



## Research article

# Intrahousehold food allocation social norms and food taboos in rural Ethiopia: The case of adolescent girls

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## ARTICLE INFO

## Keywords:

Adolescent girl

Food taboo

Intrahousehold food allocation

Social norm

## ABSTRACT

**Background:** In low-income countries, social norms play a significant role in intrahousehold food allocation practices. These norms can sometimes lead to discrimination against specific groups, posing a public health concern. This study focuses on the social norm surrounding food allocation within households and food taboos affecting adolescent girls in rural Ethiopia.

**Method:** A qualitative study was conducted using vignettes as prompts for 20 focus group discussions and 32 in-depth interviews. The vignettes were tailored to the local context. Participants were chosen purposefully, and data were collected in a comfortable setting. All sessions were recorded and transcribed verbatim. Data analysis was done using Open Code qualitative analysis software with a thematic framework approach.

**Findings:** In the community, adolescent girls were expected to eat after serving the male family members. Those who did not follow this expectation faced sanctions such as being labeled as disrespectful and could even be insulted or beaten by their spouses and siblings. However, there were some exceptions to this rule, such as when girls were giving birth, breastfeeding, sick, or when male family members were traveling. Certain foods were also prohibited for adolescent girls, including spicy foods like chili, animal products such as meat and milk, and nuts. These foods were believed to increase girls' sexual desire, potentially leading them to engage in premarital or extramarital sex. Additionally, eating outside of the house was not considered appropriate behavior for adolescent girls in this community.

**Conclusion:** In many households, social norms dictate that adolescent girls are not given enough food or are denied essential nutrients for their health. It is important to challenge these norms to ensure fair food distribution within households and support the healthy development of adolescent girls.

**Abbreviations:** FAG, Father of adolescent girls; FGD, Focus Group Discussion; HAG, Husband of adolescent girls; IDI, in-depth interview; MAG, Married adolescent girls; MOAG, Mother of adolescent girls; MIL, mother-in-law of adolescent girls; SNAP, Social norm Analysis Plot; UMAG, Unmarried adolescent girls; UAB, Unmarried adolescent boys.

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<https://doi.org/10.1016/j.heliyon.2024.e32295>

Received 7 August 2023; Received in revised form 29 May 2024; Accepted 31 May 2024

Available online 31 May 2024

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## 1. Background

Human nature is group-oriented and influenced by group trends and norms [1]. As human beings, our behavior can be influenced by our understanding of what the majority of others do and how the majority of others expect us to do it. In such a situation, the prevailing social norms can affect our behaviors [2], such as intrahousehold food allocation and food restrictions for adolescent girls. Social norms are informal rules that influence behavior in a given community and relate to perceptions of what most people do (descriptive norms) and expectations about what people should do (injunctive norms) [3,4].

Unequal distribution of food at the household level plays a crucial role in the gender-based nutrition gap. Evidence showed that girls were more undernourished in households that favored males over females and reported poor health status [5]. Studies have demonstrated preferential food allocation regarding the serving order, amount, and quality of food served during adolescence, which often favors males embedded in the social norms [5,6]. The evidence from southwest Ethiopia also shows that Girls are more likely than boys to experience food insecurity within the same household due to inequitable food allocation practices [7,8]. Although food availability and poverty seem to play a major role in the relationship between food allocation at the household level and adolescent girls' nutritional status, cultural and social norms strongly influence adolescent girls' vulnerability to malnutrition [9]. Harmful social norms and food taboos place adolescent girls at a tremendous disadvantage, reducing their diets' diversity and food security. Thus, hunger levels are higher in countries with lower levels of gender equality [10,11]. Food taboos also contribute to the high prevalence of micronutrient deficiency and exacerbate women's anemia [12]. Similarly, adolescent girls in rural Ethiopia face a significant challenge with malnutrition. Studies show high rates of stunting (low height for age) and thinness, with some areas reaching over 30 % prevalence. This malnutrition can have serious consequences for their health, growth, and future productivity.

Numerous initiatives by non-governmental organizations (NGOs) and social norm learning collaboratives, in collaboration with government and academic institutions, have been instrumental in developing robust measurement and indicator frameworks for addressing social norm-related studies and interventions in low- and middle-income countries (LMICs). This collaborative approach has significantly improved data collection and evaluation methods in social norm studies [13–15].

A review of the existing literature has revealed a gap in research on social norms related to nutrition in rural Ethiopia, particularly in the eastern part of the country.

Social norms are considered an enabling environment for better nutritional status [16]. Thus, it is critical to understand the social norms in the community related to intrahousehold food allocation practices and food taboos [17]. However, studies examining intrahousehold food allocation emphasizing social norms and food taboos are not widely available in low-income settings. Therefore, the objective of this study was to explore intrahousehold food allocation social norms and food taboos in rural Eastern Ethiopia.

## 2. Method

### 2.1. Study area

The study was conducted in the West Hararghe Zone in Oromia Regional State, Ethiopia, specifically in four selected rural districts: (Chiro, Doba, Mesela, and Boke). The area is known for prone to frequent droughts and chronically food insecurity. The livelihood in the area was mainly dependent on agriculture. The most common staple foods consumed in these communities are sorghum and maize. The main cash crops grown in the area include legumes, vegetables, khat (*Catha edulis*), and sorghum. Islam is the predominant religion in the study area. The majority of the residents are Afaan Oromo speakers. This paper utilized the baseline qualitative data generated by a larger implementation research project that aimed to improve the reproductive health and nutritional status of adolescent girls.

### 2.2. Study design

An exploratory qualitative study was used with vignette-based focus group discussion and in-depth interviews as data collection methods.

### 2.3. Study participants and sampling

The study participants for vignette-based focus group discussions (FGDs) were parents of adolescent girls, adolescent girls, and boys. Adolescents for study refers age 13–17 years. Participants of the FGDs were recruited for the study using a purposive sampling strategy. The inclusion criteria include being a permanent resident in the study area, being well conversant with the culture of the society, and willingness to participate in the study. The in-depth interviews (IDI) were conducted with the adolescent girls, the mother-in-law, and the husband of the adolescent girls. All Participants were identified with the help of the community health workers in the study area.

### 2.4. Data collection tools

Vignette-based FGDs were conducted to explore social norms around adolescent girls' related intrahousehold food allocation norms. The vignettes portrayed hypothetical scenarios to enable participants to envision a situation in participants own context. The vignettes were developed through observations in the area by the research team and informal discussions. Separate vignettes were

developed for each category of participants, namely adolescent girls, adolescent boys, fathers of adolescent girls, and mothers of adolescent girls. Each vignette story was followed by five questions assessing empirical expectation, normative expectation, sanction, severity to sanction, and condition. Example of vignette for married adolescent girls with its follow-up questions;

**Vignette:** An adolescent girl [14] is married to a man. The two of them plus her husband's two younger brothers live together. The adolescent girl prepares food and serves the three of them when they return home every day. One day the adolescent girl got up early, as usual, fetched water, cleaned the house, washed dirty clothes and cooked food for the family. By the time she was done with her household activities, she was tired and hungry. She really wants to eat, but doesn't know when her husband and his brothers would be home.

- a. What would most other married adolescent girls in her husband's situation do?
- b. What would most husbands like her husband expect their wives to do?

Now imagine that the girl decides to eat instead of waiting for them. While she was having her meal, the three of them walked into the house and saw her eating.

- c. How would her husband react in this situation?
  - What would her husband's brothers say about the girl?
  - Whose opinion would matter most to her other than her husband and brothers-in-law?
- d. How do you think her husband's and his brothers' reactions would make her feel?
  - What effects would their reactions have on her?
    - If so, what would be the effect?
    - If no, what makes you think that way?
- e. Are there any circumstances where it would be considered acceptable for the girl to eat before her husband and brothers-in-law?

[Probe: *would her husband's reaction be different if his brothers were not there?*]

In-depth interview study guides were developed based on the context. The in-depth interview helped to assess information on food taboos that needed to be addressed by the vignettes. The in-depth interview study guides and the vignettes were pretested before the interview for understandability and for using locally appropriate languages related to household food allocation norms and food taboos.

## 2.5. Data collection

The focus group discussions (FGDs) took place in private settings such as local health posts, schools, or government offices to ensure privacy. Participants were offered refreshments during the sessions. Each FGD was led by two research assistants who had postgraduate-level education and were fluent in the local language, Afaan Oromo. They received five days of training on the study objectives, interview guide, and vignettes before conducting the discussions. One assistant acted as the moderator, while the other took notes, managed the audio recorder, and provided refreshments to participants. The FGDs lasted between 90 and 120 min and individual interviews lasted 90 min. All discussions were recorded with participants' consent. After each session, the research assistants debriefed with the participants to ensure that their views were accurately captured. At the end of each data collection day, the research assistants and principal investigator held a debriefing session to discuss the main issues raised during the discussions and interviews.

## 2.6. Data analysis

All audio-recorded FGDs and IDI were transcribed word-for-word in the *Afaan Oromo* language by the same research assistants who conducted the discussion and the interview. The transcriptions were translated into English for analysis. A codebook was developed based on the main themes in the vignettes [18]. The translated data were imported into a free Open Code qualitative computer software developed by Umea University in Sweden for managing, coding, and analysis <https://www.umu.se/en/department-of-epidemiology-and-global-health/research/open-code2/> [19]. The Social Norm Analysis Plot (SNAP) is a thematic framework analysis method tailored for social norm vignettes study guides adapted from Bichieri's theory on social norms [20]. SNAP used in this study addresses the five questions asked following the vignettes: empirical expectations, normative expectations, sanctions, sensitivity to sanctions, and exceptions. The five questions were as follows; 1) What would most other adolescent girls like (the main character in the vignette) do in this situation? 2) What would (the main character in the vignette) parents/husbands expect adolescent girls to do in this situation? 3) What would (the main character in the vignette)'s parents/husbands do/say to their daughter in this situation? 4) Would the reaction of the father and the mother/husbands be different? And 5) Under what conditions would (the main character in the vignette) be able to continue to do the behavior? For the food taboo-related interview, the main questions asked were, 'Are there any food taboos that restrict certain foods from being consumed by adolescent girls? Are there beliefs about certain foods that indicate certain food items should never be eaten by young girls or should only be eaten by men?'. Illustrative quotes were integrated into the narratives to link the audience with the study participants' own descriptions.

## 2.7. Trustworthiness

This paper demonstrates trustworthiness by following Lincoln and Guba's framework. The research team spent sufficient time in the field to establish rapport with participants and gain a deeper understanding. The study employed multiple data sources, including individual interviews and focus group discussions, were used to triangulate findings and enhance their validity. Debriefing sessions and a series of discussions were held to address the research team was on the same page, acknowledge potential biases, and develop mitigation strategies. Detailed Thick and detailed descriptions were included to facilitate the potential transferability of the findings to similar contexts. Finally, selecting participants with diverse experiences enriched the range of perspectives and increased the potential applicability of the findings.

## 3. Result

In this paper, more than 72 adult community members, 40 married adolescent girls, 40 unmarried adolescent girls, 40 male adolescent boys and husbands of adolescent girls were participated [Table 1](#). The findings in this report are derived from five key Social Norms Analysis Plot (SNAP) themes and food taboos. These themes were instrumental in shaping the subtopics discussed in the results section.

### 3.1. Empirical expectations

The empirical expectation is what the participants thought most community members practice regarding intrahousehold food allocation. Most participants agreed that women prepare food and serve men, their husbands, or male household members first. Mothers and daughters in the household were responsible for food preparation and allocation in the household.

"If the husband is at home, no one can eat before him; that is our culturally accepted practice" \_FGD 2\_ MOAG\_D1

"Women prepare food and serve men first. Women should do this at all times. Women do not eat before serving their husband." \_FGD 7\_ MOAG\_D2

According to the participants, the usual order of intrahousehold food allocation was first husband and adolescent boys, then daughters, and often mothers eat last. The participants affirmed that women, including adolescent girls, should not eat before male family members, even in food-scarce households.

"... the order of food serving is, first husband, and then adolescent boys and then daughters followed by the mother" FGD\_UMAG\_D3

"Even if the meal is small, the husband should eat before the children." FGD\_UMAG\_D4

"It is a shame to give food to children before the husband. Food should be served first to the husband; then children can eat next." \_FGD\_MAG\_D1

### 3.2. Normative expectations

The normative expectation is what other community members expect adolescent girls and women should do about intrahousehold food allocation. For example, even though the wife (the woman) prepares the family food, most husbands expect her to wait for them to serve food without eating. Similarly, if an adolescent girl prepares food, which is often common in the study community, most parents and male siblings expect her to serve first male family members before she can eat.

"Parents may get angry if an adolescent girl eats the food that she prepared before them" UAB\_FGD\_D1

**Table 1**  
Number of participants for In-depth Interview and focus group discussion.

Type of method	Type of participants	Number participants
IDI	Mother-in-law	8
	Married adolescent girls	8
	Unmarried adolescent girls	8
	Husband of adolescent girls	8
	Subtotal	32
FGD	Unmarried adolescent girls	32
	Unmarried adolescent boys	32
	Mother of adolescent girl	32
	Father of adolescent girl	32
	Married adolescent girls	32
	Subtotal	160

“Parents expect their daughter to prepare food before mealtime and wait for them without eating the food she prepared” FGD\_UMAG\_D3

### 3.3. Sanctions

Sanction is the opinion or reaction of others toward adolescent girls about intrahousehold food allocation social norms. For example, women who ate first before men were taken as not having respect for men or husbands. The women would be blamed and looked down on by neighbors and friends. In the most extreme scenario, women and adolescent girls can be insulted and even beaten by their husbands and siblings for eating first.

“Her neighbor, peer, and husband’s family would say .... she doesn’t love her husband as she eats food before him.” MAG\_FGD\_D1

“Neighbors insult her(a married adolescent girl) if she eats before her husband. She will be called ‘the one that eats ahead of her husband.’” MAG\_FGD\_D2

“A girl eating first ... is taken as shame; it makes the family angry. They may beat her and treat her as a bad girl.” UAB\_FGD\_D1

If adolescent girls eat before their parents and/or male siblings, they would be insulted or considered selfish and norm breakers. The sanction could include being beaten by their male siblings.

“Parents sometimes beat daughters for having a meal before them, having a meal before a parent is not acceptable if parents are around, it is considered as disrespecting parents.” FGD\_UMAG\_D3

### 3.4. Sensitivity to sanction

Sensitivity of sanction is whether adolescent girls and women change their character regarding intrahousehold food allocation because of others’ negative opinions. Because of the sanctions, most girls would not dare to eat before their parents and male siblings. Most girls would choose not to eat before males due to fear of insult and shame. Married adolescents might feel bad about themselves and harm themselves or may decide to leave their house if they receive negative reactions. They were concerned with what others heard and would be judged as non-respectful and non-disciplined by the community for not conforming to the community’s culture and their role as a responsible woman in the household.

“If the household members get angry with her, she will hate herself and even decide to leave home” \_UAG\_FGD\_D1

“She (the adolescent girl) may be disappointed for being kicked by her brothers and may decide to leave her parents’ home” \_UAG\_FGD\_D1

### 3.5. Conditions

Condition is the circumstances that would allow adolescent girls to break the social norms and still be able to escape sanctions related to food allocation and eating practices. For example, according to the discussants, adolescent girls and women could eat first if they are pregnant, breastfeeding, or sick.

“... during delivery and sickness, she may eat food before her husband” MAG\_FGD\_D1

The other condition reported includes if the husband or male siblings are known to come home late or have traveled outside the area. However, she is expected to keep a good portion of the food for male family members.

“If boys/husbands are far from home, women can eat before boys/husbands, but if all the family is present at home, women can’t eat before them.” \_MAG\_FGD\_D3

“If male members traveled and the exact time of their return is unknown, there is no problem if she eats before them.” UAG\_FGD\_D1

### 3.6. Food taboos

Social norms restrict the consumption of some foods by adolescent girls or during pregnancy and lactation. For example, adolescent girls should avoid spicy food like chilly, animal products (meat and milk), and nuts because these are believed to cause infertility, increase girls’ sexual desire, and lead them to premarital sex or sex out of wedlock. In addition, girls should not eat much outside their homes, as it is shameful to do this for adolescent girls.

“Some foods are not eaten by females. Some parts of the cattle such as tongue, stomach, meat under the arm pit, or meat on the shoulder of cattle (chuck) are not supposed to be consumed by girls.” \_FAG\_IDI\_D2

“... girls are not allowed to eat pepper. Additionally, they shouldn’t drink too much fresh milk. If they do so, girls will be sexually initiated before they reach the ideal age of marriage. It can cause early initiation of sexual interest.” \_IDI\_MIL\_D3

“... When girls eat a lot, they are said to be big eaters, but when boys do the same, nothing is said about them” \_IDI\_MIL\_D4

“It is said that girls should not drink milk. I have never seen an adolescent girl drinking milk. I only know that guys drink milk.” \_IDI\_MIL\_D2

“Yes, girls are restricted to eating pepper, salty and spicy food, and milk. Because the foodstuffs may make her sexually active.” \_IDI\_HAG\_D1

Pregnant women were also restricted from eating meat and other animal products because their babies may grow large in the womb, and they may face difficulties giving birth.

“Pregnant women do not eat meat as it may make their baby big in the womb, and they may face difficulties during delivery. She does not eat honey, too, for the same reason. Husbands enforce these norms. If she does not respect these norms, he may beat her. She accepts it because she grew up with these norms. She knows it very well” \_IDI\_MAG\_D3

#### 4. Discussion

In the study area, adolescent girls were expected to eat after serving the male family members. Girls who deviated from this community expectation suffered sanctions such as being insulted and beaten by their spouses and male siblings. The conditions that allow them to break expectations include giving birth, lactation, and sickness. In some cases, they were allowed to eat before males if the male family members traveled far as long as enough portions were put aside for them. Spicy food like chilly, animal products (meat and milk), and nuts were prohibited for adolescent girls because these are believed to increase sexual desire and lead them to premarital sex or sex out of wedlock.

Intrahousehold food allocation could be based on need or economic contributions [2,5]. There is also evidence that it could be based on equity, equality, and household maximization rules (fair return) [21,22]. In developing countries, where households rely primarily on male income, intrahousehold food allocation can be dictated mainly by economic contributions and the household maximization rule [23]. In which food allocation follows the actual or expected contribution of household members to the household economy.

The household’s decisions on how food is shared determine individual food and nutrition security. These decisions are dictated mainly by prevailing social norms, which often do not favor women and girls [24,25]. According to this study, the community intrahousehold food allocation social norms favored men. In the community, men are the breadwinners and therefore are perceived as making a higher share of the family’s economy, so they are favored to maximize their earning potential [25,26]. This finding agrees with other studies in Asia that showed household food distribution was based on economic contribution rather than need [28,29]. These practices intensify adolescent girls’ vulnerability to food and nutrition insecurity.

Many food taboos have ecological, religious, or spiritual reasoning [30]. Moreover, they are often imposed by more dominant sectors of society [12,31,32]. Nevertheless, evidence shows that food restrictions are associated with micronutrient deficiencies among women. Even pregnant and lactating women are forced to abstain from animal products such as meat, milk, and eggs [33–35] and other nutritious and beneficial foods [26,31,32]. As a result, the practice of food taboos contributed to the prevalence of anemia and other micronutrient deficiencies among women [32,37–40].

Household food allocation and restriction norms often co-exist with other harmful social norms that limit millions of girls to better education, health, and economic independence [24,25]. Moreover, gendered household inequality intersects with other inequalities in health-related determinants [26,41]. Thus, inequality in all aspects cuts young adolescent girls’ futures short and keeps them in the cycle of malnutrition and poverty [26]. In this regard, looking deep into community social norms that affect young adolescent girls is critical. Social Institutions that reinforce harmful social norms need to be targeted for appropriate interventions [10,11,17].

Understanding the role of social norms is fundamental for any intervention aiming to improve adolescent girls’ lives. Harmful social norms can negatively influence young adolescent girls’ health, education, and independence status [42]. For example, failing to get an equal share of household food with their counterpart siblings is a violation of their right to get good food and diet and care [43,44]. Therefore, considering discriminatory household food allocation norms as a social determinant of health for young adolescent girls is crucial.

In rural Ethiopia, adolescent girls grapple with a complex web of factors contributing to malnutrition. Economic insecurity is a major driving force, with families struggling to afford enough food, let alone a nutritious variety [36]. This forces them to prioritize staple crops in the area, leaving girls vulnerable to micronutrient deficiencies. Traditional norms further compound the issue. Gender bias often dictates food distribution within families, with girls receiving smaller portions than boys, even during critical growth spurts [27]. This combination of economic hardship and unequal food norms creates a significant barrier to ensuring adolescent girls have the nutrition they need for optimal health, education, and future success.

Using the vignette to stimulate a genuine and context-appropriate interaction with participants helps to explore the practice deeply. In addition, it makes discussions less personal and less threatening for the participants [45,46]. A prolonged stay in the field also allowed the researchers to have a more in-depth view of the subject matter. Social desirability biases might be possible in such culturally sensitive issues.

Social desirability bias would be a potential limitation for this study for adolescents might be hesitant to share their true

experiences or opinions, especially if they feel judged. They might provide answers they think the researcher wants to hear, rather than their lived realities. As rural, and out of school included in the study comprehension of the complexity of the vignettes could be difficult for the adolescents to understand, though the vignettes are worded in a way that aligns with their cultural context and language. Training for research assistants was given and the vignettes were piloted with a small group beforehand and ensuring the language is clear and culturally appropriate can help address this limitation.

The study highlights the need for designing and implementing educational programs targeting communities, parents, and religious leaders to raise awareness about the importance of equitable food allocation within households, particularly for the nutritional needs of adolescent girls. Develop and integrate nutritional counseling services into existing healthcare programs or through community health workers. This can equip families with knowledge about balanced diets and the importance of addressing adolescent girls' specific nutritional needs. Advocate for policies that support girls' education and empowerment, as education can be a key factor in challenging traditional gender roles and improving girls' access to resources and decision-making within households. The finding also helps to develop culturally sensitive interventions that address the specific social norms and food taboos identified in your research. This could involve working with local community leaders and religious figures to develop strategies for promoting more equitable food allocation practices that respect cultural values.

This study underscores the importance of tailoring existing interventions to address the specific social norms and cultural contexts that influence adolescent girls' nutrition. This research suggests several promising avenues for improvement by conducting ongoing research to understand how local norms and cultural practices contribute to gendered food allocation practices. This deeper understanding will inform the development of more effective interventions. Integrate the findings on social norms and food taboos into existing adolescent nutrition initiatives. This could involve collaborating with community leaders and religious figures to develop culturally sensitive strategies that promote equitable food distribution while respecting local values. Tailor existing interventions to address the identified norms. This might involve using existing community platforms for education campaigns or involving faith-based organizations in promoting messages about adolescent girls' nutritional needs.

## 5. Conclusions

This paper study identified some silent determinants of adolescent nutritional status, which are harmful intra-household food allocation norms and food taboos. In addition, the study showed expectations and conditions that may help defy social expectations/norms. The findings have implications for nutrition-sensitive programs that address the underlying structural causes of undernutrition in low-income settings.

## Funding

No funding was provided to produce this paper.

## Ethics approval and consent to participate

The research protocol was approved by the Institutional Review Board (IRB) of the Addis Continental Institute of Public Health (Ref No. ACIPH/IRB/005/2016). Informed verbal consent was obtained from all study participants and/or their legal guardian(s). For unmarried participants below the age of 15 years, assent and parental/guardian consent were obtained. Married adolescents were able to give consent according to the national ethical guidelines. Participants above the age of 18 years consented to their participation. All interviews took place in private spaces, and no linking of participants' identifiers to the transcription and other publications. All methods were carried out in accordance with relevant guidelines and regulations.

## Consent for publication

Not applicable.

## Availability of data and materials

Data will be made available on request.

## CRedit authorship contribution statement

**Hanna Gulema:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation. **Meaza Demissie:** Writing – review & editing, Supervision, Conceptualization. **Alemayehu Worku:** Writing – review & editing, Supervision, Conceptualization. **Tesfaye Assebe Yadeta:** Writing – review & editing, Supervision, Conceptualization. **Dagmawit Tewahido:** Writing – review & editing, Formal analysis, Data curation. **Yemane Berhane:** Writing – review & editing, Supervision, Conceptualization.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Acknowledgments

The authors acknowledge the Abdiboru project for providing the data for this paper with great gratitude.

## References

- [1] R.B. Cialdini, N.J. Goldstein, Social influence: Compliance and conformity, *Annu Rev Psychol* [Internet] 55 (1) (2004) 591–621. Feb [cited 2020 Oct 5], <http://www.annualreviews.org/doi/10.1146/annurev.psych.55.090902.142015>.
- [2] J. Gittelsohn, Opening the box: intrahousehold food allocation in rural Nepal, *Soc Sci Med* [Internet] 33 (10) (1991) 1141–1154 [cited 2022 Dec 31], <https://linkinghub.elsevier.com/retrieve/pii/027795369190230A>.
- [3] C. Bicchieri, J.W. Lindemans, T. Jiang, A structured approach to a diagnostic of collective practices, *Front Psychol* [Internet] 5 (2014 Dec 5) [cited 2020 Jun 24], <http://journal.frontiersin.org/article/10.3389/fpsyg.2014.01418/abstract>.
- [4] C. Bicchieri, T. Jiang, J.W. Lindemans, A Social Norms Perspective on Child Marriage: the General Framework, vol. 21, UNICEF [Internet], 2014. C:/Users/admin/Downloads/A\_Social\_Norms\_Perspective\_on\_Child\_Marr.pdf.
- [5] D.S. Madjidian, 8. Gender, intra-household food allocation and social change in two Himalayan communities in Nepal, in: A. Niehof, H.N. Gartaula, M. Quetulio-Navarra (Eds.), *Diversity and Change in Food Wellbeing* [Internet], Wageningen Academic Publishers, The Netherlands, 2018, pp. 153–175 [cited 2022 Dec 8], <https://www.wageningenacademic.com/doi/10.3920/978-90-8686-864-3.8>.
- [6] H.A. Harris-Fry, P. Paudel, N. Shrestha, T. Harrison, B.J. Beard, S. Jha, et al., Status and determinants of intra-household food allocation in rural Nepal, *Eur J Clin Nutr* [Internet] 72 (11) (2018). Nov [cited 2022 Apr 27], <https://www.nature.com/articles/s41430-017-0063-0>.
- [7] T. Belachew, D. Lindstrom, A. Gebremariam, C. Jira, M.K. Hattori, C. Lachat, et al., Predictors of chronic food insecurity among adolescents in Southwest Ethiopia: a longitudinal study, *BMC Public Health* [Internet] 12 (1) (2012 Dec) 604 [cited 2022 Dec 31], <http://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-12-604>.
- [8] C. Hadley, D. Lindstrom, F. Tessema, T. Belachew, Gender bias in the food insecurity experience of Ethiopian adolescents, *Soc Sci Med* [Internet] 66 (2) (2008) 427–438. Jan [cited 2022 Dec 31], <https://linkinghub.elsevier.com/retrieve/pii/S0277953607004856>.
- [9] K. McNamara, E. Wood, Food taboos, health beliefs, and gender: understanding household food choice and nutrition in rural Tajikistan, *J Health Popul Nutr* [Internet] 38 (1) (2019) 17. Dec [cited 2022 Dec 8], <https://jhpn.biomedcentral.com/articles/10.1186/s41043-019-0170-8>.
- [10] H.E. Peters, Y. Irvin-Erickson, S. Adelstein, A. Malik, T. Derrick-Mills, A. Valido, et al., *Qualitative Evidence on Barriers to and Facilitators of Women's Participation in Higher or Growing Productivity and Male-Dominated Labour Market Sectors in Low- and Middle-Income Countries*, vol. 189, Lond EPPI Cent Soc Sci Res Unit UCL Inst Educ Univ Coll Lond, 2019.
- [11] J. Heymann, J.K. Levy, B. Bose, V. Ríos-Salas, Y. Mekonen, H. Swaminathan, et al., Improving health with programmatic, legal, and policy approaches to reduce gender inequality and change restrictive gender norms, *The Lancet* [Internet] 393 (10190) (2019 Jun) [cited 2022 Dec 10], <https://linkinghub.elsevier.com/retrieve/pii/S0140673619306567>.
- [12] G. Chakona, C. Shackleton, Food taboos and cultural beliefs influence food choice and dietary preferences among pregnant women in the eastern cape, South Africa, *Nutrients* [Internet] 11 (11) (2019 Nov 5) 2668 [cited 2022 Dec 19], <https://www.mdpi.com/2072-6643/11/11/2668>.
- [13] L. Lechleitner, C.L.U.S.A. Ncba, Addressing gender and social norms in food security and nutrition programming is crucial to sustainable outcomes [cited 2024 Apr 28], <https://ncbaclusa.coop/blog/addressing-gender-and-social-norms-in-food-security-and-nutrition-programming-is-crucial-to-sustainable-outcomes/>, 2022.
- [14] USAID Advancing Nutrition. 2021. Focusing on Social Norms. A Practical Guide for Nutrition Programmers to Improve Women's and Children's Diets. Arlington, VA: USAID Advancing Nutrition. Focusing on Social Norms: A Practical Guide for Nutrition Programmers to Improve Women's and Children's Diets | USAID Advancing Nutrition [Internet]. [cited 2024 Apr 28]. Available from: <https://www.advancingnutrition.org/resources/focusing-social-norms-practical-guide-nutrition-programmers-improve-womens-and-childrens>.
- [15] Guide to formulating gendered social norms indicators in the context of food security and nutrition [Internet] [cited 2024 Apr 28]. Available from: <https://openknowledge.fao.org/items/ded0d7a4-4955-4afd-b7d3-51739c1c4ffc>.
- [16] UNICEF, UNICEF Conceptual Framework on Maternal and Child Nutrition [Internet], 2021 Nov [unicef.org/media/113291/file/UNICEF%20Conceptual%20Framework.pdf](https://www.unicef.org/media/113291/file/UNICEF%20Conceptual%20Framework.pdf).
- [17] R. Morgan, A. George, S. Ssali, K. Hawkins, S. Molyneux, S. Theobald, How to do (or not to do)... gender analysis in health systems research, *Health Policy Plan* [Internet] 31 (8) (2016 Oct 1) 1069–1078 [cited 2022 Dec 10], <https://academic.oup.com/heapol/article/31/8/1069/2198200>.
- [18] Learning Collaborative to Advance Normative Change, Resources for Measuring Social Norms: A Practical Guide for Program Implementers, Institute for Reproductive Health, Georgetown University, Washington, DC, 2019 May.
- [19] <https://www.umu.se/en/department-of-epidemiology-and-global-health/research/open-code2/> [Internet]. Available from: <https://www.umu.se/en/department-of-epidemiology-and-global-health/research/open-code2/>.
- [20] CARE USA, Applying theory to practice: CARE journey piloting social norms measures for gender programming [internet]. Cooperative for Assistance and Relief Everywhere, Inc. (CARE), 2017. Available from: [http://gender.careinternationalwikis.org/\\_media/care-social-norms-paper-web-final\\_july\\_2017.pdf](http://gender.careinternationalwikis.org/_media/care-social-norms-paper-web-final_july_2017.pdf).
- [21] H.A. Harris-Fry, P. Paudel, N. Shrestha, T. Harrison, B.J. Beard, S. Jha, et al., Status and determinants of intra-household food allocation in rural Nepal, *Eur J Clin Nutr* [Internet] 72 (11) (2018). Nov [cited 2022 Dec 31], <http://www.nature.com/articles/s41430-017-0063-0>.
- [22] J.R. Behrman, Chapter 4 Intrahousehold distribution and the family, in: *Handbook of Population and Family Economics* [Internet], Elsevier, 1997, pp. 125–187 [cited 2022 Dec 31], <https://linkinghub.elsevier.com/retrieve/pii/S1574003X97800219>.
- [23] J. Harris, E.A. Frongillo, P.H. Nguyen, S.S. Kim, P. Menon, Changes in the policy environment for infant and young child feeding in Vietnam, Bangladesh, and Ethiopia, and the role of targeted advocacy, *BMC Public Health* [Internet] 17 (S2) (2017) 492. Jun [cited 2023 Jan 23], <http://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-017-4343-3>.
- [24] L. Heise, M.E. Greene, N. Opper, M. Stavropoulou, C. Harper, M. Nascimento, et al., Gender inequality and restrictive gender norms: framing the challenges to health, *The Lancet* [Internet] 393 (10189) (2019 Jun) [cited 2022 Dec 10], <https://linkinghub.elsevier.com/retrieve/pii/S014067361930652X>.
- [25] A.M. Weber, B. Cislighi, V. Meausoone, S. Abdalla, I. Mejía-Guevara, P. Loftus, et al., Gender norms and health: insights from global survey data, *The Lancet* [Internet] 393 (10189) (2019 Jun) [cited 2022 Dec 10], <https://linkinghub.elsevier.com/retrieve/pii/S0140673619307652>.
- [26] K. Hay, L. McDougal, V. Percival, S. Henry, J. Klugman, H. Wurie, et al., Disrupting gender norms in health systems: making the case for change, *The Lancet* [Internet] 393 (10190) (2019 Jun) 2535–2549 [cited 2022 Dec 10], <https://linkinghub.elsevier.com/retrieve/pii/S0140673619306488>.
- [27] A. Corley, N. Perrin, K. Geiger, M.M. Remy, N. Glass, Exploring caregivers' gender attitudes' influence on adolescent health in the eastern Democratic Republic of Congo: a mixed methods study, *Glob Public Health* [Internet] (2022 Apr 20), <https://doi.org/10.1080/17441692.2022.2049848> [cited 2022 May 1];0(0): 1–21.



- [28] S. Baird, Z.A. Bhutta, B.A. Hamad, J.H. Hicks, N. Jones, J. Muz, Do restrictive gender attitudes and norms influence physical and mental health during very young Adolescence? Evidence from Bangladesh and Ethiopia, *SSM - Popul Health* [Internet] 9 (2019) 100480. Dec [cited 2022 Nov 15], <https://linkinghub.elsevier.com/retrieve/pii/S2352827318302520>.
- [29] S.L. Martin, C.R. Mataré, R.A. Kayanda, I. Owoputi, A. Kazoba, R. Bezner Kerr, et al., Engaging fathers to improve complementary feeding is acceptable and feasible in the Lake Zone, Tanzania, *Matern Child Nutr* [Internet] 17 (S1) (2021 Jul) [cited 2022 Feb 20], <https://onlinelibrary.wiley.com/doi/10.1111/mcn.13144>.
- [30] V.B. Meyer-Rochow, Food taboos: their origins and purposes, *J Ethnobiol Ethnomedicine* [Internet] 5 (1) (2009 Dec) 18 [cited 2022 Dec 19], <https://ethnobiomed.biomedcentral.com/articles/10.1186/1746-4269-5-18>.
- [31] S. Bhanbhro, T. Kamal, R.W. Diyo, N.I. Lipoeto, H. Soltani, Factors affecting maternal nutrition and health: a qualitative study in a matrilineal community in Indonesia, in: B. Cabieses (Ed.), *PLOS ONE* [Internet] 15 (6) (2020 Jun 16) e0234545 [cited 2022 Dec 22], <https://dx.plos.org/10.1371/journal.pone.0234545>.
- [32] M.I. Santos-Torres, E. Vásquez-Garibay, *Food Taboos Among Nursing Mothers of Mexico*, *J Health Popul Nutr*, 2003.
- [33] S.H. Mohammed, H. Taye, B. Larijani, A. Esmailzadeh, Food taboo among pregnant Ethiopian women: magnitude, drivers, and association with anemia, *Nutr J* [Internet] 18 (1) (2019 Dec) 19 [cited 2022 Dec 19], <https://nutritionj.biomedcentral.com/articles/10.1186/s12937-019-0444-4>.
- [34] A. Tarfa, J. Nordin, M. Mott, M. Maurer, O. Shiyabola, A qualitative exploration of the experiences of peer leaders in an intervention to improve diabetes medication adherence in African Americans, *BMC Public Health* [Internet] 23 (1) (2023 Jan 20) 144 [cited 2023 Jan 23], <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-023-15059-2>.
- [35] D. Tsegaye, D. Tamiru, T. Belachew, Food-related taboos and misconceptions during pregnancy among rural communities of Illu Aba Bor zone, Southwest Ethiopia. A community based qualitative cross-sectional study, *BMC Pregnancy Childbirth* [Internet] 21 (1) (2021 Dec) 309 [cited 2022 Dec 19], <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-021-03778-6>.
- [36] H. Harris-Fry, N.M. Saville, P. Paudel, D.S. Manandhar, M. Cortina-Borja, J. Skordis, Relative power: explaining the effects of food and cash transfers on allocative behaviour in rural Nepalese households, *J Dev Econ* [Internet] 154 (2022 Jan) 102784 [cited 2022 Dec 31], <https://linkinghub.elsevier.com/retrieve/pii/S0304387821001425>.
- [37] T.A. Zerfu, M. Umeta, K. Baye, Dietary habits, food taboos, and perceptions towards weight gain during pregnancy in Arsi, rural central Ethiopia: a qualitative cross-sectional study, *J Health Popul Nutr* [Internet] 35 (1) (2016 Dec) 22 [cited 2022 Dec 19], <http://jhpn.biomedcentral.com/articles/10.1186/s41043-016-0059-8>.
- [38] S. Chakrabarti, A. Chakrabarti, Food taboos in pregnancy and early lactation among women living in a rural area of West Bengal, *J Fam Med Prim Care* [Internet] 8 (1) (2019) 86 [cited 2022 Dec 22], [https://journals.lww.com/10.4103/jfmpc.jfmpc\\_53\\_17](https://journals.lww.com/10.4103/jfmpc.jfmpc_53_17).
- [39] O. Maggiulli, F. Rufo, S.E. Johns, J.C.K. Wells, Food taboos during pregnancy: meta-analysis on cross cultural differences suggests specific, diet-related pressures on childbirth among agriculturalists, *PeerJ* [Internet] 10 (2022 Jul 11) e13633 [cited 2022 Dec 19], <https://peerj.com/articles/13633>.
- [40] F.G. Tela, L.W. Gebremariam, S.A. Beyene, Food taboos and related misperceptions during pregnancy in Mekelle city, Tigray, Northern Ethiopia, in: F. T. Spradley (Ed.), *PLOS ONE* [Internet] 15 (10) (2020 Oct 13) e0239451 [cited 2022 Dec 19], <https://dx.plos.org/10.1371/journal.pone.0239451>.
- [41] N. Jones, K. Pincock, S. Baird, W. Yadete, J. Hamory Hicks, Intersecting inequalities, gender and adolescent health in Ethiopia, *Int J Equity Health* [Internet] 19 (1) (2020 Dec) 97 [cited 2022 Dec 10], <https://equityhealthj.biomedcentral.com/articles/10.1186/s12939-020-01214-3>.
- [42] K.O. Ogolla, J.K. Chemuliti, M. Ngutu, W.W. Kimani, D.N. Anyona, I.K. Nyamongo, et al., Women's empowerment and intra-household gender dynamics and practices around sheep and goat production in South East Kenya [cited 2022 Dec 8];17(8), in: B. Van Campenhout (Ed.), *PLOS ONE* [Internet], 2022 Aug 4 e0269243, <https://dx.plos.org/10.1371/journal.pone.0269243>.
- [43] R.C. Dempsey, J. McAlaney, B.M. Bewick, A critical appraisal of the social norms approach as an interventional strategy for health-related behavior and attitude change, *Front Psychol* [Internet] 9 (2018 Nov 6) 2180 [cited 2023 Aug 8], <https://www.frontiersin.org/article/10.3389/fpsyg.2018.02180/full>.
- [44] J.H. Kunz, R.N. Greenley, K.A. Mussatto, B. Roth-Wojcicki, T. Miller, M.E. Freeman, et al., Personal attitudes, perceived social norms, and health-risk behavior among female adolescents with chronic medical conditions, *J Health Psychol* [Internet] 19 (7) (2014) 877–886. Jul [cited 2023 Aug 8], <http://journals.sagepub.com/doi/10.1177/1359105313481077>.
- [45] J. Murphy, J. Hughes, S. Read, S. Ashby, Evidence and practice: a review of vignettes in qualitative research, *Nurse Res* [Internet] 29 (3) (2021 Sep 9) 8–14 [cited 2022 May 1], <https://journals.rcni.com/doi/10.7748/nr.2021.e1787>.
- [46] W. Aujla, Using a vignette in qualitative research to explore police perspectives of a sensitive topic: "honor"-based crimes and forced marriages, *Int J Qual Methods* [Internet] 19 (2020 Jan 1) 160940691989835 [cited 2022 May 1], <http://journals.sagepub.com/doi/10.1177/1609406919898352>.