Food aversions and cravings during pregnancy: Prevalence and significance for maternal nutrition in Ethiopia

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Abstract

A cross-sectional study of the nutritional significance of food aversions and cravings during pregnancy was conducted on 295 women in southern Ethiopia between February and May 1995. A questionnaire was used to collect data on dietary practices. Mid-upper-arm circumference (MUAC), triceps skinfold thickness (TSFT), and weight measurements were used to assess nutritional status. Slightly fewer than three-quarters (71%) of the women craved one or more foods, whereas about two-thirds (65%) avoided at least one food. Cereal foods, despite being staple foods in the area, were avoided by more women (41%) than any other foods. Livestock products, which were scarce at the time of the study, were craved by more women (55%) than any other foods. Comparisons using various anthropometric indicators revealed that women who avoided foods had significantly higher MUAC and TSFT than those who did not ($p < .05$), *whereas there was no difference in nutritional status between women who craved foods and those who did not. However, those craving women who managed to get the desired foods had significantly higher weight gain* ($p < .05$), *but not significantly higher MUAC or TSFT, than those who did not. Aversion and craving were positively associated* ($\chi^2 = 10.66$, $p < .001$; *odds ratio, 2.36). Thus, women who avoided foods were 2.4 times more likely to crave foods than those who did not avoid foods. This implies that aversion and craving are complementary processes geared towards ensuring optimal nutrition during pregnancy. Aversion results in the avoidance of monotonous diets, whereas craving calls for varied and nutritious foods. More research, however, is needed before such a conclusion is warranted.*

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Introduction

It is common to hear pregnant women complain about changes in their appetites. Whereas some women report a dislike of or total aversion to specific foods, others report a strong craving for specific foods and non-food items, which are usually not readily accessible. Food aversions and cravings during pregnancy are known all over the world [1, 2], but despite their ubiquity, neither their causes nor their ultimate effects on maternal nutrition have been well established scientifically. The opinions that have been documented so far are speculative, contradictory, or inconclusive.

Some researchers argue that aversions and cravings are idiosyncratic, learned behaviours, which therefore should be considered extrinsic, exogenous phenomena [2]. Other researchers attribute aversions and cravings to intrinsic physiological processes geared towards ensuring the optimal growth and development of the foetus [1]. According to the latter opinion, aversions are a physiological mechanism that protects the foetus either from nutrient deficiencies (by prompting mothers away from low-quality and monotonous foods) or from excess foeto-toxic substances present in the foods; thus, aversion would be beneficial [3, 4]. The evidence that the most commonly avoided foods or substances are staple foods, alcoholic beverages, coffee, and cigarettes appears to support this opinion.

Several studies have observed that women usually avoid staple or commonly consumed foods [2]. Studies also indicate that relatively high proportions of pregnant women avoid alcoholic beverages. In a study in the United States, 21% of pregnant women avoided alcoholic beverages and 13% avoided cigarettes [5]. Similarly, in Ethiopia almost 20% of the women studied showed an aversion to coffee and 35% showed an aversion to alcoholic beverages [F. Alemu and Z. Wolde-Gabreil, personal communication, 1995]. These findings appear to support the opinion that aversions are intrinsic and beneficial.

Some researchers, however, believe that aversions play a negative role in maternal nutrition because they re-

duce the mother's food options [1] by causing her to decrease her intake of certain foods. Thus, opinions on the importance of aversion to maternal nutrition are contradictory.

Researchers who believe that craving is physiological argue that it is a mechanism to protect the foetus and the mother from nutrient deficiencies [6] and suggest that craving is triggered when a deficiency in one or more nutrients arises. Hence, they argue that women who experience cravings increase dietary intake [1]. This opinion appears to be supported by the observation that, in general, women crave nutritious foods that are lacking in their diets. In an Ethiopian study, about 43% of the women craved milk and meat [F. Alemu and Z. Wolde-Gabreil, personal communication, 1995]. Similarly, in the United States 47% of the respondents craved fruits and 34% craved dairy products [7].

The literature on aversion and craving clearly indicates that knowledge of these behaviours, especially aversion, is far from complete. Since aversions and cravings are closely linked to the dietary intake of pregnant women, understanding these behaviours is important in addressing the issue of maternal nutrition. This paper is intended to contribute to the understanding of the role of aversion and craving during pregnancy, to identify foods commonly avoided or craved, and to determine the relationship of aversion and craving to maternal nutrition, using the Hadiya Zone in Ethiopia as a case study.

Materials and methods

Study site

The Hadiya Zone was selected as the study site on the basis of the opinions of nutritionists regarding the occurrence and magnitude of qualitative changes in foods consumed during pregnancy and the presence of the facilities necessary to carry out the study. In this site, a single Mother and Child Health Clinic was randomly selected.

Study respondents

The study enrolled all of the healthy pregnant women who came to the clinic for antenatal checkups between February and May 1995. A total of 295 women (using a prevalence of 45% for both aversion and craving) were studied.

Study instruments and procedures

A questionnaire was designed to gather demographic and socio-economic data, information on the women's dietary modifications (aversion and craving), and the reasons for them. Nurses working in the clinic were trained to use the study instruments and tools. A pilot study was conducted, and the questionnaire was modified appropriately.

Body weight measurements were taken to the nearest 100 g following standard procedures, using a beam scale. In addition to the body weight measured during the interview session, one other recent body weight measurement for each subject was retrieved from clinic records. Mid-upper-arm circumference (MUAC) and triceps skinfold thickness (TSFT) measurements were taken using the standard methods described by Gibson [8]. A non-stretchable tape, calibrated to the nearest 0.1 cm, was used to measure MUAC, and a Holtain caliper, calibrated to the nearest 0.2 mm, was used to measure TSFT.

Data analysis

The data were processed and analysed using SPSS statistical software. Food types were divided into major food categories: staples, legumes, vegetables and fruits, and livestock products. Weight gain per week was calculated by subtracting the weight measurement taken from the patient's clinic records from the measurement taken on the date of interview.

Results

Demographic and reproductive characteristics of the women

Table 1 shows the demographic and reproductive characteristics of the study women. Almost equal numbers of women from rural and urban communities (51% and 49%, respectively) participated. Nearly all of the women (92%) were housewives; 6% were civil servants, and only 2% were self-employed. The majority (88%) of the women were Protestant Christians of various denominations; the remainder belonged to other religions, such as the Eastern Orthodox and Roman Catholic Churches or Islam.

None of the women came from the upper-income class. About two-thirds (65%) were from the lower-income group, and the rest were from the middle-income group. About a quarter (24%) had not attended school, close to a half (46%) had completed some level of elementary school, and about a third (30%) had gone beyond elementary school.

The low mean age (25 years) and gravidity (3.6) indicate that the respondents were mostly young women. Only about 13% of the women were over 30 years of age. There were no respondents in their first trimester, whereas 30% and 71% were in their second and third trimesters, respectively. Women go for antenatal check-

TABLE 1. Demographic and reproductive characteristics of the women ($n = 295$)

Characteristic	No.	%
Residence		
Rural	150	51
Urban	145	49
Education (yr)		
0	70	24
1–8	136	46
≥ 9	89	30
Income (Ethiopian birr)[a]		
Low (< 250)	193	65
Medium (250–1,000)	102	35
High (> 1,000)	0	0
Religion		
Protestant	260	88
Muslim	18	6
Other	17	6
Occupation		
Housewife	272	92
Civil servant	17	6
Other or self-employed	6	2
Age (yr)[b]		
< 24	135	46
24–30	122	41
> 30	38	13
Gestational age[c]		
1st trimester	0	0
2nd trimester	87	30
3rd trimester	208	71

a. 1 birr = US$0.16.
b. Mean age = 25 ± 2.6 years.
b. Mean gestational age = 7 ± 1.5 mo.

TABLE 2. Percentages of pregnant women who habitually consumed various foods during pregnancy and who had consumed them during the preceding 24 hours

Food	% habitually consuming	% consuming in preceding 24 hours		
		Breakfast	Lunch	Supper
Injera	70	35	56	59
Wheat bread	48	29	12	12
Roasted wheat	11	18	7	4
Enset bread (*kocho*)	35	10	11	14
Coffee/tea	100	45	11	9
Shiro wot	67	24	44	41
Meat	0	0	7	6
Lentils	0	0	4	4
Kale	17	0	5	9
Potatoes	0	0	0	3

ups mostly during their third trimester, as they approach delivery. The mean gestational age of seven months is evidence of this pattern.

Food consumption, aversion, and craving

Table 2 shows the proportion of women who reported consuming various foods during the recent months of their pregnancy. Over two-thirds of the women (70% and 67%, respectively) reported consuming *injera* (a cake made from fermented *teff* [*Erastus teff*] dough) and *shiro wot* (a legume flour sauce for consumption with *injera)*. Nearly half (48%) reported commonly consuming wheat bread, and slightly over one-third (35%) reported commonly consuming *kocho* (a bread made from fermented *enset* root flour). Cereals and legumes dominated the women's diet, whereas root crops, mainly *kocho,* also played a significant role in the diet.

The pattern of frequency of food consumption during the preceding 24 hours was similar to the women's usual food consumption pattern (table 2). About one-third (35%) of the women reported that they had consumed *teff injera* for breakfast, and about equal numbers (56% and 59%) had consumed it for lunch or supper, respectively. The consumption of *shiro wot* for breakfast was reported by 24%, and for lunch or supper by almost equal numbers of women (44% and 41%, respectively). About an equal but relatively small number of women also reported that they had consumed *kocho* for breakfast, lunch, or supper (10%, 11%, and 14%, respectively).

About two-thirds (65%) of the women avoided at least one food during the course of their pregnancy, with 27% avoiding more than one food (table 3). Nearly three-quarters (72%) craved at least one food, and 28% craved more than one food.

Table 4 shows the major foods avoided, along with the percentage of women avoiding them. The most commonly avoided foods were roasted wheat, coffee, wheat bread, meat sauce, *kocho,* and *injera,* which were avoided by 34%, 21%, 17%, 12%, 9%, and 9% of the women,

TABLE 3. Prevalence of aversion and craving among pregnant women

Dietary practice	Prevalence (%) ($n = 295$)
Aversion	
No food avoided	35
At least one food avoided	65
More than one food avoided	27
Craving	
No food craved	28
At least one food craved	72
More than one food craved	28

TABLE 4. Number (percentage) of pregnant women with aversion to or craving for specific foods or food categories

Food	Aversion (n = 182)	Craving (n = 212)
Specific foods		
Injera	17 (9)	17 (8)
Wheat bread	30 (17)	4 (2)
Roasted wheat	62 (34)	1 (1)
Linseed	0 (0)	1 (1)
Cheese	5 (3)	39 (18)
Milk	5 (3)	27 (13)
Enset bread *(kocho)*	17 (9)	4 (2)
Potato	13 (7)	1 (1)
Meat sauce	21 (12)	100 (47)
Fatty meat	2 (1)	1 (1)
Kale	1 (1)	18 (9)
Coffee	38 (21)	1 (1)
Banana	0 (0)	6 (3)
Orange	0 (0)	14 (7)
Food categories		
Cereals	109 (60)	22 (10)
Legumes	13 (7)	5 (3)
Roots	30 (16)	5 (3)
Livestock	24 (13)	117 (55)
Vegetables	4 (2)	23 (11)
Fruits	1 (1)	17 (8)
Beverages	29 (16)	9 (4)

respectively. With the exception of meat, these foods are widely consumed in Ethiopia. When the foods were divided into major food categories, cereal foods were found to be avoided by the largest proportion of women (60%). These were followed by root crops and beverages, which were avoided by about 16% each, whereas other food categories (e.g., legumes and livestock products) were avoided by a smaller proportion of the women.

The women were clear about the distinction between aversion and taboos (abstinence due to beliefs). The main foods that 81 (28%) of the women abstained from were milk and cheese (avoided by 44% each), linseed (16%), fatty meat (11%), and bananas (9%). All of the foods that the women mentioned as having been avoided (except *enset* bread, kale, and coffee, which none of the women abstained from) were also abstained from by 1% to 3% of the women. The reasons given for abstinence were fear that food would stick to the foetus, causing discolouration to the body, and fear that the baby would become too large to deliver easily.

The majority of the women (90%) did not have reasons for their food aversions. A few believed that aversions were caused by a dislike of the food by the foetus.

The most widely craved foods were meat sauce, cheese, and milk, which were craved by 47%, 18%, and 13% of the women, respectively (table 4). When craved foods were aggregated, livestock foods were found to be craved by the largest proportion of women (55%). Livestock foods, as stated above, were also among the least commonly avoided foods. About 10% of the women craved vegetables and fruits.

Slightly less than two-thirds (60%) of the women did not have reasons for their cravings. Almost an equal proportion (62%) said they did not know what would happen if they did not obtain the craved foods. Slightly more than a third (36%) considered craving to be a call ("demand") by the foetus, whereas an almost equal number (31%) believed that a mark would develop on the foetal body.

With respect to the relationship between food aversion and craving, well over three-quarters (78%) of the women who experienced food aversions also craved at least one food (table 5). A slightly smaller proportion (60%) of women who did not experience food aversions also craved foods. The results of our observations showed that aversion and craving were highly associated ($\chi^2 = 10.66$; $p < .001$; odds ratio, 2.36; 95% confidence interval, 1.4 to 3.98). Women who experienced aversions were 2.4 times more likely to crave foods than women who did not experience aversions.

Nutritional status of the women

The results show that the women who experienced aversions had better nutritional status than those who did not (table 6). The MUAC and TSFT of women who avoided certain foods were significantly higher than those of women who did not avoid any foods ($p < .05$). The data on weight gain, however, did not show any significant difference between the two groups, although the scores for women who experienced aversions were higher.

The anthropometric characteristics of craving and non-craving women are presented in table 7. There was no statistically significant difference between the two groups. Women who had been able to consume craved foods had significantly higher weight gain than those who had not ($p < .05$) (table 8). The differences in the other anthropometric indicators, i.e., MUAC and TSFT, were not significant. However, women who consumed their desired foods also had higher values for both indicators.

TABLE 5. Relationship between the numbers (percentages) of women experiencing aversion or craving

Experienced aversion	Experienced craving	
	No	Yes
No	41 (40)	62 (60)
Yes	42 (22)	150 (78)

Odds ratio, 2.36; $\chi^2 = 10.66$; $p < .001$.

Discussion

The relatively high prevalence of aversion found in this study (65%) is comparable to the prevalences reported by other researchers, which ranged from 50% to 80%. The high prevalence of aversion to cereal foods (which are the most commonly consumed foods in the area) supports the widely held view that pregnant women avoid staple foods. Coronios-Vargas et al. [2], in an extensive study that covered four ethnic groups in the United States, observed that women avoided staple foods. Similar results were reported in a study in Ethiopia [F. Alemu and Z. Wolde-Gabreil, personal communication, 1995]. Pregnant women in areas where *enset* foods were usually consumed avoided more of these foods, whereas those in areas where cereal foods were usually consumed avoided more cereal foods. This supports the observation that aversion to commonly eaten foods is an inbuilt mechanism to diversify the types of food consumed by avoiding monotonous diets. It is important to note that the significance of such a mechanism would depend on the mothers' ability to substitute other foods for the foods they avoided.

The fairly high prevalence of aversion to coffee in this study is comparable to that found in other studies [3, 4]. It remains to be established whether the assumption is valid that aversion to coffee is aimed at protecting the foetus against the stimulant and bitter qualities of caffeine. If the assumption is true, then the physiological nature of aversion is unlikely to be refuted. It is also to be noted here that it is difficult to establish the view held by most anthropologists that aversion is mainly due to nausea (morning sickness), since, as we observed earlier, most women did not have a reason for their aversion and therefore did not associate it with overt nausea.

The reasons given here for abstaining from food (fear that the baby would become too big to deliver or have

TABLE 6. Anthropometric characteristics of women who did or did not experience aversion

Characteristic	Aversion		No aversion		t
	n	Mean ± SD	n	Mean ± SD	
MUAC (cm)	184	25 ± 2.1	103	23 ± 2.7	3.25[a]
TSFT (mm)	184	13 ± 4.5	103	12 ± 4.6	2.35[b]
Weight gain (kg/wk)	81	0.2 ± 0.02	41	0.12 ± 0.01	0.21

a. $p < .01$.
b. $p < .05$.

TABLE 7. Anthropometric characteristics of women who did or did not experience craving

Characteristic	Craving		No craving		t
	n	Mean ± SD	n	Mean ± SD	
MUAC (cm)	208	24 ± 2.6	79	24 ± 2.2	0.74[a]
TSFT (mm)	208	13 ± 4.5	79	13 ± 5.0	1.24[a]
Weight gain (kg/wk)	92	0.2 ± 0.06	31	0.2 ± 1.2	0.72[a]

a. Difference not significant.

TABLE 8. Anthropometric characteristics of women according to frequency of consumption of craved foods

	Mean (± SD) number of times per week that a craved food was consumed		
Characteristic	0 ($n = 36$)	< 7 ($n = 111$)	≥ 7 ($n = 61$)
MUAC (cm)	23 ± 1.7	24 ± 2.3	24 ± 2.4
TSFT (mm)	12 ± 3.9	13 ± 4.5	13 ± 4.7
Weight gain (kg/wk)	0.13 ± 0.07	0.25 ± 0.04[a]	0.18 ± 0.03[a]

a. $p < .05$ as compared with women not consuming craved foods.

discolouration on its body) have been reported by others [9, 10].

The high prevalence of craving found in the study (72%) was also not unexpected, since other studies in both developed and developing countries have also observed a high rate of craving among pregnant women, ranging from 43% to 98%. This indicates that poverty and underdevelopment are not the only determinants of the incidence of craving. The high prevalence of craving for livestock foods and vegetables that were largely unavailable at the time of the study appears to support the commonly held view that women crave scarce and nutritious foods. This appears to support the observation by the Canadian Federal Committee on Nutrition that craving is a mechanism geared towards augmenting nutritional deficiencies [6]. This also appears to support the hypothesis that craving is induced by intrinsic (endogenous) biological processes rather than by exogenous factors [1]. These hypotheses, however, have yet to be confirmed by in-depth studies.

The data cannot be used to establish whether the women craved status foods (a view held by many anthropologists), because the issue was not addressed directly. Because scarce and nutritious foods are likely to be considered status foods in this community, it is important to distinguish between the determining factors in craving. Specific studies should be undertaken to establish whether high-status foods, *per se*, are craved by pregnant women in this community.

The absence of a difference in nutritional status between the craving and non-craving groups can probably be explained by the fact that most of the craving women were able to consume what they desired. The significantly higher weight gain of women who obtained their craved foods compared with those who did not get them seems to support this observation. The former group could have been of marginally better nutritional status. Most of that group could also have been in the group of women who experienced food aversions, who have been observed to enjoy better nutritional status than the group that did not experience aversions. The absence of statistically significant differences between craving and non-craving women (who, as observed above, could have been in a position to obtain the craved foods) also supports the view, held by many authors, that craving could be an intrinsic mechanism set by the body to correct nutrient deficiencies. These observations underscore the importance to maternal nutrition of fulfilling cravings.

Many authors assume that aversions decrease food choices and, thus, lead to reduced dietary intake, which would obviously affect nutritional status negatively. However, this assumption runs contrary to this study's finding that women who experienced food aversions were better nourished than women who did not. Similar observations were made in the Ethiopian study by F. Alemu and Z. Wolde-Gabreil [personal communication, 1995], who observed higher birthweights in infants born to mothers who had experienced food aversions than in infants born to mothers who had not. Because the available information is so limited, more arguments are required in support of observations of the better nutritional status of women who experience food aversions. One explanation is that, although pregnant women may dislike a specific food, whether or not they avoid it depends on the other food options available. Poor women with few food options are unlikely to avoid specific foods as commonly as women who have more choices. This would imply that women who avoid foods are better off economically and nutritionally. Another possible explanation based on the results of this study is that the correlation of food aversion with food craving (which was also observed by Coronios-Vargas et al. [2] and Alemu and Wolde-Gabreil [personal communication, 1995]) might account for the better nutritional status of those women who avoided specific foods.

The positive relationship suggests that women who experience food aversions also crave more, not only to compensate but to diversify their diets and to consume higher-quality foods. This suggestion is supported by the findings that more women avoided cereal foods and craved livestock products, which implies that monotonous staple diets are avoided, whereas nutritious and less common foods are desired. What becomes important in this scenario is the women's ability to avoid the foods they dislike and to obtain the foods they crave.

Since most of the women in this study claimed that they received what they desired, it is quite logical to expect better nutritional status in the women who experience aversions.

Conclusions and recommendations

Although aversions and cravings are considered undesirable, the few data available and the results obtained in this study strongly indicate that this view may have to change. The two should always be studied together in any community in order to establish whether they have complementary or similar effects on the nutritional status of pregnant women. Aversions and cravings should be investigated during antenatal follow-up, and advice should be offered.

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