacy to improve the maternal nutrition.

Accordingly, positive deviant PLWs have increased awareness, value, and better understanding of the importance of optimum feeding, nutrition education, and the effect of fasting on themselves and their kids; however, that kind of awareness and understanding was not reflected among negative deviants rather they had poor feeding routines and busy work and household rituals. Positive deviants including their family members have a better motivation to translate nutrition knowledge into practice, supported each other to diversify their diets by consuming more locally available and cheaper nutritious food items and they tended to be no or less influenced by food taboos and have a flexible attitude toward fasting. On the contrary, the negative deviants had no self-drive motives to adopt optimum feeding practices but were rather more influenced by family members of food taboos, with a less flexible attitude towards fasting.

Mostly positive deviants took part in diversified small business income-generating activities to be a food subsistent household and better in utilizing antenatal care (ANC), delivery, postnatal care (PNC), and vaccination at locally available health services (Health post and Health centers). Contrarily, negative deviant PLWs have bad experiences reflecting on what they have received at the health services and they complained about not to have commonly visited by both health and agriculture agents at home while they got pregnant and lactating.

Finally, the positively deviant PLWs, in productive safety net settings where food insecurity, food taboos, fasting norms, and poor nutrition services, can be considered as potential lessons to learn from to overcome barriers to maternal nutrition. Hence, nutrition programs need to consider, capture and customize the positively deviant mothers' peculiar behaviors and identify significant motivators and hindrances to design SBCC materials

and disseminate them to all community members. Further qualitative and quantitative observational studies may be needed to explore how that positive deviant could solve the challenges while overcoming barriers. There needs to be also further study on how negative deviants could not be motivated to overcome malnutrition despite the food-secure situation they lived in.

## LIMITATION OF THE STUDY

In this study, the actual food security status of the selected HHs was determined by the SPIR II team at ground level and further onsite parameters were not applied to differentiate household food security status.

## DECLARATION

### Ethics approval and consent to participate

The waiver for IRB approval was granted by the IFPRI Research committee and proper informed consent was received from each participant during key informant interviews and focus group discussions. The study was performed in accordance with the Declaration of Helsinki.

### Availability of data and material

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

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### Authors' contributions

NF has participated in the designing study approach, developing the study tools, engaged in data assurance and led analysis and write-up. AE, has participated in the designing the study approach, developing the study tools, led field data collection, and participated in data analysis and write-up.

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