

ABSTRACT

Objectives: Mothers who are employed postpartum are less likely to continue breastfeeding than mothers who are not formally employed. However, as postpartum employment is increasingly necessary for the majority of new mothers, it is important to investigate factors that influence the continuation of breastfeeding in employed mothers.

Methods: A sample of 1738 mothers who returned to paid employment postpartum were recruited from the obstetric units of four public hospitals in Hong Kong, and prospectively followed for 12 months or until their infant was weaned.

Results: More than 85% of participants returned to formal employment within 10 weeks postpartum, with over 90% of these employed full-time. About one-third of the participants (32%) were able to combine breastfeeding and employment, with breastfeeding defined as continuing for more than 2 weeks after returning to work postpartum. Later return to work and higher maternal education were associated with new mothers being able to combine breastfeeding and employment. Later return to work, shorter working hours, parental childcare, and higher maternal education were also associated with less likelihood of weaning from any or exclusive breastfeeding.

Conclusions: Improvements in employment-related conditions for mothers and additional support for lower educated mothers may be effective strategies to enable employed women to continue breastfeeding after their return to work.

Keywords: Breastfeeding, employment, maternity leave, postpartum, working hours

INTRODUCTION

Despite the widely recognized benefits of breastfeeding for both mothers and infants [1-3], early cessation of breastfeeding is common in many developed countries [4-6]. In the United States (US), although 76.5% of mothers initiate breastfeeding, rates of any or exclusive breastfeeding at 6 months postpartum are 49% and 16.4%, respectively [5]. Similarly, 86% of mothers in Hong Kong initiate breastfeeding [7], but only 13% exclusively breastfeed for the first 6 months and only 27% give any breast milk during this period [6]. These breastfeeding outcomes are far below the World Health Organization (WHO) recommendation of exclusive breastfeeding for the first 6 months of life and continued breastfeeding for up to 2 years or beyond [8]. High breastfeeding attrition rates have been attributed to factors such as sociodemographic characteristics, maternal employment, social support, early introduction of infant formula, and hospital practices [9-13]. For mothers with formal employment, the challenge of juggling breastfeeding and employment has been identified as a major barrier to continuation of breastfeeding [9, 14, 15].

Over the past several decades, an increasing number of mothers have become involved in the labor market around the world. In the US, 57% of women with infants under one year of age participate in the labor force, with almost 40% engaged in full-time employment [16]. Two-thirds of mothers in the United Kingdom (UK) are employed outside the home, and almost one-third returned to work within 5 months of birth [17, 18]. In Hong Kong, approximately 75% of women of childbearing age are participating in the workforce full-time [19] and previous studies indicate that almost 75% of new mothers resume their employment within the first 6 months [6]. Mothers resuming paid employment postpartum are less likely to continue breastfeeding than mothers who do not have formal employment [6, 15, 20-23].

For many women, paid employment is a necessity rather than an option, and new mothers

face the challenge of juggling employment and breastfeeding. Research has identified several employment-related characteristics that influence breastfeeding continuation among employed women, such as how soon they return to work and whether they are in full- or part-time employment [10, 20, 21, 24-29]. While measures of maternal workload, such as working hours, have been examined less frequently, one study found that new mothers who worked longer weekly hours were more likely to cease breastfeeding early than mothers who were not formally employed [30].

The available literature has several limitations. Specifically, many previous studies have only compared employed mothers with unemployed mothers; and although return to work is a predictor of early weaning, new mothers are increasingly combining breastfeeding with formal employment [31, 32]. In addition, exclusive breastfeeding is widely recognized to be more beneficial for infants than partial breastfeeding or formula feeding [1, 33]. Although exclusive breastfeeding can be more difficult for mothers in formal employment, there is little research to date that has measured the impact of work-related factors on the duration of exclusive breastfeeding. Furthermore, with few exceptions [23, 34], most studies on maternal employment and breastfeeding have been conducted in western countries [21, 24, 30, 35], where working patterns and maternity leave provisions often differ from Asian countries. It is noteworthy that Hong Kong has some of the highest female labor force participation rates in the developed world [16-19].

The proportion of new mothers reentering the workforce soon after birth is likely to increase worldwide and identifying variables that influence breastfeeding duration and exclusivity among this group is increasingly important. Therefore, examining the barriers to continued breastfeeding among employed mothers is essential to identify potential policy initiatives to support employed

mothers and to improve breastfeeding duration. The present study aims to investigate the factors influencing the continuation of any or exclusive breastfeeding among mothers returning to formal employment postpartum.

METHODS

Study Design and Participants

This study is based on a multi-center prospective longitudinal cohort study that was originally designed to assess the impact of maternal characteristics and hospital practices on breastfeeding outcomes. In this study, two cohorts of newly delivered women were recruited from the obstetric units of four geographically distributed public hospitals in Hong Kong. Hong Kong has eight public and 10 private hospitals that deliver obstetric care, with public hospitals accounting for 67.8% of all births to Hong Kong mothers [36]. Both cohorts were recruited from the same sites using the same study protocols, inclusion criteria, and data collection procedures. For the purpose of the current analysis, the two cohorts were combined.

In 2006–2007, 1409 mother-infant pairs were recruited, with a second cohort of 1277 mother-infant pairs recruited in 2011–12. The inclusion criteria for mothers were: 1) intention to breastfeed; 2) singleton pregnancy; 3) Hong Kong residence; 4) Cantonese speaking; and, 5) absence of serious medical or obstetric complications. In addition, selection criteria for their infants were: 1) a gestational age ≥ 37 weeks; 2) an Apgar score of ≥ 8 at 5 minutes; 3) a birth weight of ≥ 2500 grams; 4) absence of severe congenital malformations; 5) not placed in the special care baby nursery for ≥ 48 hours after birth; and, 6) not admitted to the neonatal intensive care unit. Mother-infant pairs were recruited only if both met the above criteria. For the purpose of the current analysis, only participants who planned to return to paid employment within 6

months of giving birth were included (n= 1907; 71%).

Data Collection

During postpartum hospitalization sociodemographic characteristics including maternal employment were collected by maternal self-report. The demographic questionnaire was translated into Chinese by an expert translator, and back-translated into English by a second translator to ensure translation accuracy [37, 38]. Birth data such as delivery type were collected from participants by a trained research nurse. Follow-up data on infant-feeding and actual return to work were collected by telephone interviews at months 1, 2, 3, 6, 9, and 12 after hospital discharge or until the infant was weaned, whichever came first. In the follow-up interviews participants were asked if they were currently breastfeeding, and if so, to classify the current pattern of infant feeding as exclusive, predominant, or partial breastfeeding. Clear explanations of each breastfeeding type were provided [39, 40]. Return to work data were collected in the interview after participants returned to work. Weaning data, including the total number of weeks of both any or exclusive breastfeeding, were reported by participants in the interview after they stopped breastfeeding. No further data were collected after cessation of breastfeeding.

Variable Descriptions

The first outcome variable was whether or not mothers were able to combine breastfeeding and employment, with breastfeeding defined as continuing for longer than 2 weeks after the return to work. The second outcome variable was the total duration of any or exclusive breastfeeding in weeks. The main independent variables measured were the time of return to work, weekly working hours, employment status, childcare providers, maternal education level,

and monthly household income. The time of return to work was re-coded as >0 to 6 weeks, >6 to 8 weeks, >8 to 10 weeks, and >10 weeks. Weekly working hours were categorized as ≥ 50 hours, 45–49 hours, 40–44 hours, and <40 hours. Employment status was categorized as part-time or full-time. Childcare providers included parents, family members, and paid domestic helpers. Maternal education was categorized as secondary or below, some post-secondary, and university degree or above. Monthly household income was categorized as <\$25,000 HKD, \$25,000 to \$34,999 HKD, and \geq \$35,000 HKD (1 USD=7.78 HKD). Weeks of paid maternity leave were excluded from the predictors as this was correlated with the time of return to work, and highly skewed with >90% of participants having the government-mandated 10-weeks of paid maternity leave. Previous research has also shown that the time of return to work is more predictive of breastfeeding outcomes than weeks of paid maternity leave [21]. Multiple potential confounding variables were controlled for including the study cohort, maternal age, delivery type, previous breastfeeding experience, and husband's infant feeding preference.

Data Analysis

The characteristics of participants in the two cohorts were compared using descriptive statistics and chi-square tests. No substantial differences were found between cohort 1 (recruited in 2006–07) and cohort 2 (recruited in 2011–12). All data analysis was therefore based on the combined dataset. The impact of work-related variables on combining breastfeeding and formal employment were assessed using bivariable and multiple logistic regression. The Hosmer-Lemeshow goodness of fit test [41] was used to assess the adequacy of the logistic models, and variance inflation factor (VIF) [42] used to assess for multicollinearity. Kaplan-Meier survival curves and log-rank tests were performed to explore the association between work-related

variables and duration of any or exclusive breastfeeding [43]. We also conducted bivariable and multiple Cox proportional hazards models to evaluate the effect of work-related variables on the total duration of any or exclusive breastfeeding [44]. Finally, to assess whether the impact of the primary predictors on breastfeeding outcomes varied between the two cohorts, interaction terms between the independent variables and the study cohort were tested in all multivariable models.

All data analysis was conducted using Stata version 13.1 statistical software (Stata Corp, College Station, TX) [45], and a .05 level of significance was used throughout the statistical analysis. Ethical approval was obtained from the institutional review boards of all participating institutions and informed written consent was obtained from each participant before data collection.

RESULTS

In total, 1,907 mother-infant pairs from the two cohorts were eligible for analysis. Participants with whom there was no contact after hospitalization (n=124) were excluded, as were participants with missing information relevant to this analysis (n=45). The remaining 1738 mother-infant pairs (cohort 1= 953 and cohort 2= 785) were included in the present analysis. Cohort characteristics are set out in Table 1.

Almost 85% of participants resumed formal employment within 10 weeks postpartum, over 90% worked full-time and almost 30% worked 50 hours or more per week. The majority (61%) used family members to provide childcare and just over one-third had a paid domestic helper. About one-third of the participants had a university degree.

Only 32% of participants were able to continue breastfeeding after resuming their job. The unadjusted and adjusted odds ratios of combining breastfeeding and formal employment by

maternal characteristics are set out in Table 2. While the unadjusted analyses show statistically significant associations between a number of work-related variables and breastfeeding continuation, most of these associations were not significant in the fully adjusted model. After adjustment, only returning to work from 8 to 10 weeks postpartum and higher maternal education were associated with continuation of breastfeeding after returning to work. Participants with a university degree were almost two-and-a-half times more likely to continue breastfeeding after resuming formal employment than mothers with secondary school education or below (HR=2.35; 95% confidence interval (CI) 1.79 to 3.09). Results for Hosmer-Lemeshow goodness of fit tests for the multiple logistic model ($P > .05$) indicate that this model is a good fit for the data. VIF values also indicate a low degree of multicollinearity.

Table 3 shows the unadjusted and fully adjusted associations between work-related variables and the duration of any breastfeeding. In both the unadjusted and fully adjusted models, participants who returned to work after 8 weeks postpartum were significantly less likely to stop breastfeeding than participants who returned to work within 6 weeks. Higher maternal education was also significantly associated with a lower likelihood of early weaning. Results of Kaplan-Meier survival analysis show a dose-response effect for both the time of return to work and weekly working hours on the duration of any breastfeeding (Figure 1). The median breastfeeding duration among mothers who returned to work after 10 weeks postpartum was 13.1 weeks, and 5 weeks for mothers who returned to work within 6 weeks postpartum. Similarly, work-related variables and higher maternal education were significantly associated with a longer duration of exclusive breastfeeding in both the unadjusted and fully adjusted models (Table 4), again showing a dose-response pattern (Figure 1). In addition, childcare provision by a family member or paid domestic helper was associated with a significantly higher likelihood of stopping

exclusive breastfeeding than parental childcare. No significant interactions were found between the study cohort and all independent variables in the multiple models ($P>0.05$).

DISCUSSION

Findings from the present study demonstrate that the majority of new mothers returned to full-time employment within the first few months postpartum, and had long working hours — often in excess of 44 hours per week. Only a small proportion of employed mothers continued to breastfeed after returning to work, and those that did tended to be more educated. In addition, a later return to work, shorter working hours, and higher maternal education was found to significantly prolong the duration of any breastfeeding. A similar relationship was observed between employment-related variables and the duration of exclusive breastfeeding; a factor that has been reported less frequently in previous research. These findings suggest that most mothers do not have access to breastfeeding-friendly work environments. Even among participants who return to work later (>10 weeks) the median duration of breastfeeding remained short (13 weeks), suggesting that supportive maternity leave policies and more flexible work options may improve breastfeeding outcomes for employed mothers.

The dose-response relationship between the key employment-related variables and the duration of any or exclusive breastfeeding highlight the detrimental effect that short maternity leave and extended working hours have on new mothers. The maximum maternity leave in Hong Kong is 10 weeks, and at least 2 weeks must be taken before the expected date of delivery [46]. In Mainland China, a less developed economy, 14 weeks of paid maternity leave is provided for employed mothers [47], and some European countries (i.e., Sweden) provide up to 480 days of paid parental leave [48]. At the other extreme, the US has no mandated maternity leave provisions [49, 50] and most employers provide only 12 weeks of unpaid maternity leave [51,

52].

In addition to limited postpartum leave, employed mothers in Hong Kong and around the world are increasingly burdened by heavy workloads and long working hours. Half of the participants in the present study worked 45 hours or more per week and nearly one-third worked 50 hours or more. These working hours are substantially longer than the average weekly working hours among women of childbearing age in countries such as Canada (35.0 hours), Australia (32.4 hours), and even Korea (42.7 hours) [53]. However, evidence shows an increasing global trend for new mothers to return to formal employment sooner in the postpartum period and work a greater number of hours per week [6, 8, 16-18].

Study findings also showed a discrepancy between the time of return to work and continuing breastfeeding, as mothers who returned to work between eight and 10 weeks postpartum were more likely to combine breastfeeding and formal employment than those resuming work after 10 weeks. This effect has also been observed in other studies [34, 35], and it is possible that mothers who return to work when their infant is older may be more likely to feel that they have breastfed for long enough and wean before resuming employment.

New mothers are often encouraged to move from full-time to part-time work in the postpartum period to increase breastfeeding duration [20, 31]. In Hong Kong, full-time employment is the most common and options for part-time work or reduced weekly working hours are limited. This means that part-time employment is not a viable option for most employed mothers in Hong Kong [19], and increasingly for women in other parts of the world [16-18, 54]. Our findings suggest that reasonable short-term reductions in working hours (i.e., 5 to 10 hours per week) and additional weeks of maternity leave (i.e., 2 to 4 weeks) for new mothers could lengthen the duration of breastfeeding. Alternatively, the provision of breaks for

breastfeeding mothers during the workday as a substitute for reduced working hours may help in balancing the conflicting demands of paid employment and breastfeeding [55]. Although public health institutions and the Hong Kong Government have been actively promoting breastfeeding over the past decade, few legislative actions have been taken, particularly with respect to the work environment [6]. In contrast, new mothers in Mainland China receive one hour of breaks during their workday to breastfeed their infants or to express breast milk [47].

Maternal education was a strong predictor of both continuing breastfeeding after return to work and the overall duration of any or exclusive breastfeeding. Highly educated mothers may have more control over their jobs and schedules, meaning they are able to enjoy a more breastfeeding-friendly work environment [56]. With just over one third of participants having a university degree, additional attention and support should be provided to employed mothers with lower educational attainment to facilitate better breastfeeding outcomes.

Findings from the present study also show that child-care provided by either a family member or paid domestic helper increases the likelihood of weaning, especially from exclusive breastfeeding. In Hong Kong, domestic helpers are primarily female workers imported from the Philippines or Indonesia, who live-in and provide housekeeping and childcare services. Results from a UK study found that using informal childcare was negatively correlated with breastfeeding at 4 months [31]. Other studies have also shown that childcare by female relatives is a risk factor for early weaning, and it has been suggested that new mothers may be negatively influenced by unsupportive relatives [57]. In addition, infant formula may simply be more convenient for non-parental caregivers to provide. It is of note that positive support from childcare providers has been shown to help mothers maintain breastfeeding [58].

Strengths and Limitations

The present study is one of only a few studies investigating factors influencing breastfeeding continuation, especially with regard to exclusive breastfeeding, in a large sample of mothers in formal employment who generally suffer high breastfeeding attrition rates. Outcome data in this study were collected prospectively, with participants followed until 12 months postpartum, as necessary. Maternal dropout and loss to follow-up was low (4.6%) and the large sample size allowed us to adjust for multiple confounding variables, including the study cohort, maternal age, delivery type, previous breastfeeding experience, and husband's infant feeding preference.

The present study does have some limitations. First, although our cohort was large, it was not population based, and no data were available on eligible mothers who chose not to participate. Therefore, it may be possible that only mothers with more positive attitudes, experience, and preparation for breastfeeding were inclined to participate. However, the rates of breastfeeding found in study cohorts are similar to the overall breastfeeding patterns in the Hong Kong population [59]. Second, data on breastfeeding duration were collected prospectively but were self-reported by participants and reporting of breastfeeding patterns may have been inaccurate. However, evidence suggests that maternal reports of breastfeeding duration are accurate for up to 20 years after stopping breastfeeding [60]. Third, the independent variables of time of return to work and weekly work hours were collected during the hospitalization, and no follow-up data on maternal employment were available for participants who weaned their infant before they returned to work. The outcome variable of whether or not mothers continued breastfeeding after return to work was measured during follow-up. Although discrepancies between the anticipated and actual time of return to work and work hours may have occurred, they are not likely to be substantial, as pregnant women are required to notify their employers of the length of their

maternity leave 2 to 4 weeks before their expected confinement [46]. Lastly, because many participants had weaned before returning to work, we did not specifically examine workplace support for breastfeeding.

Conclusion

Unfavorable employment-related conditions make it more difficult for mothers to combine breastfeeding and formal employment. With women around the world entering the workplace in increasing numbers, workplace policies that are breastfeeding and family friendly are needed. Measures such as longer maternity leave, short-term reductions in working hours, mandated workplace breaks and facilities to enable breast milk expression, and additional postpartum breastfeeding support for lower educated mothers would enable employed mothers to breastfeed for longer. Implementation of these measures will require support from governments, employers, and health care professionals. Future research should investigate the cost-effectiveness of these strategies and both the employer and societal benefits to provide further incentives to employers and governments to implement more breastfeeding-friendly policies.

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REFERENCES

1. Tarrant, M., et al., *Breast-feeding and childhood hospitalizations for infections*. Epidemiology, 2010. **21**(6): p. 847-54.
2. Ladomenou, F., et al., *Protective effect of exclusive breastfeeding against infections during infancy: a prospective study*. Archives of Disease in Childhood, 2010. **95**(12): p. 1004-1008.
3. Allen, J. and D. Hector, *Benefits of breastfeeding*. New South Wales Public Health Bulletin, 2005. **16**(4): p. 42-46.
4. OECD Family database. *Breastfeeding rates*. 2009 [cited 2013 21 November]; Available from: <http://www.oecd.org/els/family/43136964.pdf>.
5. United States Centers for Disease Control and Prevention. *Breastfeeding Report Card [Internet]*. 2013 [cited 2014 13 February]; Available from: <http://www.cdc.gov/breastfeeding/pdf/2013BreastfeedingReportCard.pdf>.
6. Tarrant, M., et al., *Breastfeeding and weaning practices among Hong Kong mothers: a prospective study*. BMC Pregnancy & Childbirth, 2010. **10**: p. 27.
7. Baby Friendly Hospital Initiative Hong Kong Association (BFHIHK), *World breastfeeding week annual survey summary*. 2013: Hong Kong
8. World Health Organization, *Global strategy for infant and young child feeding*. 2003, World Health Organization Geneva.
9. Thulier, D. and J. Mercer, *Variables associated with breastfeeding duration*. JOGNN, 2009. **38**(3): p. 259-68.
10. Bonet, M., et al., *Breastfeeding Duration, Social and Occupational Characteristics of Mothers in the French 'EDEN Mother-Child' Cohort*. Maternal and Child Health Journal, 2012: p. 1-9.
11. Bai, D.L., K.M. Wu, and M. Tarrant, *Association between Intrapartum Interventions and Breastfeeding Duration*. Journal of midwifery & women's health, 2013. **58**(1): p. 25-32.
12. Tarrant, M., et al., *Impact of baby-friendly hospital practices on breastfeeding in Hong Kong*. Birth, 2011. **38**(3): p. 238-45.
13. Parry, J.E., et al., *Predictors and Consequences of In-hospital Formula Supplementation for Healthy Breastfeeding Newborns*. Journal of Human Lactation, 2013.
14. Johnston, M.L. and N. Esposito, *Barriers and facilitators for breastfeeding among working women in the United States*. Journal of Obstetric, Gynecologic, & Neonatal Nursing, 2007. **36**(1): p. 9-20.
15. Skafida, V., *Juggling work and motherhood: The impact of employment and maternity leave on breastfeeding duration: A survival analysis on growing up in Scotland data*. Maternal and Child Health Journal, 2012. **16**(2): p. 519-527.
16. Bureau of Labor Statistics, The United States Department of Labor, and The Editor's Desk. *Happy Mother's Day from BLS: working mothers in 2012* [cited 2013 21 November]; Available from: http://www.bls.gov/opub/ted/2013/ted_20130510.htm
17. Walling, A., *Families and work*. Labour Market Trends, 2005. **113**(7): p. 275-283.
18. Hamlyn, B., et al., *Infant feeding 2000*. London: The Stationery Office, 2002.
19. Census and Statistics Department of Hong Kong. *Hong Kong annual digest of statistics: 2012 edition*. [cited 2013 21 November]; Available from: <http://www.statistics.gov.hk/pub/B10100032012AN12B0100.pdf>.
20. Cooklin, A.R., S.M. Donath, and L.H. Amir, *Maternal employment and breastfeeding: results from the longitudinal study of Australian children*. Acta Paediatrica, 2008. **97**(5): p. 620-623.
21. Ogbuanu, C., et al., *The effect of maternity leave length and time of return to work on breastfeeding*. Pediatrics, 2011. **127**(6): p. e1414-e1427.
22. Gatrell, C.J., *Secrets and lies: breastfeeding and professional paid work*. Social Science & Medicine, 2007. **65**(2): p. 393-404.
23. Tsai, S.-Y., *Impact of a breastfeeding-friendly workplace on an employed mother's intention to continue breastfeeding after returning to work*. Breastfeeding Medicine, 2013.
24. Jacknowitz, A., *The role of workplace characteristics in breastfeeding practices*. Women & Health, 2008. **47**(2): p. 87-111.
25. Kimbro, R.T., *On-the-job moms: work and breastfeeding initiation and duration for a sample of low-income*

- women. *Maternal and Child Health Journal*, 2006. **10**(1): p. 19-26.
26. Ogbuanu, C., et al., *Balancing Work and Family Effect of Employment Characteristics on Breastfeeding*. *Journal of Human Lactation*, 2011. **27**(3): p. 225-238.
 27. McCarter-Spaulding, D., J. Lucas, and R. Gore, *Employment and breastfeeding outcomes in a sample of black women in the United States*. *Journal of National Black Nurses' Association: JNBNA*, 2011. **22**(2): p. 38-45.
 28. Chatterji, P. and K.D. Frick, *Does returning to work after childbirth affect breastfeeding practices?* *Review of Economics of the Household*, 2005. **3**(3): p. 315-335.
 29. Ryan, A.S., W. Zhou, and M.B. Arensberg, *The effect of employment status on breastfeeding in the United States*. *Women's health issues: official publication of the Jacobs Institute of Women's Health*, 2006. **16**(5): p. 243.
 30. Mandal, B., B.E. Roe, and S.B. Fein, *The differential effects of full-time and part-time work status on breastfeeding*. *Health Policy*, 2010. **97**(1): p. 79-86.
 31. Hawkins, S.S., L.J. Griffiths, and C. Dezateux, *The impact of maternal employment on breast-feeding duration in the UK Millennium Cohort Study*. *Public Health Nutrition*, 2007. **10**(09): p. 891-896.
 32. Fein, S.B., B. Mandal, and B.E. Roe, *Success of Strategies for Combining Employment and Breastfeeding*. *Pediatrics*, 2008. **122**(Supplement_2): p. S56-62.
 33. Duijts, L., et al., *Prolonged and exclusive breastfeeding reduces the risk of infectious diseases in infancy*. *Pediatrics*, 2010. **126**(1): p. e18-e25.
 34. Chuang, C.H., et al., *Maternal return to work and breastfeeding: a population-based cohort study*. *International Journal of Nursing Studies*, 2010. **47**(4): p. 461-474.
 35. Guendelman, S., et al., *Juggling work and breastfeeding: effects of maternity leave and occupational characteristics*. *Pediatrics*, 2009. **123**(1): p. e38-e46.
 36. Panel on Health Services, *Latest arrangement for non-local pregnant women giving birth in Hong Kong*, F.a.H. Bureau, Editor. 2012: Hong Kong.
 37. Brislin, R.W., *The wording and translation of research instruments*, in *Field methods in cross-cultural research*, W.J. Lonner and J.W. Berry, Editors. 1986, Sage: Beverly Hills, CA. p. 137-164.
 38. Chapman, D.W. and J.F. Carter, *Translation procedures for the cross-cultural use of measurement*. *Educational Evaluation and Policy Analysis*, 1979. **1**(3): p. 71-76.
 39. Labbok, M. and K. Krasovec, *Toward consistency in breastfeeding definitions*. *Studies in Family Planning*, 1990. **21**(4): p. 226-230.
 40. World Health Organization, *Indicators for assessing breast-feeding practices*. 1991, World Health Organization: Geneva, Switzerland.
 41. Hosmer, D.W., et al., *A comparison of goodness-of-fit tests for the logistic regression model*. *Statistics in Medicine*, 1997. **16**(9): p. 965-980.
 42. Hair, J.F., et al., *Multivariate data analysis*. Vol. 7. 2010: Prentice Hall Upper Saddle River, NJ.
 43. Cleves, M., et al., *An introduction to survival analysis using stata*. 3rd ed. 2010, College Station, TX: Stata Press.
 44. Cox, D.R. and D. Oakes, *Analysis of survival data*. 1984, London: Chapman and Hall.
 45. StataCorp, *Stata statistical software: release 13.1 [program]*. 2013, StataCorp LP: College Station, Tx.
 46. Hong Kong Labour Relations Promotion Unit, *Maternity Protection*. 2010, Labour Relations Promotion Unit: Hong Kong.
 47. The Central People's Government of People's Republic of China. *Special Rules on the Labor Protection of Female Employees (Text in Chinese)*. 2012 [cited 2013 21 November]; Available from: http://www.gov.cn/zw/gk/2012-05/07/content_2131567.htm.
 48. Ministry of Employment and Government Offices of Sweden, *Parental Leave Act*. 2008: Sweden.
 49. Eichner, M., *Parenting and the workplace: The construction of parenting protections in United States law*. *International Breastfeeding Journal*, 2008. **3**(1): p. 14.
 50. Raju, T., *Continued barriers for breast-feeding in public and the workplace*. *The Journal of pediatrics*, 2006. **148**(5): p. 677.
 51. Calnen, G., *Paid maternity leave and its impact on breastfeeding in the United States: an historic, economic, political, and social perspective*. *Breastfeeding Medicine*, 2007. **2**(1): p. 34-44.
 52. Galtry, J., *The impact on breastfeeding of labour market policy and practice in Ireland, Sweden, and the*

- USA. *Social Science & Medicine*, 2003. **57**(1): p. 167-177.
53. Organization for Economic Co-operation and Development. *Average usual weekly hours worked on the main job 2011* [cited 2013 21 November]; Available from: <http://stats.oecd.org/Index.aspx?DatasetCode=ANHRS>.
54. The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). *Statistical Yearbook for Asia and the Pacific 2013*. 2013 [cited 2014 16 April]; Available from: <http://www.unescap.org/stat/data/syb2013/>.
55. Chen, Y.C., Y.-C. Wu, and W.-C. Chie, *Effects of work-related factors on the breastfeeding behavior of working mothers in a Taiwanese semiconductor manufacturer: a cross-sectional survey*. *BMC Public Health*, 2006. **6**(1): p. 160.
56. Johnson, T.D., *Maternity Leave and Employment Patterns of First-Time Mothers, 1961-2003*. 2008: US Department of Commerce, Economics and Statistics Administration, US Census Bureau.
57. Bick, D.E., C. MacArthur, and R.J. Lancashire, *What influences the uptake and early cessation of breast feeding?* *Midwifery*, 1998. **14**(4): p. 242-247.
58. Batan, M., R. Li, and K. Scanlon, *Association of child care providers breastfeeding support with breastfeeding duration at 6 months*. *Maternal and child health journal*, 2013. **17**(4): p. 708-713.
59. Leung, S., *Promoting, protecting and supporting breastfeeding in Hong Kong in Hospital Authority Convention 2012*. 2012: Hong Kong
60. Natland, S.T., et al., *Maternal recall of breastfeeding duration twenty years after delivery*. *BMC Medical Research Methodology*, 2012. **12**(1): p. 179.

Table 1. Characteristics of Participants According to Study Cohorts

Characteristics	Cohort 1	Cohort 2	Total
	(n=953) %	(n=785) %	(N=1738) %
Time of return to work postpartum			
>0 to 6 weeks	14.2	11.2	12.8
>6 to 8 weeks	39.4	40.9	40.1
>8 to 10 weeks	26.8	37.9	31.8
>10 weeks	19.6	10.0	15.3
Working hours per week			
≥50	26.3	30.6	28.2
45-49	24.6	28.0	26.1
40-44	37.6	29.6	34.0
<40	11.5	11.8	11.7
Employment status			
Part-time	9.9	6.6	8.4
Full-time	90.1	93.4	91.6
Childcare provider while mother at work			
Parent	4.3	2.4	3.4
Family member	62.4	59.6	61.2
Domestic helper	33.3	38.0	35.4
Maternal education			
Secondary or below	50.3	43.4	47.2
Some post-secondary	15.2	15.7	15.4
University degree or above	34.5	40.9	37.4
Monthly household income (HKD) ^a			
<\$25,000	35.7	23.9	30.4
\$25,000-\$34,999	24.5	32.9	28.3
≥\$35,000	39.8	43.2	41.3
Maternal age			
18-24y	5.3	3.7	4.5
25-29y	21.9	23.2	22.5
30-34y	49.6	46.6	48.3
≥35y	23.2	26.5	24.7
Delivery type			
Vaginal	78.7	82.8	80.6
Cesarean section	21.3	17.2	19.4
Previous breastfeeding experience			
No	71.4	66.5	69.2
Yes	28.6	33.5	30.8
Husband feeding preference			
Breastfeeding	60.1	40.4	51.2
No preference	18.2	52.6	33.7
Infant formula or mixed	21.7	7.0	15.1

^a 1 USD=7.78 HKD

Table 2. Unadjusted and Adjusted Odds Ratios of Combination of Breastfeeding and Employment by Work-related Variables

Characteristics	Combination of breastfeeding and employment ^b (n=1738)			
	Unadjusted OR ^c	95% CI	Adjusted OR ^d	95% CI
Time of return to work postpartum				
>0 to 6 weeks	1	--	1	--
>6 to 8 weeks	1.55	(1.09-2.19)	1.42	(0.98-2.08)
>8 to 10 weeks	1.93	(1.35-2.76)	1.64	(1.11-2.42)
>10 weeks	1.54	(1.02-2.31)	1.28	(0.83-1.97)
Working hours per week				
≥50	1	--	1	--
45-49	1.00	(0.75-1.32)	0.94	(0.70-1.27)
40-44	1.29	(0.99-1.67)	1.12	(0.85-1.47)
<40	1.43	(1.01-2.01)	1.29	(0.80-2.07)
Employment status				
Part-time	1	--	1	--
Full-time	0.86	(0.60-1.23)	0.76	(0.45-1.28)
Childcare provider while mother at work				
Parent	1	--	1	--
Family member	0.95	(0.54-1.66)	0.97	(0.53-1.79)
Domestic helper	1.13	(0.64-1.99)	0.90	(0.48-1.70)
Maternal education				
Secondary or below	1	--	1	--
Some post-secondary	1.96	(1.45-2.64)	1.97	(1.43-2.71)
University degree or above	2.59	(2.06-3.24)	2.35	(1.79-3.09)
Monthly household income (HKD) ^a				
<\$25,000	1	--	1	--
\$25,000-\$34,999	1.33	(1.01-1.75)	0.98	(0.72-1.33)
≥\$35,000	1.94	(1.51-2.49)	1.07	(0.78-1.48)

^a 1 USD=7.78 HKD;

^b Combination of breastfeeding and employment was defined as breastfeeding for longer than two weeks after returning to work;

^c OR: Odds ratio;

^d Adjusted for all variables included in this table and other control variables: study cohort, maternal age, previous breastfeeding experience, husband's preference for infant feeding, and delivery type.

Table 3. Unadjusted and Adjusted Hazard Ratios for Cessation of Any Breastfeeding by Work-related Variables

Characteristics	Total duration of any breastfeeding (n=1738)			
	Unadjusted HR ^b	95% CI	Adjusted HR ^c	95% CI
Time of return to work postpartum				
>0 to 6 weeks	1	--	1	--
>6 to 8 weeks	0.96	(0.81-1.13)	0.95	(0.80-1.13)
>8 to 10 weeks	0.78	(0.66-0.93)	0.79	(0.66-0.95)
>10 weeks	0.64	(0.52-0.78)	0.70	(0.57-0.85)
Working hours per week				
≥50	1	--	1	--
45-49	0.94	(0.82-1.08)	0.97	(0.84-1.12)
40-44	0.82	(0.72-0.93)	0.89	(0.77-1.01)
<40	0.65	(0.54-0.79)	0.80	(0.63-1.01)
Employment status				
Part-time	1	--	1	--
Full-time	1.44	(1.18-1.75)	1.25	(0.96-1.64)
Childcare provider while mother at work				
Parent	1	--	1	--
Family	1.50	(1.09-2.06)	1.32	(0.95-1.84)
Domestic helper	1.39	(1.01-1.92)	1.40	(1.00-1.96)
Maternal education				
Secondary or below	1	--	1	--
Some post-secondary	0.71	(0.61-0.83)	0.69	(0.59-0.81)
University degree or above	0.63	(0.56-0.70)	0.61	(0.54-0.70)
Monthly household income (HKD)^a				
<\$25,000	1	--	1	--
\$25,000-\$34,999	0.95	(0.83-1.09)	1.04	(0.90-1.20)
≥\$35,000	0.79	(0.70-0.90)	1.06	(0.91-1.25)

^a 1 USD=7.78 HKD;

^b HR: Hazards ratio;

^c Adjusted for all variables included in this table and other control variables: study cohort, maternal age, previous breastfeeding experience, husband's preference for infant feeding, and delivery type.

Table 4. Unadjusted and Adjusted Hazard Ratios for Cessation of Exclusive Breastfeeding by Work-related Variables

Characteristics	Total duration of exclusive breastfeeding (n=1738)			
	Unadjusted HR ^b	95% CI	Adjusted HR ^c	95% CI
Time of return to work postpartum				
>0 to 6 weeks	1	--	1	--
>6 to 8 weeks	1.02	(0.87-1.19)	0.98	(0.84-1.15)
>8 to 10 weeks	0.97	(0.82-1.14)	0.92	(0.78-1.09)
>10 weeks	0.73	(0.61-0.88)	0.78	(0.65-0.95)
Working hours per week				
≥50	1	--	1	--
45-49	1.00	(0.88-1.14)	1.05	(0.92-1.20)
40-44	0.82	(0.73-0.93)	0.89	(0.78-1.01)
<40	0.69	(0.58-0.81)	0.93	(0.74-1.15)
Employment status				
Part-time	1	--	1	--
Full-time	1.50	(1.25-1.80)	1.29	(1.00-1.65)
Childcare provider while mother at work				
Parent	1	--	1	--
Family member	1.52	(1.14-2.02)	1.35	(1.01-1.81)
Domestic helper	1.48	(1.11-1.98)	1.41	(1.04-1.91)
Maternal education				
Secondary or below	1	--	1	--
Some post-secondary	0.82	(0.71-0.94)	0.78	(0.67-0.90)
University degree or above	0.80	(0.72-0.89)	0.76	(0.68-0.86)
Monthly household income (HKD) ^a				
<\$25,000	1	--	1	--
\$25,000-\$34,999	1.09	(0.96-1.23)	1.08	(0.95-1.24)
≥\$35,000	0.96	(0.86-1.08)	1.09	(0.94-1.26)

^a 1 USD=7.78 HKD;^b HR: Hazards ratio;^c Adjusted for all variables included in this table and other control variables: study cohort, maternal age, previous breastfeeding experience, husband's preference for infant feeding, and delivery type.

Figure 1: Kaplan-Meier survival estimates of the duration of any breastfeeding by time of return to work (a) and weekly working hours (b), and duration of exclusive breastfeeding by time of return to work (c) and weekly working hours (d).