Mount Saint Vincent University

Department of Applied Human Nutrition

An exploration of the knowledge, attitudes, and practices of infant and young child feeding and labour laws among Cambodian factory workers

By

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Abstract

Background: Human milk is the ideal food for infants up to six months of age and continues to provide essential nutrients for two years and beyond. Rates of exclusive breastfeeding in Cambodia are currently declining, and at the same time, women are increasingly engaged in the paid labour force, particularly factory work. Cambodian Labour law allows 90 days of maternity leave, and evidence suggests that this early return to work and living away from children may impede breastfeeding. While limited research has been conducted on mother employees' knowledge, attitudes, and practices of nutrition and infant and young child feeding in Cambodian workplaces, little is known about the perspectives of other workers.

Objectives: To assess the knowledge and attitudes towards infant and young children feeding practices and peripartum labour laws among Cambodian factory workers. Also, to explore the infant and young child feeding practices and common reasons for breastfeeding cessation among mother employees.

Methods: In this cross-sectional study, interviewer-administered questionnaires were employed to collect data from three key groups in five Cambodian factories: women employees with a child <12 months (mothers; n=294), other women employees (women; n=145), and men employees (men; n=77). Descriptive statistics were computed of each subgroup's knowledge of, and attitudes toward, infant and young child feeding and Cambodian labour laws. Chi square or Kruskal-Wallis tests were employed to assess differences between subgroups. Infant and young child feeding practices and common reasons for breastfeeding cessation among mothers are presented using descriptive statistics, with proportions or means compared between dichotomized wealth groups using either chi square or independent samples t-tests.

Results: Most participants correctly indicated that infants should be exclusively breastfed for six months (70% mothers, 60% women, 58% men). Few participants correctly answered that infants should continue breastfeeding for two years or longer (22% mothers, 23% women, 23% men). Mothers were more likely than men to correctly answer questions pertaining to maternity-related Cambodian labour laws, including the length of maternity leave, wages received during this time, and additional breaks allotted for expressing milk upon return to work ($p<0.05$). Attitudes towards breastfeeding in the workplace were positive overall among all three groups; however, coworkers expressed more support for breastfeeding or pumping in the workplace than mothers felt they had ($p<0.05$). Actual IYCF practices were poor among mothers: 71% initiated breastfeeding within one hour of birth, 10% exclusively breastfed for six months, the average time for breastfeeding cessation was 3.3±2.1 months postpartum, and 61% of infants received infant formula in the 24 hours preceding this survey. The most common reason for cessation was mother's return to work (50%), and only 30% of mothers resided with their children.

Conclusion: These findings highlight gaps in breastfeeding knowledge and practices, despite positive self-reported attitudes, in Cambodian factories. The establishment of breastfeeding and other lactation supports in the workplace, enhanced IYCF and maternity leave education for all employees, IYCF education for primary caregivers, and lobbying for extended maternity leave policies, could be beneficial in optimizing early life feeding and nutrition in Cambodia.

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List of Abbreviations

CDHS	Cambodian Demographic and Health Survey
EBF	Exclusive breastfeeding
FAO	Food and Agriculture Organization of the United Nations
HIC	High income countries
HMS	Human milk substitutes
ILO	International Labour Organization
IYCF	Infant and young child feeding
LMIC	Low- and middle-income countries
MAD	Minimum acceptable diet
MDD	Minimum dietary diversity
MDD-W	Minimum dietary diversity for women
MMF	Minimum meal frequency
WHO	World Health Organization

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1.0 Introduction

Human milk is the ideal food for infants up to six months of age and continues to provide essential nutrients for two years and beyond (1). The World Health Organization (WHO) recommends the initiation of breastfeeding within 1 hour of birth, exclusive breastfeeding (EBF) for the first six months, and continued breastfeeding for 24 months and beyond alongside complementary feeding (2). Yet, in Cambodia, the rate of EBF are declining, with the percentage of exclusively breastfed children under six months dropping from 65% to 51% between 2014 and 2021 (3,4). One potential contributor to this decline is the rise in the number of women in the workforce. In 2021-2022, it was reported that 79% of women were employed in the paid labour force (4). Cambodian Labour Law allows 90 days of maternity leave, and for the first year after delivery, mothers are allowed an additional 60 minutes of break time for breastfeeding or expressing milk (5). However, recent evidence from Cambodian garment workers indicates that time constraints and living far from their children may impede the continuation of breastfeeding upon return to work (6). While some research has been conducted on mother employees' knowledge, attitudes, and practices of nutrition and infant and young child feeding in Cambodia, little is known about the perspectives of other workers. The purpose of this study is to document the knowledge and attitudes towards nutrition and infant and young child feeding and Cambodian labour laws from the perspective of mother employees, and other employees, to assess infant feeding and maternal nutrition practices among working mothers in Cambodian workplaces, and to explore the common reasons for breastfeeding cessation by working mothers.

2.0 Literature Review

2.1 Infant and Young Child Feeding

Globally, sub-optimal infant and young child feeding (IYCF) practices are associated with at least 35% of deaths, and 10% of the disease burden in children <5 years old annually (7). To combat this, in 1991, the WHO developed indicators for assessing and reporting breastfeeding and other infant feeding practices from birth up to two years of age, within and across countries (2). Since their initial release, these indicators continue to be revised to reflect new advancements in optimal breastfeeding and complementary feeding practices. In 2021, the United Nations Children's Fund (UNICEF) and the WHO updated these indicators, which currently serve as the guiding principles for the feeding of children 6-24 months of age. Seventeen indicators now exist to allow for standardized data collection and evaluation of infant IYCF practices worldwide. These indicators are split into breastfeeding indicators and complementary feeding indicators (see ***Table 2-1***). Some of the most commonly reported indicators from this standardized tool include the Minimum Acceptable Diet for Children (MAD), which is composed of Minimum Meal Frequency (MMF) and Minimum Dietary Diversity (MDD) scores. These three indicators aim to ensure appropriate feeding frequency with sufficient dietary variety to ensure optimal growth and development as well as to avoid micronutrient deficiencies and stunting (2). These indicators will be referenced in upcoming sections when discussing breastfeeding rates and infant diet.

***Table 2-1**. Select indicators from UNICEF and WHO breastfeeding and complementary feeding indicators (2)*

Indicator	**Definition**
Early initiation of breastfeeding	Percentage of children born in the last 24 months who were put to breast within one hour of birth
Exclusive breastfeeding under six months (EBF)	Percentage of infants 0-5 months of age who were fed exclusively with human milk during the previous day
Continued breastfeeding 12-23 months	Percentage of children 12-23 months of age who were fed human milk during the previous day
Minimum dietary diversity (MDD)	Percentage of children 6-23 months who consumed food and beverages from at least five out of eight defined food groups during the previous day
Minimum meal frequency (MMF)	Percentage of children 6-23 months of age who consumed solid, semi-solid or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more during the previous day • Breastfed children 6-8 months: 2 feedings • Breastfed children 9-23 months: 3 feedings • Non-breastfed children 6-23 months: 4 feedings
Minimum acceptable diet (MAD)	Percentage of children 6-23 months of age who achieved both acceptable MMF and MDD during the previous day

2.2 Human Milk and Breastfeeding

The first two years are of particular importance in child development, with feeding practices strongly influencing growth and development during this time and beyond (8). Human milk is the ideal food for infants: it contains all the nutrients required for optimal development within the first six months of life, and continues to provide essential nutrition after this time (8). The composition of human milk will change over time to match infants' age-related nutritional requirements (9). The WHO recommends breastfeeding initiation within the first hour after delivery, EBF for the first six months, and continued breastfeeding for 24 months and beyond alongside appropriate complementary feeding (2). EBF has been found to reduce the risk of

infectious disease and other morbidities, mortality, and prevent future non-communicable diseases such as diabetes mellitus and obesity (10). Both the short-term and long-term benefits of breastfeeding, as well as the global rates of breastfeeding, will be discussed in greater detail in the following section.

2.2.1 Short-Term Benefits of Breastfeeding

In addition to essential nutrients, human milk provides unique immunological and anti-inflammatory compounds that aid in several essential physiological functions and disease prevention (9). Some of the non-nutritive proteins in human milk, such as immunoglobulins (Ig), K-casein, lysozyme, lactoferrin, haptocorrin, α-lactalbumin, and lactoperoxidase have antimicrobial activity that contributes to immune defence against pathogenic bacteria and viruses (11). Maternal IgA and IgG are both passed through milk and will bind to toxins, bacteria, and viruses in the infant's body, inhibiting these pathogens from attaching to cells (9). IgA, in particular, protects against respiratory and diarrheal infection by acting on the mucosal surface to neutralize pathogens (12). Infants begin to generate their own IgA at approximately one month of age, meaning mother's milk is the exclusive source of IgA before this time and remains an important source until infant production reaches adult gut levels at about two years of age (13). These processes help develop and strengthen infants' immune systems and intestinal microbiota, decreasing the risk of infections and disease (11). A study conducted by Frank et al. (2019) (n=6861) found that EBF for six months conferred a 55% lower odds of contracting a gastrointestinal infection (OR=0.45 [95% CI= 0.32-0.62]) compared with no breastfeeding (14). A reduction in respiratory infection with reported fever was also observed in this sample (0.72 [0.60-0.87]) (14). A meta-analysis of studies mostly from low-middle income countries (LMIC) conducted by Horta et al. (2013) concluded that breastfeeding could prevent 72% [50%-84%] of hospital admissions for diarrhea and reduce the risk of diarrhea mortality by 77% [58%-87%];

with the highest effect observed in infants exclusively breastfed compared to non-breastfed infants (15). In addition, the risk of hospitalization for respiratory infections decreased by 67% [54%-76%] when children were breastfed compared to not breastfed (15). Another meta-analysis of seven case-control studies found breastfeeding reduced the odds of sudden infant death syndrome by 36% [19%-49%] as compared to no breastfeeding (16). Early introduction of complementary foods can also increase the risk of infection, as evidenced by a comparative prospective study in Nigeria (n=345) (17). This study found a 4.4 [2.1-9.3] fold increase in the risk of infants contracting a respiratory infection if complementary feeding was introduced before four months of age and a 2.3 [1.5-5.7] fold increased risk if introduced between four and six months (17).

2.2.2 Long-Term Benefits of Breastfeeding

Beyond the short-term benefits of breastfeeding, there is also evidence of long-term health effects that extend well beyond breastfeeding cessation. A meta-analysis of 25 (n=226 508) studies concluded that any breastfeeding was associated with an overall 22% [19%-26%] reduction in the odds of childhood obesity when compared with those who were never breastfed (18). This result aligns with a meta-analysis by Horta et al. (2015), which concluded that breastfed participants were less likely to be classified as obese/overweight when the child was 1-9 years of age (0.74 [0.70-0.78]) than those who were never breastfed (10). While more of an effect was observed during childhood, there was still a 12% reduction in the prevalence of overweight observed in adults ≥ 20 years of age if participants were breastfed as a child (0.88 [0.82-0.94]) (10). Breastfeeding also reduces the odds of developing type-2 diabetes: a meta-analysis of 7 studies (n=76 744) reported children who had been breastfed had a lower odds of developing type 2 diabetes later in life than those who were fed human milk substitutes (HMS) (0.61 [0.49-0.86]) (19). One potential mechanism for this lowered risk is the long-chain

polyunsaturated fatty acid content of human milk, which is thought to ensure an adequate number of insulin receptors in the child's brain and induce early changes in skeletal muscle, protecting against insulin resistance and ensuring normal glycemic metabolism (19,20). Breastfeeding has also been found to have positive effects on the cognitive performance of children later in life, with higher intellectual quotient scores associated with length of breastfeeding. A recent meta-analysis of 12 studies found that children who were breastfed for >6 months were more likely to have higher performance scores on intelligence tests (1.06 [1.05-1.08]) than those who had been breastfed for ≤6 months (1.02 [1.00-1.04]) (21) These results are consistent with a meta-analysis from 2015, which found that breastfed children achieved an average of 2.62 [1.25-3.98] points higher on intelligence tests than non-breastfed children, even when controlling for maternal intelligence scores (22).

In addition to long-term benefits to the infant, breastfeeding also confers positive long-term outcomes for mothers. A systematic review of the association between breastfeeding and maternal health outcomes found that ever breastfeeding was associated with a 30% risk reduction in ovarian cancer (0.70 [0.64-0.77]), as compared to never breastfeeding (23). The highest risk reduction was found among women who breastfed for more than 12 months, with a 37% risk reduction compared to women who never breastfed (0.63 [0.56-0.71]) (23). Duration of breastfeeding is an important factor in risk reduction of breast carcinoma as well, as breastfeeding for more than 12 months was found to confer a 26% reduced risk (0.74 [0.69-0.79]) compared to never breastfeeding (23). Breastfeeding duration is additionally linked to a lower risk of developing type 2 diabetes, as evidenced by a meta-analysis conducted by Aune et al. (2014), which reported that for each 12 month increase in lifetime breastfeeding, there was a 9% decrease in risk of maternal type 2 diabetes (0.91 [0.86-0.96]) (24).

2.2.3 Global Trends in Breastfeeding

Rates of breastfeeding differ around the globe, and can vary greatly by country and region.Globally, UNICEF reported that between 2015 to 2021, 47% of children were breastfed within 1 hour of birth, with the highest prevalence seen in Eastern Europe and Central Asia (72%), and the lowest in South Asia (39%) (25). High income countries (HIC) tend to have better initiation rates, with similar rates reported in Canada (91%), the United States (84%) and the United Kingdom (81%) (26–28). Lower income countries tend to exhibit lower rates, with 44% of LMIC meeting this recommendation (25).

Similarly, between 2015 to 2021, the global rate of EBF was 48%; South Asia showcased the highest rate (61%) and North America the lowest (26%) (29). This is an increase from 2012, when the global rate of EBF was 38% (30). The highest increase in EBF was seen in LMIC: a study completed to map EBF prevalence in LMIC from 2000 to 2018 found that EBF increased by ten percentage points over the 18 year period, with countries in South America and Southeast Asia having the highest rates overall (31).

With regards to breastfeeding continuation, in 2021, there was a 65% prevalence of continued breastfeeding for 12-23 months (32). Across all global regions, rates of continued breastfeeding were highest in households in the lowest wealth quintile (32), likely due to inadequate access to alternative methods of infant feeding . HIC tend to have a shorter breastfeeding duration than LMIC, (33) due to reasons such as perceived inadequate milk supply, breast and nipple pain, return to work, and maternal fatigue (34). These factors will be discussed in more depth in later sections.

2.3 Determinants of Breastfeeding

Many extrinsic factors affect whether and for how long a woman will breastfeed. Decisions pertaining to infant feeding are influenced by aspects such as familial, community and social structures, guidance from health care advisors, cultural expectations, and personal philosophies, to name a few. These factors also vary between LMIC and HIC, resulting in different breastfeeding rates and practices, as reflected in the differences in breastfeeding rates reported above. For the purpose of this thesis, factors impacting breastfeeding determinants will be grouped into four categories: maternal characteristics, societal support, familial support, and cultural influences, with a focus on LMIC.

2.3.1 Maternal Characteristics

Characteristics such as a women's age, self efficacy and knowledge can all influence infant feeding practices (35). While in HIC, older mothers are more likely to breastfeed exclusively, the opposite is true in LMIC, where younger mothers are more likely to follow this practice (35), given factors such as higher employment rates, maternal fatigue and difficulty combining work and domestic demands, among older mothers (35).

Maternal self confidence in breastfeeding is another predictive factor of EBF and breastfeeding duration (36). A prospective study from the Democratic Republic of the Congo (n=422) found that a mother's lack of confidence in breastfeeding was the strongest factor associated with the discontinuation of EBF before six months; mothers who were not confident in their ability to breastfeed were 3.9 [1.7-9.2] times more likely to cease the practice early, than those who were more confident (36). Similarly, a study from Hong Kong (n=199) found that mothers with a high level of breastfeeding self efficacy were 7.8 [2.5-23.7] times more likely to practice EBF than those with lower self efficacy (37).

Maternal knowledge of infant and young child feeding is an additional predictor of rates of EBF (38). A cross-sectional study from Ethiopia (n=860) found that mothers with low knowledge of IYCF practices were 3.4 [2.4-4.7] times less likely to practice EBF than mothers with high IYCF knowledge (39). Similarly, a cross-sectional study from Tanzania (n=316) reported that mothers with higher breastfeeding knowledge were 2.2 [1.2-3.8] times more likely to EBF than those with poor knowledge (40). Additional maternal characteristics cited as contributing to early cessation of breastfeeding include breast and nipple pain and post-partum depression (34,41).

2.3.2 Societal Support

The amount of breastfeeding counselling and support women receive from healthcare workers is a good predictor of breastfeeding rates (7). The WHO defines breastfeeding counselling as support that health care workers provide to mothers in decision-making, overcoming difficulties, and implementing optimal feeding practices (7). A systematic review of 63 studies found that breastfeeding counselling reduced the risk of women stopping any breastfeeding at 4-6 weeks by 15% (RR 0.85 [95% CI= 0.77-0.94]) and at six months by 8% (0.92 [0.87-0.97] compared to no counselling support (42). The effect was even more pronounced for breastfeeding exclusivity, with a 21% reduction of cessation at 4-6 weeks (0.79 [0.72-0.87]) and 16% at six months (0.84 [0.78-0.91) (42).

Support from a woman's community is another significant predictor of breastfeeding rates. Community support can come in different forms, such as social groups for mothers or one-on-one peer support. In LMIC, the presence of community support programs increased the rate of EBF at five months by 9.55 fold ([6.65-13.70]; 2 studies; n=1448) (43). A randomized control trial in Syria (N=876) found that community-based post-natal home visits with registered

midwives significantly increased EBF among mothers when compared to no post-natal visits (p=0.023) (44).

2.3.3 Familial Support and Partner Attitudes

A further predictor of a mother's breastfeeding practice is support given by the family. In a cross-sectional study from Indonesia (n=158), women with adequate support from partners and grandmothers had a higher likelihood of practicing EBF (2.89 [1.29-6.44]), compared to those for whom familial support was low (45). Family members can contribute to adherence to proper breastfeeding practices by emphasizing the important nourishment human milk provides to infants (45).

Among familial support, support from a spouse/partner is an important determinant in women's breastfeeding decisions (46,47). An Australian study (n=1059) concluded that mothers who received breastfeeding support from the infant's father were 9.13 [4.83-17.26] times more likely to breastfeed at hospital discharge than mothers without support (46). Similarly, in Malaysia, mothers with husbands supportive of breastfeeding were four times more likely to practice EBF, compared to those with non-supportive husbands (4.20 [1.12-15.75]) (47). Two factors that contribute to this support are a partner's high level of knowledge and positive attitudes towards breastfeeding (48). However, due to cultural differences, these factors can not be generalized across countries. For example, in Malaysia, a cross-sectional study (n=196) found that fathers of infants 6-24 months of age had a high knowledge of EBF, with 75% understanding the practice and 95% understanding the advantages for the infant (49). However, while most (80%) of fathers in this study reported supporting their partners if they chose to practice EBF, the practice was only supported if done in private, as most (82%) had negative attitudes toward breastfeeding in front of others (49). Similarly, a cross-sectional study of fathers from Turkey (n=203), found

that half of these fathers were uncomfortable if their wife breastfed in public, yet almost all (92%) still wanted their baby to be breastfed (50). In some countries, mothers experience partners with both low knowledge and poor attitudes towards breastfeeding. An exploratory study from Nigeria (n=200) found that despite most (83%) men having heard of EBF, they showcased both poor knowledge and attitudes towards the practice (51). Less than half (43%) could correctly define what EBF was, and many (43%) were not accepting of the practice, with most (69%) not believing that human milk alone should be the only nourishment for infants under six months (51). These low levels of knowledge and poor attitudes toward breastfeeding discourages mothers from partaking in the practice, and contributes to the low levels of EBF in the country (17%) (51).

2.3.4 Cultural Influences

Cultural norms play a large role in a mother's decision to breastfeed. Often in Western societies, breasts are highly sexualized by the media, reducing the connection of the breast with infant feeding (52). This is in part due to a lack of visibility of breastfeeding in public. This is exemplified by a recent study from Nova Scotia, which found participants were more comfortable (on a visual analog scale of 1-10) looking at photos of women breastfeeding in private spaces than public ones (7.9 [95% CI:7.7-8.1] vs, 7.3[95% CI:7.0-7.5]) (53). However, in many LMIC, breastfeeding in public is a common practice (54), although non-optimal feeding practices such as delayed breastfeeding initiation do still exist given cultural or religious norms (52). For example, reports from Ghana note that some first time mothers go through a cultural cleansing process which lasts three to four days before they can breastfeed, and in some Muslim families, three Adhan calls (calls to prayer) must be held before a baby can first feed, delaying the onset of feeding for up to 8-16 hours (52). Additionally, some cultures, mainly in Africa and

Asia, promote discarding colostrum, believing it has little value, is dirty, may be harmful to the baby, or is bad luck for the baby to consume (55,56).

2.4 Risks of Not Breastfeeding in Low-and Middle-Income Countries

The benefits of breastfeeding are outlined above, but another important consideration is the alternative, the risks associated with not breastfeeding. Suboptimal feeding practices confer severe consequences for infant and child health, including a higher risk of death among children <5 years of age (57). In 2021, the mortality rate of children under 5 in LMIC was 38 per 1000 live births, with Africa and the Eastern Mediterranean the most prominently affected areas (60). The practice of EBF could help to reduce these figures, as not only does human milk contain bioactives that support immune development, but because human milk substitute preparation is inherently risky given the need for sterilization and clean water.

A meta-analysis of 13 studies, predominately from Africa, Latin America, and South-East Asia, found that the risk of all-cause mortality was significantly higher among non-breastfed (14.4 [6.13-33.9]), partially breastfed (2.84 [1.63-4.97]), and even predominately breastfed (1.48 [1.13-1.92]) infants compared to EBF infants (57). North et al. (2021) used the Lives Saved Tool to estimate mortality related to suboptimal breastfeeding practices on data from 123 countries. The authors estimated that nearly 200 000 deaths among children <5 years could be prevented in LMIC between 2020 to 2030 if early, exclusive, and continued breastfeeding rates increased to meet the 2030 goals set by the WHO to have coverage of 60% to 80% (59).

In addition to the risks of not practicing EBF, consideration must be given to the alternate foods given to children who are not breastfed. When HMS are used, it is important to consider the possible adverse health risks, particularly in low-resource settings with poor sanitation and hygiene, due to the higher risk of contamination. Reconstituted infant formulas are classified as a

high risk food for infants due to infants' susceptibility to enteric bacterial pathogens, their severe response to enterotoxins, and the increased risk of mortality from infection given immature immune systems (60). Powdered infant formula is an ideal food environment for the growth of pathogenic bacteria due to its nutrient composition (61,62). For example, infant formula is fortified with iron to minimize the risk of iron deficiency anemia; however, iron is also necessary for the growth of many pathogenic bacteria (62). To avoid possible contamination and pathogen growth, the WHO has created guidelines for the use of HMS coined the *Acceptable, Feasible, Affordable, Sustainable, Safe (AFASS) Principles* that should be met to safely formula feed (63). Here caregivers should have access to safe water and sanitation at both the household level and in the community to keep equipment clean and properly sanitized, to reduce the risk of contamination (63). In resource-poor settings, access to these materials may be unavailable; therefore, the proper cleaning, sterilization and storage of these products may be unattainable. Therefore, the use of HMS in resource-poor areas of LMIC presents adverse risks to infants that can be avoided with the practice of breastfeeding.

A further factor to consider when HMS are used is how this affects a household's food security. Food security is a complex and multidimensional concept; thus, its definition varies across disciplines and countries (64). The most widely accepted definition comes from the FAO, which states that food security occurs when all people at all times have physical, social and economic access to sufficient and nutritious foods that meet their dietary needs for a healthy and active life (65). Purchasing HMS could threaten food security for the entire family, as the cost of these substitutes can use up a large proportion of the family income (66). As of 2019/20, 25% of Cambodian households were food insecure or vulnerable to food insecurity, largely driven by economic vulnerability (67). On average, households spend almost half (49%) of their monthly

income on food, with poorer households spending upwards of 60% (67). Households that face food insecurity may employ food or non-food based coping strategies to protect their basic needs (68). One such strategy is the reduction of food intake of some family members to reallocate food to others (69). This inequitable intrahousehold food allocation often prioritizes the nutritional needs of the children and male members of the household over the women, placing women at risk for lower dietary diversity (70). Families may also focus on cooking what is available in their home, switch to cheaper, lower quality foods and decrease the intake of non staple foods such as those from animal sources (68,71). These food reductions impact the diets of the entire household, resulting in decreased dietary diversity and quality (68,71). Additionally, expenses are often reduced in other areas of life, such as child education, health care and shelter (68,72).

2.5 Maternal Nutrition

The physiological demands of pregnancy and lactation make women of reproductive age more nutritionally vulnerable (73,74). During pregnancy and lactation, a women's requirements for nutrients such as protein, iron, thiamine, vitamin B12, folate, iodine, and zinc all increase to help support the growth and development of the fetus and infant (74). Therefore, insufficient nutrient intake before and during pregnancy and lactation can detrimentally affect both mother and infant, particularly during the critical first 1000 days period (75). However, often in resource poor settings, women of reproductive age have diets that lack the diversity required to provide sufficient nutrients resulting in nutritional deficiencies in both women and children (76).

To assess the dietary quality in women of reproductive age, in 2015, the FAO launched the Minimum Dietary Diversity for Women (MDD-W) indicator, which included nine food groups

(77). In 2021, this indicator was updated and now includes ten food groups, with consumption of <5 of these groups in a given day indicating a low dietary diversity status (77).

2.6 Cambodian Context

2.6.1 Overview of the country

The Kingdom of Cambodia is a Southeast Asian country located on the Indochinese peninsula, bordered by Vietnam, Thailand, Laos, and the Gulf of Thailand (78). It is a predominantly agricultural country, with 61% of the population residing in rural settings (79). However, urbanization is rising in the country, with the urban population increasing by 17 percentage points between 2014 and 2019 (79). The national population is also growing; between 2008 and 2019, the population expanded from 13.4 million to 15.5 million (an average annual growth rate of 1.4%) (80). Cambodia has had a tumultuous history following its independence from France in 1953 (3). In 1970, a military coup overthrew the country's national leadership, resulting in a civil war raging for the next five years between the Khmer Rouge regime and the new power (3). In 1975 the Khmer Rouge took control of the country, with this new regime resulting in the death of nearly 2 million Cambodians over the next four years until the genocide ended in 1979 (3). Cambodia is classified as a lower-middle income country (81), and in 2019,18% of the population lived below the poverty line (82). However, with the onset of the COVID-19 pandemic it is unknown how the country currently fairs. This crisis impacted the tourism and labour markets resulting in the country having its worst economic performance in 16 years, and a rise in poverty rates of approximately 2.8 percentage points from before the pandemic (81). This COVID-19 related rise in poverty has likely exacerbated pre-existing health issues, particularly for infants and children.

The most recent Cambodian Demographic Health Survey (CDHS) estimated infant mortality rates to be 12 per 1000 live births and the under-five mortality rate to be 16 per 1000 live births

(4), these rates are likely now higher given the rise in poverty levels, particularly in rural areas (81). In terms of child nutrition, almost one quarter (22%) of Cambodian children under five were stunted (4), and while this was a significant improvement from previous years (2014 32%; 2010 40%) (3,83), a stunting prevalence of between 20%-29% is considered to be high as defined by the WHO/UNICEF prevalence thresholds (84). There is also a high prevalence (as classified by the WHO/UNICEF prevalence thresholds) of wasting, with 10% of children under five years old being classified as such (4). Infant nutrition practices in Cambodia will be discussed in more explicit detail below; however, it is important to note that inadequate IYCF practices, which are of concern in Cambodia, contribute to elevated levels of child morbidity and mortality. Poor maternal nutrition can also contribute to an intergenerational cycle of poverty and malnutrition. National data from 2014 indicate that 14% of women of reproductive age were undernourished, and 45% were anemic (3). In 2016, the government of Cambodia released its National Social Protection Policy Framework aimed to support income security, alleviate poverty, and promote welfare for all citizens (85). This framework-aims to enhance current social systems, including those aimed at increasing nutrition education programs for pregnant and lactating women and children to promote maternal and infant health (85).

2.6.2 Breastfeeding Rates in Cambodia

According to the 2021-2022 CDHS (4), the prevalence of early initiation of breastfeeding and EBF are declining. In 2014, 63% of infants were put to breast within 1 hour of birth (3); however, in 2021-2022, this rate declined to 50% (4). Similarly, in 2021-2022 the EBF rate was 50% (4), down from 65% in 2014, with practice rates higher in rural areas (58%) than urban areas (35%) (4). Similar data were reported in a recent cross-sectional study, which found a significant difference between EBF rates at 5.5 months between urban Phnom Penh (7.9%) and two rural provinces, Kratie and Ratanakiri (22.1% and 23.9%, respectively; $p<0.001$) (86). Of

additional concern was that only 30% of children in Phnom Penh were still receiving any human milk at six months, compared to 94% in the rural provinces (86). Nationally, in 2021-2022, only 40% of children continued to be breastfed to the WHO-recommended age of 24 months (3).

2.6.3 Infant and Young Child Feeding Practices in Cambodia

Beyond breastfeeding, adherence to additional feeding practices is a cause of concern. Before any comparisons can be made between infant feeding trends from the updated 2021-22 CDHS and the versions proceeding this, some important changes should be noted. Of particular relevance, the requirements for MAD were updated in 2021; therefore, these data ultimately differ from previously reported data. Previous to 2021, MAD included the consumption of human milk or other types of milk or milk products as a third category; in 2021, this indicator was omitted, and MAD encompasses only MDD and MMF (2).

Timely introduction of complementary foods was adequate, with 88% of infants in 2021-2022 receiving complementary foods at six months (4). However, while these children are receiving foods at the correct age, the quantity and diversity of food are where shortcomings can be observed. In 2021-2022, over three quarters of infants 6-12 months met MMF (85% of those aged 6-8 months, 82% of those aged 9-12 months) (4), an increase from 2014 (72% of those aged 6-8 months, 70% of those aged 9-12 months) (3,4). In regards to the diversity of these diets, in 2010, 37% of children met MDD, and an increase has been observed since then (48% in 2014, 51% in 2021-2022) (3,4,83). A similar trend was observed for the composite MAD score (24% in 2010, 30% in 2014, 42% in 2021-2022) (3,4,83). Similar results were found by a cross-sectional study from 2022 (n=2724), which found that 37% of children 6-23 months met MAD, 55% met MMF, and 36% met MDD (87).

2.6.4 Use of Human Milk Substitutes

The use of HMS is a common practice in Cambodia, with usage rates increasing, despite the known risks of this practice described above (3,83,88). In 2014, 31% of non breastfed infants <24 months received HMS, increasing to 63% in 2021-2022 (3,4). Usage of HMS was lower among breastfed infants <24 months, with 17% of those in 2021-2022 receiving HMS (4). Additionally, a cross-sectional study conducted in Phnom Penh (n=294) reported high HMS usage, with almost half (43%) of children <6 months and 29% of those 6-23 months receiving HMS in the day prior to the survey, regardless of breastfeeding status (88). As with the CDHS, a majority of non-EBF children in this sample (67%) consumed HMS (88). Maternal employment was significantly associated with children receiving HMS ($p<0.001$), with mothers who worked outside of the home 2.3 [1.5-3.4] times more likely to provide their children with HMS than those who did not work outside of the home (88). Of course, a counterpoint to these data could be that HMS like infant formula is a better alternative to other non-human milk foods such as coffee creamers, watery rice porridge, or cow's milk since, when prepared safely and appropriately, infant formula is formulated to meet infant nutritional needs. This may be the case in Cambodia, as within the sample of mothers from Phnom Penh, although almost half of infants <6 months received HMS, very few (5%) had started complementary feeding (88).

2.6.5 Women's Dietary Diversity

Women's dietary diversity is generally poor in Cambodia. According to the CDHS 2021-2022, 57% of women were meeting adequate dietary diversity (4). A study conducted with garment factory workers in Phnom Penh (n=158) found that on average, women were consuming 4.7 [3.6-5.8] food groups, which at the time of this study was deemed adequate (89). However, this adequate rating could be due to the urban setting of this study, as a different cross-sectional study of MDD-W among women from Phnom Penh and two rural Cambodian provinces concluded

that MDD-W was higher among urban than rural women ($p<0.001$) (86). Similarly, a study of women's dietary diversity in Kampong Thom province (n=430) found that less than half (44%) of women achieved MDD-W (90). However, it is important to note that little research is available on women's dietary diversity after the 2021 update of the MDD-W from nine to ten food groups; therefore, most data presented uses the previous definition of adequacy.

2.6.6 Knowledge of Infant and Young Child Feeding

Knowledge is a key predictor of breastfeeding practice (38). While little research has been conducted on mothers' knowledge of ICYF in Cambodia, evidence to date indicates that knowledge is generally low. A cross-sectional study completed in Phnom Penh (n=312), with mothers of children aged 6-24 months, found that over half (55%) did not have adequate knowledge of breastfeeding practices (91). An additional study completed by the Khmer-Soviet Friendship National Hospital in Phnom Penh (n=119) asked mothers 15 knowledge questions related to breastfeeding (92). On average, mothers were able to answer between 5-6 of the 15 questions correctly ($\bar{x}=5.70$, $\sigma=1.57$) (92). However, within this study, it was found that multiparous mothers had a significantly higher knowledge of proper breastfeeding techniques than first time mothers ($p=0.025$), showcasing that knowledge is gained with parenting experience (92).

2.6.7 Attitudes Towards Breastfeeding

Breastfeeding is the cultural norm in Cambodia; given its ubiquity, there is little research exploring the attitudes towards this commonplace practice (93). As such, not much thought is given to attitudes towards breastfeeding in the country. One exploratory study (n=141) from Kep province did assess mothers' attitudes towards the practice, concluding that nearly all (94%) mothers believed in breastfeeding for the recommended six months, with three quarters indicating comfort with breastfeeding in public (94). As with mothers, little research has

investigated men's breastfeeding attitudes. One qualitative study which conducted IYCF nutrition education sessions found that paternal attendance was low due to fathers' reported perceptions that their own workloads were too high and childcare was women's business (95).

2.6.8 Breastfeeding Support in Cambodia

As previously stated, the amount of lactation support women receive is a good indicator of breastfeeding rates. Per WHO recommendations, breastfeeding counselling should: be provided in both the antenatal and postnatal periods up to 24 months, be provided at least six times, be provided by appropriately trained health-care professionals and community-based lay and peer breastfeeding counsellors, and should establish skills, competencies and confidence among mothers (96). Cambodian health care professionals additionally recommend that women receive antenatal care within the first three months of pregnancy (3). The Government of Cambodia is working with Alive and Thrive to establish centres to deliver breastfeeding and early essential newborn care, including education on the importance of skin-to-skin contact and the early initiation of breastfeeding (97).

According to the 2021-2022 CDHS, nearly all (99%) women receive antenatal care from a skilled provider, with 86% attending four or more visits (4). These numbers show an improvement from 2014, when 95% of women received antenatal care, and 75% attended four or more visits (3). However, urban women are more likely than rural women to have more antenatal visits (85% versus 74%, respectively) and start these visits earlier (at two months versus three months, respectively) (3). Similar data were reported in Krong Kep province (n=141), where three quarters of women received some form of antenatal care, albeit often later than recommended, with almost half not receiving care until the fifth month of pregnancy (94). Within this study, almost all (96%) women stated that breastfeeding support programs or

"mother classes" did not exist in their village (94). Despite the low support levels reported, 64% of women reported being confident in their breastfeeding skills. Yet, low support levels coincide with gaps in breastfeeding practice (98). A qualitative study of 27 caregivers in Takeo province found that despite high knowledge among participants, there were practice gaps in areas such as initiation and use of HMS, as well as practical issues such as positioning, latch, frequency and duration of feeding (99). These qualitative findings, alongside the national decline in key breastfeeding indicators since 2014, indicate that programs targeted to help decrease these gaps in breastfeeding practices are needed to improve breastfeeding rates.

2.6.9 Predictors of Infant and Young Child Feeding Indicators in Cambodia

As previously mentioned, the current low rates of adherence to IYCF recommendations in Cambodia are cause for concern. Possible reasoning for low adherence includes familial living arrangements, a lack of caregiver knowledge regarding proper infant feeding, gender disparities, and poverty (6,100–102).

When a mother is the primary caregiver, maternal education has been positively associated with higher child dietary diversity and, thus, better infant and child nutritional status (101). A longitudinal study assessing child growth in Phnom Penh, Kratie, and Ratanakiri (n=2129) found that low maternal education was the strongest predictor of child undernutrition ($p<0.001$) (103). Mothers with higher education levels may have better access to information, services and resources that promote knowledge of IYCF practices and optimal child growth (103). However, non-mother primary caregivers may be unaware of the importance of a nutritious diet during the first two years of life (101). Cambodia has seen an increase in ‘skip-generation’ households in which grandparents and grandchildren reside without the parents, generally due to parents’ engagement in paid labour away from the home (100). In these cases, with mothers unable to

breastfeed their children, grandmothers often take over infant feeding, which often involves the use of HMS or the early introduction of complementary foods (100). Additionally, in a qualitative study of primary health care providers (n=31), over half noted that elderly grandparents did not have current or adequate knowledge of infant feeding recommendations, which participants felt could result in substandard feeding practices (102). Examples of suboptimal behaviours included inadequate hand washing, improper milk storage, and a lack of dietary diversity (102). Working parents who reside with their children still tend to leave their children in the care of their grandparents, as evidenced by a recent study among Cambodian factory workers, which noted that mothers who could provide care after work still left their infants in the care of their grandmothers while away at work (6).

Gender disparities also influence child nutrition. Culturally, men are served first and given the best food at mealtimes, followed by male children, and finally women and female children (104). This potential lack of nutrition could lead to wasting and undernutrition in young girls. Finally, wealth is an additional indicator of child nutrition, with an increase in household wealth decreasing the prevalence of undernutrition due to greater food accessibility (101).

2.7 Paid Labour and Breastfeeding

There are three main forms of labour: unpaid, informal paid, and formal paid labour. Unpaid labour is defined as work that produces goods or services but is unremunerated (105); while important, this is not a focus of this thesis. Informal labour is not registered, regulated, or protected by existing legal or regulatory frameworks; these workers do not have secure employment contracts, worker benefits, or social protection, which would be available to those employed in formal paid labour positions (106). The informal sector is often included in labour datasets since these are still paid occupations; thus, the term ‘paid labour force’ will be used

throughout this thesis to describe employment. By definition, most of the Cambodian economy is considered informal. In rural areas, work often includes household enterprises and agriculture jobs, while in urban settings, informal occupations can include moto drivers, street vendors, garbage collectors, construction workers, and hairdressers (107).

In 2021, 52% of women globally participated in the paid labour force (108) and represented less than one-third of the total paid labour force (109). The prevalence of women in the workforce varies significantly by geographic area, particularly in LMIC. For example, in Western Asia and North Africa, only 29% of women of working age participate in the paid labour force, while in South-East Asia, the participation rate is 72% (108). High female labour force participation rates typically reflect poverty since, in times of crisis, women often take up employment (formal or typically informal) to contribute to household incomes (110).

2.7.1 Global Lactation-Related Labour Laws

Little is known about the historical development of paid maternity leave policies (111). In 1919 the International Labour Organization (ILO) held the first Maternity Protection Convention regarding maternity benefits for women before and after childbirth; this convention was followed by two subsequent conventions in 1952 and 2000, updating maternity law standards (112). The current ILO standards give grounds for women to receive 14 weeks of maternity leave, with a compulsory six weeks of this period given after childbirth, and a monetary benefit of no less than two thirds of previous earnings (113). The standards also state that it is unlawful to terminate the labour contract of a woman during pregnancy or maternity leave, and provides breastfeeding mothers with additional rights to one or more daily breaks to breastfeed their child (113).

However, not all countries uphold these standards. As of 2015, half of all LMIC provided paid maternity leave of at least 14 weeks per ILO standards, with 6% of low-income and 22% of

middle-income countries offering a longer paid leave of at least 26 weeks (114). Currently, lactation-related laws vary greatly by country, and also by employment type, with these laws often falling short in the informal and agrarian sectors (111). Concerning paid breaks, a content analysis conducted by Atabay et al. (2015) found that 136 countries worldwide had laws stating that mothers had the right to take paid breaks during the day for breastfeeding until the infant turns six months (115). However, 51 countries had no policies protecting the rights of mothers to breastfeed during work hours (115). The highest proportion of countries that did not guarantee breastfeeding breaks were in East Asia, the Pacific, and the Americas regions (115). Maternity leave is a more common benefit received by mothers than breastfeeding breaks, as seven of the countries without paid breastfeeding breaks did mandate paid maternity leave (115).

2.7.2 Advantages to Longer Maternity Leaves

Having a longer maternity leave is associated with higher rates of recommended breastfeeding practices (114). In Canada, the increase of paid maternity leave from 25 to 52 weeks increased the rate of mothers practicing EBF by 7.7 to 9.1 percentage points (116). Similarly, in China it was found that even a six week increase in paid leave increased the probability that mothers breastfeed for at least six months by 16.4% (117). A longitudinal study of maternity policies in 38 LMIC concluded that a one month increase in paid maternity leave was associated with a 7.4 [3.2-11.7] percentage point increase in the prevalence of early initiation of breastfeeding, a 5.9 [2.0-9.8] percentage point increase in EBF, and a 2.2 [1.1-3.4] month increase in breastfeeding duration (114). From these results, it is evident that maternity leave policies protect breastfeeding.

2.7.3 Barriers to Breastfeeding in Workplaces

Despite ILO standards, women still face many barriers when continuing breastfeeding upon return to work, most notably mother-infant separation, inadequate maternity leave length, a lack of scheduling accommodations, and a lack of a dedicated workplace lactation space.

While the evidence above showcases the advantages longer maternity leaves have on breastfeeding practices, this information may not translate to LMIC, where many women are employed in the informal sector and hence do not receive maternity leave benefits, or are from countries which do not receive adequate maternity leaves (35). For example, a systematic review of 25 studies from 19 LMIC concluded that maternal employment was the most frequently cited barrier to EBF (35). A cross-sectional study in Sri Lanka showed that mothers would stop EBF as early as four months postpartum if they returned to work due to work-related separation from their infant (118). Similarly, a cross-sectional study from Kenya (n=1186) found that the most commonly cited reason for early breastfeeding cessation was return to work (47%), with employed mothers less likely than unemployed to practice EBF at 24 weeks (19% compared with 50%, respectively; OR 0.25 [0.14-0.44]) (119). However, EBF at six weeks postpartum was high regardless of employment status (94% formally employed, 87% formally unemployed), and thus the drop seen in employed mothers from 6-24 weeks can likely be attributed to their return to work, as mothers in Kenya only receive a three month maternity leave (119).

Lack of accommodation upon returning to work can make breastfeeding difficult, even in HIC, where legal protections are more common. A survey completed by 2363 US physician mothers showed that nearly half (49%) of mothers would have continued breastfeeding longer if their job had been more accommodating (120). The most cited challenges to breastfeeding were inadequate time (85%), schedule inflexibility (37%) and insufficient space (23%) (120). In line

with this American study, the lack of adequate lactation space is a common barrier to breastfeeding in the workplace globally (121,122). A study conducted in Malaysia found that not having a designated space for breastfeeding or expressing milk was linked to a 1.8 [1.1-3.1] fold increased odds of breastfeeding cessation (121). Similarly, a cross sectional study in China found that women with a designated lactation space were less likely to discontinue breastfeeding (Hazard Ratio=0.37, $p<0.01$) than those without this space (122). Furthermore, a study in Iran reported decreased HMS consumption among infants 6-12 months when mothers had access to a workplace lactation space, with only 28% of participants with access to an available lactation space opting to feed HMS, compared to 59% among those without access ($p=0.004$) (123). While there is evidence from various regions, at this time, little is known about barriers to breastfeeding among Cambodian women in the paid labour force.

2.7.4 Attitudes on Breastfeeding in Workplaces

Positive workplace support for breastfeeding can bolster breastfeeding duration (124). Depending on the workplace, mothers can encounter mixed support towards breastfeeding, with coworkers capable of enabling or challenging breastfeeding (125). Wallenborn et al. (2018) found that workplace support accounted for 16% of the effect in confidence in attaining breastfeeding goals ($p<0.001$) (126). Attitudes towards breastfeeding in the workplace in HIC are generally positive (127). A study of 1000 working adults in the US found that three out of four coworkers were willing to support colleagues in taking breaks to lactate during the workday (127). While there are many possible reasons for this support, Suyes, Abrahams & Labbok (2008) found that exposure to a co-worker who had previously breastfed was positively associated with supportive attitudes toward breastfeeding in the workplace ($p<0.001$) (128). Conversely, a lack of support can undermine breastfeeding. In the large American study mentioned above, the minority, 25% who were not supportive of workplace lactation responded

with resentment and a lack of support, viewing lactating at work as unprofessional and the need to take extra breaks as unproductive (127). However, this level of support may not be the same in LMIC. A qualitative study of male worker attitudes toward female coworkers breastfeeding in India and South Africa found that male coworkers had a strong understanding of the need to breastfeed and were sympathetic to breastfeeding mothers who had to work, yet showed ambivalence towards their female coworkers actually breastfeeding at work (129). Men only expressed a strong preference that women cover themselves while breastfeeding in the workplace (129).

2.8 Paid Labour in Cambodia

2.8.1 Prevalence of Working Women of Reproductive Age

In 2019/20, the sex breakdown of the Cambodian labour force, 50% female and 50% male, closely aligned with the country's age demographic of the working population, 52% female and 48% male (79). While there are no data available nationwide on the percentage of employed mothers in Cambodia, we know that in 2021-2022, 79% of married women of reproductive age were engaged in the paid labour force (4). The rates of paid labour force participation are higher in rural areas than in Phnom Penh and other urban areas, which is unsurprising given that the primary industry women are employed in is the agriculture sector (38%) (79).

2.8.2 Cambodian Labour Laws and Workplace Lactation Practices

Cambodian labour law closely follows the standards set out by the ILO: women are entitled to a maternity leave of ninety days, and upon return to work, women should be assigned light work for the two months following maternity leave (5). Employers are prohibited from laying off women during their maternity leave or on a date when the end of the notice period would fall during the maternity leave. During their maternity leave, women are entitled to half of their wages paid by the employer (5), which is less than the ILO recommended two thirds (113), and

these wage benefits only apply if the woman has had one year of uninterrupted service in the enterprise (5). For one year after the delivery date of the child, women are entitled to one hour per shift to breastfeed, separate from their normal breaks. This hour may be divided into two periods of thirty minutes each, one during the morning and the other during the afternoon, with exact times agreed upon between the mother and the employer. If no agreement is made, the periods shall be at the midpoint of each work shift. Enterprises with a minimum of 100 female employees shall set up a nursing room and a day care centre either on the premises or provide free access to these services nearby (5). While these are the laws laid out in the Constitution of Cambodia, this does not imply compliance, and may not reflect the reality of benefits that women receive in the workplace.

From the little information available about workplace lactation in Cambodia, it does not appear that breastfeeding is a common practice in formal workplaces. One recent qualitative study explored female garment workers' health-seeking behaviours for maternal and infant care in central Kampong Chhnang province (6). Participants (n=109) worked six days a week for nine hours, including a 1-hour lunch break. Overtime shifts, while technically voluntary, were deemed by employees as practically mandatory since transportation home for workers was not provided until after overtime shifts were complete. Along with the legally mandated maternity leave, pregnant workers were given time off each month for antenatal care visits, could leave 15 minutes earlier at lunch and the end of the day, and were guaranteed a seat on the transport vehicle. Factories were equipped with childcare and breastfeeding spaces; however, these often went underused for reasons cited as feasibility issues (child could not be brought to them at work) and distrust of factory management to provide adequate childcare. For workers in rural factories, the distance between the home and the workplace was often deemed too great for

women to have their child brought to them to breastfeed during their provided breaks. As a result, proper infant feeding practices are unattainable to these mothers, as evidenced by EBF cessation often occurring before the WHO recommended six months, and commercial infant formula being the preferred HMS for all mothers, usually beginning from 3 months postpartum, once mothers returned to work (6). These reports align with a study investigating the promotion of HMS among mothers in Phnom Penh, where mothers who worked outside of the home were 2.3 [1.5-3.4] times more likely to feed their children a HMS compared to unemployed mothers (88). These concerns are not exclusive to this one factory, as a study conducted among skip generation households found that 78% of participants (n=301) commuted daily to work in garment factories; however, only nine of 41 grandmothers reported exclusive human milk feeding of the child under six months in their care (130).

2.9 Research Gap and Potential Significance

Despite WHO recommendations and ongoing efforts from the Cambodian Ministry of Health to promote breastfeeding, rates of exclusive and continued breastfeeding are declining in Cambodia (3,4,83). A possible barrier to exclusive breastfeeding is the high number of women engaging in the paid labour force. Workplace lactation support programs have been successful in other countries in increasing breastfeeding duration, while also increasing worker satisfaction and reducing absenteeism (121,131–137). However, no such programs currently exist in Cambodia and little research has been done to assess breastfeeding practices, nor the knowledge and attitudes towards breastfeeding and IYCF among other workers, which could influence the uptake of these programs. As such, a needs assessment is required to understand the current infant feeding and labour law knowledge, attitudes, and practices to tailor such a program to these Cambodian workplaces' specific needs. To address this gap, this research aims to explore these themes in Cambodian factories to help inform future workplace lactation support programs.

3.0 Methods

3.1 Research Objectives

There are three main objectives of this research:

1) To assess the knowledge of IYCF and Cambodian labour laws, and attitudes towards breastfeeding in the workplace among mother employees and other employees, in Cambodian factories in Phnom Penh/Kandal, Kampong Thom, and Kampot provinces, and to compare whether knowledge and attitudes differed by worker groups.
2) To explore the current IYCF and dietary practices among mother employees in Cambodian factories.
3) To explore common reasons for breastfeeding cessation among mother employees in Cambodian factories.

3.2 Study Design

This thesis used the baseline data collected as part of a quasi-experimental evaluation of workplace lactation support programs in factories, offices, and government institutes. Data was collected at eight workplaces; however, as this thesis only concerns factories, only data from the five participating factories was used. This was a cross-sectional assessment designed to assess data collected from four key groups of interest in factories: mother employees with children <12 months (mothers), women employees (women), men employees (men), and supervisors. However, due to the low participation rate of supervisors, this subgroup was omitted from this thesis.

3.2.1 Study Setting

This study took place in three Cambodian regions: Phnom Penh/Kandal, Kampong Thom, and Kampot. These locations were chosen to enable data collection from a variety of settings.

Kandal is a province in central Cambodia that entirely surrounds the country's capital city of Phnom Penh (138). While Phnom Penh is an autonomous municipality, in the context of this study, Phnom Penh and Kandal province have been combined into one region due to geographic proximity. As of 2019, Phnom Penh had the highest provincial population with 2.3 million people (15% of the total population), with Kandal following at 1.2 million (8%) (139). As of 2014, most residents of Kandal province were classified as falling in within the third or fourth national wealth quintiles (27% and 34%, respectively), while almost all residents of Phnom Penh were classified into the highest wealth quintile (84%) (3). Almost all infants had been breastfed at some point in Kandal (96%) and Phnom Penh (91%). Only one quarter (23%) of children in Kandal province met MAD, while almost two-thirds (61%) of children in Phnom Penh did, which was the highest reportage in the country. Three quarters of women aged 15-49 years in both Kandal (75%) and Phnom Penh (76%) were employed, but occupations differed, with skilled manual labourer and sales and services the most common, respectively (3).

Kampong Thom is the most central province of Cambodia (140), while Kampot is a southwestern province positioned on the Gulf of Thailand (141). In 2019, the two provinces hosted similar population sizes (Kampong Thom 680 000; Kampot 590 000) (139). In 2014, most residents in both provinces were either in the lowest or second national wealth quintiles (Kampong Thom 36% and 28%, respectively; Kampot 23% and 29%, respectively) (3). Breastfeeding is a common practice in both provinces with almost all infants having been breastfed (96%) (3). However, diet quality is poor with around one quarter of children 6-23 months meeting MAD (Kampong Thom 29% and Kampot 22%) (3). More women aged 15-49 years are employed in Kampong Thom than Kampot (80% vs 69%), however in both provinces these women are generally employed in the agriculture sector (64% and 69%, respectively) (3).

3.2.2 Sample Size and Sampling

The sample size for this analysis is based on the larger program evaluation study. An overarching goal of the overall study is to assess the impact of workplace lactation support programs on breastfeeding exclusivity rates among infants <6 months of working mothers in Cambodia, so the sample size calculation for this study was based on exclusive breastfeeding rates.

Per the equation below (142), a sample size of 301 mothers was required to detect a 10% increase in exclusive breastfeeding rates (estimated at 51%), using 80% power and a 5% alpha.

$$n = \frac{(p_1(1-p_1) + p_2(1-p_2))(z_\alpha + z_\beta)^2}{\delta^2}.$$

Where:

n = sample size

P1 = 51%

P2 = 10 increase to 61%

Za = 1.645 (corresponding to alpha of 0.05)

ZB = 0.84 (corresponding to 80% power)

D = 10% difference = 0.1

To account for attrition, 350 mothers were recruited. In addition, given the exploratory nature of this study, based on factory demographics, it was decided that 285 other employees would be invited to participate in order to explore the knowledge and attitudes of these other factory employees.

Five factories of the 27 workplaces in the larger program evaluation were purposively selected, from which sampling proportional to factory size was employed (number of recruited participants will vary depending on factory size). Within each factory, convenience quota

sampling was used to recruit from the three participant interest groups: mothers, women, and men.

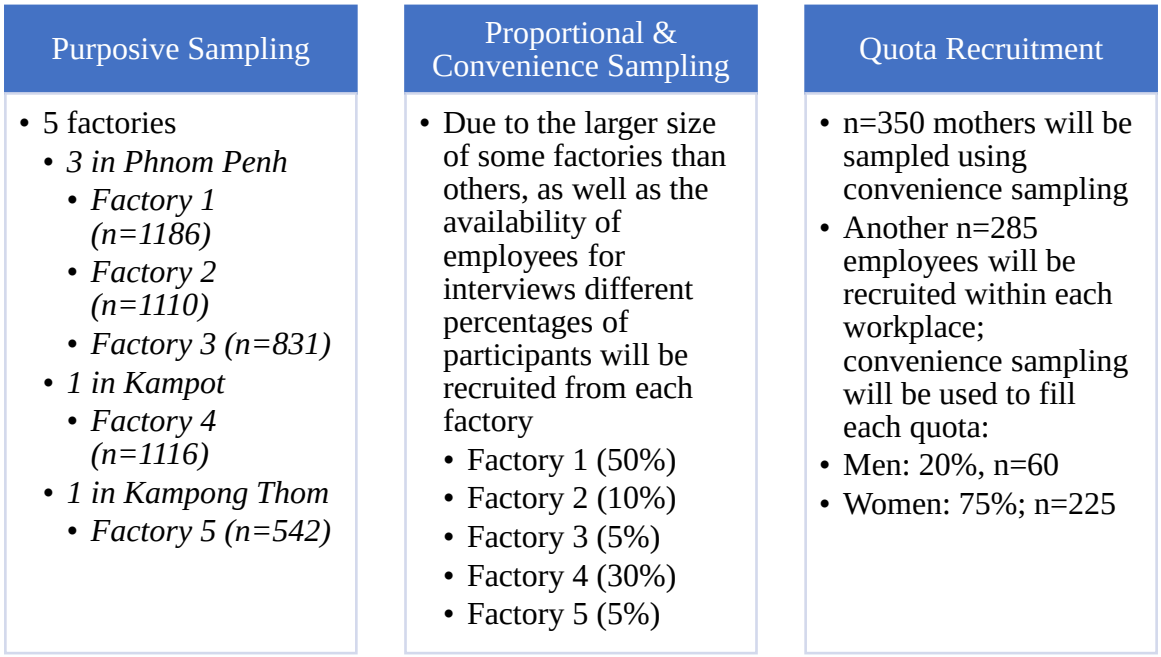

Figure 3-1. *Study sampling frame*

3.2.3 Eligibility Criteria

Study participants must have been employed by one of the five participating factories. All employees were eligible to participate if they were at least 18 years of age and provide written consent to participate. Mother employees must have given birth within the 12 months prior to the interview date.

3.3 Ethical Considerations

Ethical approval was obtained from the Cambodian National Ethics Committee for Health Research (NECHR#291) (**Appendix A**) and the Mount Saint Vincent University Research Ethics Board in Canada (#MSVU#2021-097) (**Appendix B**). Written and informed consent will be obtained from all participants **(Appendix C).** The study meets criteria for minimal risk of human participants and the subject matter of the surveys is not overly sensitive. All participants will be

informed of their right to refuse to participate at any point in the study process without threat or fear of retribution, including potential loss of employment. Information collected will be kept confidential and will have no names attached to participants, only ID codes. Questionnaires will be conducted by trained enumerators.

3.4 Data Collection

Data collection took place at participants factories using interviewer-administered, tablet-based questionnaires. The date and time of the data collection was selected to limit adverse impacts on the factory work schedule. The study procedures were explained to each participant, who then read (or were read) and signed the study consent form **(Appendix C)**. Two questionnaires were used depending on the subgroup of the participant (mother or other employee) **(Appendix D).** On average, questionnaires took 30-60 minutes to complete. Upon completion of the questionnaires, participants were provided a modest remuneration such as a sarong, soap, or a personal hand sanitizer dispenser (valued at USD$3).

3.5 Research Tools

3.5.1 Questionnaires

Two questionnaires **(Appendix D)** were used to capture the key indicators. Questionnaires were translated into Khmer and then back translated to English to check for accuracy. Prior to the commencement of data collection, questionnaires were pre-tested with enumerators, and revisions were made to improve the clarity and relevance of the questions, the completeness of pre-coded response choices, and the flow of the interview.

The questionnaires were split into several modules. Both questionnaires included: participant sociodemographic information, equity index, IYCF knowledge, and knowledge and opinions of maternity leave, labour laws, and breastfeeding practices in the factory. Additionally, the questionnaires for mother employees with a child <12 months contained modules on IYCF

practices, including indicators to calculate MDD, MMF, and MAD, maternal dietary diversity, health outcomes, workplace maternity leave, and individual breastfeeding practices at the factory.

The wealth status of participants were measured in quintiles using the EquityTool survey for Cambodia, which is a short survey used to assess a household's relative wealth based on household assets, normed to CDHS 2014 (111).

3.6 Data Analysis

IBM SPSS v. 26.0 for Windows (IBM Corp, 2018) was used to perform quantitative data analyses. Shapiro-Wilks test was applied to assess the normality of data distribution (enabling selection of parametric or non-parametric tests), and if tests reveal statistical differences a Bonferroni post-hoc test ($p<0.05$) was used to assess where differences lie.

3.6.1 Objective 1: Assessing differences in knowledge and attitudes

Descriptive statistics were computed to report the number of participants (*n* %) from each subgroup who either correctly answered, incorrectly answered, or responded "I don't know" to each knowledge question posed, marked per IYCF recommendations (2) and Cambodian labour laws (5). Descriptive statistics *(n %)* were also used when reporting on perceived benefits to breastfeeding. A chi square test was employed to assess whether the proportion of correct responses differs significantly by subgroup. Bonferroni post-hoc analysis was used to assess differences in responses by subgroup.

Attitudes towards breastfeeding were reported as mean ± SD for each subgroup (using the 7-point Likert scale scores). Normality of data were assessed using the Shapiro Wilks test ($p>0.05$ considered normally distributed). If data was normal, a one-way analysis of variance (ANOVA) test was used to compare whether attitude scores differ by sub-group. If the data were not

normally distributed, the Kruskal-Wallis Test was used instead. If tests revealed a significant result, Dunn-Bonferroni post-hoc tests were employed, to assess between group differences.

3.6.2 Objective 2: Exploring current IYCF practices

To assess current IYCF and dietary practices of mother employees, descriptive statistics were computed to report the number of participants who correctly adhere to the guidelines set out by the FAO and the WHO (2,77) as n % (EBF, ever breastfed, breastfeeding initiation, introduction of complementary foods, and acceptable dietary practices: MMF, MDD, MAD and MDD-W), or as mean ± SD (continuous variables such as the duration of breastfeeding, and dietary indicators: MMF, MDD, MDD-W). Means were compared between wealth groups, which were collapsed into two categories (wealth quintiles 2&3, and wealth quintiles 4&5). Wealth quintile 1 was excluded from this analysis, as no participants fell within this quintile. For categorical data chi square tests were employed and if continuous independent samples t-test (or Mann-Whitney U if data was not normally distributed).

3.6.3 Objective 3: Exploring reasoning for breastfeeding cessation

To assess mothers' common reasoning for breastfeeding cessation, descriptive statistics were computed to report the number of participants (*n %)* who gave each response (e.g. problem with breast, went back to work, not enough time to feed). As with Objective 2, chi square tests were used to compare the means between the two categories of wealth groups.

3.7 Potential Sources of Bias

A potential area for bias is social desirability bias: participants may feel the need to report following recommendations more closely than reality or may choose not to answer questions if they are unaware of the correct answer, in fear of judgement. To combat this, participants were reminded that there is no right or wrong answer to any of the questions. Enumerators were trained on neutrality and building rapport and were encouraged to use probing techniques to ensure questions were answered to the best of the participant's abilities. For questions regarding breastfeeding practices in the workplace and workplace satisfaction, workers may feel they need to present their factory in a positive light for fear of retribution. To try to prevent this, workers were reminded that all surveys are anonymous, collected by enumerators with no relationship with their employers, and noted that their employers will have no ability to access the data collected through the study.

Cultural bias is important to consider when conducting research in a country foreign to the researcher. To mitigate cultural bias in this study, all interviews were conducted by Khmer enumerators. Study co-investigator Hou Kroeun (Country Director, Helen Keller International, Cambodia) were available for consult on culturally relevant information. In addition, Drs. Whitfield and Sigh, who have spent considerable time living in Cambodia, were available for consult if any questions, concerns or misunderstandings arose.

4.0 Dissemination of Findings

The findings of this study will be shared with relevant stakeholders within Cambodia, such as through a presentation at the Cambodia Nutrition Working Group. Results will also be published in a peer-reviewed journal (e.g. *Breastfeeding Medicine*) and at an academic conference (e.g.

Canadian Nutrition Society) in 2023. The findings will also be used to inform future lactation support programs in Cambodia.

5.0 Results

5.1 Participant Characteristics

Participant characteristics, by subgroup, are detailed in **Table 5-1**. Mothers had a mean ± SD age of 29 ± 5 years, with the mean age of their youngest child being 7.6 months. Only 30% of mothers lived in the same household as their infant <12 months. Most mothers were part of the upper two wealth quintiles (85%). A majority had either primary or lower secondary education (43% and 41%, respectively), and over half had between 5-10 years of work experience (55%). Similarly, women and men were aged 29 (5) and 31 (7) years, although their youngest children were significantly older than mothers (3 and 5 years, respectively; $p<0.001$). Most women and men were also in the upper wealth quintile (66% and 73%, respectively), had completed lower secondary education (46% and 40%, respectively), and approximately half had between 5-10 years of work experience (52% and 44%, respectively).

Table 5-1. Sociodemographic characteristics of participants, by subgroup[1]

	Mother Employees *n=294*	**Women Employees** *n=145*	**Men Employees** *n=77*	**p-value**[2]
Age, *years*	28.8 ± 5.2	29.2 ± 4.8	30.8 ± 6.6	0.11
Education				0.23
None	9 (3%)	5 (3%)	2 (3%)	
Primary	126 (43%)	52 (36%)	24 (31%)	
Lower secondary	120 (41%)	66 (46%)	31 (40%)	
Upper secondary	33 (11%)	18 (12%)	18 (23%)	
Higher education	6 (2%)	4 (3%)	2 (3%)	
Years of combined work experience				0.03
Less than 5 years	75 (25%)	33 (23%)	22 (29%)	
5-10 years	162 (55%)	76 (52%)	34 (44%)	
11-15 years	49 (17%)	29 (20%)	11 (14%)	
16-20 years	7 (2%)[a]	5 (4%)[a,b]	8 (10%)[b]	
More than 20 years	1 (1%)	2 (2%)	2 (3%)	
Age of youngest child, *months*	7.6 ± 2.7[a]	34.5 ± 20.7[b]	58.3 ± 50.3[b]	<0.001
Ethnicity, *Khmer*	293 (100%) [a]	140 (97%) [b]	76 (99%) [a,b]	0.03
Equity Index wealth classification				0.05
WQ2	3 (1%)	1 (1%)	-	
WQ3	41 (14%)	10 (7%)	2 (3%)	
WQ4	73 (25%)	39 (27%)	19 (25%)	
WQ5	177 (60%)	95 (66%)	56 (73%)	
Resided with child	87 (30%)	-	-	

[1]*data presented as mean ± SD, n (%). Columns may not add to 100% due to rounding*
[2]*values in a row with different superscript letters differ significantly, p<0.05 (Kruskal Wallis or chi square test with a Bonferroni post-hoc test)*

5.2 Knowledge of IYCF and Perceived Benefits to Breastfeeding

Table 5-2 details participants knowledge of IYCF by subgroup. Knowledge of proper breastfeeding initiation was high among mothers and women, who knew to breastfeed within 1 hour of birth (86% and 90%, respectively); however, significantly fewer men correctly answered this question (66%; p<0.001) and were more likely to have responded "I don't know" (33%, versus 5% and 3% among mothers and women, respectively; p<0.001). Between half and three-quarters of all participants knew to EBF their children for six months. The largest knowledge gap

was found regarding the continuation of breastfeeding, with fewer than one-quarter of all participants knowing the correct answer of two years or beyond, and men being more likely to report not knowing an answer ($p<0.001$).

Table 5-2. Knowledge of IYCF by subgroup[1]

Response to knowledge questions		**Mothers Employees** *n=294*	**Women Employees** *n=145*	**Men Employees** *n=77*	**p-value**[2]
Breastfeeding initiation: within 1 hour of birth	Correct	254 (86%)[a]	130 (90%)[a]	51 (66%)[b]	<0.001
	Incorrect	24 (8%)	10 (7%)	2 (3%)	
	Don't Know	16 (5%)[a]	5 (3%)[a]	24 (31%)[b]	
Exclusive breastfeeding: for 6 months	Correct	206 (70%)	87 (60%)	45 (58%)	0.05
	Incorrect	84 (29%)	56 (39%)	28 (36%)	
	Don't Know	4 (1%)	2 (1%)	4 (5%)	
Continued breastfeeding: for 2 years	Correct	66 (22%)	33 (23%)	18 (23%)	<0.001
	Incorrect	226 (77%)	111 (77%)	53 (69%)	
	Don't Know	2 (1%)[a]	1 (1%)[a]	6 (8%)[b]	

[1]all data presented as n (%). Columns may not add to 100% due to rounding
[2]values in a row with different superscript letters differ significantly, p<0.05 (chi square with a Bonferroni post-hoc test)

All groups were asked about the benefits of breastfeeding, with the most common responses reported in **Table 5-3**. The most commonly reported reasons for breastfeeding were that breastmilk improves infant health (86%) and prevents infant illness (67%) and is less expensive than using HMS (43%). Responses did not differ by participant subgroup (all $p\geq0.05$).

Table 5-3. Self-reported benefits of breastfeeding[1]

	Mothers Employees *n=294*	**Women Employees** *n=145*	**Men Employees** *n=77*	**p-value**[2]
Improves infant health	251 (85%)	128 (88%)	65 (84%)	0.64
Prevents infant illness	202 (69%)	102 (70%)	44 (57%)	0.11
Less expensive than HMS	118 (40%)	73 (50%)	33 (43%)	0.13
Less work than preparing HMS	35 (12%)	19 (13%)	13 (17%)	0.51
Prevents maternal disease	36 (12%)	15 (10%)	9 (12%)	0.84
Prevents infant mortality	29 (10%)	7 (5%)	5 (7%)	0.16
HMS increases risk of infant illness	16 (5%)	7 (5%)	3 (4%)	0.85
HMS increases risk of infant mortality	10 (3%)	5 (3%)	1 (1%)	0.61

HMS, human milk substitutes
[1]Columns do not add to 100% because multiple responses were accepted; % calculated out of total responses
[2]Differences between subgroups were assessed using a chi square test

5.3 Attitudes on breastfeeding in the workplace

Overall, attitudes towards breastfeeding in the workplace were positive across all subgroups (**Table 5-4**). In general, women and men were less satisfied than mothers regarding current attitudes towards breastfeeding in the workplace. Mothers were more likely to believe that their breaks for breastfeeding or expressing breastmilk were long/frequent enough compared to their women and men coworkers ($p<0.001$). Men and women showed stronger support for breastfeeding women asking for accommodations to lactate than mother employees felt comfortable asking for ($p<0.001$), and additionally purported having more support for their breastfeeding counterparts than mothers felt they had ($p=0.03$). Finally, mothers more strongly believed that they should skip their breastfeeding breaks if work became too hectic compared with women ($p=0.02$).

Table 5-4. Attitudes on breastfeeding in the workplace, measured using a 7-point Likert scale[1,2], by subgroup

	Mother Employees *n=294*	**Women Employees** *n=145*	**Men Employees** *n=77*	**p-value**[3]
Female employees should be entitled to maternity leave	6.25 ± 0.48	6.28 ± 0.46	6.14 ± 0.58	0.29
Female employees should be entitled to paid time during work to breastfeed their children	6.11 ± 0.51	6.21 ± 0.54	6.10 ± 0.62	0.14
Workplaces should be required to set up a day care centre and/or nursing room or pay for an employee's daycare costs	5.91 ± 0.87	5.86 ± 0.91	5.77 ± 1.0	0.50
Breastfeeding women should get a designated place for breastfeeding or pumping breast milk at work.	5.98 ± 0.62	5.95 ± 0.65	5.9 ± 0.64	0.50
Breastfeeding women currently get long enough and frequent enough breaks for breastfeeding or pumping breastmilk (Mothers: My breaks are currently long enough and frequent enough for breastfeeding or pumping breastmilk)	5.88 ± 0.68[a]	5.67 ± 0.74[b]	5.59 ± 0.85[b]	<0.001
Breastfeeding women should skip breaks for breastfeeding or pumping if work gets too hectic (Mothers: Some days I would need to skip a breastfeeding or pumping session because my workdays are so hectic)	2.68 ± 1.56[a]	2.33 ± 1.41[b]	2.43 ± 1.46[a,b]	0.02
Breastfeeding women should be able to ask for accommodations to help them breastfeed or pump breastmilk at work (Mothers: I would feel comfortable asking for accommodations to help me breastfeed or pump breastmilk at work)	5.10 ± 1.44[a]	5.81 ± 0.78[b]	5.71 ± 0.76[b]	<0.001
Breastfeeding is common in my workplace	5.74 ± 0.85	5.60 ± 0.91	5.52 ± 1.0	0.10
I support my coworkers breastfeeding at work (Mothers: My supervisor/coworkers says things that make me think they support breastfeeding)	5.64 ± 0.91[a]	5.84± 0.67[b]	5.79 ± 0.96[b]	0.03
I would accept someone pumping breastmilk at work but not breastfeeding their child at work (Mothers: My workplace would accept me pumping breastmilk at work but would disapprove of me breastfeeding my child at work)	2.77 ± 1.44	3.1 ± 1.57	2.90 ± 1.5	0.17

[1]*data are mean ± SD*

[2]*scale response options were: 1 'strongly disagree'; 2 'disagree'; 3 'somewhat disagree'; 4 'neither agree nor disagree'; 5 'somewhat agree'; 6 'agree'; 7 'strongly agree'*

[3]*values in a row with different superscript letters differ significantly, p<0.05 (Kruskal Wallis with a Bonferroni post-hoc)*

5.4 IYCF practices of mothers in factories and reasons for breastfeeding cessation

Overall, adherence to many IYCF guidelines were low (see **Table 5-5**) and did not differ by wealth quintile. While 83% of infants were ever put to the breast, and 71% of mothers initiated breastfeeding within one hour of birth, only 10% of infants were exclusively breastfed to 6 months. On average, breastfeeding ceased long before the recommended two years or beyond, at 3 ± 2 months, and 61% of infants had received infant formula in the previous day and night. Only 32% of those who had already started complementary feeding began at the WHO recommended six months; instead, early introduction was common (4 ± 3 months).

Most infants met acceptable MMF (89%), but MDD was only met by 40% of infants, and overall, only 38% of infants met MAD. Maternal diet was generally better, with 63% of mothers meeting acceptable MDD-W.

The common reasons for breastfeeding cessation are listed in **Table 5-6**. The most common reasoning was mothers return to work (50%), followed by self-perceived insufficient milk supply (23%). No significant differences were found between wealth quintiles.

Table 5-5. IYCF practices of mother participants[1]

			All mothers		Wealth Quintiles 2 and 3		Wealth Quintiles 4 and 5	p-value[2]
Breastfeeding Indicators								
			n		n		n	
Ever breastfed			294	83%	44	73%	250	84%	0.06
How long after birth infant was put to breast[3]			243		32		211	
≤1 hour postpartum				71%		78%		70%	0.33
>1 hour postpartum				29%		22%		30%	
Exclusively breastfed to 6 months			294	10%	44	9%	250	10%	0.79
Infants who received infant formula in the 24 hours preceding the survey			294	61%	29	66%	166	60%	0.09
Age of complementary food introduction[4], *months*			214	3.7 ± 2.7	43	3.4 ± 2.7	222	3.7 ± 2.7	0.49
Appropriate introduction of complementary foods at 6 months				32%		37%		31%	0.40
Age of breastfeeding cessation[5], *months*			200	3.3 ± 2.1		3.3± 1.8		3.4 ± 2.1	0.87
Dietary Indicators								
Minimum Dietary Diversity for Women (MDD-W)			294	5.7 ± 2.3	44	5.8 ± 2.3	250	5.7 ± 2.3	0.80
Acceptable MDD-W				185 (63%)		29 (66%)		156 (62%)	0.66
Minimum Meal Frequency (MMF)[6]									
Breastfed	*6-8 months*	*Number of Feedings*	5	2.8 ± 0.4	1	2.0 ± 0	4	3.0 ± 0	-
		Acceptable MMF		5 (100%)		1 (100%)		4 (100%)	-
	9-12 months	*Number of Feedings*	21	3.0 ± 1.0	1	4.0 ± 0	20	3.0 ± 1.0	0.32
		Acceptable MMF		19 (91%)		1 (100%)		18 (90%)	0.74
Non-Breastfed		*Number of Feedings*	100	9.8 ± 3.4	20	9.9 ± 2.6	80	9.8 ± 3.6	0.91
		Acceptable MMF		88 (88%)		16 (80%)		72 (90%)	0.22
Overall		*Number of Feedings*	126	8.4 ± 4.1	22	9.3 ± 3.2	104	8.2 ± 4.3	0.28
		Acceptable MMF		112 (89%)		18 (82%)		94 (90%)	0.25
Minimum Dietary Diversity (MDD)[6]			126	3.9 ± 1.9	22	3.2 ± 1.8	104	4.0 ± 1.8	0.05
Acceptable MDD				50 (40%)		8 (36%)		42 (40%)	0.73
Acceptable Minimum Acceptable Diet (MAD)[6]			126	48 (38%)	22	8 (36%)	104	40 (39%)	0.85

MAD, Minimum Acceptable Diet; MDD, Minimum Dietary Diversity; MDD-W, Minimum Dietary Diversity for Women; MMF, Minimum Meal Frequency

[1]*all data presented as mean ± SD or n (%)*

[2]*Differences between subgroups were compared using either an independent t-test or chi square test*

[3]*missing n=51 infants were never breastfed*

[4]*missing n=80 infants had not yet started complementary feeding*

[5]*missing n=94 infants were either never breastfed or were still being breastfed*

[6]*missing n=168 mothers did not know what children ate in the past 24 hours*

Table 5-6. Reasons for breastfeeding cessation, among mothers who ever breastfed[1]

	All mothers[2] *(n=200)*	**Wealth Quintiles 2 and 3** *(n=29)*	**Wealth Quintiles 4 and 5** *(n=171)*	**p-value**[3]
Maternal return to work	100 (50%)	12 (41%)	88 (52%)	0.32
Maternal self-reported insufficient milk supply	46 (23%)	8 (28%)	38 (22%)	0.53
Infant self-weaned	25 (13%)	2 (7%)	23 (14%)	0.32
Maternal self-reported breast pain (pain, cracked nipples, engorgement)	7 (4%)	2 (7%)	5 (3%)	0.28
Maternal illness	7 (4%)	2 (7%)	5 (3%)	0.28
Maternal COVID-19 vaccination	6 (3%)	2 (7%)	4 (2%)	0.21
Maternal plan to stop breastfeeding (child age)	4 (2%)	1 (3%)	3 (2%)	0.55
Not enough time to feed	3 (2%)	0 (0%)	3 (2%)	0.47

[1]*Data are n (%)*
[2]*missing n=94, as mothers were either still breastfeeding or had never breastfed*
[3]*Differences between wealth quintiles were compared using chi square test*

5.5 Knowledge of Cambodian Labour Laws

Knowledge of Cambodian labour laws is reported in **Table 5-7**. Significant differences between subgroups were seen with regards to knowledge of maternity leave length and wages, additional break time allowed to express breastmilk, and companies requirements for daycare services. Men were less likely to know that the allotted amount of maternity leave is 90 days and were more likely to respond "I don't know" to this question than both women and mothers ($p<0.05$). Mothers were more likely than both women and men to know that they are entitled to 50% of their wages while on maternity leave ($p<0.001$) and were more likely than men employees to know that the additional break time allowed for expressing breastmilk is 60 minutes ($p<0.001$). Additionally, mothers were less likely to respond incorrectly if companies are required to set up

a daycare than their coworkers (p<0.001). The largest knowledge gap was knowing that workplaces with 100 or more female employees were required to install a daycare, with nearly no employees knowing the correct answer.

Table 5-7. Knowledge of Cambodian labour laws by subgroup[1]

Response to knowledge questions		**Mother Employees** *n=294*	**Women Employees** *n=145*	**Men Employee** *n=77*	**p-value**[2]
Maternity leave period: 90 days paid leave	Correct	277 (94%)[a]	135 (93%)[a]	62 (81%)[b]	0.002
	Incorrect	1 (1%)	2 (1%)	2 (3%)	
	Don't Know	16 (5%)[a]	8 (6%)[a]	13 (17%)[b]	
Wages during maternity leave: 50%	Correct	159 (54%)[a]	55 (38%)[b]	16 (21%)[c]	<0.001
	Incorrect	59 (20%)	39 (27%)	21 (27%)	
	Don't Know	76 (26%)[a]	51 (35%)[a]	40 (52%)[b]	
Additional breaks for breastfeeding women: 2 per day	Correct	163 (55%)	86 (59%)	44 (57%)	<0.001
	Incorrect	102 (34%)[a]	31 (21%)[b]	15 (20%)[b]	
	Don't Know	29 (10%)[a]	28 (19%)[b]	18 (23%)[b]	
Additional time of breaks: 60 mins	Correct	229 (78%)[a]	101 (70%)[a,b]	42 (55%)[b]	0.001
	Incorrect	31 (11%)[a]	19 (13%)[a,b]	18 (23%)[b]	
	Don't Know	34 (12%)	25 (17%)	17 (22%)	
Companies required to set up or provide a daycare: yes	Yes	230 (78%)	113 (78%)	56 (73%)	<0.001
	No	7 (2%)[a]	15 (10%)[b]	9 (12%)[b]	
	Don't Know	57 (19%)	17 (12%)	12 (16%)	
Number of female employees required for a daycare: 100	Correct	6 (2%)	2 (1%)	2 (3%)	0.63
	Incorrect	24 (8%)	11 (8%)	10 (13%)	
	Don't Know	264 (90%)	132 (91%)	65 (84%)	

[1]*all data presented as n (%). Columns may not add to 100% due to rounding*
[2]*values in a row with different superscript letters differ statistically, p<0.05 (chi square with a Bonferroni post-hoc test)*

6.0 Discussion

Through this cross-sectional study we describe the knowledge and attitudes towards IYCF and nutrition and Cambodian labour laws from the perspective of mother employees, and other employees, in Cambodian factories. It also documents the infant feeding and maternal nutrition practices, and common reasons for breastfeeding cessation, among mother working in these factories.

Our sample had a higher socioeconomic status than most of the country, with most participants in the upper two wealth quintiles compared to the CDHS 2014-normed data (3). In this study, men employees exhibited lower knowledge of IYCF than mothers and women, analogous with trends of other LMICs such as Vietnam and Turkey (50,143). While we identified high knowledge by all participants of the benefits of breastfeeding to infants, there was low knowledge of the benefits for maternal health and low awareness levels of the harms of using HMS. Despite these knowledge gaps, overall, all subgroups' attitudes towards breastfeeding in the workplace were positive.

We found a concerning lack of adherence to recommended IYCF practices among mother factory workers. Most mothers had ceased breastfeeding by approximately three months postpartum, began introducing complementary foods between three and four months, and over half (61%) of infants were receiving HMS. This timeline coincides with the end of the 90-day maternity leave in Cambodia and, ultimately, when mothers return to work (reason given by 50% of mothers for breastfeeding cessation). Furthermore, there were large knowledge gaps across all subgroups for maternity-related labour laws, specifically of the wages to be received during maternity leave, the number and duration of additional breaks for lactation, and the number of female employees required for a daycare to be provided to workers children.

Taken together, this study revealed two main, novel findings. The first was the low adherence to proper IYCF practices, which will be explored detail below within the context of the high usage of HMS, high wealth status of participants, and fact that nearly three quarters of mothers lived away from their child. The second major finding was the large gaps in knowledge regarding Cambodian labour laws among all workers, which we speculate may be related to insufficient maternity benefits and/or noncompliance by factories, which will also be explored in more depth below.

6.1 Women Working Away from Home

6.1.1 IYCF Practices

There was low dietary diversity and overall diet quality among children in this study. The low levels of acceptable MDD (40%) and MAD (38%) observed in our sample are comparable to a cross-sectional study from 2022 conducted in three Cambodian provinces, among children 6-23 months (n=4036; 36% MDD and 37% MAD) (87). However, the MMF observed in our study (89%) was much higher than both the aforementioned cross-sectional study (55%) (87). A high number of feedings but lack of diversity is consistent with a study of complementary feeding practices in 80 LMICs, which found a higher proportion of countries meeting MMF than MDD in all regions, with East Asia and the Pacific having the highest MMF (144). While children are fed frequently enough, they lack diversity in their diet, resulting in a low number of children achieving MAD. In a recent dietary analysis study in northern Cambodia (n=1164), the most commonly consumed food groups among children 6-23 months were grains, roots and tubers; flesh foods; and other fruit and vegetables (95), consistent with a typical Cambodian diet (145) (which consists mainly of white rice, porridge made from white rice, fish, vegetables). This typical diet lacks essential micronutrients such vitamin A, vitamin D, thiamine, calcium, iron, zinc (146), and many children under two in the country do not meet their daily energy

requirements (147). Early nutritional deficits are linked to long term impairments in growth and health such as stunting (7,148). Therefore, a lack of child dietary diversity is concerning, particularly as 22% of children under 5 in Cambodia are stunted (deemed high by WHO/UNICEF prevalence thresholds) (4,84).

However, IYCF indicators have been found to have low sensitivity and specificity toward different forms of undernutrition (149). In an attempt to better assess the nutritional adequacy of children, Hondru et al. (2019) conducted a longitudinal study (n=2129) in Phnom Penh, Kratie, and Ratanaikiri provinces in Cambodia, assessing both MDD and a new indicator termed 'appropriate daily feeding of children' (103). This indicator was calculated from the perspective of appropriate feeding for age, including the quantity of complementary foods as part of the indicator's criteria (103). While 35% of children achieved MDD, only 15% 'achieved appropriate daily feeding', and the prevalence of stunting increased as children got older (14% to 31%) (103). This further suggests that even though 40% of our sample achieved acceptable MDD, the actual nutritional adequacy of these infant's diets is unknown given that neither MDD nor MMF assess the quantity of foods consumed.

6.1.2 Change in Labour Migration and Child Caregivers

It is important to note that 57% of our sample of mother employees were unaware of what their child ate in the 24 hours prior to the survey and therefore could not complete the diet questions. We attribute this low response rate to the fact that 70% of mothers did not reside with their infant, which in turn is likely due to the recent large expansion of the Cambodian garment sector (130). As a result, mothers are beginning to either travel daily or independently relocate for work to generate remittances for their families (150). While previously, many women of reproductive age migrated outside of the country to neighbouring countries such as Thailand (151), the

concept of within-country migration and remittances seems to be a new phenomenon in the country, as there are little to no data available on the internal migration of women with children in the country and its impact on IYCF. However, this new phenomenon may be short lived as a lack of work orders have led many factories to lay off workers or close altogether in recent years (152,153).

During mothers' prolonged work absences, the child's grandmother will often become the primary caregiver (130). Despite Cambodian grandparents self-reporting their prioritization of their grandchildren's nutrition, they face numerous challenges and structural barriers to providing adequate nutrition to children, including household poverty, age-related barriers such as a decline in energy, and food insecurity (100). Additionally, grandparents tend to follow outdated feeding habits and practices (such as not feeding children fresh fruits, vegetables, and meat due to the fear of the child developing diarrhea), and have poor hygiene, which can have negative implications on children's nutrition status (6,102). Of particular importance is these caregivers' inability to breastfeed, which means grandparents must rely on artificial milk feeding for these infants (100).

6.1.3 High Use of HMS

A high proportion of primary caregivers fed children HMS, despite the potential risks associated with their use. This rate is higher than a cross-sectional study from Phnom Penh (n=294; 43% of children 0-5 months, 29% of children 6-23 months), and usage rates among breastfed children are much higher than the data from the CDHS 2021-2022 (17%) (4,88). In our study, regardless of breastfeeding status, usage of HMS was high (70% of those still breastfeeding and 61% of those not breastfeeding). There are several potential reasons for this high usage, including the barrier to breastfeeding that formal employment outside the home presents, the perceived

insufficient milk supply of mothers, the pervasive marketing of these substitutes, and wealth status.

The previously mentioned cross-sectional study from Phnom Penh found mothers who worked outside of the home to be 2.3 [95% CI= 1.5-3.4] times more likely to use HMS compared to mothers who did not work outside the home (88). HMS use is also linked with perceived insufficient milk supply, as evidenced by a cross-sectional study from Indonesia (n=595), which found perceived milk insufficiency to be the main reason for mothers feeding HMS (154). With this, it is unsurprising that HMS use was prevalent given that all participants were employed, and perceived insufficient milk supply was the second most common reason for breastfeeding cessation in our study (23%).

Despite the International Code for Marketing of Breast-Milk Substitutes of 1981 and a national policy passed by the Government of Cambodia in 2005 to regulate the promotion of HMS, the country still experiences a high prevalence of HMS promotion (88,155,156). A cross-sectional study (n=294) of mothers in Phnom Penh found that 85% had observed commercial promotion for HMS, 18% had received a recommendation from a health care professional to feed their child HMS, and 10% had received a sample of HMS from a health care professional (88,157). Moreover, HMS companies employ social media to advertise their products to Cambodian consumers, and leveraging personal data to specifically target pregnant women and mothers, as indicated in a report by World Vision (158). This extensive marketing may adversely influence caregivers' infant feeding practices and is detrimental to breastfeeding practices (154), as evidenced by a cross-sectional study from Phnom Penh (n=306) which found mothers who received a recommendation from a health care professional had a 2.4 [1.20-4.91] fold increased odds of using these substitutes (159).

Using HMS has additionally been linked to wealth status in Cambodia (160). An analysis of breastfeeding data from the CDHS 2014 found that mothers in lower wealth quintiles were more likely to breastfeed (160). This socioeconomic difference in breastfeeding practices is consistent with an analysis of five East and Southeast Asian countries reporting that higher socioeconomic status at both individual and community levels negatively affected EBF (161), and an investigation of infant formula consumption in 90 LMICs reporting that formula use was positively associated with wealth status (162). Some suggest that HMS usage is now regarded as a symbol of wealth and is potentially perceived as sophisticated and modern, while breastfeeding may be deemed old-fashioned (163). Given that most mothers in our study were of higher socioeconomic status, they were likely better able to act on marketing and use available funds to purchase HMS compared to peers of lower socioeconomic standing.

6.1.4 Potential Adverse Risks of HMS

The high usage of HMS in our study is worrisome, given the possible adverse health risks associated with its use in lieu of breastmilk. When using infant formula as a substitute, its reconstitution with water poses potential health risks due to the increased risk of pathogenic contamination (61,62) given the microbiological quality of drinking water in Cambodia, with high contamination having been reported in several districts (86). Ingestion of water with bacterial contamination can cause diarrhea and increase the risk of stunting and wasting (164). While human milk is the optimal source of nutrition for infants, infant formula can be an adequate substitute if properly prepared (165). However, the use of other HMS (i.e. products such as cows milk, powdered milk, and coffee creamer) can have negative implications on child nutrition given the insufficient nutritional value of these products, such as low iron content (166). A milk feed as defined by the WHO when assessing dietary adequacy for infants 6-23 months, encompasses any formula or animal milk other than human milk (e.g. cow milk, goat milk,

evaporated milk, or reconstituted powdered milk), as well as semi-solid and fluid/drinkable yogurt and fermented products made with animal milk (2). Yet, feeding cow's milk to infants under one year is discouraged, due to its association with an increased risk of intestinal bleeding and iron deficiency anaemia (167). Although 88% of non breastfed children in our study achieved adequate MMF, nutrient adequacy of this sample is unknown, as all forms of HMS are considered milk feeds.

6.1.5 Economic Burden of HMS

In addition to the potential health risks associated with HMS, consideration must also be given to the economic burden that purchasing these substitutes can cause. A cost-benefit analysis highlighting the risks of not breastfeeding in seven Southeast Asian countries found that purchasing HMS was a significant expense for working families (168). For instance, in Indonesia, families spent an estimated 21% of their monthly earnings on HMS, while families in Vietnam spent 47% of their monthly incomes (168). In our study, mothers who purchased HMS spent an average of $95 US per month on these substitutes, which accounts for almost one third (29%) of their monthly income. Authors of a qualitative study (n=109) investigating the health-seeking behaviours of garment factory workers in Cambodia conducted in-depth interviews with caregivers and found that all mothers who returned to work in the factories used HMS, despite the substantial expense purchasing this food imposed (6). One father participant commented that their child consumed the equivalent of one to two days' salary per day in infant formula (6). This high proportion of income spent on HMS means spending to other areas of life must be reduced. A secondary analysis of the 2003 Family Income and Expenditure Survey in the Philippines found that families spent more on formula than education and medical costs (169). When faced with these costs, mothers may resort to other strategies to deal with the economic burden, such as borrowing money or changing their own eating habits (170). Changes in maternal eating patterns

can negatively affect mothers' diet quality, which may have been a factor in the approximately one-third of mothers in our study who did not meet adequate dietary diversity (37%).

6.2 Insufficiency and Noncompliance of Maternity Benefits

6.2.1 Insufficient Maternity Leave

We identified poor adherence to the recommended IYCF practices of EBF (10%) and timely introduction of complementary foods at six months (32%) in this study. Although the most recent CDHS reports a national EBF rate of 50% (4), given that the majority of our study population resided in and around Phnom Penh, our findings are unsurprisingly more similar to a recent cross-sectional study conducted in Phnom Penh which found that only 8% of women exclusively breastfed to 6 months (86). In our sample, the average age infants were introduced to complementary foods was three to four months. This early introduction of complementary foods starkly contrasts data from the CDHS 2021-2022, which reported that 88% of infants received foods as recommended at six months (4). This early breastfeeding cessation and introduction of complementary foods may be driven by mothers' return to work.

As noted above, this study found that mothers ceased breastfeeding around three months post-partum, which aligns with the most cited reason for breastfeeding cessation (maternal return to work, 50%) and the current Cambodian maternity leave policy of 90 days (5). These findings are similar to those reported in both Sri Lanka and Kenya, where maternal return to work due to inadequate maternity leave length was the most common reason for early breastfeeding cessation (118,119). As human milk is the ideal food for infants during the first six months of life (8), early cessation of breastfeeding is concerning, given possible adverse outcomes such as diarrhea and wasting (171).

Mothers return to work could additionally be driving the early introduction of complementary foods reported in our study. This explanation was posed in a qualitative study (n=109) that reported inappropriate feeding of complementary foods by caregivers upon mothers' return to work to garment factories in central Kampong Chhnang province (6). Similarly, a report on IYCF practices by Alive & Thrive in Vietnam found that most infants were introduced to complementary foods in their fourth month (172). Mothers cited maternity leave as an important factor in deciding when to introduce solids (at the time this report was released, maternity leave in Vietnam was four months, this has since been extended to six months) (172,173). Early introduction of complementary foods is concerning, given its association with malnutrition, stunting, and morbidity due to gastrointestinal diseases, particularly in areas where proper sanitation is a concern (174,175).

A possible solution to these concerns is the extension of maternity leave in Cambodia. A longitudinal study merging national maternity leave policies and breastfeeding outcomes from 38 LMIC concluded that a one month increase in legislated maternity leave was associated with a 5.9 [95% CI= 2.0-9.8] percentage point increase in EBF and a 2.2 [1.1-34.] month increase in breastfeeding duration (114). A study in Iran (n=212), where governmental and private sectors have a six month mandated maternity leave, found that mothers with maternity leave of six months or greater were significantly less likely to use infant formula ($p=0.05$) than mothers with less maternity leave, with authors speculating that extended maternity leave promoted breastfeeding (123). Similarly, a longitudinal study (n=20 172) in Taiwan reported that mothers who returned to work within six months postpartum ceased breastfeeding earlier than those who returned after six months ($p<0.001$) (176). While the ILO recommends 14 weeks of maternity leave, the WHO has recently advocated for six months of paid maternity leave to promote

optimal breastfeeding practices (113,177), which we speculate could also facilitate the timely introduction of complementary foods.

6.2.2 Knowledge of Labour Laws and Noncompliance by Workplaces

In our study, most participants demonstrated correct knowledge regarding the duration of maternity leave; however, large gaps were identified in workers' knowledge of other relevant provisions of maternity-related labour laws. Specifically, knowledge of the wages to be received during maternity leave, the number and duration of additional breaks allocated for lactation, and the minimum number of female employees required for employers to provide a daycare facility were all low. These findings are consistent with a report released by the ILO of Cambodian factory workers, which highlighted that many workers were aware of the 90 day maternity leave policy but lacked awareness of other maternity rights (178). It is noteworthy that the ILO report also highlighted the supervisors' inadequate knowledge of maternity leave rights, which can be problematic as supervisors are responsible for disseminating this information to workers, and enforcing these policies (178). Therefore, it is challenging for workers to be aware of their entitlement to these rights if their supervisors are not well-informed (178). Implementing education sessions on maternity-related labour laws for both workers and supervisors could aid in reducing these knowledge gaps, and ultimately in supporting continued lactation.

An alternate explanation for the knowledge gaps regarding lactation breaks identified in our study could be the lack of necessity for such breaks. A large proportion of mothers in this study (70%) did not reside with their infant, and a majority (68%) had already ceased breastfeeding, suggesting that lactation breaks may not have been relevant or required by a considerable proportion of these mothers. Similar conclusions were drawn from the aforementioned report from ILO, where several mothers indicated that they did not utilize their lactation breaks due to

logistical challenges such as distance from their child's location, transportation constraints, and reluctance to bring their children to the employer's daycare facility (178).

Mothers who are aware of their legally mandated maternity benefits may still lack the agency to advocate for their rights to breaks due to gender norms and economic vulnerability (179). According to the *Chbab srey*, the traditional Cambodian code of conduct for women, men rank higher on the societal hierarchical ladder (180,181); in workplaces where female workers report to male supervisors, this gendered power imbalance may make mothers hesitant to advocate for their breaks (179). They may also fear retribution from supervisors should they advocate for accommodations, particularly if workplaces are not in compliance with legally mandated maternity benefits. A report by Human Rights Watch conducted in the Cambodian garment industry noted there was often failure to make reasonable accommodations for pregnant workers, such as lighter work, or taking breaks, without the loss of pay (182). Furthermore, a case study (n=72) conducted in Phnom Penh garment factories found that even though workplaces with over 100 female workers are required by law to provide childcare facilities to mother workers, in many factories, these facilities either did not exist or were inaccessible to workers (183). As a result, while women may be aware of their legally mandated benefits upon return to work, they may fear advocating for these rights; thus, they are not used.

6.2.3 Attitudes and Support towards Breastfeeding in the Workplace

We found positive attitudes towards breastfeeding in the workplace among all employees. However, there were significant differences in responses between different worker groups regarding whether breastfeeding women currently got long and frequent enough breaks, should skip lactation breaks during hectic workdays, should ask for accommodations, as well as regarding support for breastfeeding in the workplace. Although mothers exhibited positive

attitudes toward these domains, their attitudes were significantly less positive than their coworkers. These findings are in contrast to a report released by the Ministry of Health in Cambodia, which conducted focus groups in five Cambodian villages and indicated that mothers who worked in garment factories did not feel supported by their employers to continue breastfeeding (184). Another possibility is that breastfeeding supports in the workplace may be unnecessary, given that many women do not live with their children and have ceased breastfeeding.

6.3 Recommendations for Future Research and Interventions

Although we gleaned valuable insights into the knowledge, attitudes, and practices of nutrition, IYCF, and Cambodian labour laws among Cambodian factories, important gaps were also identified. Given that a large proportion of mothers do not reside with their infants, future research should conduct dietary assessments of children by way of the primary caregiver to accurately represent children's dietary practices and assess the caregiver's knowledge and attitudes toward IYCF. Given that MDD, MMF, nor MAD capture the quantity of foods consumed by children, quantifying the amounts of foods consumed by children could help to identify potential nutrient gaps that could impact health. Additionally, research should be conducted both in and out of the workplace to gauge whether outcomes differ depending on whether participants are in the vicinity of their employer.

Despite most mothers in our study living apart from their children, the barriers to workplace lactation discussed previously inhibit those who live with their children from continuing breastfeeding. A previous report from the ILO in Cambodia indicated that many mothers who lived close to their workplaces would have preferred to continue to breastfeed upon return to work but were inhibited by institutional barriers such as a lack of lactation space in their

workplace (185). Therefore, interventions such as the establishment of breastfeeding and other lactation supports in the workplace may increase breastfeeding practices among working mothers. Previous research has shown a positive association between workplace lactation support programs (e.g. lactation rooms) and higher breastfeeding rates and duration, while also increasing worker satisfaction and reducing absenteeism (121,131–137,186). These interventions could include private facilities for mothers to lactate, the provision of equipment for women to pump, on-site childcare, and educational sessions for mothers and other workers on IYCF and maternity leave to enhance knowledge (136). The implementation of such programs could be beneficial in reducing both the practice and knowledge gaps highlighted in this study.

Additionally, education sessions for primary caregivers have the potential to increase caregiver knowledge of proper IYCF and aid in reducing HMS usage and promoting proper dietary diversity. Programs such as the *Grandmother Inclusive Approach Project* from World Vision have been successful in improving child nutrition outcomes among Cambodian skip-generation households (130), and can be used as a model when designing future interventions.

In addition, factory compliance with Cambodian maternity-related labour laws should be ensured for any future interventions to be successful, therefore enforcement with considerable repercussions for noncompliance should be considered.

Finally, given that half of mothers in this study stopped breastfeeding in order to return to work, lobbying for extended maternity leave policies to align with the WHO recommended six months (177), as was the case in Vietnam (187), holds potential to improve IYCF practices in Cambodia.

6.4 Strengths and Limitations of this Study

To the best of our knowledge, this study was the first to provide quantitative evidence of the knowledge, attitudes, and practices of nutrition, IYCF and Cambodian labour laws among Cambodian factory workers. The process of data collection in workplaces, during working hours, was done for ease of collection but also enabled us to capture an accurate representation of the workers within these workplaces. The wide sampling frame of this study can be considered a strength, as it allowed us to capture data from a large number of respondents at several factories, suggesting that the results of this study may be generalizable to similar workplaces. Another notable strength of this study was the employment of local enumerators, who all spoke Khmer fluently and understood the cultural context.

However, there are several limitations to this study. Likert scales was used for their high reliability and ease of administration (188). However, there is evidence of cultural differences in responses when employing such scales outside of HIC where they were originally designed for use. Studies by Lee et al. (2002) and Yeh et al. (1998) found that American participants were more likely to answer on the extreme ends of the scale, while Asian populations were more likely to use the middle of the scale (189,190). While important to consider, in this study, a vast majority of participants used the endpoints of the scale, which aligns with previous work from Whitfield (2016) where Khmer participants used the full scale (191). While conducting surveys in workplaces was a strength of the study, it should also be considered as a limitation due to potential social desirability bias. We attempted to mitigate this bias during the consent process when all participants were told that while employers were aware of the research, they were not involved in any data collection or analyses, would not see any raw data or individual responses, and responses would not impact a participant's job. However, workers may still have felt

compelled to present their situation in a better light for fear of retribution from employers, as has previously been reported by Human Rights Watch who found that factory workers were coached to positively report about working conditions prior to the arrival of visitors (182). Additionally, as fewer than half of mothers were aware of what their child consumed in the 24 hours prior to the study, and primary caregivers were not surveyed, it is unclear if the reported child dietary indicators accurately represent consumption among this sample. Finally, although dietary data were collected per WHO IYCF measurement methods (2), there is always risk of inaccurate data due to self-report and recall bias (192).

7.0 Conclusion

This study provides quantitative evidence of the knowledge, attitudes, and practices of nutrition, IYCF, and Cambodian labour laws among Cambodian factory workers. While Cambodian factory workers exhibited positive attitudes towards breastfeeding practices in the workplace, there was poor knowledge of IYCF and Cambodian labour laws among these workers. Additionally, adherence to proper infant and young child feeding recommendations was poor, with only 10% exclusive breastfeeding (44 percentage points below the most recent CDHS), and more than half of children receiving HMS. Furthermore, fewer than half of children were receiving an adequately diverse and acceptable diet.

Infant feeding practices were likely poor in this group because women lived apart from their infants, were unable to continue breastfeeding, and thus replaced human milk with human milk substitutes and/or started complementary foods earlier than recommended. This may be the sign of a larger trend across the country as labour market trends shift and more women of reproductive age engage in the paid labour force. In tandem, insufficient maternity benefits and

factory non-compliance with Cambodian maternity labour laws are additional barriers for women to continue breastfeeding, and hinder workers' ability to use their legally mandated maternity rights. The establishment of breastfeeding and other lactation supports in the workplace, enhanced IYCF and maternity leave education for all employees and supervisors, IYCF education for primary caregivers, and lobbying for extended maternity leave policies, could be beneficial in reducing these gaps.

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9.0 Appendices

Appendix A: NECHR Certificate of Ethics Clearance

ព្រះរាជាណាចក្រកម្ពុជា
KINGDOM OF CAMBODIA
ជាតិ សាសនា ព្រះមហាក្សត្រ
NATION RELIGION KING

ក្រសួងសុខាភិបាល
MINISTRY OF HEALTH
គណៈកម្មាធិការជាតិក្រមសីលធម៌
សំរាប់ការស្រាវជ្រាវសុខភាពលើមនុស្ស
National Ethics Committee for Health Research

Nº 291 NECHR

Phnom Penh December 02, 2021

Dr. Kyly C Whitfield

Project: Pilot study on Workplace Lactation Support Programs and Lactation Rooms in Cambodia. Version N° 1, dated 28th October 2021.

Reference:
- Your letter on 08th November 2021
- Report of NECHR's secretaries on 25th November 2021

Dear Dr. Kyly C Whitfield,

I am pleased to notify you that your study of protocol entitled "Pilot study on Workplace Lactation Support Programs and Lactation Rooms in Cambodia. Version N° 1, dated 28th October 2021" has been approved by National Ethics Committee for Health Research (NCEHR).This approval is valid for twelve months after the approval date.

NECHR also wish to remind the Principal Investigator that all research activities to be conducted during the COVID-19 pandemic must strictly follow the latest prevention measures set by the MOH and the relevant load authorities.

The Principal Investigator of the project shall submit following document to the committee's secretariat at the National Institute of Public Health at #80, Samdach Penn Nouth Blvd (289), Sangkat Boeungkok2, Khan Tuol Kork, Phnom Penh. (Tel: 012 528 789, 086 762 113, 012 203 382 Email: nouthsarida@gmail.com, cheatasoft27@gmail.com):

- Annual progress report
- Final scientific report
- Patient/participant feedback (if any)
- Analyzing serious adverse events report (if applicable)

The Principal Investigator should be aware that there might be site monitoring visits at any time from NECHR team during the project implementation and should provide full cooperation to the team.

Regards,

Chairman

Prof. ENG HUOT

National Ethics Committee
for Health Research
(NECHR)

Lot #80, Samdach Penn Nouth Blvd (289), Sangkat Boeung Kok 2, Khan Tuol Kork, Phnom Penh, Cambodia. Tel: (855-012) 842 442, (855-012) 528 789, (855-012) 203 382

Appendix B: MSVU REB Certificate of Ethics Clearance

University Research Ethics Board (UREB)

Certificate of Research Ethics Clearance

☒	Clearance	☐	Secondary Data Clearance	☐	Renewal	☐	Modification	☐	Change to Study Personnel

Effective Date	**November 24, 2021**	**Expiry Date**	**November 23, 2022**

File #:	**2021-097**
Title of project:	Evaluation of Workplace Lactation Support Programs and Lactation Rooms in Cambodia
Researcher(s):	Kyly Whitfield
Supervisor (if applicable):	n/a
Co-Investigators:	Hou Kroeun; Rem Ngik; Chum Senveasna
Version :	1

COVID-19 - Researchers are reminded that they and their research team must abide by all **Public Health** directives and **MSVU** requirements (Resumption of Human Research (msvu.ca)) regarding in-person contact with participants. In-person research requires additional clearance and may not proceed until the second level clearance is obtained.

The University Research Ethics Board (UREB) has reviewed the above named research proposal and confirms that it respects the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* and Mount Saint Vincent University's policies, procedures and guidelines regarding the ethics of research involving human participants. This certificate of research ethics clearance is valid for a period of **one year** from the date of issue.

Researchers are reminded of the following requirements:	
Changes to Protocol	Any changes to approved protocol must be reviewed and approved by the UREB **prior** to their implementation. **Form: REB.FORM.002** **Info: REB.SOP.113** **Policy: REB.POL.003**
Changes to Research Personnel	Any changes to approved persons with access to research data must be reported to the UREB immediately. **Form: REB.FORM.002** **Info: REB.SOP.113** **Policy: REB.POL.003**
Annual Renewal	Annual renewals are contingent upon an annual report submitted to the UREB **prior** to the expiry date as listed above. You may renew up to four times, at which point the file must be closed and a new application submitted for review. **Form: REB.FORM.003** **Info: REB.SOP.116** **Policy: REB.POL.003**
Final Report	A final report is due on or before the expiry date. **Form: REB.FORM.004** **Info: REB.SOP.116** **Policy: REB.POL.003**
Privacy Breach	Researchers must inform the UREB immediately and submit the Privacy Breach form. The breach will be investigated by the REB and the FOIPOP Officer. **Form: REB.FORM.015**
Unanticipated Research Event	Researchers must inform the UREB immediately and submit a report to the UREB within seven (7) working days of the event. **Form: REB.FORM.008** **Info: REB.SOP.115** **Policy: REB.POL.003**
Adverse Research Event	Researchers must inform the UREB immediately and submit a report to the UREB within two (2) working days of the event. **Form: REB.FORM.007** **Info: REB.SOP.114** **Policy: REB.POL.003**

*For more information: http://www.msvu.ca/ethics

DSeguin

Daniel Seguin
Chair, University Research Ethics Board

Halifax Nova Scotia B3M 2J6 Canada
Tel 902 457 6350 • msvu.ca/ethics

Appendix C: Consent Form (*English)*

Evaluation of workplace lactation support programs and lactation rooms in Cambodia

CONSENT FORM – BASELINE QUESTIONNAIRE

Study Investigators	**Helen Keller International Cambodia** Mr. Hou Kroeun, Deputy Country Director Mr. Rem Ngik, Monitoring and Evaluation Manager Mr. Chum Senveasna, Program Manager **Department of Applied Human Nutrition, Mount Saint Vincent University** Dr. Kyly Whitfield, Associate Professor Ms. Emily Meier, Research Assistant Ms. Kathleen Chan, Research Coordinator
Contact	If you have questions you can ask the interviewer, or contact a Khmer speaking co-investigator, Hou Kroeun, at 089 956 199.
Sites	Phnom Penh, Cambodia Kampong Thom, Cambodia Kampot, Cambodia
Granting Agency	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Introduction
Following child feeding recommendations about breastfeeding and solid foods is known to improve health and prevent disease in children. However, breastfeeding and other child feeding practices may change as more women take on paid labour positions in Cambodia.

Workplace lactation support programs, including education and a space for breastfeeding or pumping, may provide a low-cost solution by allowing women employees to continue breastfeeding upon their return to work. Although previous research on workplace lactation support programs is promising, research in Cambodia is needed. A new program, funded by GIZ, will see the implementation of 26 new workplace lactation support programs in factories and offices in three Cambodian provinces. This research study aims to evaluate the impact of local lactation support programs in eight workplaces (five factories) of the overarching 26 workplaces.

Participation
Your participation in this study is entirely voluntary, so it is up to you to decide whether you would like to take part in this study. Before you decide, it is important for you to understand what the research involves. This consent form will tell you about the study, why the research is being done, what participation in the study will look like, and the possible benefits, risks, and discomforts.

If you wish to take part in the study, you will be asked to provide consent to the interviewer by signing or stamping your thumbprint on this consent form. If you do decide to take part in this study, you are still free to withdraw at any time and without giving any reasons for your decision. If you do not wish to take part, you do not have to provide any reason for your decision not to participate. Importantly, participation in this study will in no way impact your current employment.

Please take time to listen to the following information carefully and to discuss it with your family, friends, and Village Chief before you decide. Workers from 8 workplaces in Phnom Penh, Kampong Thom, and Kampot will be invited to participate in this study.

Who is conducting the study?
Researchers from Helen Keller International are conducting this study in collaboration with Mount Saint Vincent University. You are entitled to request further details from the investigators, who are listed on the first page. If you have questions you can ask the interviewer, or contact a Khmer speaking co-investigator, Hou Kroeun, at 089 956 199.

Who Can Participate?
To participate in this study, you must be at least 18 years of age, work at one of the 8 workplaces involved in the study, provide written informed consent, and fall into one of the following groups:

- mother employees with a child <12 months (“mothers”)
- women employees who do not have a child <12 months (“women”)
- male employees (“men”)
- managers (managers or and supervisors) of any gender and parent type (“employers”)

What will participation in this study look like?
If you agree to participate in this research study, you will be asked to complete a questionnaire lasting about 45-60 minutes. We will ask questions about you (e.g. your education), your workplace (e.g. hours of work), and ask a series of questions about your knowledge and opinions of infant feeding, breastfeeding in the workplace, and Cambodian Labour Laws about maternity leave. These interviews will take place in a quiet location at or near your workplace at a time convenient for you (usually before/after a work shift). First you will provide informed consent to participate, and then the interviewer will ask you the questions from the questionnaire in a quiet place. You do not need to answer any questions you do not want to answer.

Risks
We do not think participation in this study poses much of a risk. While your employer is aware of this research, they are not involved in any collection or analyses of these data: what you say to researchers will in no way impact your job. However, participation in this interview will take time away from your day.

Please be advised that the data will be sent electronically between Cambodia and Canada and the data could be intercepted by domestic or foreign authorities. The data will be coded and it cannot be used to identify your personal information.

Benefits
Unless you are a mother using the lactation rooms, there is unlikely to be a direct benefit to you from this study. However, you will help us to understand whether workplace lactation support programs are impactful in Cambodia, and whether more programs like it should be developed across the country in the future.

Compensation
We understand this survey will take some time away from your day, so we will provide you with a small gift (i.e. laundry soap or a krama) to thank you for taking the time to participate.

Confidentiality
Your confidentiality will be respected. You will be assigned a unique study number as a participant in this study. This number will not include any personal information that could identify you (e.g., it will not include your initials, date of birth, etc.). Only this number will be used on any research-related information collected about you during the course of this study, so that your identity will be kept confidential. Information that contains your identity will remain only with the Principal Investigator and/or designate.

All data from this study will be sent electronically from Cambodia to Canada in that requires a secret password to be accessed. Only members of the research team will know this password.

Participation and Withdrawal from this Study
Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time and do not have to give a reason for your decision. If you decide not to take part or decide to leave the study, you may do so at any time without any consequences. All data collected about you up to the point of withdrawal will be retained for analysis. You will be given a copy of this signed and dated consent form. You will be kept informed if any information should arise that might affect your willingness to participate in the follow up interviews.

If you have questions about how this study is being conducted and wish to speak with someone who is not directly involved in the study, you may contact the Cambodian National Ethics Committee for Health Research at 023 880 345.

What happens after the study finishes?
The information collected from you will be used to inform future workplace lactation support programs in Cambodia. We will return to your workplace after the study is complete to share the results of the study.

Evaluation of workplace lactation support programs and lactation rooms in Cambodia

CONSENT FORM - BASELINE QUESTIONNAIRE

- I have listened to, or read, and understood the information provided on this consent form.
- I have had sufficient time to consider the information provided and to ask for advice (if needed).
- I have had the opportunity to ask questions and have received a satisfactory response to my questions.
- I understand that all of the information collected will be kept confidential and that the results of this study will only be used for scientific objectives.
- I understand that participation in this study is voluntary and that I am completely free to refuse to participate or to withdraw from this study at any time.
- I understand that I am not waiving any of my legal rights as a result of signing this consent form.
- I have listened to, or read, the information on this form and I freely consent to participate in this study.
- I have been told that I will receive a dated and signed copy of this form.

I consent to participating in this study.

_____ _____

Participant's name Participant's signature or thumbprint

Date: _____

_____ _____

Name of person obtaining consent Signature of person obtaining consent

Appendix D: Study Questionnaires (*English)*

EVALUATION OF WORKPLACE LACTATION SUPPORT PROGRAMS AND LACTATION ROOMS IN CAMBODIA

QUESTIONAIRE FOR EMPLOYEES WHO ARE MOTHERS OF A CHILD <12 MONTHS

IDENTIFICATION INFORMATION

Q01. Date of Interview ____/____/_____ (DD/MM/YYYY)
Q02. Consent Given 1=YES
0=NO

Q03. Workplace number:___
Q04. Workplace ID_____
Q05. Type of Workplace: 1= Factory
2= Bank

3=NGO

4=Government Institution

Q06. Enumerator name
Q07. Name of respondent

MODULE 1: PARTICIPANT INFORMATION		
1.	What is your date of birth?	____/_____/_____(DD/MM/YYYY)
2.	What is your ethnicity?	1. Khmer 2. Chinese 3. Vietnamese 2. Other-specify_____
3.	What is your highest degree/level of education?	1. Primary School 2. Lower Secondary School 3. Upper secondary school 4. Higher education
4.	How many years of combined work experience do you have?	1. Less than 5 years 2. 5 – 10 years 3. 11 – 15 years 4. 16 – 20 years 5. More than 20 years
5.	How long have you been employed by this workplace?	_____months or _____ years

6.	What is your current workload designation?	1. Part-time staff 2. Regular full-time staff/employee 3. Contract/casual staff 4. Other, Specify: _____
7.	What is your role/job title at your workplace?	_____add precodes after a couple days
8.	Taking everything into consideration, how do you feel about your job as a whole?	1. Extremely Dissatisfied 2. Dissatisfied 3. Somewhat dissatisfied 4. Neither satisfied nor dissatisfied 5. Somewhat satisfied 6. Satisfied 7. Extremely satisfied
9.	What shifts do you normally work?	3. 8 hour day shift (e.g. 8am-4pm, 9am-5pm 4. 8 hour morning shift (e.g. 7am-3pm) 5. 8 hour afternoon shift (e.g. 3 pm-11pm) 6. 8 hour night shift (11pm-7am) 7. Other-specify_____ 9 hour 7-4
10.	What is your usual monthly income? (USD$)	_____ code- 999
11.	What is your marital status?	1. Married 2. Divorced/Separated 3. Widowed 4. Single
12.	How many children do you have in total?	_____
13.	How many children under 2 years of age do you have?	_____
14.	What is the date of birth of your youngest child?	____/____/_____ (DD/MM/YYYY)
15.	Is your youngest child a boy or a girl?	1. Boy 2. Girl
16.	Where did you give birth to your youngest child?	1. At home 2. Health center 3. Public hospital 4. Private clinic 5. Other – Specify: _____
17.	What method of delivery was used for your youngest child?	1. Vaginal Birth 2. Cesarian Section (C-section)

18.	How many antenatal visits did you attend during the pregnancy with your youngest child?	_____ visits. If 0, record and skip to #21.
19.	Who was your antenatal care healthcare provider?	1. Doctor 2. Nurse 3. Midwife 4. Traditional birth attendant 5. Village health volunteer 6. other: _____
20.	How many deworming tablets did you take during pregnancy?	_____ tablets
21.	How many iron+folic acid tablets were you provided during pregnancy?	_____ tablets
22.	How many iron+folic acid tablets were you provided for postpartum care?	_____ tablets
23.	Do you live with your child that is under 12 months old?	1. No → If no, record and skip to #28. 2. Yes
24.	How far is your workplace from your home (km)?	_____km
25.	How do you typically travel from home to your workplace?	1. Walk 2. Bicycle 3. Public transport 4. Work provided truck 5. Other- specify_____
26.	When you are at work, who primarily looks after your youngest child?	1. Child is with me at work 2. Husband 3. Child's grandmother /grandfather 4. Child's aunt 5. Other family member (specify): _____ 6. Daycare 7. Other non-family member/place
27.	If your child is left with family, Where does this caregiver live?	1. Nearby: _____km 2. In the same province: _____km 3. In a different province: _____km 4. Other, specify:_____
28.	What are your living accommodations while you work?	1. Room in boarding house 2. Live with relatives 3. Own home, with child < 12 months → SKIP NEXT 2 Questions 4. Other- specify_____
29.	If you do not live at home, how far is your workplace from your living accommodations?	_____km

30.	How do you typically travel from your living accommodations to your workplace?	1. Walk 2. Bicycle 3. Public transport 4. Work provided truck 5. Other- specify_____
MODULE 2: EQUITY INDEX		
31.	Does your household have electricity?	0. No 1. Yes
32.	Does your household have a television?	0. No 1. Yes
33.	Does your household have a refrigerator?	0. No 1. Yes
34.	Does your household have a CD / DVD player?	0. No 1. Yes
35.	Does your household have a wardrobe?	0. No 1. Yes
36.	Does your household have a generator / battery / solar panel?	0. No 1. Yes
37.	Does any member of your household own a motorcycle / scooter?	0. No 1. Yes
38.	Does any member of your household own a watch?	0. No 1. Yes
39.	Does any member of this household have a bank account?	0. No 1. Yes
a	Floor	
b	walls	
40.	What type of fuel does your household mainly use for cooking?	1. Charcoal 2. Wood 3. Electricity 4. LPG (natural gas) 5. Biogas 6. Straw/shrubs/grass 7. Animal dung 8. Other – Specify _____
41.	What is the main source of drinking water during the rainy season for members of your household?	1. Piped into dwelling 2. Open well 3. Covered well

		4. Drilled Borehole (with hand pump or other type of pumping system) 5. Surface water (e.g. spring, river/stream, pond/lake/dam) 6. Rainwater 7. Bottled water 8. Other – Specify: _____
42.	What kind of toilet facility do members of your household usually use?	0. No facility—bush, field 1. Flush to piped sewer system (not shared with other households) 2. Flush to septic tank (not shared with other households) 3. Flush or pour toilet piped sewer system (shared with other households) 4. Flush or pour toilet to septic tank (shared with other households) 5. Traditional pit latrine 6. Ventilated Improved Pit (VIP) latrine 7. Pit latrine without slab 8. Composting toilet 9. Bucket 10. Other – Specify: _____
43.	Do you share this toilet facility with other households?	0. No 1. Yes
MODULE 3: IYCF KNOWLEDGE AND PRACTICES		
Read: I'd know like to ask you some questions to assess your <u>knowledge</u> on Infant and Young Child Feeding (IYCF) indicators		
44.	When should infants begin breastfeeding?	_____ minutes after birth
45.	Until what age should infants be **<u>exclusively</u>** breastfed (fed **only** breast milk, not water, coconut water, or any foods)? *If Don't Know, record 88*	_____ months
46.	Until what age should children **<u>continue</u>** to be breastfed while also eating other foods? *If Don't Know, record 88*	_____months

47.	What are some of the reasons that infants should be breastfed?	DO NOT READ OPTIONS TO RESPONDANT. - improves infant health (e.g. IQ) - Prevents infant illness - Prevents infant mortality - Prevents maternal disease (e.g. cancer, type 2 diabetes) - Less expensive than BMS - Less work than preparing BMS - BMS increase risk of infant illness - BMS increase risk of infant mortality - Other: _____
48.	What are the first foods a child should eat, other than breast milk?	1. _____ 2. _____ 3. _____
***READ*: Now I'd like to ask a few questions on your specific infant feeding practices**		
49.	Which of the following statements is closest to your opinion? The best way to feed a baby is:	1. Breastfeeding 2. A mix of breastfeeding a formula feeding 3. Formula feeding 4. Breastfeeding and formula feeding are equally good ways to a feed a baby
50.	Did you ever breastfeed your youngest child?	0. No → If no, record and skip to #53 1. Yes
51.	How long after birth was your youngest child put to the breast?	1. Immediately 2. _____Hours 3. _____Days
52.	In the first two days after delivery was your youngest child given anything other than breastmilk to eat or drink- anything at all like water, infant formula etc. [insert common drinks and foods, including ritual feeds, that may be given to newborn infants]?	0. No 1. Yes- Specify_____
53.	Are you still breastfeeding your youngest child?	0. No 1. Yes → If yes, record and skip to #57.
54.	How old was your child when you stopped breastfeeding? (in MONTHS)	_____ months
55.	Why did you [***stop / never***] breastfeed your youngest child?	1. Problem with breast (pain, cracked nipples, engorgement)

		2. Not enough time to feed 3. Not enough breastmilk 4. Became pregnant again/new infant born 5. Went back to work 6. Infant resisted breastfeeding 7. Infant already grown up 8. Other – specify: _____ ALL → Record and skip to #58.
56.	In the last 24 hours - from yesterday morning to this morning (i.e. during the day and night) - how many times did you breastfeed your youngest child during the day? And during the night? *(accept estimates if not sure)* *If none, record 00.*	During the day: _____ times During the night:_____ times
57.	Did your youngest child drink anything from a bottle with a nipple yesterday during the day or at night?	0. No 1. Yes 88. Don't know
READ: Now I would like to ask you about liquids that your youngest child had yesterday during the day or night. Please tell me about all drinks, whether they had them at home or somewhere else. Yesterday during the day or night did your child have:		
58.	Plain Water?	0. No 1. Yes 88. Don't know
59.	Infant formula, such as [insert local names of common formula]?	0. No → If no, record and skip to #63. 1. Yes 88. Don't know→ Record and skip to #63.
60.	How many times did your child drink formula yesterday? *If don't know record 88*	_____ times

61.	You said your child drank formula milk yesterday. On average, how much do you spend per month on this item for your child? (in US dollars)? *(Accept estimates)* *If Don't Know, record 88*	_____ US DOLLARS
62.	Milk from animals, such as fresh, tinned or powdered milk?	0. No → If no, record and skip to #66. 1. Yes 88. Don't know → Record and skip to #66.
63.	How many times did your child drink milk? *If Don't Know, record 88*	_____times
64.	Was the milk or were any of the milk drinks a sweet or flavoured type of milk?	0. No 1. Yes 88. Don't know
65.	Yogurt drinks such as [insert local names of common yogurt drinks]?	0. No→ If no, record and skip to #69. 1. Yes 88. Don't know → Record and skip to #69.
66.	How many times did your child drink yogurt? *If Don't Know, record 88*	_____times
67.	Was the yogurt or were any of the yogurt drinks a sweet or flavoured type of yogurt drink?	0. No 1. Yes 88. Don't know
68.	Chocolate-flavoured drinks including those made from syrups or powders	0. No 1. Yes 88. Don't know
69.	Fruit juice or fruit-flavoured drinks including those made from syrups or powders?	0. No 1. Yes 88. Don't know

70.	Sodas, malt drinks, sports drinks or energy drinks?	0. No 1. Yes 88. Don't know
71.	Tea, Coffee or herbal drinks?	0. No → If no, record and skip to #74. 1. Yes 88. Don't know→ Record and skip to #74.
72.	Was/were the drink(s) sweetened?	0. No 1. Yes 88. Don't know
73.	Clear broth or clear soup?	0. No 1. Yes 88. Don't know
74.	Any other liquids?	0. No → If no, record and skip to #77. 1. Yes → specify_____ 88. Don't know → record and skip to #77.
75.	Was/were the drink(s) sweetened?	0. No 1. Yes 88. Don't know
Now I would like to ask you about everything that your child ate yesterday during the day or the night. I am interested in foods your child ate whether at home or somewhere else. Yesterday during the day or night did your child have:		
76.	Yogurt, <u>other than</u> yogurt drinks?	0. No→ If no, record and skip to #79. 1. Yes → specify_____ 88. Don't know→ record and skip to #79
77.	How many times did your child eat yogurt? *If Don't Know, record 88*	_____times
78.	Porridge, bread, rice, noodles, pasta or [insert other commonly consumed grains]	0. No 1. Yes 88. Don't know

79.	Pumpkin, carrots, sweet red peppers, squash or sweet potatoes that are yellow or orange inside? [any additions to this list should meet "Criteria for defining foods and liquids as 'sources' of vitamin A" in Box A6.1 in indicators for assessing IYCF practices]	0. No 1. Yes 88. Don't know
80.	Plantains, white potatoes, white yams, manioc, cassava or [insert other commonly consumed starchy tubersor starchy tuberous roots that are white or pale inside from table A6.1 in indicators for assessing IYCF practices]]	0. No 1. Yes 88. Don't know
81.	Dark green leafy vegetables, such as [insert commonly consumed vitamin A-rich dark green leafy vegetables – see examples in table A6.5]?	0. No 1. Yes 88. Don't know
82.	Any other vegetables, such as [insert commonly consumed vegetables from table A6.6]?	0. No 1. Yes 88. Don't know
83.	Ripe mangoes, ripe papayas or [insert other commonly consumed vitamin A-rich fruits from table A6.7]?	0. No 1. Yes 88. Don't know
84.	Any other fruits, such as [insert commonly consumed fruits from table A6.8]?	0. No 1. Yes 88. Don't know
85.	Liver, kidney, heart or [insert other commonly consumed organ	0. No 1. Yes

	meats – see examples on table A6.9]?	88. Don't know
86.	Sausages, hot dogs, ham, bacon, salami, canned meat or [insert other commonly consumed processed meats – see examples on table A6.10]?	0. No 1. Yes 88. Don't know
87.	Any other meat, such as beef, pork, lamb, goat, chicken, duck or [insert other commonly consumed meat – see examples on table A6.11]?	0. No 1. Yes 88. Don't know
88.	Eggs?	0. No 1. Yes 88. Don't know
89.	Fresh fish, dried fish or shellfish?	0. No 1. Yes 88. Don't know
90.	Beans, peas, lentils, nuts , seeds or [insert commonly consumed foods made from beans, peas, lentils, nuts, or seeds]?	0. No 1. Yes 88. Don't know
91.	Hard or soft cheese such as [insert commonly consumed types of cheese – see examples in table A6.16]?	0. No 1. Yes 88. Don't know
92.	Sweet foods such as chocolates, candies, pastries, cakes, biscuits, or frozen treats like ice cream and popsicles, or [insert other commonly consumed sentinel sweet foods – see examples in table A6.17]?	0. No 1. Yes 88. Don't know

93.	Chips, crisps, puffs, French fries, fried dough, instant noodles or [insert other commonly consumed sentinel fried and salty foods – see examples in table A6.18]?	0. No 1. Yes 88. Don't know
94.	Other solid, semi-solid or soft foods? List all other solid, semi-solid or soft foods that do not fit food groups 7A-7Q here: _____	0. No 1. Yes 88. Don't know
95.	Did you child eat any solid, semi-solid or soft food yesterday during the day or night? If "yes" probe: What kind of solid, semi-solid or soft food did your child eat?	0. No→ If no, record and skip to #99. 1. Yes → specify_____ 88. Don't know→ record and skip to #99.
96.	What is the number of meals and snacks your child consumed yesterday during the day or night?	_____ meals _____ snacks
MODULE 4: EMPLOYEE HEALTH INFORMATION		
97.	Did your child <12 months have any of the following illnesses in the previous month?	1. Diarrhea 2. Vomiting 3. Fever 4. Cough 5. Running/Blocked Nose 6. Sore Throat 7. Other- specify_____ 88. Don't know
98.	What actions did you take when your child <12 months was ill?	1. No action was taken 2. Visited the health centre 3. Visited the midwife 4. Visited VHV

		5. Visited traditional village healer 6. Purchased medicines without seeking input from a VHV / healer / healthcare provider 7. Other -specify_____
99.	Was your child given less than usual to drink or more than usual to eat when they were sick? *IF LESS PROBE: Were they given much less than usual to eat or somewhat less?*	1. Much less 2. Somewhat less 3. About the Same 4. More 5. Nothing to drink 88. Don't know
100.	How much time did you take off work to deal with your youngest child's illness(es) last month?	____ hours, or ____ days
101.	Did <u>you</u> have any of the following illnesses in the previous month?	1. Diarrhea 2. Vomiting 3. Fever 4. Cough 5. Running/Blocked Nose 6. Sore Throat 7. Other- specify_____ 88. Don't know
102.	What actions did you take when <u>you</u> were ill?	1. No action was taken 2. Visited the health centre 3. Visited the midwife 4. Visited VHV 5. Visited traditional village healer 6. Purchased medicines without seeking input from a VHV / healer / healthcare provider 7. Other - specify_____

103.	How much time did you take off work to deal with your illness(es) last month?	_____hours, or _____ days	
104.	Is there health insurance/health coverage provided for by your workplace?	0. No 1. Yes	
105.	What percentage of costs does this workplace health insurance cover?	_____ %	
106.	How much money do you contribute to this workplace health insurance?	_____ USD	
107.	What does this health insurance cover? Check all that apply.	1. Visits to government healthcare centres 2. Visits to private health clinics 3. Prescription medications 4. Surgeries 5. Eye health (glasses, contact lenses) 6. Dental health 7. Birth control Other: ___	
108.	Who does your workplace health insurance/health coverage include?	1. Only me 2. Me and my husband 3. Me and my children 4. Me and my husband and my children 5 .Other: ___	
MODULE 5: DIETARY INTAKE			
READ: I would like to ask you about the foods and drinks that you may have consumed **yesterday** during the day or night. Yesterday did you have:			
109.	FOODS MADE FROM GRAINS	Corn/maize, rice, wheat, sorghum, rice borbor, sarghum, pasta/noodles, barley, millet or any other grains or foods made from these (e.g. bread, noodles, porridge or other grain products)	0. No 1. Yes
110.	WHITE ROOTS AND TUBERS	White potatoes, white yam, white cassava, taro roots or tubers, cocoyam, plaintainsor other foods made from roots	0. No

			1. Yes
111.	PULSES (BEANS, PEAS OR LENTILS	Beans, peas, lentils, hummus, tofu, tempeh	0. No 1. Yes
112.	NUTS AND SEEDS	Groundnut/peanut, cashew, walnut, Baobab seeds, chia seeds, flaxseed	0. No 1. Yes
113.	MILK	Milk	0. No 1. Yes
114.	DAIRY FOODS	Cheese, yogurt or other dairy products	0. No 1. Yes
115.	ORGAN MEAT	Liver, kidney, heart or other organ meats or blood-based foods	0. No 1. Yes
116.	RED FLESH MEATS FROM MAMMALS	Beef, lamb, pork, goat, rabbit, yak, game, mutton	0. No 1. Yes
117.	PROCESSED MEAT	Salami, bacon, bologna, hot dogs	0. No 1. Yes
118.	POULTRY AND OTHER WHITE MEATS	Chicken, duck, goose, guinea fowl	0. No 1. Yes
119.	FISH AND SEAFOOD	Fresh or dried fish or shellfish	0. No 1. Yes
120.	EGGS	Eggs from chicken, duck, guinea fowl or any other egg	0. No

			1. Yes
121.	DARK GREEN LEAFY VEGETABLES	Kale, mustard greens, spinach, amaranth greens, chicory, broccoli, swiss chard	0. No 1. Yes
122.	VITAMIN A RICH VEGETABLES AND TUBERS	Pumpkin, carrot, squash or sweet potato that are orange inside, red peppers	0. No 1. Yes
123.	VITAMIN A RICH FRUITS	Ripe mangoes, cantaloupe, apricot (ripe or dry), papaya, dried peach, 100% fruit juice made from any of these	0. No 1. Yes
124.	OTHER VEGETABLES	Any other vegetables	0. No 1. Yes
125.	OTHER FRUITS	Any other fruits and 100% fruit juices	0. No 1. Yes
126.	FRIED AND SALTY FOODS	Crisps, chips, doughnuts, fried dough/bread, samosas, instant noodles, fast food	0. No 1. Yes
127.	OILS AND FATS	Oils, fats or butter added to food or used in cooking	0. No 1. Yes
128.	SWEETS	Sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies, and cakes	0. No 1. Yes
129.	SPICES, CONDIMENTS , BEVERAGES	Spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages	0. No 1. Yes
130.	Who is primarily responsible for food preparation in your household?	1. Self (woman) 2. Husband/partner 3. Grandmother	

		4. Grandfather 5. Male children ____ 6. Female children 7. sister (children's aunt) 8. Other – specify:_____
131.	Are there any of the following educational materials about women's diet or nutrition available to you at your place of work? *Check all that apply*	0. None 1. Pamphlets 2. Books 3. Videos 4. Links to websites/social media 5. Info on community resources 6. Other, specify:
MODULE 6: KNOWLEDGE OF LABOR LAW ON MATERNITY LEAVE AND BREASTFEEDING PRACTICES IN THE WORKPLACE		
For the next set of questions, we want to understand what you know about Cambodian labour laws related to pregnancy and lactation.		
132.	Under the Cambodian Labour Law, how many days of maternity leave are female employees entitled to? *If Don't Know, record 888*	_____days
133.	Under the Cambodian Labour Law, what percentages of their wages are female employees entitled to during their maternity leave? *If Don't Know, record 888*	_____%
134.	Are female employees entitled to paid time to breastfeed, and if yes, how many hours of paid time are female employees entitled to per day for the purposes of breastfeeding? *Record to the nearest half hour* *If less than half an hour, record*	_____ hours

	0.0 *If Don't know, record 88.8*	
135.	If yes, are these breastfeeding/nursing breaks part of the normal breaks an employee receives throughout the day, or in addition to normal breaks?	1. Part of normal breaks 2. In additional to normal breaks 3. Depends, specify:_____ 88. Don't know
136.	Under the Cambodian Labour Law, are companies required to set up a nursing room and/or a day care center, or pay for an employee's daycare costs?	0. No → If no, record and skip to #145. 1. Yes 88. Don't know → record and skip to #145.
137.	If yes, how many female employees must a company have for them to offer these benefits? *If Don't Know, record 888*	_____ employees
MODULE 7: OPINIONS ON MATERNITY LEAVE AND BREASTFEEDING PRACTICES IN THE WORKPLACE		
138.	Do you agree or disagree? Female employees should be entitled to maternity leave. '*Maternity leave' meaning a period of absence from work granted to a mother before and/or after the birth of her child.*	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
139.	In your opinion, how long should female employees be entitled to a maternity leave?	_____ days, or _____ months
140.	In your opinion, what percentage of wages should female employees receive while on maternity leave?	_____%
141.	Do you agree or disagree? Female employees should be	1. Strongly disagree

	entitled to paid time during work to breastfeed their children.	2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
142.	In your opinion, how many <u>extra</u> breaks should women workers get for breastfeeding or pumping breastmilk during one full work shift? *(e.g. if a worker normally gets 3 breaks, and supervisor thinks they should get 4 in total in one shift, record "1" extra break).*	_____ breaks. → If 0, record and skip to #151.
143.	In your opinion how long should these breastfeeding breaks be, in total, for a full work shift? (*e.g. if a supervisor thinks that breastfeeding workers should get 2 extra 15 minute breaks, record "30 minutes")*	_____ minutes
READ: For the next questions I will be asking if you agree or disagree with the following statements		
144.	Workplaces should be required to set up a day care centre and/or nursing room or pay for an employee's daycare costs.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
145.	My breaks are <u>frequent</u> enough for breastfeeding or pumping breastmilk.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree

		5. Somewhat agree 6. Agree 7. Strongly agree
146.	My breaks are long enough for breastfeeding or pumping breastmilk.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
147.	Some days I would need to skip a breastfeeding or pumping session because my workdays are so hectic.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
148.	I can adjust my break schedule for breastfeeding or pumping breast milk.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
149.	I feel comfortable taking several breaks during work hours to pump breastmilk.	1. Strongly disagree 2. Disagree 3. Somewhat disagree

		4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
150.	I would feel comfortable asking for accommodations to help me breastfeed or pump breastmilk at work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
151.	Breastfeeding is common in my workplace.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
152.	My supervisor says things that make me think they support breastfeeding.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree

153.	My supervisor would consider it part of their job to help me combine breastfeeding and work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
154.	My supervisor would think I couldn't get all my work done if I needed to take breaks for breastfeeding or pumping breastmilk.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
155.	My supervisor would consider breastfeeding at work a personal choice, not something they should have to deal with.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
156.	My supervisor would help me deal with my workload so I could breastfeed or pump breastmilk at work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree

157.	My coworkers believe that breastfeeding is better for a baby's health than formula feeding.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
158.	My coworkers do not make fun of me when I sometimes leak milk through my clothes.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
159.	My coworkers would think they are inconvenienced if I took time to breastfeed or pump breastmilk.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
160.	I have supportive coworkers who cover for me when I need to pump my milk	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree

		7. Strongly agree
161.	The designated place for breastfeeding or pumping breastmilk at work would be available when I needed it.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree 88. Not applicable
162.	The designated place for breastfeeding or pumping breastmilk includes everything I need.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree 88. Not applicable
163.	My workplace would accept me pumping breastmilk at work, but would disapprove of me breastfeeding my child at work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
164.	My job could be at risk (e.g. lose my job or get fewer scheduled hours) if I breastfed or pumped breastmilk at work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree

		5. Somewhat agree 6. Agree 7. Strongly agree
165.	My opportunities for job advancement would be limited if I breastfed or pumped at work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
166.	I had enough maternity leave (paid and/or unpaid time off) to get breastfeeding started before going back to work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
167.	My productivity at my job has decreased since I had my baby because I take extra breaks for breastfeeding.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
168.	I work harder at my job because I take extra breaks to breastfeed during work hours.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree

		6. Agree 7. Strongly agree
MODULE 8: MATERNITY LEAVE AND BREASTFEEDING PRACTICES IN THE WORKPLACE		
169.	Have you ever been oriented or given information about the Cambodian Labor Law and its articles on breastfeeding practices and maternity leave?	0. No → If no, record and skip to #190 1. Yes
170.	Where or from whom have you received information about the Cambodian Labor Law? *Check all that apply.*	1. This company 2. A previous company/employer 3. Government officials 4. Trade unions 5.Co-workers 6.Friend, neighbor 7. Family member 8. Others – Specify: _____
171.	For the birth of your youngest child, were you working at this company?	0. No → If no, record and skip to #194 1. Yes
172.	For your youngest child, how many days of maternity leave did you take?	_____ days
173.	What type of benefits did you receive when you took maternity leave? *Check all that apply.*	1. Half pay of wage including prerequisites, for full time taken 2. Half pay of wage including prerequisite for part of the time taken 3, Fully reserve rights to other benefits in kind, if any 4. Other benefits, specify: _____

174.	[*Were / Are*] you allowed paid time during working hours to breastfeed your child, in addition to regular breaks?	0. No time given 1. Yes 2. Not breastfeeding
175.	Here at your workplace, how many regular breaks does an employee in your job role get in one shift?	_____ breaks
176.	Here at your workplace, what is the total time for regular breaks an employee in your role gets in one shift?	_____ minutes
177.	Here at your workplace, how many <u>extra</u> breastfeeding breaks does mother employee get in one day?	_____ breaks
178.	Here at your workplace, what is the total time for <u>extra</u> breaks for breastfeeding for female workers with small children? *If don't know, record 888*	_____ minutes
179.	[*Were/Are*] you able to adjust your break schedule to breastfeed?	0. No 1. Yes
180.	Does your workplace offer a day-care center at or near your workplace for working mothers?	0. No → If no, record and skip to #203 1. Yes: at my work 2. Yes: near my work
181.	Do you use this daycare for your youngest child?	0. No → If no, record and skip to #203 1. Yes
182.	Is the childcare service free? Or do you have to pay?	1. Free because paid by employer 2. Free because paid for my NGO or government 3. Have to pay Other, specify: _____
183.	How useful would a lactation room in your workplace be? Would you say…not useful,	0. Not useful

	somewhat useful, useful, or very useful?	1. Somewhat useful 2. Useful 3. Very useful
184.	In your opinion, how would a lactation room impact employee performance? Would you say it would make performance… much worse, a little worse, no difference, a little better or much better?	1. Much worse 2. A little worse 3. No difference 4. A little better 5. Much better

THANK YOU FOR YOUR TIME AND PARTICIPATION.

END OF THE QUESTIONNAIRE.

EVALUATION OF WORKPLACE LACTATION SUPPORT PROGRAMS AND LACTATION ROOMS IN CAMBODIA

QUESTIONAIRE FOR EMPLOYEES WHO ARE NOT MOTHERS OF A CHILD <12 MONTHS

IDENTIFICATION INFORMATION

Q08. Date of Interview ____/____/_____ (DD/MM/YYYY)
Q09. Consent Given 1=YES
0=NO

Q10. Workplace ID_____
Q11. Type of Workplace: 1= Factory
2= Bank

3=NGO

4=Government Institution

Q12. Enumerator ID:_____

MODULE 1: PARTICIPANT INFORMATION		
1.	What is your date of birth?	____/_____/_____(DD/MM/YYYY)
2.	What is your gender?	1. Man 2. Woman
3.	What is your ethnicity?	1. Khmer 2. Other-specify_____
4.	What is your highest degree/level of education?	1. Primary School 2. Lower Secondary School 3. Upper secondary school 4. Higher education
5.	How many years of combined work experience do you have?	1. Less than 5 years 2. 5 – 10 years 3. 11 – 15 years 4. 16 – 20 years 5. More than 20 years
6.	How long have you been employed by this workplace?	_____months or _____ years
7.	What is your current workload designation?	1. Part-time staff 2. Regular full-time staff/employee 3. Contract/casual staff

		4. Other, Specify: _____
8.	What is your role/job title at your workplace?	_____
9.	Taking everything into consideration, how do you feel about your job as a whole?	1. Extremely Dissatisfied 2. Dissatisfied 3. Somewhat dissatisfied 4. Neither satisfied nor dissatisfied 5. Somewhat satisfied 6. Satisfied 7. Extremely satisfied
10.	What shifts do you normally work?	1. 12 hour day shift 2. 12 hour night shift 3. 8 hour day shift (e.g. 8am-4pm, 9am-5pm 4. 8 hour morning shift (e.g. 7am-3pm) 5. 8 hour afternoon shift (e.g. 3 pm-11pm) 6. 8 hour night shift (11pm-7am) 7. Other-specify_____
11.	What is your usual monthly income? (USD$)	_____
12.	What is your marital status?	1. Married 2. Divorced/Separated 3. Widowed 4. Single
13.	Do you have any children?	0. No → If no, record and skip to #17. 1. Yes
14.	How many children do you have in total?	_____
15.	In what year was your youngest child born?	____/_____/_____(DD/MM/YYYY)
MODULE 2: EQUITY INDEX		
16.	Does your household have electricity?	0. No 1. Yes
17.	Does your household have a television?	0. No 1. Yes
18.	Does your household have a refrigerator?	0. No 1. Yes
19.	Does your household have a CD / DVD player?	0. No 1. Yes

20.	Does your household have a wardrobe?	0. No 1. Yes
21.	Does your household have a generator / battery / solar panel?	0. No 1. Yes
22.	Does any member of your household own a motorcycle / scooter?	0. No 1. Yes
23.	Does any member of your household own a watch?	0. No 1. Yes
24.	Does any member of this household have a bank account?	0. No 1. Yes
25.	What type of fuel does your household mainly use for cooking?	0. No 1. Yes
26.	What is the main source of drinking water during the rainy season for members of your household?	1. Charcoal 2. Wood 3. Electricity 4. LPG (natural gas) 5. Biogas 6. Straw/shrubs/grass 7. Animal dung 8. Other – Specify_____
27.	What kind of toilet facility do members of your household usually use?	9. Piped into dwelling 10. Open well 11. Covered well 12. Drilled Borehole (with hand pump or other type of pumping system) 13. Surface water (e.g. spring, river/stream, pond/lake/dam) 14. Rainwater 15. Bottled water 16. Other – Specify: _____
28.	Do you share this toilet facility with other households?	10. No facility—bush, field 11. Flush to piped sewer system (not shared with other households) 12. Flush to septic tank (not shared with other households) 13. Flush or pour toilet piped sewer system (shared with other households)

		14. Flush or pour toilet to septic tank (shared with other households) 15. Traditional pit latrine 16. Ventilated Improved Pit (VIP) latrine 17. Pit latrine without slab 18. Composting toilet 19. Bucket 10. Other – Specify: _____
MODULE 3: IYCF KNOWLEDGE		
Read: I'd know like to ask you some questions to assess your knowledge on Infant and Young Child Feeding (IYCF) indicators		
29.	Which of the following statements is closest to your opinion? The best way to feed a baby is:	1. Breastfeeding 2. A mix of breastfeeding a formula feeding 3. Formula feeding 4. Breastfeeding and formula feeding are equally good ways to a feed a baby
30.	When should infants begin breastfeeding?	_____ minutes after birth
31.	Until what age should infants be **exclusively** breastfed (fed **only** breast milk, not water, coconut water, or any foods)? *If Don't Know, record 88*	_____ months
32.	Until what age should children **continue** to be breastfed while also eating other foods? *If Don't Know, record 88*	_____months
33.	What are some of the reasons that infants should be breastfed?	DO NOT READ OPTIONS TO RESPONDANT. - improves infant health (e.g. IQ) - Prevents infant illness - Prevents infant mortality - Prevents maternal disease (e.g. cancer, type 2 diabetes) - Less expensive than BMS - Less work than preparing BMS - BMS increase risk of infant illness - BMS increase risk of infant mortality - Other: _____

34.	What are the first foods a child should eat, other than breast milk?	1. _____ 2. _____ 3. _____
MODULE 4: KNOWLEDGE OF LABOR LAW ON MATERNITY LEAVE AND BREASTFEEDING PRACTICES IN THE WORKPLACE		
For the next set of questions, we want to understand what you know about Cambodian labour laws related to pregnancy and lactation.		
35.	Under the Cambodian Labour Law, how many days of maternity leave are female employees entitled to? *If Don't Know, record 888*	_____days
36.	Under the Cambodian Labour Law, what percentages of their wages are female employees entitled to during their maternity leave? *If Don't Know, record 888*	_____% for _____ days
37.	Under the Cambodian Labour Law, how many years of service must a female employee have before she's entitled to *[read percentage from above]* of her wages?	0. No years of service; she's eligible for wages at any time 1. 1 year of service 2. Any other amount of time (specify) _____ 88. Don't know
38.	Under the Cambodia Labour Law are employers entitled (or 'allowed'?) to lay off women during their maternity leave?	0. No 1. Yes 2. Depends, specify: _____ 88. Don't know
39.	Under the Cambodian Labor Law, are female employees entitled to paid	0. No → If no, record and skip to #43 1. Yes

	time during working hours to breastfeed their children?	2. Depends, specify: _____ 88. Don't know → If no, record and skip to #43
40.	Under the Cambodian Labor Law, how many hours of paid time are female employees entitled to for the purposes of breastfeeding? *Record to the nearest half hour* *If less than half an hour, record 0.0* *If Don't know, record 88.8*	_____ hours
41.	Under the Cambodian Labor Law, are these breastfeeding/nursing breaks part of the normal breaks an employee receives throughout the day, or in addition to normal breaks?	1. Part of normal breaks 2. In additional to normal breaks 3. Depends, specify:_____ 88. Don't know
42.	Under the Cambodian Labor Law, are companies required to set up a nursing room and/or a day care center, or pay for an employee's daycare costs?	0. No → If no, record and skip to #45 1. Yes 88. Don't know → record and skip to #45
43.	If yes, how many female employees must a company have for them to offer these benefits *If Don't Know, record 888*	_____ employees
MODULE 5: OPINIONS ON MATERNITY LEAVE AND BREASTFEEDING PRACTICES IN THE WORKPLACE		
44.	Do you agree or disagree? Female employees should	1. Strongly disagree

	be entitled to maternity leave. '*Maternity leave' meaning a period of absence from work granted to a mother before and/or after the birth of her child.*	2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
45.	In your opinion, how long should female employees be entitled to a maternity leave?	_____ days, or _____ months
46.	In your opinion, what percentage of wages should female employees receive while on maternity leave?	_____%
47.	Do you agree or disagree? Female employees should be entitled to paid time during work to breastfeed their children.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
48.	In your opinion, how many <u>extra</u> breaks should women workers get for breastfeeding or pumping breastmilk during one full work shift? *(e.g. if a worker normally gets 3 breaks, and supervisor thinks they should get 4 in total in one shift, record "1" extra shift).*	_____ breaks. If "0", → record and skip to #51
49.	In your opinion how long should these breastfeeding breaks be, in total, for a full work shift?	_____ minutes

	(*e.g. if a supervisor thinks that breastfeeding workers should get 2 extra 15 minute breaks, record "30 minutes")*	
READ: For the next questions I will be asking if you agree or disagree with the following statements		
50.	Workplaces should be required to set up a day care centre and/or nursing room or pay for an employee's daycare costs.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
51.	Breastfeeding women should get a designated place for breastfeeding or pumping breast milk at work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
52.	Workplaces should supply the equipment needed for pumping breastmilk at work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
53.	Breastfeeding women currently get long enough	1. Strongly disagree

	and frequent enough breaks for breastfeeding or pumping breastmilk.	2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
54.	Breastfeeding women should skip breaks for breastfeeding or pumping if work gets too hectic.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
55.	Breastfeeding women should be able to ask for accommodations to help them breastfeed or pump breastmilk at work	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
56.	Breastfeeding is common in my workplace.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree

57.	My supervisor says things that make me think they support breastfeeding.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
58.	My coworkers say things that make me think they support breastfeeding.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
59.	My supervisor would consider breastfeeding at work a personal choice, not something they should have to deal with.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
60.	My supervisor would help a breastfeeding mother deal with her workload so she could breastfeed or pump breastmilk at work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree

		7. Strongly agree
61.	I support my coworkers breastfeeding at work.	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
62.	I would accept someone pumping breastmilk at work but not breastfeeding their child at work	1. Strongly disagree 2. Disagree 3. Somewhat disagree 4. Neither agree nor disagree 5. Somewhat agree 6. Agree 7. Strongly agree
MODULE 6: FINAL QUESTIONS		
63.	How useful would a lactation room in your workplace be? Would you say…not useful, somewhat useful, useful, or very useful?	0. Not useful 1. Somewhat useful 2. Useful 3. Very useful
64.	In your opinion, how would a lactation room impact employee performance? Would you say it would make performance… much worse, a little worse, no difference, a little better or much better?	1. Much worse 2. A little worse 3. No difference 4. A little better 5. Much better

THANK YOU FOR YOUR TIME AND PARTICIPATION.

END OF THE QUESTIONNAIRE.