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Original Article

FEEDING PRACTICES AND ITS ASSOCIATION WITH CO-MORBIDITIES AMONG THE INFANTS OF WORKING MOTHERS IN A SELECTED GARMENTS FACTORY OF BANGLADESH

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Abstract:

Background: *Breastfeeding has numerous health advantages for both the mother and the child and also it acts as a pivotal role for the growth and development of children. For the first six months of a baby's life, breastfeeding supplies all the energy and nutrients they require. Half or more of a child's nutritional demands in the second half of the first year and up to a third in the second year is meets up by the breastmilk.*

Objective: *This study determines the feeding practices and its association with co-morbidities among the infants of working mothers in a selected garments factory of Bangladesh.*

Methods: *This was a cross sectional study which conducted in a selected Garments Factory in Narayangonj on 267 working mothers of 0-12 months aged infants. After taking consent of the study subjects were enrolled in the study. A detail history was taken regarding breastfeeding practices and complementary feeding as well as co-morbidities.*

Results: *The bulk of infants (58.8%) belonged to the 6–12 month age range. 6.70±2.77 months was found to be the mean age. Male babies made up over half (52.4%) of the total. Of the 267 moms surveyed, 174 (65.2%) reported starting to breastfeed after a period of one to twelve hours, 200 (74.9%) had experience with colostrum feeding, 64 (24.0%) had administered pre-lacteal feeding, and 58 (21.72%) had exclusively breastfed. After 2.9±0.8 months of exclusive breastfeeding, 92 moms (58.6%) began supplemental feeding by the time their babies were 6 months old. Thirty two (50.0%) received honey as a pre-lacteal meal. The majority of 31.58% of newborns received suji, or rice powder, in addition to nursing. In the last six months, 87 (32.58%) infants experienced pneumonia, 45 (16.85%) experienced diarrhea, 43 (16.10%) experienced skin infection, and 19 (7.12%) experienced ear infection.*

Conclusion: *Evidence of incorrect feeding practices among working mothers was found in this study. Their infants developed a variety of related co-morbidities (such as pneumonia, diarrhea, skin infections, and ear infections) as a result of non-exclusive breastfeeding and improper supplemental feeding.*

Keywords:
Breastfeeding; Complementary feeding, IYCF, Feeding practices.

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Introduction:

Breast milk serves as a baby's natural first food, giving them all the energy and nutrients they require for the first six months of life. It also continues to meet a child's nutritional needs for up to half of the second half of the first year and up to one third of the second year[1]. Because Breastfeeding contains antimicrobial components (secretory IgA, lactoferrin, oligosaccharides, and cytokines), it has been shown to have both short- and long-term health and neurodevelopmental benefits[2].

Human milk provides protection against a number of conditions, including allergies, lymphoma, leukemia, septicemia, otitis media, urinary tract infections, necrotizing enterocolitis, celiac disease, and crohn's disease. It also helps prevent childhood cancer[3]. Preventive measures such as avoiding colostrums, providing some prelacteal feed (meals other than mother's milk before starting breast feeding)[4] , and bottle feeding infants are variables that contribute to these avoidable diseases, which ultimately result in high infant mortality[5].

According to the World Health Organization, the best practices for Infant and Young Child Feeding (IYCF) include starting breastfeeding as soon as possible after birth, breastfeeding exclusively for the first six months, continuing to breastfeed for two years, giving colostrum, not starting prelacteal feeding or bottle feeding, starting solid and semi-solid food at six months, consuming iron-rich or iron-fortified foods, age-appropriate breastfeeding, predominant breastfeeding before the age of six months, and milk feeding frequency for children who are not breastfed [6,7]. The Bangladesh Demographic Health Survey (BDHS, 2017–2018) reports that 65% of Bangladesh's infants younger than six months old are exclusively breastfed. Bangladesh, along with India, Nigeria, China, Pakistan, the Democratic Republic of the Congo, and Ethiopia, is ranked seventh in the world with over 3,40,000 child fatalities annually. Afghanistan, Tanzania, and Indonesia are among the top 10 nations with the highest rate of pediatric fatalities[8].

In comparison to infants who are exclusively breastfed, non-breastfeeding infants (0–5 months) have 7– and 5-fold higher risks of dying from pneumonia and diarrhea, respectively[9]. Severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) in children under five are estimated to affect 600,000 (0.6 million) and 1.8 million children, respectively[10]. The current study aimed to investigate the relationship between co-morbodities of infants of working mothers and feeding practices, given that the prevalence of chronic malnutrition among children under five years old is 41%.

Materials and Methods:

From July 2020 to June 2021, a cross-sectional study was carried out at the Department of Paediatrics, ICMH, Matuail, Dhaka, Bangladesh. All working mothers of infants aged 0–12 months of both sexes who were employed at the Peri-Mohon Garments Factory in Narayangonj, Dhaka, Bangladesh, were included in the study. A total number of 267 working moms were included in this study after the working mothers who had been unwell and had babies with any type of congenital defect were eliminated. Following consent, study participants' information was gathered using the purposive sampling method via a pretested semi-structured questionnaire. A detail history was taken regarding breast feeding, practices on colostrum, pre-lacteal feeding, initiation of breast feeding, duration of exclusive breast feeding and formula feeding. History was taken regarding complementary food diversity, starting of complementary feeding, amount of food, frequency of feeding per day, consistency of food, hand washing practice and responsive feeding. Concomitantly co-morbidites history (Pneumonia, acute watery diarrhoea, skin infection, ear infection) were taken in last 6 months of the experiments. Data were checked and cleaned before entry into statistical software (SPSS -version 23) and analyzed. Descriptive analytical techniques including percentage mean and SD etc. were used. Chi square test was used for categorical variables. P value<0.05 were considered significant. This study was ethically approved by the Institutional Review Board (IRB) of Institute of Child and Mother Health (ICMH).

Exclusive breast feeding refers to the practice of feeding breast milk only, including expressed breast

milk to infants and excluding water, other liquids breast milk substitutes and solid foods. Vitamin drops, minerals, oral rehydrating solution (ORS) and medicines may be given[11]. Complementary Feeding (CF) refers to the introduction of foods in addition to breast milk children who completed six months of age (181 days) [6].

Pneumonia: Chest indrawing or fast breathing (respiratory rate of ≥ 60 breaths per minute for infants < 2 months. ≥ 50 breaths per minute for infants aged 2-12 months)[12]. Acute ear infection: Pain or pus is seen draining from the ear and discharge less than 14 days. Chronic ear infection: pus is seen draining from the ear and discharge is more than 14 days[13]. Acute watery diarrhea: The passage of three or more loose stools without visible blood in 24 hours lasting for less than a week[14]. Regarding common skin infections: Cradle cap (diffuse or focal scaling and crusting of the scalp), Impetigo (a tiny vesicle or pustule form honey colored crusted plaque), Cellulites (infection and inflammation of loose connective tissue manifested as an area of edema, warmth, erythema and tenderness), Ring worn (erythematous and scaly circular plaque), and Scabies (threadlike burrows and pruritic red papules excoriation, crust, scaling, bullie and pustules) were noted[3].

Result:

A total number of 267 infants were included in this study. Majority 58.8% of the infants belonged to age 6-12 months, 88.39% were delivered at term and the mean age was found 6.70±2.77 months. 52.4% infants were male and 41.2% from urban & 24% were from urban slum area. 73.4% working mother belonged to age 21-30 years, 67.8% mothers completed their secondary education, 61.4% mother received breast feeding counseling during Ante natal checkup (ANC), 69.7% father's had completed secondary education, and 41.2% fathers were service holder. Regarding socioeconomic condition 85.8% of the infants belongs to lower-middle class family, 82.4% were sibling number two, 89.9% were found single family [Table I].

Table I

Socio demographic characteristics of the study infants (n=267)

Socio demographic characteristics	Frequency	Percentage
Age (months)		
<6	110	41.2
6-12	157	58.8
Mean±SD	6.70±2.77	
Gender		
Male	140	52.4
Female	127	47.6
Residence		
Urban	110	41.2
Semi urban	93	34.8
Urban slum	64	24.0
Father's education status		
Below primary	9	3.4
Primary	68	25.5
Secondary	186	69.7
Above secondary	4	1.5
Father's occupation status		
Farmer	3	1.1
Service	110	41.2
Self employed	31	11.6
Business	66	24.7
Day laborer	32	12.0
Rickshaw puller	25	9.4
Age of mother (Years)		
≤20	6	2.2
21-30	196	73.4
31-40	65	24.3
Mean±SD	26.98±4.19	
Mother's education		
Below primary	2	0.7
Primary	84	31.5
Secondary	181	67.8
Monthly family income (TAKA)		
Poor (< 7000 Tk)	25	9.4
Lower middle (7000-27000 Tk)	229	85.8
Middle class (27000- 74000Tk)	13	4.9
Number of sibling		
1-2	220	82.4
3-4	47	17.6
Type of family		
Joint family	27	10.1
Single family	240	89.9
Breast feeding counseling in ANC		
Yes	164	61.4
No	103	38.6
Gestational age		
Term	236	88.39
Preterm	31	11.16

Regarding breast feeding Table II showed that 65.2% respondents initiated breastfeeding within 1 to 12 hours, 74.9% respondents given their infants colostrum, 24.0% given pre-lacteal feeds, exclusive breastfeeding were 58 (21.72%), mean duration of exclusive breastfeeding was 2.9±0.8 months and 92(58.6%) were starting of complementary feeding by 6 months. Majority 64.96% respondents initiated complementary feeding with rice/bread, 54.11% with milk and dairy products. Appropriate food diversity was only 27.39% and inappropriate 72.61%. Majority 59.9% infants given food less than half bowl at a time, 42.7% were feeding per day <2 time, 28.7% respondents given their infants semi solid food, and 35.67% respondents mentioned that they fed their infants by own hand. Majority 73.25% respondents were washing their hand before feeding, and 49.7% mothers encouraged the infants for self-feeding. [Table III]

Table II

Breast feeding practice of infant under study (n=267)

History of related to feeding	Frequency	Percentage
Initiation of breast milk		
Within one hour	89	33.3
1 to 12 hrs	174	65.2
13 to 24 hrs	4	1.5
Colostrum is given		
Yes	200	74.9
No	67	25.1
Pre-lacteal feeding		
Yes	64	24.0
No	203	76.0
Breast feeding status		
Exclusive breastfeeding	58	21.72
Non-exclusive breastfeeding	209	78.28
Mean duration of exclusive breast feedings (months) Mean±SD	2.9±0.8	
Starting of complementary feeding		
• < 6 months	23	14.6
• Completed 6 month (181 days)	92	58.6
• > 6 months	42	26.8

Table III

Complementary feeding practice among study infant (n=157)

Complementary food diversity	Frequency	Percentage
1. Rice/bread	102	65.0
2. Animal protein	41	26.1
3. Milk and dairy products	85	54.1
4. Dark green or bright yellow & orange colored fruits and vegetables	53	33.8
5. Pulse/Dal/Lentils	47	29.9
6. Ghee/Butter/Nuts and oil seeds	17	10.8
Appropriate food diversity	43	27.39
Inappropriate	114	72.61
Amount of food (250 ml bowel) given at a time		
< half bowel	94	59.9
Half bowel	56	35.7
One bowel	7	4.5
Frequency of feeding per day		
<2	67	42.7
2 or more (6-8 months)	53	33.8
3 or more (9-11 months)	37	23.6
Consistency of food		
Liquid	91	58.96
Semi solid (6-8 months)	45	28.66
Small piece(9-11 months)	21	13.38
Feeding technique		
With spoon	44	28.03
Baby use own hands in front of mother	16	10.19
By mothers hand	56	35.67
With family members	41	26.11
Hand washing practice		
i. Hand washing infant before feeding	9	5.73
ii. Hand washing of mother before feeding	115	73.25
iii. What kinds of materials use in hand washing		
Only water	91	79.13
Soap	24	20.87
Responsive feeding		
Mother encouraged the child for self-feeding	78	49.7

Figure 1 showed that 68% infants given pre-lacteal feeds by honey and Figure 2 showed that majority 31.58% infants were given rice powder (Suji) along with breast milk after 6 months.

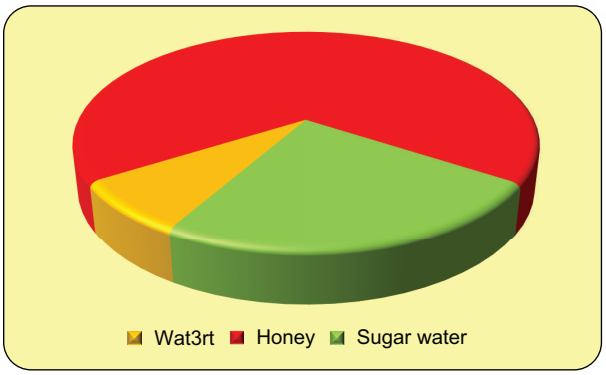

Figure 1: *Type of pre-lacteal feeding of the study infants*

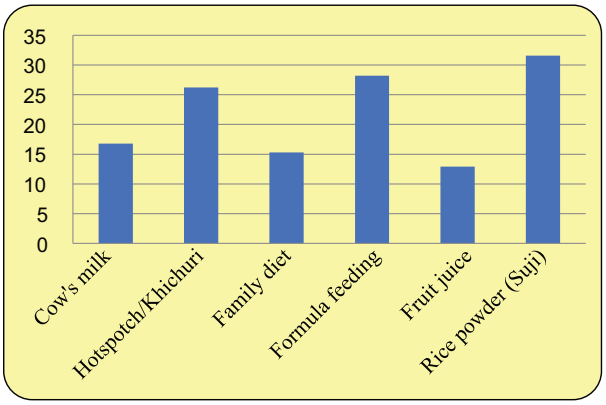

Figure 2: *Foods given with breast milk after 6 months.*

Regarding co-morbidities 87 (32.58%) infants had pneumonia, 45 (16.8%) had diarrhea, 43 (16.1%) had skin infection and 19 (7.1%) had ear infection in last 6 months [Figure 3].

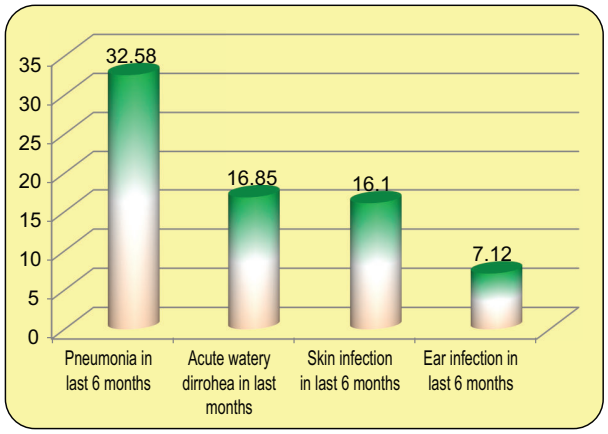

Figure 3: *Bar diagram showed co-morbidites of the study infants (n=267)*

Table IV showed that pneumonia was significant higher in non-exclusive breast feeding than exclusive breast feeding (35.4% vs 15.5%) with odds ratio 0.32, 95% CI 0.15 to 0.69%. Acute watery diarrhea, skin infection and ear infection were not statistically significant (p>0.05) between two groups. Table V showed that regarding primary education of father, majority 92.6% infants developed co-morbidities followed by 88.9% were in below primary education level.

Table IV

Association of breast feeding and co-morbidities (n=267)

Co-morbidities	Breast feeding				Odds ratio (95% CI)	P value
	EBF(n=58)		Non EBF(n=209)			
	n	%	n	%		
Pneumonia	9	15.5	78	35.4	0.32 (0.15-0.69)	0.003[s]
Acute watery diarrhea	6	10.3	39	18.7	0.50 (0.20-1.25)	0.134[ns]
Skin infection	7	12.1	36	17.2	0.66 (0.25-1.67)	0.344[ns]
Ear infection	3	5.2	16	7.7	0.66 (0.15-2.52)	0.375[ns]

s=significant

P value reached from Chi square test

Table V

Relation of co-morbidities and father's education

co-morbidities	Father's education							
	Below primary (n=9)		Primary (n=68)		Secondary (n=186)		Above secondary (n=4)	
	n	%	n	%	n	%	n	%
Pneumonia	2	22.2	30	44.1	54	29.0	1	25.0
Acute watery diarrhoea	3	33.3	13	19.1	29	15.6	0	0.0
Skin infection	2	22.2	17	25.0	23	12.4	1	25.0
Ear infection	1	11.1	3	4.4	15	8.1	0	0.0
Total	8	88.9	63	92.6	121	65.1	2	50.0

Discussion:

This study was carried out with an aim to determine feeding practices and associated co-morbidities among infants of working mothers in a selected garments factory. A total number of 267 working mothers having infants 0-12 months of age were enrolled in this study.

According to this study, the majority of infants (58.8%) belonged to the 6–12 month age group. More than half of the babies (52.4%) were male; 196 mothers (73.4%) were between the ages of 21 to 30; 181 mothers (67.8%) had completed their secondary education; 229 mothers (85.8%) were from lower-middle class families; 220 mothers (82.4%) had a second sibling; and 240 mothers (89.9%) were discovered to be single family. According to Saleh et al. (2014), the children's mean age was 14.68 months[15]. The 625 mothers who were observed by Shefa et al. (2010) had a mean age of 30 years (range: 18–45 years) [16]. These results from this study were comparable.

In the current study, 74.9% of respondents gave their children colostrum, 24.0% gave pre-lacteal meals, and 65.2% of respondents started breastfeeding within 1 to 12 hours. Half of the pre-lactateal feeding contained honey. 21.72% of infants were exclusively breastfed, with an average length of 2.9±0.8 months. By the time they were 6 months old, 58.6% had begun supplemental feeding. According to a study, 91.1% of mothers started breastfeeding within an hour, and another author found that most respondents (89%), had good understanding of beginning feeding and 77%, had good knowledge of colostrum feeding[17,18]. An author reported that 71.6% of mothers were still nursing after one month, 49.6% at two months, and 29.8% at four months. Six months later, the percentage of breastfeeding dropped to 21.1%, which is consistent with the findings of this study [16]. In a study conducted in our context, reported most mothers working in garments factories introduced formulas as early as 2 months after giving birth [19].

31.6% of the infants in this study received rice powder, or suji, in addition to breast milk beyond six months of age. According to Haque et al. (2010), boiled eggs (25.6%), apple juice (24.4%), hotchpotch (khichuri) (36.1%), and rice powder (suji) (43.5%) were the most common supplemental foods[20].

According to this study, the majority of respondents 102(65.0%), started supplementary feeding with moderate food such grains or breads, and 85, or 54.1%, used milk. 43 people (27.39%) received suitable complementary feeding, whereas 114 people (72.61%) received inappropriate complementary feeding. A majority of 94 (59.9%) newborns received less than half their body weight in meals at a time. 45 respondents (28.66%) fed their infants semi-solid food, whereas 67 respondents (42.7%) fed their newborns less than twice a day. According to Demilew et al. (2017), just 20 (7%) of the participants in the current study were receiving acceptable supplemental feeding practices [21].

This study showed that 87(32.58%) infants had pneumonia in last 6 months, 45(16.85%) had diarrhoea, 43(16.10%) had skin infection and 19(7.12%) had ear infection in last 6 months. Pneumonia was significantly higher in non-exclusive breast feeding than exclusive breast feeding (35.4% vs 15.5%) with odds ratio 0.32, 95% CI 0.15 to 0.69%. Acute watery diarrhoea, skin infection and ear infection were not statistically significant ($p>0.05$) between two groups. An author reported that the prevalence of diarrhoea and acute respiratory infection in 0-3-month old infants in Bangladesh was 14.3% and 31.2% respectively [22]. The prevalence of both illnesses was significantly associated with lack of exclusive breastfeeding.

Conclusion

Evidence of incorrect feeding practices among working mothers was found in this study. Their infants developed a variety of related co-morbidities (such as pneumonia, diarrhea, skin infections, and ear

infections) as a result of non-exclusive breastfeeding and improper supplemental feeding.

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References:

1. Chowdhury FR, Yasmeen BN, Rahman S. Study on Exclusive Breastfeeding practice and related factors among mothers attending in a tertiary care hospital of Bangladesh. Northern International Medical College Journal. 2018 Dec 20; 10(1):343-6.
2. Reniker LN, Frazer LC, Good M. Key biologically active components of breast milk and their beneficial effects. Semin Pediatr Surg. 2023 Jun;32(3):151306
3. Kleigman RM, Geme ST, Blum NJ, Shah SS, Tasker RC. & Wilson KM. Nelson, Textbook of Pediatrics, 21st edi, 2020, Elsevier, pp. 1796-1801.
4. Woods NK, Chesser AK, Wipperman J. Describing adolescent breastfeeding environments through focus groups in an urban community. Journal of primary care & community health. 2013 Oct; 4(4):307-10.
5. Iqbal SM, Afzal MF, Azhar IA, Sultan MA. First feed in newborn: are we following WHO recommendations? Annals of King Edward Medical University. 2010; 16(4):229.
6. World Health Organization. Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals. World Health Organization; 2009.
7. World Health Organization. Indicators for assessing infant and young child feeding practices part 3: country profiles. World Health Organization; 2010.
8. World Health Organization. Guiding principles for feeding non-breastfed children 6-24 months of age. World Health Organization; 2005.
9. Arifeen S, Black RE, Antelman G, Baqui A, Caulfield L, Becker S. Exclusive breastfeeding reduces acute respiratory infection and diarrhea deaths among infants in Dhaka slums. Pediatrics. 2001 Oct 1;108(4):e67.
10. Anato A. Severe acute malnutrition and associated factors among children under-five years: A community based-cross sectional study in Ethiopia. Heliyon. 2022 Sep 29;8(10):e10791
11. Gultie T, Sebsibie G. Determinants of suboptimal breastfeeding practice in Debre Berhan town, Ethiopia: a cross sectional study. Int Breastfeed J. 2016 Mar 22;11:5.
12. Ginsburg AS, Mvalo T, Phiri M, Gadama D, Chirombo C, Maliwichi M, Hwang J, May S. Malawian children with chest-indrawing pneumonia with and without comor-bidities or danger signs. J Glob Health 2021;11:04016
13. Integrated Management of Childhood Illness (IMCI), Students Handbook, Government of the people's Republic of Bangladesh, 2019.
14. Udoh EE, Meremikwu MM, Ee U. Antibiotic prescriptions in the case management of acute watery diarrhea in under-fives. Int. J. Contemp. Pediatr. 2017 May;4(3):691-5.
15. Saleh F, Ara F, Hoque MA, Alam MS. Complementary feeding practices among mothers in selected slums of Dhaka city: a descriptive study. Journal of health, population, and nutrition. 2014 Mar;32(1):89.
16. Shefa J, Rahman MF, Alamgir M, Azad MA, Ara R. Awareness on Breast Feeding among Readymade Garments (RMG) Working Women in Dhaka city. Bangladesh Journal of Medicine. 2010; 21(2):65-70.
17. Haider R, Thorley V. Supporting exclusive breastfeeding among factory workers and their unemployed neighbors: Peer counseling in Bangladesh. Journal of Human Lactation. 2020 Aug; 36(3):414-25.
18. Afrose L, Banu B, Ahmed KR, Khanom K. Factors associated with knowledge about breastfeeding among female garment workers in Dhaka city. 1. 2012; 3(249):255.
19. Hasan AR, Smith G, Selim MA, Akter S, Khan NU, Sharmin T, et. al. Work and breast milk feeding: a qualitative exploration of the experience of lactating mothers working in ready-made garments factories in urban Bangladesh. International Breastfeeding Journal. 2020 Dec; 15:1-1.
20. Haque MJ, Rahman MM, Sarker SK, Ali MA, Fakir M, Rahman MM. et. al. Infant feeding practice by the rural mothers of Dinajpur district. Dinajpur Med Col J. 2010; 3(1), pp.35-38.
21. Demilew YM, Tafere TE, Abitew DB. Infant and young child feeding practice among mothers with 0–24 months old children in Slum areas of Bahir Dar City, Ethiopia. International breastfeeding journal. 2017 Dec; 12(1):1-9.
22. Mihrshahi S, Ichikawa N, Shuaib M, Oddy W, Ampon R, Dibley MJ, et. al. Prevalence of exclusive breastfeeding in Bangladesh and its association with diarrhoea and acute respiratory infection: results of the multiple indicator cluster survey 2003. Journal of health, population, and nutrition. 2007 Jun; 25(2):195.

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