



# Early Childhood Nutritional Implications of the Rise in Factory Employed Mothers in Rural Cambodia: A Qualitative Study

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## Abstract

**Objectives** Limited research has been conducted on the maternal and child health situation of garment factory workers in Cambodia. This qualitative study investigated the health-seeking behaviours for maternal and infant care of female garment factory workers in Kampong Tralach district, Cambodia.

**Methods** We conducted 54 in-depth interviews, six focus group discussions and observed two factories. Participants were pregnant women and mothers of infants who have worked in factories, young women currently working in factories, caregivers of children, village leaders, healthcare workers, and factory managers. Deductive and inductive thematic analysis was performed.

**Results** The women were accessing regular antenatal and facility-based delivery care. Most factory managers provided maternity leave, and some also provided leave for regular antenatal (ANC) visits. Women often returned to work 2 months post-delivery and this triggered the cessation of exclusive breastfeeding. Feeding was also compromised for the 6–12 months old children as carers, delayed the introduction of complementary feeds. Factories were equipped with childcare and breastfeeding spaces, however these were not used due to both feasibility issues and distrust of factory management. Instead, grandmothers were the preferred childcare providers.

**Conclusions for Practice** Current factory policies regarding ANC, maternity leave and childcare provisions are context insensitive to rural workers who live far from the workplace to avail themselves of mandated ANC leave or breastfeeding breaks. Our study suggest that the increasing number of young women working in garment factories is compromising the early nutrition of their children, with a reduction in exclusive breastfeeding and inadequate complementary feeding.

**Keywords** Infant and child nutrition · Garment factory workers · Cambodia · Breastfeeding practices · Complementary feeding

## Significance

*What is already known about this subject?* There is a rise in the proportion of young women working in the garment manufacturing industry in Cambodia, many of whom are mothers to young children and infants. Legal provisions exist for factory workers to access reproductive health services, including maternity leave and designated spaces and time to support breastfeeding at work.

*What this study adds?* For rural factories, the distance between the factory and home is too great to enable women to use legally mandated breastfeeding breaks. There is significant distrust of factory childcare provisions and uptake is low. Nutrition in infants of garment factory workers is compromised due to: early cessation of exclusive breastfeeding

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when women return to work and delayed introduction of adequate complementary foods by carers.

## Introduction

Cambodia has made significant strides in reducing maternal and child mortality over the past two decades. The under-five child mortality rate reduced from 108 deaths per 1000 live births in 2000 to 29 in 2015 (The World Bank 2015a). Likewise, the maternal mortality ratio declined from 484 per 100,000 live births in 2000 to 161 in 2015 (The World Bank 2015b). Progress has been attributed to the significant uptake of antenatal care (ANC), delivery with skilled birth attendants, and postpartum maternal and newborn care (National Institute of Statistics, Directorate General for Health, & ICF Macro 2015). According to the 2014 Cambodia Demographic and Health Survey (CDHS), 95% of mothers received ANC from a skilled health provider, 83% of births were facility-based deliveries, and 90% of women received postnatal care (PNC) in the first two days of delivery (National Institute of Statistics et al. 2015). Nonetheless, Cambodia consistently reported one of the higher neonatal mortality rates (NMR) in Southeast Asia, the national NMR being 18 per 1000 live births in 2014 (National Institute of Statistics et al. 2015). Vast geographical health disparities are observed between urban and rural populations and between provinces. Neonatal mortality in rural populations is more than twice the urban rates (at 23 per 1000 live births and 10 per 1000 live births respectively) (National Institute of Statistics et al. 2015).

The garment industry has played a central role to Cambodia's economy since the late 1990s, generating an estimated 15% of GDP, remaining one of the largest industries in the country alongside tourism (International Labour Organization 2015). In 2015, there were 640 registered garment and shoe factories operating in Cambodia, with over 607,000 workers, 85% of whom are women (International Labour Organization 2015). In recognition of the reproductive needs of women factory workers, there has been a significant legislative agenda to protect the reproductive

rights of women factory workers. Mandated entitlements include three months unpaid maternity leave, or at half pay if the employee has worked for 12 months and provision for leave for ANC visits, and breastfeeding breaks once a woman returns to work (Cockcroft 2014). These laws are summarised in Table 1. In recent years, there has been an increase in the establishment of factories, resulting in the expansion of factory locations from in and around the outskirts of Phnom Penh—Cambodia's capital—to rural regions of the country.

The study site is Kampong Tralach district, located in Kampong Chhnang province, and is one of the provinces with the highest neonatal mortality rate in Cambodia at 50 per 1000 live births in 2014 (National Institute of Statistics et al. 2015). 88,027 women and 18,317 children under-five reside in Kampong Chhnang. Kampong Tralach has nine registered garment factories and employs approximately 25,000 women. A majority of the workers employed are young women aged 18–25 and are either residents of Kampong Chhnang or immigrants from neighbouring provinces such as Kampong Cham, Kandal, Battambang, and Kampot.

Although women represent a high proportion of workers in the garment factory industry, the maternal health situation of this population in Kampong Tralach has not been studied previously and a background literature review reveals there is minimal research conducted about the health-seeking behaviours of pregnant factory workers in Cambodia. This qualitative study aims to identify and understand the care-seeking behaviours for maternal and infant health for female garment factory workers in Kampong Tralach district. The findings of this research will be used to inform national policies to improve maternal and newborn health outcomes for female factory garment workers in Cambodia.

## Methods

### Study Setting

The study was conducted in Kampong Tralach district, Kampong Chhnang province during July 2015. Kampong

**Table 1** The Cambodian Labour Laws regarding maternity leave & working mothers (Cockcroft 2014)

#### Factory work policies

Women are entitled to 90 days (3 months) of maternity leave (unpaid)

During the first 2 months after returning to work from maternity leave, women are only expected to do light work

Pregnant employees cannot be dismissed during maternity leave or immediately before taking leave

Pregnant employees are entitled to receive half salary and benefits in cash and full benefits, provided that the employee has worked for a minimum of one uninterrupted year at the factory

Factories employing at least 100 women or girls are required to establish a nursing room and a supervised child-care centre

For 1 year from the date of delivery, mothers who breastfeed are entitled to 1 h breastfeeding break a day during working hours

Tralach has nine garment factories and as such, has a high proportion of female factory workers residing in the area.

### Study Team

The research team consisted of 20 Cambodian staff of a large non governmental organisation in Cambodia, under the direction of a national researcher with over 10 years research experience and one international researcher who is a medical graduate with a PhD and extensive experience in teaching and conducting qualitative research. All the members of research team were experienced in conducting community surveys, individual interviews and facilitating focus group discussions (FGDs), and prior to the data collection for this study they participated in an intensive 3 day training in research ethics and qualitative research methods.

### Study Design

Multiple qualitative methods including observation, in-depth interviews and FGDs were employed. Fifty-four in-depth interviews and six FGDs were conducted across Kampong Tralach district. Interviews were conducted in pairs and FGDs were led by four researchers. The interview and FGD question guides were developed drawing on existing literature and explored the knowledge, attitudes and behaviours, and healthcare seeking related to pregnancy, childbirth, the postnatal period and early childhood (available upon request). Photographs representing women at different stages of pregnancy and during the postpartum period were used during FGDs as cues to stimulate discussion among the women, eliciting information from women on the health challenges at each stage of pregnancy, and where they seek care. Caregivers of young children were asked to provide a 24 h recall of food provided to that child.

### Sample Population

Multiple informant groups were included in the study to ensure that various perspectives were captured including: pregnant women and mothers of young children aged 0–23 months who have experience working in factories, women of reproductive age currently working in factories, caregivers of children whose mothers work in the factories, village leaders, health centre workers, and factory managers. The participants were selected from 12 villages in the immediate vicinity of the main garment factories in the district, and where the NGO sponsoring the study had had a program supporting health facilities, although they had had no direct involvement with any of the participants of the study. Interviews were conducted in the courtyards of the homes of participants, and FGDs conducted in community meeting spaces. A total of 109 people participated in the study. Two companies gave permission for the research team to visit their factories, observe the facilities and interview factory executives. Details of the study participants are outlined in Table 2, with the socio-demographics of pregnant women and women with young children presented in Table 3.

### Data Collection

The interviews and FGDs were conducted in Khmer and were audio recorded, translated, and transcribed to English. They lasted between 30 and 90 min. Each interview involved an interviewer and a note taker (and either one male and one female data collector or two female data collectors made up each team). Each FGD was conducted by a facilitator with two note takers. One factory manager declined to be audio-recorded, so written notes documented that interview.

### Data Analysis

Following data collection, an initial content analysis was performed, which identified the initial themes of the study. After the transcription of two to three interviews, the

**Table 2** Participant groups involved in the research

Group	Description	Number
1	Pregnant women and women who have a child 0–23 months who work in factories	22 Women, 10 currently pregnant, 12 with young children aged less than 2 years
2	Women of reproductive age who work in factories	Six focus group discussions involving 55 women
3	Village leaders	12
4	Caregiver of child with woman working in factory	12 (10 Grandmothers and 2 fathers)
5	Health centre workers—one midwife or health worker from six health centres	6
6	Factory managers	2
	Total	109 Participants

**Table 3** Characteristics of garment factory workers (Group 1)

Characteristics	Sample
Age	
Age range	19–37 years
Median age	26 years
Marital status	
Married	15
Separated/divorced	4
Unknown	2
Factory workers	
Pregnant	10
Women with children > 24 months old	12
Average income	USD \$75–200
Mode of transportation	
Motorbike	1
Car/van/truck	13
Unknown	8

research team met to re-read the transcripts and identify recurring concepts and subthemes using an inductive analysis approach. The remaining transcripts were coded against

**Table 4** Themes and sub themes examined in the study

Theme	Subthemes
Factory working conditions	General conditions (wages, hours of work, overtime, permission for leave, time off) Special provisions during pregnancy-delivery and for childcare Positive and negative aspects of work (autonomy, empowerment, pressure on overtime, personal safety) Rural versus urban factory work conditions
Healthcare facilities	Attitudes of healthcare providers Women's experiences of facilities Access (distance, cost, opening hours, waiting times) Health care centre services and standardised ANC/PNC guidelines Other providers (private, referral hospitals)
Childcare provisions	Choice of carer Childcare arrangements (lengths, location, payment)
Child nutrition and early childhood development	Initiation of breastfeeding and pre-lacteal feeding Breastfeeding and complementary feeding practices Child development
Maternal nutrition	Factory policies on bringing in and eating food during working hours Managing morning sickness Knowledge on good diet & practice on diet
Knowledge, attitudes and practices during pregnancy, delivery and postpartum period	Health knowledge Traditional practices & beliefs Change in behaviours Delivery site Hospital stay ANC & PNC check-ups
Female empowerment	Women's health-seeking behaviour Health autonomy: initiation of postpartum injections Women as providers Active participation in family planning

the identified key themes and thematically categorised. NVivo 11 was used to re-analyse the transcripts to ensure thematic concordance and to ensure that all possible themes were identified. This final analysis produced the key themes and subthemes presented in Table 4.

## Results

This study provides an insight into the behaviours, attitudes and practices regarding maternal and infant healthcare of female garment factory workers in Kampong Tralach district. Seven major themes were identified: factory working conditions; healthcare facilities; childcare provisions; child nutrition; maternal nutrition; knowledge, attitudes and practices during pregnancy, delivery and postpartum period; and female empowerment.

### Factory Working Conditions

The women worked 6 days a week and factory working hours are from 7 am to 4 pm, with an hour lunch break between 11 am and 12 pm. Overtime shifts were regularly offered

by factory managers and these ran until 6 pm. Although voluntary, overtime shifts were almost mandatory if the factory requests. Overtime pay bonuses were a significant incentive, resulting in many women to work past the regular working hours. Workers are transported by the factory to and from their villages in factory-supplied trucks, with limited seating reserved for pregnant workers. Most women left home at 6 am and often returned late in the evening. If the factory was completing an order that required overtime, the transport did not leave until after the overtime shift was completed. This made it difficult for women who relied on factory transport to get home at 4 pm, forcing them to participate in overtime shifts.

Pregnant workers were given special privileges and concessions by the factories including: time off each month for antenatal check-ups (this varied between factories as it is not a legal labour requirement); the ability to leave 15 min earlier at lunch time and at the end of the day; a seat in the transport vehicle; and maternity leave for 3 months starting 1 month before delivery. To claim these privileges, the women had to visit the health centre and receive a certificate confirming their pregnancy. These considerations for pregnant workers encouraged access to early and regular ANC:

We always inform women to check ANC and show the factory the card to ensure that they get checked up and thus their salary is not cut. Pregnant women are not allowed to do hard work. They are given half hour in the morning and another half in the afternoon to take rest. They are also allowed to leave 15 min before other workers so that they do not have to squeeze with others. The factory has schedule which women should go for ANC and there is a doctor in factory providing health education about how to take care and eating good food.

(Factory Manager, interview).

However, the women were often pressured to work overtime by factory managers and some pregnant workers worked until their due date. Factories would incentivise this through economical means, often resulting in women delivering in the factories:

The main pressure is from the factory because women are pressured to not take leave. As you know when you are working in a factory, not just for pregnant women, you tend to save up money, so the same, pregnant women don't want to take a leave just in order to save money. They work until on the birthing day.

(Healthcare worker, interview).

Pregnant worker: It would be better if you can deliver in the factory because there will be more support from the factory. The factory will be responsible. There will

be a company car to send us to the HC. But only if we can put up with working until then.

Interviewer: So they encourage the women to to work until close to the delivering date?

Pregnant worker: Yes. That's right, but again, only if we can put up with it until then.

(Pregnant factory worker, interview).

The availability of onsite breastfeeding spaces (i.e. a private breastfeeding room) is mandated by law for factories with more than 100 workers. In addition, women are allowed paid leave to breastfeed for one hour per day. Whilst these provisions were supplied by the factories, they were not used by the women, who cited, long travel distances between their home and the factory, a reluctance for their babies to travel to and from the factory in the midday heat, and unavailability of public transport:

I've never been in that room because this is for breastfeeding and there needs to be a father or grandmother to bring the child to the mother for the breastfeed. They give one hour breastfeeding. For me, because my house is too far away, I never bring my baby.

(Factory worker mother, interview).

Despite the long working hours, the women valued the opportunity to work and the economic independence and power associated with it:

Everything is good for me to work here because it helps me so much especially on economic front. I can receive a salary and I can borrow money from others, then I can return when getting my salary.

(Factory worker mother, interview).

## Healthcare Facilities

Most women sought regular antenatal and delivery care at local health centres and demonstrated high levels of knowledge on the positive effects of ANC and facility-based deliveries. Factories located near healthcare facilities allowed women to take one to 2 h (short) breaks for check-ups, while others which were located further, allowed half to one day visitation breaks (although this incurred a salary deduction). The long waiting times at facilities meant that short breaks were insufficient for ANC consultations, forcing some women to take half to one day leave which reduced their daily income. They also received an additional pay penalty when health centre staff forgot to sign the pregnancy registration card as their visits could not be verified:

It's difficult to get the medical report when women need to go for ANC. Sometimes the health centre pro-

viders do not write on the mother's card so it's hard for the factory to give permission to them.  
(Factory manager, interview).

To avoid the complications associated with weekday antenatal visits, most women elected to visit the health centre on their day off (Sunday). These however, presented their own set of challenges as there was usually a shortage of midwives during this time, with midwives attending to both antenatal consultations and labour patients. This resulted in an overwhelming workload for staff:

Usually on the weekend days I have hard work because if many labouring women come I have to keep OPD patients waiting for a while and give priority to labouring women, but if it is a working day we have many staff to help so I only work as a midwife in delivery room.  
(Midwife, interview).

Most health workers were described as friendly, their services satisfactory, and they generally established a good relationship with the women. Despite that, there was one report of a midwife mistreating a woman during labour, described by a grandmother who had also participated in the abuse. One father suggested that poor patients receive less care suggesting discriminatory care practices:

I was angry with her [pregnant daughter during labour]... she did not pay attention. I hit her and the birth attendant hit her too.

(Caregiver-grandmother, interview).

When my wife delivered, we gave the midwife 30,000 Riel (USD8). Now I don't know what the patient is meant to pay. If we bring the poor card the service is free; however, the nurses don't want us to bring it as they will earn nothing. Moreover, patients with that card do not get much attention from the midwives. (Caregiver-father, interview).

### Childcare Provisions

Family members, particularly grandmothers and fathers, were the preferred childcare providers after women returned to factory work. Mothers would typically return to work 3–6 months after delivery and leave their children in the care of grandmothers as they were perceived to provide better care and nurture than fathers:

I leave my baby with her grandmother or her father. With her grandmother is better, she is warm and more confident than her father. It would be better to care for the babies ourselves.  
(Factory worker mother, interview).

The option of paid childcare was also raised during the interviews, however, this was rarely used due to its high expense, with only one respondent utilising this option, citing it as a last resort:

I hired someone in my neighbourhood, because my mother lives too far away. It's difficult. It costs 100,000 Riel [USD \$25] a month.

(Factory worker mother, interview).

Whilst the legally mandated factory-managed childcare for children aged 18 months to 3 years was available, women were reluctant to use this service due to distrust of the factory administration and staff. This view was similarly expressed by one of the factory managers who stated that due to the lack of any employee using the childcare service, the assigned childcare staff were reassigned as factory workers instead:

The workers tell us that they don't want to bring their small children. Our workers are afraid that nobody will look after their children and they don't want anyone other than relatives to care for their children.  
(Factory manager, interview).

### Child Nutrition and Early Childhood Development

Two components of compromised child nutrition associated with mothers returning to factory work were identified: cessation of exclusive breastfeeding for infants aged less than 6 months and delayed or inadequate complementary feeding between 6 and 12 months. Early initiation of breastfeeding was usually practiced by mothers, facilitated by attending midwives, although some mothers reported withholding colostrum. The cessation of exclusive breastfeeding was triggered when women returned to factory work, which for some, occurred when the baby was less than 3 months old. Other mothers deferred returning to work until their child was eating complementary foods. For all mothers who returned to work, formula milk was the preferred breast milk substitute although it came at a significant expense:

While waiting for his [child] mother to return from factory work we feed him formula milk, mostly he drinks formula milk...quite an expenditure, he finishes one can in just three days, one can for 24,000 Riels [USD \$6], one-two days salary equivalent.  
(Caregiver-father, interview).

However, if the alternative feeding arrangement failed, many mothers would resign from work and stay home to care for their child instead:

After three months [post-delivery] my friend went back to work. You know what, her infant got diar-

rhoea which lasted for 17 days, because the formula milk is not suitable for the baby. Then she changed the milk brand but it still didn't work out so she quit the factory, and came back to look after the baby. (Factory worker, FGD).

The consumption of age-inappropriate foods and delayed complementary feeding was another factor with potential implications for child nutrition. When caregivers were asked to describe a 24 h recall of the food given, one father described giving porridge to a 3 month old, while one grandmother fed a 2 year old only milk. Fear of diarrhoea was cited by three grandmothers as the main reason to provide only porridge for children aged 6-12 months in their care:

Interviewer: So the white porridge is for the whole day from morning until evening?

Caregiver: Yes, I heat the porridge. I do not give anything else because I am afraid she [child] might get diarrhoea

(Caregiver-grandmother, interview)

Concerns relating to poor physical development and growth from the lack of motor activities such as running was also raised during one of the interviews. In this interview, the grandmother was the childcare provider for a 1 year old girl whose mother was a factory worker. This grandmother was elderly and to avoid running after her granddaughter, she would tie the child's legs every day to restrict her movements:

Interviewer: So when she woke up in the morning, you lifted her and put her on the bed and tied her legs?

Caregiver: Yes, tie her leg every day

(Caregiver-grandmother, interview)

## Maternal Nutrition

Morning sickness is a common symptom during early pregnancy and was experienced by many of the pregnant factory workers. The best way to manage morning sickness is through frequent snacking throughout the day, however most factories do not permit eating during working hours, resulting in the women to wait and only eat during lunchtime:

Interviewer: So we can say that one of the problems in here [photograph of woman in early pregnancy] is the morning sickness. A lot of it. Anything else?

Factory worker: We really want to eat sour fruit, but I'm afraid we got caught because we are working. If the Chinese boss see that, they will blame us...

Interviewer: So if you really want to eat, what do you do?

Factory worker: So we have to get out to eat, or wait until lunchtime

(Factory worker mother, FGD)

The women were aware about the importance of a good, well-balanced diet and some women altered their eating habits once they knew they were pregnant, opting for more nutritious foods such as vegetables and fruit. However, morning sickness restricted many women's appetite during the early stages of pregnancy, causing them reduce their food intake and variety of foods. Snacks and sour fruits were the preferred food choice of women during the early stages of pregnancy which were consumed in smaller, regular portions:

For me for the first three months, I had to eat sour fruits all the time. You know I could not eat rice and food, always about to throw up. The fruit can help take away the fish smell.

(Factory worker mother, FGD).

Other than being unable to manage morning sickness, working long hours without much rest was also challenging for the pregnant workers as many respondents reported feeling exhausted during the day but were unable to take leave due to the fear of wage deduction:

We have to work the whole day and get very tired, and with the morning sickness from the early stage of pregnancy, we still have to work to earn money to support our living. To be honest, if I could avoid it, I would rather stay at home during this period. But we have to struggle. You know like 8 h at work, it's terrible. Sometimes 10 h if you are in Phnom Penh. (Factory worker, FGD).

Despite that, some factories did make allowances for their pregnant employees by allowing them to bring in and eat snacks during working hours, which helped manage the women's morning sickness:

Interviewer: If you compare the pregnancy and non-pregnancy, when you eat more and more frequently?

Pregnant worker: I would say during pregnancy. Also more snacks because the factory allows to bring snack in. So I can eat during morning sickness. The factory wouldn't ban

(Pregnant factory worker, interview)

## Knowledge, Attitudes, and Practices During Pregnancy, Delivery, and Postpartum Period

All the study participants demonstrated widespread knowledge of the importance of ANC and facility-based delivery. There was a high uptake of ANC and skilled deliveries at healthcare facilities and the women were able to describe danger signs during pregnancy, and the importance of a good diet and iron supplementation:

When she [wife] knows she is pregnant she stops working hard, like carrying water, stops washing clothes and working hard, she works carefully. She eats lots of green vegetable like morning glory. She goes to check her health at centre regularly one time per month, she gets iron, and gets TT vaccination (Caregiver-father, interview)

Similar to other low- and middle-income countries, traditional pregnancy, birthing and postpartum beliefs and rituals are deeply embedded in Khmer culture. Food restrictions during and after pregnancy, and mother roasting (heating a stone and placing it on mother's abdomen to warm the body) after delivery were still practiced by some women. However, they were disregarded by a majority of the women following increases in community health education:

Before, most mothers dared not eat some kinds of food since they were afraid of agalactia. Now, they follow our instruction to eat every food that is good for them. Further, our patients reduce the practice of warming with fire. Another change is the abandon of practice of drinking salt water which is used to be practiced by older generation. After we advise to them the bad effects of such practices, they reduce it (Healthcare worker, interview)

Interviewer: So for women after labour, you stay at the hospital for three days to keep track of your health, as you mentioned earlier. So how about your work? How do you take care of your work?

Factory worker: You come back home and you can't heat the fire because it can cause a bleeding problem from the medication used during the labour. So we follow instructions, we can't do it [heating] immediately. But we can take medicine and drink water for one week, then we can start the heating if we want.

(Factory worker mother, FGD)

Facility-based deliveries were the norm and the preferred option of women. Women stayed at the facility up to three days post-delivery, receiving postnatal care and breastfeeding advice. During this time, many women reported

receiving frequent injections, which raised the concern of the overuse of postpartum injections:

Interviewer: What did they do after delivery?

Factory worker: They [nurses] gave me an injection and an intravenous perfusion. They gave me injections three times a day. When I came home I was wearing a thick and long cloth and a hat to prevent exposure to the heat... I was drinking herbal medicines and getting injections for ten days from the healthcare provider.

(Factory worker mother, FGD).

Postnatal care after patient hospital discharge was poor as most women did not seek health check-ups and healthcare staff did not conduct further evaluation on the women. Women only sought care if problems arose:

It's difficult. Because mostly we want to have at least 3 times follow-ups, but they couldn't come accordingly. Why? Because there seems to be nothing wrong with their health. So they think they don't really need to come back.

(Healthcare worker, interview).

Interviewer: During the first week of delivery and after leaving the health centre to stay at home, did anyone visit you?

Mother: No... If I have problems, my husband will bring me back to health centre.

(Factory worker mother, interview).

## Female Empowerment

Another striking finding was the role of women as (sometimes sole) breadwinners in their families. It was not uncommon to find women as single working parents in Kampong Tralach having been separated/divorced from their husbands. In some families, the women went to work whilst their husbands stayed at home and became child caregivers instead:

Before employing in garment factories, we used to earn a small income from pig farming and selling the home made rice wine or distilled spirits. But now most women work in garment factories and husbands stay at home all day.

(Village leader, interview)

The women's health-seeking behaviour, health autonomy, and their active participation in family planning are other examples demonstrating female empowerment. Reproductive health knowledge was apparent in the community with the women recognising different contraceptive methods and where to access them:

Interviewer: So you said that you don't want to have kids too often. What do you do to not have kids?

Mother: We protect. Injection, natural way, pills, an intra-uterine device, condoms.

Interviewer: How about women here, what do they usually use?

Mother: Mostly injection and pills. And some who don't want at all they can insert an intra-uterine device.

Interviewer: Pills from where?

Mother: From the health centre. They [healthcare staff] will check if each technique is suitable for us. If it doesn't work well, we have to discuss for more options.

(Factory worker mother, FGD)

## Discussion

This study explored the knowledge, attitudes and health-seeking behaviours for maternal and infant care of female garment factory workers in Kampong Tralach. Some of the findings of this study are consistent with previous research conducted in Phnom Penh, Svay Rieng, and Kampong Speu which also explored the maternal and infant health situation of female garment factory workers (Cockroft 2014; *Enfants and Development* 2015; Makurat et al. 2016; National Institute of Statistics et al. 2015; *Partnering to Save Lives* 2014; UN-Joint Programme for Children Food Security and Nutrition in Cambodia & International Labour Organization 2010). These include high access rates to ANC and skilled birth attendants, reasonable reproductive health knowledge, low levels of postnatal care, poor breastfeeding practices, delayed complementary feeding practices and inadequate maternal nutritional status. However, this study was unique in that it explores the maternal health behaviours of rural female factory workers in Kampong Tralach who are typically locals in the district. This differs to other studies which are conducted in more urban environments where worker migration is common. For example, as most women were living in their homes and had high levels of family support, the vulnerabilities expressed by migrant workers in Phnom Penh were not widely reported by the participants in this study (Cockroft 2014; International Labour Organization 2012).

Factory working regulations are developed for the protection and benefit of its employees. This study found that there was high factory compliance to legislated maternity leave, breastfeeding and child care arrangements in the two factories that gave permission for our visit. Yet, some of these provisions—such as nursing and crèche services—were context-inappropriate and irrelevant for rural factory

workers. In Kampong Tralach, many women worked long hours, had to travel at least 30 min to the factories from their homes, and shared factory provided transport to reach there. This resulted in the universal cessation of exclusive breastfeeding if mothers returned to work within 6 months of delivery, as it was not feasible to return home or bring children to the factories to be fed. The children received formula milk instead, usually starting from 3 to 4 months post-delivery, and some were breastfed at night when their mothers returned home.

There were no reports of mothers expressing breast milk in this study, however, a pilot study supporting working mothers to express breastmilk in Phnom Penh found that participants were reluctant to continue this practice, citing difficulties in transporting expressed milk between work and home and mistrust of the storage fridges at work (Cockroft 2014). In our study population there were many women living in homes without refrigerators making storage of expressed breastmilk impossible.

The benefits of exclusive breastfeeding are widely established; it contains all the essential nutrients required for optimal early child development and protection, and it is economical. Despite this, exclusive breastfeeding rates in Cambodia have declined in recent years from 74% in 2010 to 65% in 2014 (National Institute of Statistics, Directorate General for Health, & ICF Macro 2011; National Institute of Statistics et al. 2015). Further research is necessary to determine whether these lower rates correspond to increasing numbers of female factory workers.

Delayed introduction of complementary foods and early initiation of age-inappropriate foods were additional negative effects associated with working mothers. Official nutritional guidelines recommend that infants 6–24 months should be fed complementary foods in addition to breast milk, with these foods being rich in protein, energy, and micronutrients. Contrary to that, children in this age group were often fed a limited diet of foods such as porridge which are both energy- and nutrition-deficient. Nutrition essentials such as fresh vegetables, fruit, and meat were absent from many children's diet due to the fear of the children developing diarrhoea. This lack of a varied diet and poor nutrition intake raises concern given that chronic malnutrition is widespread in Cambodia and a global public health issue (National Institute of Statistics et al. 2015; Prak et al. 2014).

Stunting occurs in nearly one-third of children under-five, whereas 56% of children aged 6–59 months are anaemic, with the prevalence of this higher in rural regions (National Institute of Statistics et al. 2015). Kampong Chhnang, the province in which Kampong Tralach is situated, has one of the highest rates of stunting and wasting for children under-five at 43% and 11% respectively. The consequences of child malnutrition are severe for both childhood and adult life: it is the one of the major causes of child mortality, it hinders

physical and cognitive growth and development, and contributes to reduced work performance and productivity (UN-Joint Programme for Children Food Security and Nutrition in Cambodia & International Labour Organization 2010; UNICEF 2009).

Several recommendations which aim to address child nutrition and factory working conditions for pregnant and working mothers are raised. Given the importance of malnutrition in Cambodia, there needs to be increased support for exclusive breastfeeding for 6 months and improvements in complementary feeding practices. Options such as introducing part-time work for women for 6 months post-delivery so that they can continue to exclusively breastfeed could be considered. As a way to improve complementary feeding practices, caregiver support groups (or those of similar nature) facilitated by community health workers with training in early child nutrition could be established within communities to educate caregivers on the quantity, quality, and variety of complementary foods. One option would be for factories to equip available day-care centres with canteens which supply nutrition-rich foods so that both mothers and their children can receive healthy meals, yet the widespread distrust of factory administrators as providers of childcare is a barrier to enhancing the childcare policies through workplace means.

### Limitations

It is important to recognise the limitations of this study. As a qualitative study it may not be generalizable to other rural populations of garment factory workers. The inclusion of just two factories is a limitation, although the women described conditions in a number of other factories. Both factories had a strong union presence, which again, may not be representative of the working conditions/worker rights in other factories in the district, particularly those unregistered with the International Labour Organization. The data analysis followed standard guidelines for qualitative research with coding conducted by two researchers however there was no formal interrater reliability assessment conducted.

### Conclusions for Practice

There is a high uptake of ANC and hospital-based deliveries among the female garment factory worker population in Kampong Tralach. In terms of labour policies, many factories are compliant to legislated maternity leave, breastfeeding and child care arrangements, and most make allowances for pregnant workers to access regular ANC. However, the current factory policies regarding ANC care, maternity leave and childcare provisions are irrelevant to rural workers as they are context-insensitive and do not address the

women's situation, which results in the underutilisation of these breastfeeding and crèche services. The consequences of women returning to work after delivery is the cessation of exclusive breastfeeding and delayed introduction to complementary feeding, ultimately resulting in the prevalence of poor child nutrition. Understanding the maternal and child health situation of garment factory workers (and their children) is important as this is an under-researched area and the information obtained can be used to improve maternal and newborn outcomes for female factory garment workers in Cambodia.

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### Compliance with Ethical Standards

**Ethical Approval** Ethical approval was obtained from the National Ethics Committee for Health Research, Cambodia.

**Informed Consent** Informed consent prior to all interviews and FGDs were also provided by the participants. Participants were provided with a bar of soap as a form of appreciation and recognition of their time.

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