



Family, Gender, and Women's Nutritional Status: A Comparison Between Two Himalayan Communities in Nepal

Dónya S. Madjdian & Hilde A.J. Bras

To cite this article: Dónya S. Madjdian & Hilde A.J. Bras (2016) Family, Gender, and Women's Nutritional Status: A Comparison Between Two Himalayan Communities in Nepal, *Economic History of Developing Regions*, 31:1, 198-223, DOI: [10.1080/20780389.2015.1114416](https://doi.org/10.1080/20780389.2015.1114416)

To link to this article: <https://doi.org/10.1080/20780389.2015.1114416>



© 2016 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 08 Mar 2016.



[Submit your article to this journal](#)



Article views: 8045



[View related articles](#)



[View Crossmark data](#)



Citing articles: 12 [View citing articles](#)

FAMILY, GENDER, AND WOMEN'S NUTRITIONAL STATUS: A COMPARISON BETWEEN TWO HIMALAYAN COMMUNITIES IN NEPAL

 OPEN ACCESS

Dónya S. Madjdian & Hilde A.J. Bras¹

ABSTRACT

During the last decades, the focus of food and nutrition security research has shifted from issues of macro-level availability to problems of unequal access, and distribution within the household. Little systematic attention has however been paid to the role of family systems in household food allocation processes. This study focuses on the extent to which family relations, and particularly gender roles, in two Himalayan communities with different family systems influence intra-household food allocation, and the subsequent nutritional status of women of reproductive age (15–49). In-depth interviews were conducted with 15 Buddhist and 15 Hindu women, the latter belonging either to the higher Chhetri or lower Dalit castes. Additionally, anthropometric data of women were collected. Results show that women from Hindu families were worse off than women from Buddhist households in terms of nutritional status, which is due to different intra-household allocation patterns. Secondly, women's nutritional status varied over the reproductive life course. Women were most vulnerable during menses, pregnancy, and the post-partum period. Comparison with research conducted in the 1980s in this area suggests that the influence of family-level values and practices on women's nutritional status is slowly changing.

- 1 Dónya S Madjdian MSc (corresponding author), Wageningen University, Department of Social Sciences, Hollandseweg 1, 6706 KN Wageningen, The Netherlands. Email: donya.madjdian@gmail.com; Professor Hilde AJ Bras, Wageningen University, Department of Social Sciences. Email: hilde.bras@wur.nl

The authors would like to express their gratitude to The Nepal Trust, Nepal/UK, for the practical and logistical support during fieldwork.

Economic History of Developing Regions Vol. 31 (1) 2016

ISSN Print 2078-0389, Online 2078-0397

© 2016 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. pp 198–223

<http://dx.doi.org/10.1080/20780389.2015.1114416>



Keywords: food security, nutritional status, intra-household food allocation, gender, family systems, ethnicity, caste, Tibetan Buddhism, Hinduism, Himalayas, Nepal

JEL Codes: I140, I150, J120, J150, J160

INTRODUCTION

The ‘Asia Enigma’, or food scarcity and malnutrition amidst plenty, is a problem in Asia from which mostly women and children suffer, often with large consequences (Ramachandran 2006; De Schutter 2013). Undernutrition during childhood means that girls cannot reach their full growth potential, and are deprived later on in their lives not only in terms of health, but also regarding their chances in education and in the labour market. Undernutrition and its life course consequences in women are often handed over from one generation to the next, creating vicious cycles of female deprivation (DeRose et al. 2000). Since the 1974 World Food Conference the focus of food security and nutrition research has shifted from an emphasis on adequacy and availability of food on the aggregate level to issues of access to food and nutrition of households and individuals (Den Hartog et al. 2006). It is now clearly understood that even when a region is food secure, certain households may be food insecure. Likewise, a household that is considered food secure may still contain members, often women and girls, who suffer from malnutrition (Messer 1997; Gitelsohn et al. 1998; Maharjan & Khatri-Chhetri 2006). Hence, food allocation within households, and the role of gender therein, has become an important component of current research on food security and nutrition.

By now, a large literature documents gender gaps in food security and nutrition at the intra-household level (Backstrand et al. 1997; Haddad 1999; Darnton-Hill et al. 2005; Hadley et al. 2008). Empirical research shows however that a pro-male bias in actual food intake is mainly located in South Asia, and that the extent of gender bias in nutritional status varies strongly within the region (Haddad et al. 1996). Other studies show that women’s nutritional status also lags behind because of differential care giving practices and lesser access to formal healthcare (Larme 1997; DeRose et al. 2000; Marcoux 2002; Fledderjohann et al., 2014). Thus, the evidence of previous research on the negative effects of gender on nutrition is inconclusive. The question remains why and under what conditions women suffer from malnutrition.

A way to improve in this debate are comparative studies that attend carefully to the spatial, social, and cultural differences in the influence of gender on intra-household allocation processes. Families and individuals bargaining on the distribution of food, care giving, and access to health care, are influenced by spatially and culturally varying norms, values and practices about family, and gender relations. Clusters of such norms and practices can be viewed as family systems. In different family systems, family relations influence people’s nutritional and health outcomes in highly distinctive ways (Lorimer 1954; Davis 1955; Hajnal 1982; Todd 1990; Kertzer 1991; Skinner 1997; Das Gupta 1999; Therborn 2004).

The nature of family values is one of the most relevant cultural traits, and influences the cultural and economic organization of a society (Alesina & Giuliano 2010). As such, ‘cultural change and persistence are important channels through which history continues to matter today’ (Nunn 2012, 17). Family systems are reflective of norms and values regarding family life, which have long-standing historical roots. For instance, family systems include gender norms, influencing the roles that women have in society and the power relations between men and women (Alesina & Giuliano, 2010). Alesina and Giuliano (2010) found that women in families with strong ties, in often complex family systems, have more traditional roles, and are more homebound than women in families with weaker ties. Gender attitudes and power relations are shaped by historical changes (Alesina et al. 2011). However, the values and practices underlying these are relatively persistent, changing only slowly over time, thereby highlighting the relevance of historical and cultural perspectives on today’s development outcomes (Alesina et al. 2011).

Hence, this study focuses on how different family systems, and the rigidity of gender bias inherent in them, impact women’s nutritional status through the different stages of the food allocation process, i.e., selection, preparation, and distribution of food. Moreover, we study how such family influences may vary across the life course. Our case study compares the effects of family and gender on the nutritional status of women of reproductive age (15–49) in two Himalayan communities in Humla district, Nepal, a remote and food insecure area located in the north-western Himalayas. We compare a Hindu and a Tibetan Buddhist community, both situated in the same ecological environment, but having different family systems. In-depth interviews were conducted with 15 Buddhist and 15 Hindu women. Additionally, anthropometric data of all women was collected.

In the next section we elaborate our theoretical framework, centring on processes of intra-household food allocation (IHFA), gender bias, and its variation across family systems. We subsequently describe our field sites, i.e., the Tibetan Buddhist community of Bargaun and the Hindu community of Thehe. Next, our data and methods are presented. Then we describe our main findings. Finally, we draw conclusions, and discuss them in the light of current debates on economic development, food security and nutrition, and the roles of family systems and gender therein.

THEORETICAL BACKGROUND

How do family systems influence intra-household allocation processes of food, and how may such patterns result in (unequal) nutritional outcomes of household members, and women in particular? We start this section by considering intra-household food allocation patterns, and then discuss what family systems are, how they differ in terms of gender roles and biases, and how they may influence the food allocation patterns and nutritional outcomes of women. In discussing these issues and processes we use the terms ‘family’ and ‘household’ alternatively to refer to ‘coresiding kin who participate in a single domestic economy’

(Skinner 1997, 56). Family members that live outside the household arena are referred to as non-coresident kin.

Intra-household food allocation patterns

In order to understand intra-household food allocation processes, and their outcomes, we depart from a conceptual scheme developed by Gittelsohn (1991), which consists of three stages: selection, preparation, and distribution of food. It is first of all essential to find out who is in power of food selection, including who is in charge of buying, and bringing crops and other foodstuffs into the home. Secondly, it is important to find out who prepares the food. Thirdly, food distribution in eating groups should be questioned, including who serves and how, who receives the food first and who later, i.e., the serving order, and who gets what, and how much (Den Hartog et al. 2006). Additionally, understanding these stages provides insights in the food decision-making process within households, and reveals power dynamics in the household (Alam 2012), which is a good indicator of women's bargaining power. It is this bargaining power of women, or the extent to which they are empowered, that might explain household and individual outcomes (Doss 2013).

There are several ways of defining patterns of IHFA. Gittelsohn (1991) distinguishes four allocation patterns, including 'egalitarian allocation', 'favouritism in terms of quantity', 'favouritism in terms of quality', and 'food allocation during transitory states'. The latter pertains to the nutritional status of individuals in vulnerable life stages, such as menses, illnesses, pregnancy, and lactation. Behrman (1990) mentions four other patterns: 'equity', meaning that each member is entitled to a fair share of a resource, which is broadly similar to egalitarian allocation; 'equal outcome' where food is distributed in a way so that the welfare of members is equalized, i.e., the least endowed members get the most; 'allocation according to the household maximization rule', so-called 'fair return', in which food is distributed in proportion to actual or expected material contribution to household; and 'allocation according to the individual maximization rule' meaning that those who are expected to benefit most from a resource get the largest share, resulting in more inequality than the other outcomes (Behrman 1990). Whereas Gittelsohn (1991) takes the difference between the quantity and quality of food, including the differences between micro- and macronutrients, and transitory life course stages into account, Behrman (1990) is more attentive to the needs of and contributions to the household, which are linked to social, cultural and economic factors, such as for instance son preference. All aspects are important to consider when examining the influence of family systems on nutritional status outcomes of IHFA.

Family systems

Families bargaining on the distribution of food, care, and access to healthcare are influenced by spatially and culturally varying norms, values and practices about

family and kin relations. Clusters of such norms and practices can be viewed as family systems. As Skinner (1997, 238) puts it:

the family system ... refers to the customary, normative manner in which family processes unfold – to the usual preferred pattern of household dynamics. It incorporates marriage form (s), succession, the transmission of property, the normal sequence of co-residential arrangements, and the customary bias by gender and relative age (if any) that informs these other dimensions.

The term family *system* refers to the fact that the various parts of family life are contingently related in a systematic fashion and can be captured in a single processual model (Skinner 1997). Thus, in different family systems, family relations, norms, and practices influence people's life chances and outcomes in highly distinctive ways (Lorimer 1954; Davis 1955; Hajnal 1982; Todd 1990; Kertzer 1991; Skinner 1997; Das Gupta 1999; Therborn 2004).

Usually three broad classes of family systems are distinguished: conjugal, stem, and joint (Skinner 1997, 55). Conjugal family systems are marked by partible inheritance and neolocal residence upon marriage. The choice of the marriage partner is free. Descent and property transmission is generally bilateral, that is, through men and women alike. The latter factors provide for a relatively good position for women (Todd 1990). Coresidential arrangements in the conjugal family system include an initial phase when the couple is childless, an extended phase of the conjugal family, and an empty-nest phase when all offspring have departed.

Stem and joint family systems are characterized by the fact that a spouse is brought in for at least one child in each generation. Such systems have corporate household structures consisting of two or more conjugal units. Stem families are characterized by impartible inheritance, with the male heir co-residing with the parents. However, female succession is not uncommon, thus descent is bilateral. Marriages are exogamous and generally arranged by the parents. In the stem family system, married women hold a strong position.

In the joint family system, households may consist of parents and several married brothers with their wives and children. Upon marriage, daughters leave the parental household for the household of their father-in-law. Inheritance is equal among brothers but descent is strictly patrilineal, leaving women in a rather weak position in the household of their father-in-law. A characteristic of joint family systems is son preference, which can be explained in terms of household benefits and needs. Boys help to maintain the family and provide old-age support; girls are eventually lost to the household.

The conjugal, stem and joint family systems are ideal-typical variants. In reality many intermediate variants exist. In the launching-pad family system (intermediate between conjugal and stem family stems) the young couple starts its household career by a phase of co-residence with of the parents, leaving the parental home when economic resources allow it (Skinner 1997, 62). In a hiving-off stem family systems (which is between the classic stem and joint family systems) all brothers can marry and inherit family resources but a difference is made as to sibling position, with senior members being expected to set up their independent households before junior brothers can marry and 'fly out'. Hence, there is never

more than one conjugal unit in the same household (Childs 2008, 110–111; Skinner 1997, 62). Moreover, family systems may even more complex, combining elements of different systems and conjugal, stem and joint phases.

Gender bias informs different types of family systems in a contingent manner. Structural bias is most pronounced in joint family systems and least in conjugal family systems, with stem families intermediate. Within family systems the extent and rigidity of patriarchy and gender bias may vary. Patrilineal joint family systems present the most extreme example of consistent, thoroughgoing male bias. They are characterized by patrilineally-organized extra-familial kin groups, by virilocal marital residence (whereby the bride moves to the groom's household), by inheritance norms favouring sons, and by descent through the male line. The patriarchy of the patrilineal joint family is, according to Skinner (1997, 239) normatively stark, if only because of its reinforcement by every other structural feature of the system. Within the joint family systems in Asia, patriarchy is much more rigid and women are in a far weaker position in China and northern India than in the joint families of southern India, Sri Lanka, or Tibet. For instance, Tamil women of southern India, whether Muslim or Hindu, do in all aspects better than women in northern India or Pakistan (Therborn 2004, 111). Hence, the gradient in patriarchy and gender bias is not so much nationally or religiously based, but is anchored in regional and sometimes even local variation of cultural norms.

Gender bias and women's nutritional status

Gender bias and cultural power differences within households may have an impact on women's food and nutrition security via decision-making processes, and responsibilities for producing, earning, purchasing, preparing, and consuming food (Ramachandran 2006). Earlier research, however, has generated contradictory results. Some studies have shown food allocation preferences for adult males over those of adult females, resulting in that women were less likely to meet their nutrient requirements as compared to men (Gittelsohn 1991; Gittelsohn 1997). Although women are often found responsible for food preparation, food distribution is in the hands of men (DeRose et al. 2000). Men have the bargaining power to decide about food allocation because they are perceived as contributing most to the household budget (Griffiths et al. 2002). Hence, women's weak bargaining position results in little voice in decision-making around food and differential feeding and caring practices favouring males (De Schutter 2013).

However, other research has not found a systematic bias against women in caloric intake; if there was female-bias, it was more an issue of quality than of quantity (DeRose et al. 2000). Moreover gender bias was found to also strongly fluctuate with age and life course stage. Adult women in joint families have the lowest position in household hierarchies when they are young, especially in the beginning of their marriage when they have to reproduce and take care of children. During this phase, they have little autonomy and decision-making power to act on

problems resulting in negative maternal and child health outcomes. Bearing and raising children, especially sons, gradually increases the status and power of married woman (Das Gupta 1999; Griffiths et al. 2002).

Moreover, some studies have found that women are at a disadvantage compared to men only around specific life course events or in certain life stages, such as menses, pregnancy and lactation, or in certain periods of the year. In Punjab, Das Gupta (1987) observed for instance that pregnant and lactating women were not free to eat more nutritious food resulting in undernourishment during these life stages, and did not have a voice about getting medical care during labour resulting in higher maternal mortality. In contrast to this, Mondal (2003) showed that in joint households where a mother-in-law was present, pregnant women were kept an eye on, and their access to nutritional food was higher. Yet, other studies have proposed that female disadvantage in nutritional status was not primarily the result of low and/or deficient food intake, but of limited access to care giving, healthcare, education, and leisure (DeRose et al. 2000). Gender bias also becomes apparent in times of crises, such as a state of food insecurity resulting from natural disasters such as the 2015 earthquakes in Nepal (Duflo 2011; de Schutter 2013). The vulnerability of women then increases exacerbating gender inequality.

The ability of women to negotiate in resource allocation, or bargaining power, shapes via household decisions development outcomes (Duflo 2011; Alam 2012; Doss 2013). In terms of household food security, expenditures are more directed towards nutrients and health when women are decision makers (Duflo 2011; Alam 2012). Women may spend resources according to collective consumption needs (Bobonis 2009). Factors such as, but not limited to, women's income and educational attainment increase women's bargaining power and empowerment (Doss 2013). Bobonis (2009) found in his study about whether households made Pareto-efficient intra-household resource allocation decisions, that women's income had positive effects on child and women's expenditures. Poverty and lack of opportunity increase gender inequality, and economic development reduces (but not overcomes) gender inequality. Hence, when poverty declines, gender inequality diminishes, and women's condition improves (Duflo 2011).

Summary

Family systems may influence women's nutritional status via intra-household food allocation processes. However, the evidence is not consistent and few empirical studies have explicitly examined the roles of family systems and gender in different stages of distribution processes, including selection, preparation, and distribution of food. Moreover, there is a lack of comparative studies, systematically focusing on changes in IHFA across the life course, surrounding specific life events, and depending on during times of food abundance and food shortages. In this article we compare such household distribution patterns of women of reproductive age from a Hindu and a Tibetan Buddhist community in Nepal. In the next section we present our two cases.

BARGAUN AND THEHE: TWO COMMUNITIES IN THE HIDDEN HIMALAYAS

The study was conducted in two communities in Humla, one of the 75 districts of Nepal, situated in the north-western corner of the country (see [Figure 1](#)). Humla, a post-conflict area that was heavily affected during the Maoist insurgency during 1996 to 2006, is the highest and most remote area of Nepal (altitude 1500–7300 meters), and the second-least-developed district. It is only accessible by foot, reachable in a nine-day walk from the nearest motor-road, or by small aircrafts, which only take off when weather allows. The lack of infrastructure and communication, and the extremely cold mountain climate which leaves the region snow-covered for five months of the year, makes Humla one of the most underdeveloped regions in Nepal. This is reflected in its Human Development Index of 73/75. Difficult environmental conditions and its remoteness complicate living conditions of the people in Humla. The average life expectancy is 58 years, which is relatively low compared to Nepal's life expectancy of 66.6 years. It also has a mortality rate of 32/1000, and a child mortality rate of over 30%. The Humli people suffer from a lack of basic healthcare services, communication, electricity, clean drinking water, and education. Disease epidemics are common, due to the easy spread of infectious diseases, as are nutritional disorders and maternal and perinatal diseases (The Nepal Trust 2011). Gender issues are also of major concern as indicated by the Women Empowerment Index of 73/75.

Humla has a relatively high fertility rate compared to the rest of Nepal (6.2 vs 2.7 respectively). High fertility is often linked to maternal mortality in the prenatal and postnatal stage, but especially during childbirth. Maternal mortality is over 8%,



Figure 1: Location of Humla District, Nepal.

due to low access to healthcare, lack of birth attendants, and cultural practices during and after childbirth (Buvinic et al. 2009; The Nepal Trust 2011). Moreover, the heavy workload during pregnancy and lactation increases the chance of negative health outcomes (Ramachandran 2006). Considering that pregnancy and lactation are demanding more nutritious food, maternal mortality might be closely linked to undernutrition (Messer 1997). For instance, the high incidence of anaemia often complicates labour and results in maternal and infant mortality. Statistics from the Nepal Demographic and Health Survey (2011) show that in 2011 one-third of the women of reproductive age in Humla were anaemic and more than 20% were underweight. In line with the goal of the World Food Summit (Food and Agriculture organization 1996), Nepal's food security situation is improving. However, still one-third of all households in the mountains experience inadequate access to food compared to the rest of Nepal. Particularly, the period between November and March is challenging due to harsh winter conditions, depletion of household stocks, and lower income from non-timber forest products, which include all forest products, except wood.

In 2011, the total population of Humla was 50,858, of which 49% was female and 51% was male. The ethnic composition of Humla is similar to that of other High Himalaya districts with the majority (82%) of the Humli people being Hindu, and 18% being Buddhist. The Hindu population, living mainly in the southern part of Humla, was made up of 44.2% Chhetri (warrior and ruler caste group), 19.5% Thakuri, 6.2% Brahmin (priest and scholar caste group), and 30.1% occupational caste group (Dalit), including Kami, Damai, and Sarki (Central Bureau of Statistics 2012). The Dalits are socially and economically disadvantaged and excluded from, for instance water taps (McKay 2002). The northern part of Humla is populated by Buddhists, called Lama (including Limi, Yulthodun, Trugchulung, Nyinba and Tsangba), which is a Tibetan ethnic group (United Nations Field Coordination Office 2013). The main spoken language in Humla is Humli Khas, followed by Lama Kham (The Nepal Trust 2011).

Humla consists of 27 Village Development Committees (VDCs), meaning a village or a cluster of villages. Thehe (in Thehe VDC) and Bargaun (in Bargaun VDC) were subjects of this study. Bargaun is mostly populated by a group of ethnic Tibetan Buddhists, the so-called Nyinba. The Nyinba practice fraternal polyandry, meaning that women marry two or more husbands, who are brothers. This is often seen in the Himalayan region with scarce environmental resources, and little arable land due to the practical reason that if every man would marry a woman, the land would be split up in too many small plots. Daughters marry, and leave the house with a small dowry but often keep visiting their natal home. The fraternal polyandry system in this region is a combination of a joint family system with elements of a hiving-off stem family system, meaning that daughters-in-law are brought in according to the birth order of the brothers (Skinner 1997, 86; Childs 2008, 110–111). Although the system is inherently virilocal with women marrying into the home of their husbands' parents, who hold the wealth and power of the household, women exercise relatively more power than in other

patrilineal joint family systems (Sapkota 2001, 21). The prevalence of fraternal polyandry in this region differs between villages, but is now gradually declining due to the increase of monogamy, divorce, and conflicts among brothers (Haddix 1999). Yet in general most couples in most families in Bargaun live in joint families (The Nepal Trust 2011).

A few hours walk downwards from Bargaun is the village of Thehe, which is populated by a mix of Hindu castes. Thehe is one of the poorest VDCs where people suffer from extremely poor living standards and conditions (McKay 2002; The Nepal Trust 2011). The main ethnicities or casts in Thehe are the Chhetri and the Dalit castes, which inhabit their own ward. Historically, the Hindu population lived in joint families, where after marriage daughters entered their husband's house. Nowadays however, conjugal households are found more often, and especially in the higher castes couples start their own household after marriage due to processes of modernization, educational expansion, and mixing with other caste groups. Living in a conjugal household is more preferred nowadays (The Nepal Trust 2011), although many of these are households in a temporary conjugal phase living on the parental compound. Preference for at least one son is still alive, although less in conjugal households than in joint families. This has mainly to do with traditions, for instance that only sons can arrange funerals, and the fact that daughters leave their parents' house after marriage. Gender bias and patriarchy are far more rigid among Hindu and Muslim South Asian women than among the Tibetan Buddhist women, including the Nyinba group, where married women have more autonomy and somewhat more economic independence (Acharya & Bennett 1981, 222–236; Levine 1987, 300). It might thus be expected that Buddhist women have a better nutritional status than Hindu women in Humla.

DATA, MEASURES, AND METHODS

Data were collected by means of in-depth interviews with the help of a local interpreter from September 2014 until December 2014. Participants were selected along the way and on site on the basis of purposive sampling, using the snowball method, since no detailed information about households and villages was available. Sampling was based on the main criterion that participants were women in the reproductive age (15–49 years old), who were pregnant at the time of visiting, or had been pregnant at least once before. In case there were more women in the household, the youngest women fitting the inclusion criteria were selected. Oral informed consent was obtained from the respondents before taking the interviews, considering the illiteracy of many women. Interviews were conducted until data saturation and lasted between 45 minutes and one-and-a-half hours, depending on time availability of the participants, and the interview process. Interviews took place in or outside the interviewee's home. Interviews were recorded and notes were taken. Prior to the interview, a list of household members and a birth history was filled in together with the women, in order to understand the household

composition and provide some background for the interview. For this purpose several parts of UNICEFs Multiple Indicator Cluster Surveys (MICS), the Household Questionnaire and Questionnaire for Individual Women, were used as an example format (United Nations Children's Fund 2012).

Interviews focused on four specific themes based on the conceptual framework. The first theme included introductory questions to provide some background information for the interview, whilst at the same time checking for instance age and marital status. Women were also asked to rate their health as good, neutral or bad in order to put the interview in context later on. The second theme was about pregnancies and immediate post-partum. This also included for instance the topics of birth spacing, contraceptives, maternal and child health and care. The third theme covered intra-household allocation of food during normal and lean seasons. These questions were partly derived from the manual by Den Hartog et al. (2006) for field studies on food habits and consumption in developing countries. This made it possible to compare our results to similar studies that have used this manual. The final theme embraced food, culture and gender with questions about general and food beliefs during specific life course events and stages (e.g., menses, pregnancy, immediate post-partum, lactation).

No individual data concerning health or nutritional status was available from registers or health clinics. Therefore, anthropometric indicators of nutrition and health of all interviewed women were collected. Weights and heights of women were used to calculate their Body Mass Index (BMI), and to assess adult malnutrition on the basis of the World Health Organization International BMI classification that is also proved as adequate for use in the Asian context (WHO 2004; Ververs et al. 2013; WHO 2014). The Mid Upper Arm Circumference (MUAC) was used as screening tool for pregnant and lactating women, as it is also strongly related to low birth weight. It is an indicator for maternal malnutrition for which a MUAC below 23 centimetres is seen as cut-off point, indicating maternal malnutrition.

In total 30 married women were interviewed (n=30), with an age ranging from 18 to 48 years old. Fifteen of these women were Buddhist, belonging to the Nyinba community. Two of them lived in Torpa, which is part of Bargaun VDC, seven lived in Bargaun, and six lived in Simikot and Bargaun alternately, meaning that their families possessed a house in both Bargaun and Simikot. The mother tongue of these women and the language of the interview was Lama. Six of the 15 women were living in a conjugal household (which could also be a joint household in a conjugal phase), whereas the remaining nine were living in joint families. All women living in a conjugal family originally came from joint families. In three joint families fraternal polyandry was practised. Two women had lived in a fraternal polyandrous household, but were living in a conjugal-based household nowadays because of divorce or death of one of their husbands. Educational levels of women varied from no education at all to higher education. Among the Buddhist women most only went to primary school (n=10). Two of them were uneducated, one finished secondary school, and two followed higher education (BSc level) in Simikot. The

average age of the interviewed women was 28.7; the average age of marriage was 19 years old, and the age of first pregnancy was 21 years old. Women above 35 years old at the moment of interviewing married at around the age of 16.

The other 15 women were Hindu and lived in the Thehe area. Eight of these women belonged to the lowest Hindu caste, which is Dalit. The other seven belonged to the Chhetri caste, which is the warrior and ruler caste – one of the highest caste groups – of Hinduism, and also the largest caste group in Nepal. Their mother tongue, and the interview language, was Nepali. All Dalit women and most Chhetri women lived in a conjugal family (often being indicative of a temporary conjugal phase, as they were based in the parental compound), except for two who lived in a joint family. Education of the Hindu women was primary school (n=9) or no education at all (n=6). The average age of interviewed women was 28.6. Chhetri women married on average when they were 16.5, while Dalit women married on average when they were 14.4 years old. While on average Chhetri women got pregnant for the first time when they were 17.5, Dalit women got pregnant at an average of 16.5 years old. See [Tables 1](#) and [2](#) for an overview of interviewee characteristics per ethnic group.

Interviews were transcribed verbatim with F5 Audio transcription software, then checked by the interpreter for accuracy, and compared to the field notes. Transcripts were coded inductively on the basis of the conceptual framework using Atlas Ti software. However, new concepts were allowed to emerge. A combination of bottom-up and top-down coding was thus used. On the basis of the coded data answers to the research questions could be provided, which are elaborated below.

RESULTS

Intra-household food allocation patterns

Foodstuffs and meals

At first, interviewees were asked to describe a typical meal during a normal day, and whether they owned any land or livestock in order to place answers on IHFA in context. All Buddhist families owned land in Bargaun, also those who were living mainly in Simikot. Growing crops did not differ much in this community and between households; the main crops grown were: local yellow and/or red

Table 1: Education level of interviewed women per ethnic group

| | No education | Primary education | Secondary education | Higher education |
|---------|--------------|-------------------|---------------------|------------------|
| Nyinba | 13% | 67% | 7% | 13% |
| Chhetri | 29% | 71% | 0% | 0% |
| Dalit | 50% | 50% | 0% | 0% |

Table 2: Family systems, and average age of marriage and first pregnancy of interviewed women per ethnic group

| | Average age | Conjugal family | Extended family | (Former) fraternal polyandry | Average age marriage | Average age first pregnancy |
|---------|-------------|-----------------|-----------------|------------------------------|----------------------|-----------------------------|
| Nyinba | 28.7 | 40% | 60% | 40% | 19.5 | 21 |
| Chhetri | 28.4 | 71% | 29% | 0% | 16.5 | 17.5 |
| Dalit | 28.8 | 100% | 0% | 0% | 14.4 | 16.5 |

rice; pulses including beans and peas; white and yellow buckwheat; normal wheat; millet; chili; and potatoes. Furthermore, all families cultivated vegetables including: white radish; pumpkin; cabbage; spinach and mustard greens; cauliflower; and turnips. Some families grew also barley and corn. In addition, all families bought in Simikot, from Nepal or China imported white rice, oil, salt and sugar, or went to upper China to buy mainly white rice and rice or processed wheat flour. All families owned livestock, cows, bulls, horses, mules and/or donkeys.

In Thehe, only Chhetri families said that they owned some, in comparison with the Nyinbas, small plots of land. This was confirmed by observations; however, specific dimensions cannot be given. On these lands, Chhetri families cultivated basic crops such as millet, yellow rice, buckwheat, chili, nettle greens, and some pulses. None of the Dalit families owned land except for two families who had one or two pieces of land. Hindu women told that their fields were not sufficient, and that therefore they had to work on the fields of the Buddhist people that were located in the surroundings of Bargaun and Thehe. In exchange for working in these fields called *adhya* (Lama), they got 50% of the yield. Only a few Chhetri and Dalit families owned some livestock, mainly goats, bulls or donkeys. However, these animals were intended to use for *adhya*. Some women said that the reason why they had so little land was because they were separated from their families and had become conjugal families:

We don't have much land, because we are separated from my father-in-law and mother-in-law. Since we have so few lands, we have to work in the Buddhist fields. (Chhetri woman, 22 years old)

Buddhist families ate four times a day starting with an early breakfast with butter tea or black tea, sometimes with biscuits, noodle soup, or dough balls. At the end of the morning, they had lunch consisting of *chapatti* (flatbread, Nepali), or *daal bhat* (white rice and lentil soup, Nepali) with seasonal vegetables, or *lagar* (buckwheat pancakes, Lama). Afternoon snacks included *lagar* or *chapatti*, or noodles in Simikot. Diner was from 8.00pm onwards, and consisted of mainly *daal bhat* with vegetables and white rice, or *momos* (spicy dumplings filled with vegetables or meat, Nepali). Sometimes diner included meat (beef, chicken or mutton), depending on the season. Those living in Simikot could eat meat every day, brought by cargo from the Southern part of Nepal, the Terai.

Sometimes we eat meat during the summer, but mostly during the winter. Because during the winter there is no grass to feed the animals, so it is easier to slaughter and eat them. (Nyinba woman, 34 years old)

Meals were served with either (butter) tea, home brewed *chaang* (rice wine, Lama) containing an alcohol percentage of between 7 and 14%, or *rakshi* (rice wine, Nepali), a distilled rice or millet wine with a much higher percentage compared to vodka or gin. These beverages were said to ward off the extreme cold during winter by providing warmth and well-being.

Families living in Thehe in general had a less varied diet, and often ate fewer than three times a day. Since most families depended on *adhya*, and people did not own livestock, meat was rarely part of their diet. Those who did not cultivate their own vegetables, or did not have money, seldom ate vegetables and meat. In contrast to Nyinba families, most families skipped breakfast (or just drank tea), but rather had their lunch directly. Some differences were found between Chhetri and Dalit people. For Dalits, lunch consisted of *chapatti*, mostly without any vegetables. Sometimes *chapatti* was alternated with *lagar* or fried wheat. Most Dalit people did not eat snacks, but again ate *chapatti* for dinner, or sometimes rice and vegetables if there was money.

We eat *lagar* mostly. And sometimes rice. During the day, we work in the fields of Nyinba people. They prepare snacks for us; they make snacks at home, and bring that to the fields. They give *lagar* to everyone. It's thick and big right? I get one *lagar*, but I have only half of it. The other half I take home for my children. (Dalit woman, 35 years old)

Many Chhetri families had to skip breakfast too, and directly ate lunch. Compared with Dalits, they had more access to seasonal vegetables, mostly potato and radish, because some of them owned land, or could afford meat sometimes.

What's there at Humla? There's nothing here! Those who have money can eat everything. We don't have sugar for our tea in the morning. We don't even have tea. So we directly eat lunch, then we eat *chapatti*. Always millet *chapatti*. For snacks we again eat *chapatti*, and dinner is also *chapatti*. We rarely eat rice. (Chhetri woman, 39 years old)

Buying power and decision-making

In most Nyinba families buying power and decision-making concerning food was in the hands of either the eldest woman in the household, or the husband(s). Often husbands were responsible for buying food as they generated the families' income. In a temporary absence of their husband(s), women received the power to buy. In Simikot, women had more decision-making and buying power or shared this with their husbands, since men were away for work or women generated a second income.

My husbands go away for business and all, so I always buy the food. My husbands earn the money, but I buy the food. I have more power, because I have two husbands. Because I'm the only wife, I get more priority. (Nyinba woman, 38 years old)

In conjugal Hindu families, husbands owned the food. In one conjugal family, the mother-in-law decided what to eat – even though she did not live in the same household. *Dalit* women told that they did not have money to buy anything, and that there was no need to decide what to eat, as they ate the same food every day.

Food selection

After deciding upon and buying food, food for dinner was selected. Whereas husbands or fathers-in-law often owned and bought the food, food selection (or what

to eat exactly) was the responsibility of the cook. In Buddhist families, women selected the food themselves. In some joint families with fraternal polyandry, or where the interviewed woman was a daughter-in-law, husbands or mothers-in-law selected the food. Even in Thehe most women selected the food themselves.

Cooking and preparing food

In all cases, women prepared and cooked food. In Nyinba joint households, daughters-in-law cooked. In conjugal families, women or the eldest daughter cooked. Mothers-in-law only cooked when necessary, husbands took over occasionally. Buddhist families used metal stoves with chimneys and electric heaters for cooking. In joint Hindu families, daughters-in-law cooked. In conjugal Hindu families, women were responsible for cooking. Their husbands cooked when their wives were menstruating, or during the first month after delivery because women were then regarded impure and not allowed to cook. Hindu households did not have access to electricity and cooked on mud-stoves or open fires, causing indoor smoke (see Figure 2).

Food serving and serving order

Families in both communities ate together and from their own plates. Although the cook served, when mothers-in-law or husbands cooked, still the daughter-in-law or wife served food. In all families, the male head of the household was served first, which was the husband or father-in-law. In case of fraternal polyandry, the eldest husband was served first. Thereafter the younger husbands were served. In joint families, the father-in-law was served first, followed by the husband(s). Men were served first, then women, both according to age (eldest first). Children were



Figure 2: Improved stove in Buddhist household versus open-fire stove in Hindu household.

served next, starting often with the eldest. The one who served ate last. Upon adolescence (start of menstruation), a girl ended up second last in the serving order. In most Hindu families, children were served according to age and gender. Male children were served first. Some Hindu households served children according to the principle of the 'survival of the fittest', or before the father was served.

Food division

In Buddhist families, food was divided according to appetite, and upon request. There were no specific good or bad foods for women and men, or boys and girls. Men and women were treated equally, even though women ate last. No difference was mentioned between the food division for girls and boys. Food quality, in other words, what was served, was equal, whereas food quantity differed, but according to appetite. In Buddhist families, there was no sex discrimination concerning food division, in terms of both quantity and quality.

Although the serving system was the same in both communities, Hindu households did not divide food equally in terms of quantity and quality. For instance, women were not allowed to drink alcohol. Due to food scarcity, households ate whatever there was available; there was no difference in division concerning food quality. In conjugal Hindu families, men and children were served first, and ate until they were satisfied. As a consequence often women and adolescent girls ate what was left over, even when that meant there was nothing to eat. Sleeping with an empty stomach was for all Dalit women and most Chhetri women a common problem. This was especially the case in times of food scarcity, which was chronic for all Dalit and most Chhetri families. One exception concerned a husband forcing his wife to eat first and until she would be satisfied since they believed that previous births ended in miscarriages because of this serving system. Food division between children appeared equally, until the age a girl would be grown up.

My main priority is that I have to feed my husband and children first. I eat what is left over. And if I'm not tired, and there is sufficient food, I cook again for myself. For example, I again make chapatti and eat that. Otherwise I have to deal with, and be happy, with the food that is left over. (Chhetri woman, 35 years old)

Seasonal food deficits and intra-household food allocation

Buddhist women interviewed in Bargaun, Torpa and Simikot did not experience food insecurity. However, most of them could not depend on their own cultivated food crops; hence they relied on buying food during times when yield was not sufficient. Many women talked about food scarcity in terms of white rice shortage. Imported white rice was brought in Simikot, or from upper China if not available in Simikot. Families could afford to buy rice, however when there was no rice flown in from Nepal, they had to walk for a few days to the Chinese border to buy rice or rice flour.

We don't face any food scarcity, because we buy rice and wheat flour from upper China. We have many horses and mules for carrying goods so we don't face problems with that. We buy food from China, but if we didn't had that, if we had to depend on our fields, we would have problems. (Nyinba woman, 34 years old)

In contrast, in Thehe, Hindu families experienced food insecurity as expressed in shortages of meat, rice and vegetables.

We face food scarcity most of the time. You can buy white rice in Simikot, but we don't have money to pay rice. So, we depend on whatever is cultivated in the fields. We face many food shortages because we don't have sufficient land to cultivate. We work in our own fields, and besides we also have to go to different villages of Bargaun VDC and work for Buddhists. In return, we get some food crops, like one sack full of grains, those kinds of deals: if you work in my field, I'll give you a bag full of wheat, or something like that. (Chhetri woman, 23 years old).

All Dalit households experienced chronic food insecurity, but mainly before the rainy season and during the winter. Food insecurity was linked to harvest failures, snow-covered fields during winter, thus no 'income' to buy good food (white rice), and having too many children and health problems. During times of food insecurity, most women stressed the importance of feeding men and young children first, resulting in their and their adolescent daughters depending on leftovers, or not getting any food at all. Even during pregnancy and lactation, women said that they had to eat leftovers in times of food insecurity.

Yes, I eat leftovers. First, I serve my husband. If his stomach is full then I can eat [...] Because we cook, we sometimes don't have a full stomach. We have to compromise. Men always get sufficient [food]. (Dalit woman, 25 years old)

We [women] don't get extra food. We're not given more care, even not during food scarcity. Men eat until they are satisfied, and then go away. (Dalit woman, 33 years old)

Food allocation during transitory life course events and stages

Menses

Nowadays, among the Nyinba, menses is not perceived as a problem. It does not lead to changes in diet or specific food pro- or prescriptions.

Nowadays, during menstruation a girl is treated normally. Only those who have a Dhahe (*shaman, Lama*) in their family have to do some things; they have to take a bath before entering the house, and are not allowed to touch the stove. But for us it's completely normal. We don't get extra food. Actually family members don't even know that a girl is having her period. No, we're treated completely normal. (Nyinba woman, 24 years old)

In contrast, Hindu women are regarded as impure and untouchable during menses. The first time a girl menstruates, she would be given fried flatbread once-only, as oil was considered healthy. During menses women were not allowed to touch men,

food, or enter their kitchen. Chhetri women stayed outside their kitchen, meaning that when there was only one room in the house, women had to stay outside, in front, or on the rooftop of their house. Dalit women were not even allowed to stay in or in front of their house. For at least four to six days they were confined to animal sheds during night, and daytime when there was no work. Women expressed their concerns on the difficult conditions they experienced, including extreme cold, lack of cloths and blankets, and dirty and dark circumstances.

Pregnancy, delivery, and the post-partum period

During pregnancy, most women continue their work in the household, and in the fields until the day of delivery.

On the day of delivery my whole family was working in the farm. I cooked snacks for them. I went to deliver the snacks and when I came back it was around 6pm. I started preparing dinner for everyone, but then I felt the pain, like stomach pain, and after a few hours I gave birth. It was a normal delivery. (Nyinba woman, 33 years old)

Many Buddhist and Hindu women complained about carrying heavy loads, such as firewood, during pregnancy. This was perceived as difficult and uncomfortable. Back pain often was the result. Women complained about lack of support by husbands:

Most husbands don't care about their wives when they're pregnant. They think it's a burden. The problem that I had was not physical, but more emotional. I didn't receive any support from husband. He was a bad husband, you know? He didn't care about the family. He used to drink alcohol every time and kept on gambling. And so I had to look after everything. I didn't have my mother-in-law to help me [...] (Nyinba woman, 48 years old)

Many Hindu women experienced bleedings and miscarriages, especially when the number of pregnancies increased. There were no pre- or proscribed foods for Nyinba women during pregnancy, the local rice wine (*chaang*) was allowed. The Hindu women from Thehe, on the other hand, said that certain foods, such as millet buckwheat and radish, were unhealthy, but women did not avoid anything due to general food insecurity.

We face many food shortages. Whatever we can get during pregnancy or menstruation, we take. Because we have lots of food scarcity. We have to work hard. When we, during pregnancy, don't eat and we have to work hard, blood will flow out. (Dalit woman, 18 years old).

After delivery, Nyinba women took a rest of between two weeks and three months, depending on their family situation. In joint families, women were supported by their mothers-in-law, and by their own mothers, and were able to rest many weeks longer than women living in conjugal families, who had to resume their tasks as soon as possible. During the immediate post-partum period, and the first month of breastfeeding (which sometimes was extended to four) Nyinba women changed their diet in order to gain more strength. In general they consumed

more butter, honey, meat, local red rice instead of white rice, and eggs, which was considered healthy food. Specific dishes and drinks included for instance *chhaang col* (hot rice wine with butter and honey, Lama), *tsampa* (dough of wheat flour with butter and honey, Lama); and *san* (millet with butter and honey, Lama). Buckwheat, white rice, black pulses, flatbread, turnips, spinach, radish, chili, pumpkin, and potato were restricted. The exact reason was unclear for most women but they took on the advice of ancestors. Some explained that spinach and pumpkin would cause the baby motion problems and diarrhoea, potato was believed to cause skin allergies, and radish would cause a cold.

Hindu women were seen as impure after delivery. The same practices as during menses were adhered to. For approximately 25 days, or depending on the season and workload, women were confined to cowsheds. Hindu women also believed that they should change their diet during immediate post-partum. Sour, spicy and oily food, including almost all available fruits such as apples and peaches, were avoided. Some women also believed that millet flatbread, buckwheat and radish would damage the baby's health, while rice, eggs and green vegetables should be eaten extra. Despite these beliefs, many women told that they could not comply with these pre- and proscriptions because of food scarcity.

During breastfeeding there are specific foods we should avoid, and there are specific foods we have to eat extra. But we always face food scarcity. We eat whatever is cooked. So I didn't avoid any foods, and I didn't get extra food. (Dalit woman, 33 years old)

I wanted extra food, but my husband is very lazy. Instead, I had to cook and serve him. (Dalit woman, 38 years old)

Anthropometric indicators of nutritional status

In the Nyinba group, 11 out of the 15 women had a BMI within the range of 18.5–24.99, and a MUAC of over 23 centimetres showing no signs of undernutrition. Interestingly, two women from joint Buddhist families had a BMI over 25, indicating being overweight. One woman had a BMI below 18.5 (17.3) and one woman had a MUAC below 23 (21.5) indicating they were underweight, or thinness grade one, and maternal malnutrition. However, they rated their health as neutral and good respectively.

Three out of seven Hindu women had a BMI between 18.5 and 24.99 or a MUAC over 23 centimetres showing no signs of undernutrition. Two of them rated their health as poor, whilst the other woman rated her health as good. Four out of seven Chhetri women, all except one living in conjugal families, had a BMI slightly below 18.5 (18.2, 18.1), or a MUAC between 21 and 23 (22, 21.5) indicating thinness grade one, and maternal malnutrition. Two women rated their health as good, whilst the other two rated their health as neutral or poor. Only two out of the eight Dalit women had a BMI within the healthy normal range of 18.5 and 24.99 (19.2 and 19.1). However, they rated their health as neutral or

poor. The other six women had a BMI below the cut-off point of 18.5, or a MUAC below 23 indicating maternal undernutrition. Except for one woman, all rated their health as neutral or poor.

CONCLUSION AND DISCUSSION

In this study, we examined the influence of family and gender on intra-household allocation patterns of food in two adjacent Himalayan communities both with a variant of a joint family system, but differing in the rigidity of patriarchy and gender bias. Family systems are known to influence aspects of social organisation and behaviour and thereby impact health outcomes. Previous research by Das Gupta (1999) has shown the adverse implications of patrilineal joint family systems for women's health outcomes. In the present study, we compared a community of Tibetan Buddhists, practising fraternal polyandry, and a community with Hindus of both the Chhetri and Dalit castes in terms of women's nutritional status. Previous research has shown that Tibetan Buddhist women in this region have more autonomy and economic independence than Nepalese Hindu women. We conducted 30 in-depth interviews with women of reproductive age (15–49), 15 in each community, and collected anthropometric indicators of all interviewed women.

Young married Buddhist women, who had just entered their husbands' households, were lowest in the household hierarchy, and did not have decision-making power regarding food. Although the women, as daughters-in-law, had to cook, it was the mother-in-law or father-in-law who had the decision-making power concerning buying and selecting food. Moreover, this power difference also became visible in the serving order, in which the daughter-in-law was served last. However, in the end, the food division was egalitarian, with women receiving equal portions in terms of food quantity and quality. During the transitory stages of the post-partum period and lactation, women were given more nutritious food in terms of calories and micronutrients. Hence, specific patterns of intra-household food distribution in this group did not affect women's nutritional or health status in a negative way.

In contrast, in the Hindu group gender bias was much starker, which became visible in several ways in food allocation patterns. Husbands had the decision-making power concerning food; women cooked, and served their husbands and children until they were satisfied. In times of food insecurity, which was chronic for most families, and during transitory stages of pregnancy, immediate post-partum, and lactation, this meant that women ate leftovers or nothing at all. Women were even more vulnerable during immediate post-partum, when they were regarded as impure and had to follow certain food proscriptions. They were denied micronutrient-rich food (e.g., fruit and vegetables) and had to confine themselves to unhygienic places. This negatively influenced the MUAC and BMI of all Dalit women, and left many Chhetri women at the edge of undernutrition.

It is clear that women from the Tibetan Buddhist ethnic group were to a lesser extent confronted with gender bias in food distribution within the household than the Hindu women. Already in the 1980s a study by Levine (1987) found that after birth Buddhist women were released from work, and had to eat more nutritious food for at least a month. During the last 25 years much has changed, amongst others an increase in the number of Buddhist couples that live in conjugal households. Although the shift to a conjugal household composition means greater autonomy for women, for women's nutritional and health outcomes it may also have unintended negative consequences. We found that in such conjugal Buddhist families, women were only able to rest for one or two weeks as there was no mother-in-law who could take care of her. For these women the post-partum period was more difficult than for women living in joint families. Thus change in family systems, in this case in household structures, takes place, but does not always benefit women.

Clearly, unequal patterns of intra-household allocation of food and subsequent disadvantageous female nutritional status among Thehe Hindu women was based on allocation according to the household maximization rule (Behrman 1990), drawing on cultural notions of gender bias inherent in this rigidly patrilineal joint family system. The findings of this study are somewhat different from Gittelsohn (1991) who found in another Hindu community in West Nepal that men were given foods that no other household members ate. This was not the case in Thehe; there were no gender differences in terms of allotted foodstuffs, but in terms of quantity and quality of food. The nutritional status of women was also influenced by unhygienic conditions and bad caring practices during transitory stages. For both Chhetris and Dalits such gendered biased food allocation was a routinized process which was visible in serving order and food proscriptions during lactation. Hindu women thus encountered a double burden of undernutrition during immediate post-partum, and partly during menses and pregnancy. These women were already deprived of certain foods, but were extra deprived during these specific stages in which the need for nutritious food is even more. This is a serious problem as women in this still high-fertility setting spend a lot of time being pregnant and lactating. Upon reaching adolescence, girls would end up second-last in the serving order. This is in line with Zimmermann's (2012) study, which found that gender discrimination regarding education increased with age, leading to widespread gender bias once children were 15–19 years old, and with Gittelsohn's (1997) findings suggesting increased gender bias in food allocation with age.

Although the literature on gender and food security is increasing, the role of culture, and specifically of the influence of cultural norms of family systems, is still often ignored. The strength of this study is that it provides insights into the extent to which different variants of family systems regarding patriarchy and gender bias influence patterns of intra-household food distribution, and through that the nutritional and health outcomes of women. Although we did not include data on the characteristics of the different family systems, such as inheritance practices and succession, still there remains a clear difference between the family systems of the Nyinba and the Hindu communities. The absence of such data

might be a limitation of the study, and should be incorporated in future research. Furthermore, despite cultural norms of family systems and gender seeming to influence IHFA to a great extent, also poverty and the difference in wealth status between the communities, women's bargaining power, and women's level of educational attainment could influence the relation between IHFA and undernutrition. No individual socioeconomic status data was derived from the sample; however, in general, the Nyinba community was wealthier than the Hindu community as visible in differences between communities regarding the size of agricultural plots, housing, and other assets. Considering the interrelationship between poverty and gender inequality, economic development (but not confined to) is believed to improve gender equality by reducing the need for discriminative choices, and increasing resources. This improves women's condition by reducing their vulnerability (Duflo 2011). This could be the case in the Nyinba community where women were healthier than Hindu women. Furthermore, Alam (2012) found that women's bargaining power or status in the household increased when their income rose, translating into increased spending on her valuable goods, including child health and education. A higher level of women's empowerment and bargaining power could be the case in the Nyinba community, and especially in Simikot, where some women earned a second income. Here women had a better say in food preparation and consumption, which is a good proxy for women's bargaining power (Doss 2013). Additionally, also education increases women's empowerment, diminishes gender inequality, and leads to different consumption of goods compared to women without education (Haddad 1999; de Schutter 2013; Doss 2013). Compared to Hindu women, Buddhist women were, despite the same serving order, relatively more empowered and had higher educational levels. These factors could indirectly and further explain the more equal food allocation processes within Nyinba households. Finally, the food security status differed between the Buddhist and Hindu group. The first did not experience food shortages, while the latter did most of the year and during specific times of the year. During times of food shortages, Hindu women depended on leftovers even more. This is in line with Ramachandran's (2004) study, which found that reduced food consumption by women was a first step adopted by households faced with seasonal food shortages, so that the male members of the family and the children had larger portions of food. Duflo (2011) argues that women's vulnerability increases in times of crises such as food scarcity because discrimination against them would be more prominent. However, food shortages do not per se have to affect or change distribution processes, as Mottaleb et al. (2015) conclude, who found that cyclone-affected farms, experiencing loss of income crops, did not differentiate or change health expenditures between male and female household members. Anthropometric data on men's nutritional status could further explain the differences between communities. It is recommended to include this in future research in this area.

This study underlines the importance of family systems, their values, practices, and gender relations, as being determinant for the health and nutritional status of women. Such culturally rooted practices influence food and nutrition security and

other developmental outcomes of individuals, households, and communities. Although these norms are changing slowly over time, persistent distribution mechanisms related to the family as a universal institution still have a major impact on the position of women, especially during the vulnerable stages of their reproductive life course.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This study was funded by a research grant of the Neys-van Hoogstraten Foundation [FW/NP039].

References

- Acharya, M & Bennett, L, 1981. Rural women of Nepal: An aggregate analysis and summary of 8 village studies. Volume II, Part 9: Field Studies. Centre for Economic Development and Administration, Tribhuvan University, Kathmandu.
- Alam, S, 2012. The effect of gender-based returns to borrowing on intra-household resource allocation in rural Bangladesh. *World Development* 40(6), 1164–1180.
- Alesina, AF, Giuliano, P & Nunn, N, 2011. On the origins of gender roles: Women and the plough. National Bureau of Economic Research (NBER) Working Paper no. w17098. NBER.
- Alesina, AF & Giuliano, P, 2010. The power of the family. *Journal of Economic Growth* 15(2), 93–125.
- Backstrand, JR, Allen, LH, Pelto, GH & Chávez, A, 1997. Examining the gender gap in nutrition: An example from rural Mexico. *Social Science & Medicine* 44(11), 1751–1759.
- Behrman, JR, 1990. Peeking into the black box of economic models of the household. In Rogers, BL and Schlossman, NP (Eds), *Intra-household resource allocation: Issues and methods for development policy and planning: Papers prepared for the workshop on methods of measuring intra-household resource allocation*. United Nations University Press, Gloucester MA, USA, 42–50.
- Bobonis, GJ, 2009. Is the allocation of resources within the household efficient? New evidence from a randomized experiment. *Journal of Political Economy* 117(3), 453–492.
- Buvinic, M, Das Gupta, M & Casabonne, U, 2009. Gender, poverty and demography: An overview. *The World Bank Economic Review* 23(3), 347–369.
- Central Bureau of Statistics, 2012. National Population and Housing Census 2011, Nepal. Government of Nepal. National Planning Commission Secretariat. National Report, Volume 01, NPHC 2011. Available online: <http://countryoffice.unfpa.org/nepal/drive/Nepal-Census-2011-Vol1.pdf>. (accessed 21 January 2015).
- Childs, G, 2008. Tibetan transitions: Historical and contemporary perspectives on fertility, family planning & demographic change. Koninklijke Brill NV, Leiden, The Netherlands.
- Darnton-Hill, I, Webb, P, Harvey, PWJ, Hunt, JM, Dalmiya, N, Chopra, M, Ball, MJ, Bloem, MW & De Benoist, B, 2005. Micronutrient deficiencies and gender: Social and economic costs. *The American Journal of Clinical Nutrition* 8(Suppl), 1198S–1205S.
- Das Gupta, M, 1987. Selective discrimination against female children in rural Punjab, India. *Population and Development Review* 13(1), 77–100. doi:10.2307/1972121
- Das Gupta, M, 1999. Lifeboat versus corporate ethic: Social and demographic implications of stem and joint families. *Social Science & Medicine* 49(2), 173–184.

- Davis, K, 1955. Institutional patterns favoring high fertility in underdeveloped areas. *Eugenics Quarterly* 2, 33–39.
- De Schutter, O, 2013. Gender equality and food security: Women's empowerment as a tool against hunger. Asian Development Bank. Available online: <http://www.adb.org/sites/default/files/pub/2013/gender-equality-and-food-security.pdf> (accessed 20 January 2015).
- Den Hartog, AP, van Staveren, WA & Brouwer, ID, 2006. Food habits and consumption in developing countries. Manual for field studies. Wageningen Academic, Wageningen.
- DeRose, LF, Das, M & Millman, SR, 2000. Does female disadvantage mean lower access to food? *Population and Development Review* 26(3), 517–547.
- Doss, C, 2013. Intrahousehold bargaining and resource allocation in developing countries. *The World Bank Research Observer* 28(1), 52–78. doi:10.1093/wbro/lkt001.
- Dufló, E, 2011. Women's empowerment and economic development. The National Bureau of Economic Research. Working paper no. w17702. Available online: <http://www.nber.org/papers/w17702.pdf> (accessed 2 June 2015).
- Fledderjohann, J, Agrawal, S, Vellakkal, S, Basu, S, Campbell, O, Doyle, P, Ebrahim, S & Stuckler, D, 2014. Do girls have a nutritional disadvantage compared with boys? Statistical models of breastfeeding and food consumption inequalities among Indian siblings. *PloS ONE* 9(9), e107172.
- Food and Agriculture Organization, 1996. Rome Declaration on World Food Security and World Food Summit Plan of Action. World Food Summit 13–17 November, FAO, Rome.
- Gittelsohn, J, 1991. Opening the box: Intrahousehold food allocation in rural Nepal. *Social Science & Medicine* 33(10), 1141–1154.
- Gittelsohn, J, Thapa, M & Landman, LT, 1997. Cultural factors, caloric intake and micronutrient sufficiency in rural Nepali households. *Social Science & Medicine* 44(11), 1739–1749.
- Gittelsohn, J, Mookherji, S & Peltó, G, 1998. Operationalizing household food security in rural Nepal. *Food & Nutrition Bulletin* 19(3), 210–222.
- Griffiths, P, Matthews, Z & Hinde, A, 2002. Gender, family & the nutritional status of children in three culturally contrasting states of India. *Social Science & Medicine* 55(5), 775–790.
- Haddad, L, 1999. Women's status: Levels, determinants, consequences for malnutrition, interventions and policy. *Asian Development Review* 17(1–2), 96–131.
- Haddad, L, Peña, C, Nishida, C, Quisumbing, A & Slack, A, 1996. Food security and nutrition implications of intrahousehold bias: A review of the literature. Food Consumption and Nutrition Division: Washington DC.
- Haddix K, 1999. 'Excess women': Non-marriage and reproduction in two ethnic Tibetan Communities of Humla, Nepal. *Himalaya, the Journal of the Association for Nepal and Himalayan Studies* 19(1), Art. 9. Available online: <http://digitalcommons.macalester.edu/cgi/viewcontent.cgi?article=1647&context=himalaya> (accessed 8 July 2015).
- Hadley, C, Lindstrom, D, Tessema, F & Belachew, T, 2008. Gender bias in the food insecurity experience of Ethiopian adolescents. *Social Science & Medicine* 66(2), 427–438.
- Hajnal, J, 1982. Two kinds of preindustrial household formation system. *Population and Development Review* 8(3), 449–494.
- Kertzer, DI, 1991. Household history and sociological theory. *Annual Review of Sociology* 17, 155–179.
- Larme, AC, 1997. Health care allocation and selective neglect in rural Peru. *Social Science & Medicine* 44(11), 1711–1723.
- Levine, NE, 1987. Differential child care in three Tibetan communities: Beyond son preference. *Population and Development Review* 13(2), 281–304.
- Lorimer, F, 1954. Culture and human fertility: A study of the relation of cultural conditions to fertility in nonindustrial and transitional societies. Unesco: Paris.
- Maharjan, KL & Khatri-Chhetri, A, 2006. Household food security in rural areas of Nepal: Relationship between socioeconomic characteristics and food security status. Paper

- presented at the International Association of Agricultural Economics Conference, 12–18 August, Queensland, Australia.
- Marcoux, A, 2002. Sex differentials in undernutrition: A look at survey evidence. *Population and Development Review* 28(2), 275–284.
- McKay, K, 2002. Health needs in two ethnic communities of Humla District, Nepal. *Contributions to Nepalese Studies* 29(2), 241–273.
- Messer, E, 1997. Intra-household allocation of food and health care: Current findings and understandings. *Social Science & Medicine* 44(11), 1675–1684.
- Mondal, SK, 2003. Health, nutrition and morbidity: A study of maternal behaviour. development evaluation society of India (DESI). Bookwell, New Delhi,
- Mottaleb, KA, Mohanty, S & Mishra, AK, 2015. Intra-household resource allocation under negative income shock: A natural experiment. *World Development* 66, 557–571.
- Nunn, N, 2012. Culture and the historical process. *Economic History of Developing Regions* 27 (sup. 1), 108–126.
- Ramachandran, N, 2004. Seasonal hunger: Implications for food and nutritional security. In M.S. Swaminathan & Medrano Pedro (Eds.) *Towards hunger free India: From vision to action*. East West Books, Madras,.
- Ramachandran, N, 2006. Women and food security in South Asia: Current issues and emerging concerns. United Nations University, WIDER research paper. Available online: http://www.wider.unu.edu/publications/working-papers/research-papers/2006/en_GB/rp2006-131/ (accessed 15 January 2015).
- Sapkota, BN, 2001. The polyandry transition: Rural change and marriage practices in Nepal's Tibet frontier zone. Master's thesis, Development Studies, Population and Development, Institute of Social Studies, The Hague, The Netherlands.
- Skinner, GW, 1997. Family systems and demographic processes. In Kertzer, DI & Fricke, T (Eds), *Anthropological demography: Toward a new synthesis*. The University of Chicago Press, Chicago, 53–95.
- The Nepal Trust, 2011. Primary Healthcare Programme. Project proposal. The Nepal Trust, United Kingdom.
- Therborn, G, 2004. *Between sex and power: Family in the world, 1900–2000*. Psychology Press, London.
- Todd, E, 1990. *L'invention de l'Europe*. Éditions du Seuil, Paris.
- United Nations Children's Fund, 2012. Multiple Indicator Cluster Surveys (MICS). Available online: http://www.childinfo.org/mics4_questionnaire.html (accessed 1 July 2014).
- United Nations Field Coordination Office, 2013. District Profile: HUMLA. Mid Western Region, Nepalgunj, Nepal. Available online: http://un.org.np/district_profile/humla (accessed 25 June 2014).
- Ververs, MT, Antierens, A, Sackl, A, Staderini, N & Captier, V, 2013. Which anthropometric indicators identify a pregnant woman as acutely malnourished and predict adverse birth outcomes in the humanitarian context? *PLOS Currents Disasters*, Ed. 1. doi:10.1371/currents.dis.54a8b618c1bc031ea140e3f2934599c8.
- WHO (World Health Organization), 2004. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *The Lancet* 363(9403), 157–163.
- WHO, 2014. BMI classification. Available online: http://apps.who.int/bmi/index.jsp?introPage=intro_3.html (accessed 17 January 2015).
- Zimmermann, Z, 2012. Reconsidering gender bias in intrahousehold allocation in India. *Journal of Development Studies* 48(1), 151–163.

