



Comparison of knowledge, attitude and social support of exclusive breastfeeding between primiparae and multiparae after delivery within 6 months in Changsha, China: a cross-sectional study

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Background: The knowledge, attitude, and social support of exclusive breastfeeding among mothers are the important predictors of the starting time of lactation and the duration time of breastfeeding. Evaluating the knowledge, attitude, social support of exclusive breastfeeding of mothers is critical to recognize those at risk for suboptimal breastfeeding practices. There were a small amount of studies related to knowledge, attitude and social support of mothers, a blank for comparative study of the knowledge, attitude, social support of breastfeeding between primiparae and multiparae existed. Our aim was to compare the feeding situation between firstborns and second-born infants, and to compare the knowledge, attitude, and social support between primiparae and multiparae.

Methods: This was a cross-sectional study, a total of 354 mothers of infants aged 0–6 months who underwent physical examination between February 2019 and July 2019 were randomly recruited to the study and finished an on-site questionnaire. Chi-square test or Fisher's exact test were used to make a comparison among groups.

Results: The average rate of exclusive breastfeeding among infants aged 0–6 months was 61.30%. There is no statistical difference between the firstborns and the second-born infants regarding whether cod liver oil was supplemented, whether it was breastfeeding after birth, the signal of breastfeeding for infants, and the duration of each lactation ($P>0.05$); The rate of exclusive breastfeeding of second-born infants was lower than that of firstborns ($P=0.001$); The starting time of breastfeeding of second-born infants was earlier than that of firstborns ($P=0.041$). Compared to primiparae, multiparae had a higher degree of understanding of feeding knowledge ($P<0.001$), a higher proficiency level of self-evaluation of feeding techniques ($P<0.001$); and a better self-evaluation of feeding habit ($P<0.001$); more multiparae had prenatal feeding counselling ($P<0.001$); primiparae and multiparae had no statistical difference in attitude and social support of breastfeeding (all $P>0.05$).

Conclusions: Breastfeeding knowledge, skills, and habits of mothers all need to be improved. It's urgent to make up for the deficiency of news media such as television and radio in the dissemination of breastfeeding knowledge. Primiparas with a high level of education are the key object of our publicity and education.

Keywords: Exclusive breastfeeding; knowledge; attitude; social support

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Introduction

Both World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) propose that infants should be exclusively breastfed during the first six months after birth, and then added with supplementary food while breastfeeding is still provided to the age of 2 or above (1). Breastfeeding can bring a great benefit to the public health and economy. According to the statistics, breastfeeding can reduce the human virus that cause disease in guts of infants (2). Improving the breastfeeding practices can save the life of 820,000 people, 87% of which are infants under 6 months. Increasing the rate of breastfeeding can bring the increase of hundreds of billions of dollars of the world's economy. Breastfeeding has an active effect on the decrease of the prevalence rate of chronic disease, the improvement of intelligence development of children, and the decrease of medical expenses (3,4). Among the 101 countries in the world, only 32 countries reached the goal of 50% of exclusive breastfeeding rate that the World Health Assembly (WHA) determined. The global average exclusive breastfeeding rate was 43% (5), and the exclusive breastfeeding rate of infants under 6 months in low- and middle-income countries was 37% (6). During 2007 to 2017, in massive China's cohort study, the exclusive breastfeeding rate of infants under 6 months was between 0.50% to 33.45%, lower than that of the average level of low- and middle-income countries and showing a decreasing tendency (7,8). The factors that influenced breastfeeding were various. The study of *The Lancet* attributed the influencing factors of breastfeeding to three aspects: individual, institution, and social structure (6). Individual factors included maternal and child health, and the cognition of mothers about the knowledge of breastfeeding; institutional factors included the social support of Healthcare and Medical Institutions, communities, work units and families to breastfeeding; Social structural factors included social culture, laws and policies, and market environment. All of the three aspects influenced simultaneously the practices of breastfeeding. Together, breastfeeding knowledge, attitudes, and social support represent a substantial portion of a mother's orientation toward breastfeeding. Studies showed that the knowledge, attitude, and social support of breastfeeding among mothers were important predictors of the starting time and duration time of breastfeeding (6,9,10).

Evaluating the knowledge, attitude, social support of exclusive breastfeeding of mothers is critical to recognize

those at risk for suboptimal breastfeeding practices, so as to adopt improvement measures for dangerous problems existed in the current situation, and it is of great significance in raising the breastfeeding rate and ensuring the maternal and child health. There were a small amount of studies related to knowledge, attitude and social support of mothers (11-19). A blank for comparative study of the knowledge, attitude, social support of breastfeeding between primiparae and multiparae existed. This study aimed to compare and analyse the feeding situation of firstborns and secondborn infants, and to compare the knowledge, attitude, and social support of primiparae and multiparae in Changsha city, so as to provide scientific basis for the increase of the rate of breastfeeding, and to fill up the research gap to some extent. We present the following article in accordance with the SURGE reporting checklist (available at <https://tp.amegroups.com/article/view/10.21037/tp-22-327/rc>).

Methods

Research objects

This cross-sectional study was conducted in the Children's Health Center of The Third Xiangya Hospital of Central South University in Changsha. By calculation, a sample size of 352 cases was required for this study. We used the random sampling method to select the study subjects, that was, to choose a research subject by casting a coin. A total of 354 mothers of infants aged 0–6 months who underwent physical examination between February 2019 and July 2019 and the same time met the inclusion criteria and exclusion criteria were finally recruited to the study. This study was conducted in accordance with the Declaration of Helsinki (as revised in 2013) and was approved by the Ethics Committee of The Third Xiangya Hospital of Central South University (No. Quai I 22107), informed consent was taken from the mothers of all infants.

The inclusion criteria of research objects were: (I) the registered permanent residence of mothers and infants were locally, and infants could have physical examination at the hospital at the prescribed time; (II) the mothers of infants signed the informed consent and could cooperate with the survey; (III) the mothers and infants had no breastfeeding taboos; (IV) the mothers had no communication barrier. The exclusion criteria of research objects were: (I) the mothers had diseases that made them not suitable for breastfeeding such as acquired immune deficiency syndrome (AIDS); (II) the infants were deformed or had other congenital diseases; (III) the infants were undergoing

medical treatment at neonatology department right after birth; (IV) the infants had organic diseases.

The estimation of sample quantity

In China's cohort study, the rate of exclusive breastfeeding among infants aged 0–6 months from 2007 to 2017 was fluctuated between 0.50% and 33.45% (8). This study set 33.45% as the sample estimation basis. The calculation formula was:

$$n = \frac{Z_{\alpha}^2 \times P(1-P)}{E^2} \quad [1]$$

In this formula, n was the sample quantity, Z_{α} was the statistics of significance testing, P was the probability value, E was the error value. In this study, $\alpha=0.05$, $Z_{\alpha}=1.96$, allowable error $E=0.05$, the probability $P=0.3345$. After calculation, $n=342$. Considering 3% of refusal rate and rate of unqualified questionnaires, the sample quantity was increased to 352.

Research methods

Unified questionnaires were used to conduct to mothers of infants in accordance with the inclusion criteria. The content of questionnaires was:

- (I) The basic features of mothers: age, occupation, educational level, primiparae/multiparae, household incomes per capita, place of residence, pre-pregnancy weight, weight before delivery, height, have complications of pregnancy or not (anemia, gestational hypertension, gestational diabetes, etc.), have breast problems or not (retracted nipples, chapped nipples, mastitis, flat nipples and so on), have prenatal breastfeeding counselling or not, the main approaches of acquiring the knowledge of breastfeeding.
- (II) The basic features of infants: the primary caregiver, the educational level of primary caregiver, singleton/twins, way of delivery, gestational week, sex of infants, age in months, and birth weight. In this study, the number of the third-born child and above was small, we classified them to secondborn infants uniformly.
- (III) The feeding situation of infants: have supplemented cod liver oil or not and the age in months when started to add after birth, have breastfeeding or not after birth, the starting time

of breastfeeding, the signal of breastfeeding, the duration of each lactation, the feeding ways of infants in recent two weeks, and the reasons for not choosing exclusive breastfeeding.

- (IV) Knowledge: the knowledge scale of breastfeeding developed and applied by Min Zhao (20) was used to analyze the degree of mothers' knowledge of breastfeeding. The scale included 17 items. One point would be obtained if the answer of one item was right. The total score was 17. The higher the score was, the better the mother grasped the knowledge of breastfeeding. The scores were divided into five levels: 0–2 points was very ignorant, 3–6 points was ignorant, 7–10 points was common understanding, 11–14 points was understanding, 15–17 points was understanding very well. Due to the fact that the Cronbach's α coefficient of the original study was smaller than 0.7 which may be related to the small quantity of pre-experimental samples, this study chose 60 puerperae who conformed to the inclusion criteria to conduct a preliminary test to check the reliability of this questionnaire. The Cronbach's α coefficient retested was 0.8.
- (V) Attitude: we used Maternal Breastfeeding Evaluation Scale (MBFES) (21) to assess the attitude of mothers on breastfeeding. This scale was established by Ellen and other people in 1994, including three dimensions: the degree of satisfaction of puerperae, the degree of satisfaction of infants, the lifestyle of puerperae. It could assess the practices of breastfeeding, especially the degree of satisfaction of breastfeeding, which was helpful to find the factors that influenced the degree of satisfaction of breastfeeding and could predict the way of feeding and the duration time of breastfeeding of infants. This scale included 30 items and all adopted Likerts' 5-Point Scale. Eleven items were reverse scoring. The total score was 30–150 points. The higher the score was, the more one agreed with breastfeeding: 30–53 points was strongly disagree, 54–77 points was disagree, 78–102 points was no opinion or unsure, 103–126 points was agree, 127–150 points was strongly agree. The Cronbach's α coefficient of the scale was 0.93.
- (VI) Social support: social support rating scale of exclusive breastfeeding was self-designed by virtue of references (6,22). Given that social

support comes from many different venues (e.g., workplace, family). It was divided into three aspects: support of family (lived with family for nearly a year, can get the support and care from husband and parents, breastfeeding is a experience full of maternal for me, the baby is very cooperative during breastfeeding, I feel satisfied and proud when I breastfeed, my family is not worried about me whether I have enough breast milk, family members are not worried about exclusive breastfeeding having not enough nutrition for babies, the family atmosphere is positive, optimistic and relaxed, be able to basically achieve cooperative family nursing care, other family members have basic nursing knowledge), support of work (have care from most colleague, working hours flexible, breastfeeding leave adequate, have room to squeeze breast milk, have refrigeration conditions of breast milk, the work unit is close to the home, have perfect and reasonable rules and regulations, can protect the legitimate rights and interests of nursing woman, have no physical harm in the work, have plenty of rest time), and support of other factors (have multiple close friends, have continuous breastfeeding guidance, have a professional person to guide the breast milk initiating, easy to get treatment and help when have problems like mastitis, have nursing rooms or mother and baby rooms in public places, infants have no physiology reason unfit for breastfeeding, mothers have no disease unfit for breastfeeding, babies like to eat breast milk, easy to obtain emotional support and psychological care, existing breastfeeding welfare policies are relatively perfect). Each of the three aspects included 10 items. The answer was in the form of “yes” or “no”. If the answer was “yes”, then 1 point was obtained, otherwise 0 point was got. Seven points and above were support. After the formation of the questionnaire, five experts were invited to review it and evaluate whether the content of the items were related to the index that it wanted to measure. The Content Validity Index (CVI) of the questionnaire was 0.9. Before the formal study, the researcher chose 30 puerperae who conformed with the inclusion criteria to conduct a preliminary test to check the reliability of the questionnaire. The resulting data was

statistically analyzed with the software SPSS 21.0. The measured Cronbach's α coefficient was 0.8.

- (VII) The self-evaluation of the proficiency level of breastfeeding skill: it included 6 items which were washing hands before breastfeeding, cleaning the nipples, the posture of breastfeeding of mothers, the milking method, the posture of infants keeping the nipple in the mouth, recognizing hunger/full stomach indication of infants timely. One point was obtained for one correct answer. The total score was 0–6 points: 0–1 was very unskilled, 2 points was unskilled, 3–4 points was average, 5 points was skilled, 6 points was very skilled.
- (VIII) The self-evaluation of breastfeeding habit: It included 6 items, which were directly sucking, bilateral lactation, the selection of breastfeeding time, the selection of breastfeeding site, the posture of infants, burping infants after breastfeeding. One point was obtained for one correct answer. The total score was 0–6 points: 0–1 was very bad, 2 points was bad, 3–4 points was average, 5 points was good, 6 points was very good.

Statistical analysis

All the data was input into the software Epidata3.1 and was statistically analyzed with SPSS 21.0. The measurement data was described with mean \pm standard deviation; The count data was described with frequencies (percentage). Chi-square test or Fisher's exact test were used to make a comparison among groups. Wilcoxon rank sum test was used for the ranked data, and the significance level was set as $P < 0.05$ with two-tail test.

Quality control

- (I) Before the survey: all the interviewers of this study were child care staff, among whom the main leader was one of the authors of this paper. All the interviewers received the unified training before the survey so they would ask the questions of the questionnaire in a standard way. The unique identity of every research object was the file number of physical examination. Before the survey, the file number of physical examination would be searched in the input system of questionnaire information to ensure every research object would not be interviewed

repeatedly. The phone information of every research object in the physical examination information system was verified before the survey finished to ensure the research objects could be follow-up by telephone.

- (II) During the survey: the research objects would be interviewed by child care staff one by one; After each interview, the interviewer would verify the questionnaire on the spot and fill the gaps to ensure the integrity of the questionnaire information.
- (III) After the survey: after finished the questionnaire, the research objects would be guided and corrected by child care staff in terms of their bad breastfeeding behaviour in the survey. In this way, they could be motivated to actively finish the questionnaire. On the day when the questionnaires were collected, the information of the questionnaires would be entered into Epidata3.1 with dual computers and dual input to ensure the accuracy of data. When finding the information of the questionnaire was not consistent with the reality or incomplete, telephone follow-up would be conducted to ensure the completeness and accuracy of every questionnaire. The questionnaires that failed to follow up would be regarded as invalid questionnaires.

Results

This research gave out 360 samples, and received 354 valid questionnaires with the recovery rate of 98%. The first-born infants were 214 cases (60.5%), and secondborn infants were 140 cases (39.5%). Most infants were 1-month-old infants, accounting for 64.7% (229 cases). The ways to acquire knowledge of breastfeeding were mainly books, newspapers, or periodicals (24.0%), the experience of relatives (33.1%), the experience of last breastfeeding (26.3%), the Internet (33.3%), medical workers (29.4%). Few people chose television and broadcast (2.3%).

The comparison of basic features between firstborns and secondborn infants

No statistical difference existed between the firstborns and secondborn infants in terms of the educational level of primary caregiver, singleton/twins, way of delivery, preterm delivery or not, sex of infants, age in months, and birth weight. The fact that the primary caregiver of firstborns was mother/father was more than that of secondborn infants ($P=0.040$, see *Table 1*).

The comparison of basic features between primiparae and multiparae

Compared to primiparae, the age of multiparae was relatively larger ($P<0.001$), the educational level of multiparae was relatively lower ($P=0.001$); the pre-pregnancy body mass index (BMI) and antepartum BMI were relatively higher ($P=0.002$ and $P<0.001$, respectively). Complications of pregnancy of multiparae were more than that of primiparae ($P=0.005$); No statistical difference existed between primiparae and multiparae in terms of occupation, household incomes per capita, place of residence, and having breast problems or not ($P>0.05$). See *Table 2*.

The comparison of feeding situation between firstborn and secondborn infants

Both the proportions of infants who received the supplement of cod liver oil and of infants who were exclusively breastfed were 98.31% (384/354); The proportion of the starting time of breastfeeding was “after birth >2 h” was 47.74% (169/354). A proportion of 65.54% (232/354) of mothers chose “breastfeeding on demand”; 46.05% (163/354) of mothers chose 10–20 min as the duration of each lactation; 217 infants’ major feeding way in recent 2 weeks was exclusive breastfeeding, and the exclusive breastfeeding rate was 61.30% (217/354). The exclusive breastfeeding rate of 1-, 3- and 6-month-old infants was 61.14% (140/229), 73.13% (49/67) and 48.28% (28/58), respectively.

No statistical difference existed between firstborn and secondborn infants in terms of having supplemented cod liver oil or not, having breastfeeding or not, the signal of breastfeeding, and the duration of each lactation ($P>0.05$); The exclusive breastfeeding rate of secondborn infants was lower than that of firstborns ($P=0.001$); The starting time of breastfeeding of secondborn infants was earlier than that of firstborns ($P=0.041$). See *Table 3*.

The comparison between primiparae and multiparae in knowledge, attitude, and social support situation of exclusive breastfeeding

The understanding level of knowledge of exclusive breastfeeding of mothers mainly concentrated on “common understanding” and “understanding”, which respectively accounted for 45.20% (160/354) and 49.72%

Table 1 The comparison of basic features between firstborn and secondborn infants

Variable	n	Firstborn (n=214)	Secondborn (n=140)	P
The primary caregiver of infants				0.040 ^b
Mother/father	304	191 (89.25)	113 (80.71)	
Grandfather/grandmother	40	20 (9.35)	20 (14.29)	
Babysitter/other relatives	10	3 (1.40)	7 (5.00)	
The educational level of the primary caregiver				0.829 ^a
Primary school and below	22	13 (6.07)	9 (6.43)	
Junior high school	59	37 (17.29)	22 (15.71)	
High school/vocational school/technical secondary school	72	40 (18.69)	32 (22.86)	
University, junior college	180	112 (52.34)	68 (48.57)	
Master and above	21	12 (5.61)	9 (6.43)	
Singleton/twins				1 ^b
Singleton	346	209 (97.66)	137 (97.86)	
Twins or polyembryony	8	5 (2.34)	3 (2.14)	
Way of delivery				0.153 ^b
Vaginal delivery	186	119 (55.61)	67 (47.86)	
Cesarean delivery	168	95 (44.39)	73 (52.14)	
Preterm delivery or not				0.421 ^b
Yes	36	24 (11.21)	12 (8.57)	
No	318	190 (88.79)	128 (91.43)	
The sex of infant				0.334 ^b
Male	186	108 (50.47)	78 (55.71)	
Female	168	106 (49.53)	62 (44.29)	
Age in month				0.236 ^b
1-month-old	229	131 (61.22)	98 (70.00)	
3-month-old	67	44 (20.56)	23 (16.43)	
6-month-old	58	39 (18.22)	19 (13.57)	
Birth weight ^c				0.694 ^a
Low-birth weight	18	14 (6.54)	4 (2.86)	
Normal birth weight	304	179 (83.65)	125 (89.28)	
Macrosomic	32	21 (9.81)	11 (7.86)	

Data are presented as n (%). ^a, Wilcoxon rank sum test was used for a ranked data; ^b, categorical variables were compared using the χ^2 test or Fisher's exact test; ^c, the birth weight <2,500 g was low-birth weight, the birth weight of 2,500–4,000 g was normal birth weight, the birth weight >4,000 g was macrosomic.

(176/354); the proportion of the attitude of “strongly agree” towards exclusive breastfeeding was 81.36% (288/354); the social support situation of exclusive

breastfeeding was mainly support from family, accounting for 95.76% (339/354); the self-evaluation of proficiency level of breastfeeding skill centered on “skilled” and

Table 2 The comparison of basic features between primiparae and multiparae

Variable	n	Primiparae (n=214)	Multiparae (n=140)	P
Age				<0.001 ^a
<30 years	169	142 (66.35)	27 (19.28)	
30–35 years	143	64 (29.91)	79 (56.43)	
>35 years	42	8 (3.74)	34 (24.29)	
Occupation				0.147 ^b
Public servants	17	9 (4.21)	8 (5.71)	
Professional and technical personnel	91	55 (25.70)	36 (25.72)	
Staff member	109	73 (34.11)	36 (25.72)	
Enterprise manager	41	22 (10.28)	19 (13.57)	
Worker	2	0 (0)	2 (1.43)	
Individual operator	31	14 (6.54)	17 (12.14)	
Freelancer	26	16 (7.48)	10 (7.14)	
Farmer	1	0	1 (0.71)	
Unemployed person	36	25 (11.68)	11 (7.86)	
Educational level				0.001 ^a
High school/vocational school/technical secondary school and below	51	19 (8.88)	32 (22.86)	
University, junior college	262	166 (77.57)	96 (68.57)	
Master and above	41	29 (13.55)	12 (8.57)	
Household incomes per capita (CNY/month)				0.220 ^a
<5,000 CNY	60	39 (18.23)	21 (15.00)	
5,000–10,000 CNY	158	98 (45.79)	60 (42.86)	
>10,000 CNY	136	77 (35.98)	59 (42.14)	
Place of residence				0.953 ^b
Cities and towns	336	203 (94.86)	133 (95.00)	
Rural areas	18	11 (5.14)	7 (5.00)	
Pre-pregnancy BMI ^c				0.002 ^a
Low weight	61	43 (20.09)	18 (12.86)	
Normal weight	247	153 (71.50)	94 (67.14)	
Overweight	42	15 (7.01)	27 (19.29)	
Obesity	4	3 (1.40)	1 (0.71)	
Antepartum BMI ^d				<0.001 ^a
Low weight	4	3 (1.40)	1 (0.71)	
Normal weight	60	49 (22.90)	11 (7.86)	
Overweight	189	111 (51.87)	78 (55.72)	
Obesity	101	51 (23.83)	50 (35.71)	

Table 2 (continued)

Table 2 (continued)

Variable	n	Primiparae (n=214)	Multiparae (n=140)	P
Have complications of pregnancy or not				0.005 ^b
Yes	130	66 (30.84)	64 (45.71)	
No	224	148 (69.16)	76 (54.29)	
Have breast problems or not				0.924 ^b
Yes	92	56 (26.17)	36 (25.71)	
No	262	158 (73.83)	104 (74.29)	

Data are presented as n (%). ^a, Wilcoxon rank sum test was used for a ranked data; ^b, categorical variables were compared using the χ^2 test or Fisher's exact test; ^c, pre-pregnancy BMI <18.5 kg/m² was low weight, pre-pregnancy BMI of 18.5–23.9 kg/m² was normal weight, pre-pregnancy BMI of 24–27.9 kg/m² was overweight, pre-pregnancy BMI >28 kg/m² was obesity; ^d, antepartum BMI <19.8 kg/m² was low weight, antepartum BMI of 19.8–26 kg/m² was normal weight, antepartum BMI >26 was overweight, antepartum BMI \geq 28 kg/m² was obesity.

Table 3 The Comparison of feeding situation between firstborn and second-born infants

Variable	n	Firstborn (n=214)	Second-born (n=140)	P
Have supplemented cod liver oil or not after birth				0.409 ^b
Yes	348	209 (97.66)	139 (99.29)	
No	6	5 (2.34)	1 (0.71)	
Have breastfeeding or not after birth				0.684 ^b
Yes	348	211 (98.60)	137 (97.86)	
No	6	3 (1.40)	3 (2.14)	
The starting time of breastfeeding				0.041 ^a
0–1 h after delivery	95	52 (24.30)	43 (30.71)	
1–2 h after delivery	90	50 (23.36)	40 (28.57)	
>2 h after delivery	169	112 (52.34)	57 (40.72)	
The signal of breastfeeding				0.238 ^b
When put to sleep	19	10 (4.67)	9 (6.43)	
When crying	50	32 (14.95)	18 (12.86)	
On time	53	26 (12.15)	27 (19.28)	
On demand	232	146 (68.23)	86 (61.43)	
The duration of each lactation				0.373 ^a
3–5 min	13	7 (3.27)	6 (4.29)	
5–10 min	84	54 (25.23)	30 (21.43)	
10–20 min	163	88 (41.12)	75 (53.57)	
20–30 min	69	48 (22.43)	21 (15.00)	
30 min and above	25	17 (7.95)	8 (5.71)	
The way of feeding in recent 2 weeks				0.001 ^b
Exclusive breastfeeding	217	148 (69.16)	69 (49.29)	
Mixed feeding	116	57 (26.63)	59 (42.14)	
Artificial feeding	21	9 (4.21)	12 (8.57)	

Data are presented as n (%). ^a, Wilcoxon rank sum test was used for a ranked data; ^b, categorical variables were compared using the χ^2 test or Fisher's exact test.

Table 4 The comparison between primiparae and multiparae in the knowledge, attitude, and social support situation of breastfeeding

Variable	n	Primiparae (n=214)	Multiparae (n=140)	P
The understanding level of knowledge of exclusive breastfeeding				<0.001 ^a
Understanding very well	10	2 (0.94)	8 (5.72)	
Understanding	176	92 (42.99)	84 (60.00)	
Common understanding	160	113 (52.80)	47 (33.57)	
Ignorant/very ignorant	8	7 (3.27)	1 (0.71)	
The attitude of breastfeeding				0.763 ^a
Strongly agree	288	173 (80.84)	115 (82.14)	
Agree	61	38 (17.76)	23 (16.43)	
No opinion or unsure	5	3 (1.40)	2 (1.43)	
Disagree/strongly disagree	0	0	0	
The social support situation of breastfeeding				0.184 ^b
Support of family	339	208 (97.20)	131 (93.57)	
Support of work	4	2 (0.93)	2 (1.43)	
Support of other factors	11	4 (1.87)	7 (5.00)	
The self-evaluation of proficiency level of breastfeeding skill				<0.001 ^a
Very skilled	53	18 (8.41)	35 (25.00)	
Skilled	169	90 (42.06)	79 (56.43)	
Average	114	90 (42.06)	24 (17.14)	
Unskilled	16	14 (6.54)	2 (1.43)	
Very unskilled	2	2 (0.93)	0	
The self-evaluation of breastfeeding habit				<0.001 ^a
Very good	27	8 (3.74)	19 (13.57)	
Good	202	106 (49.53)	96 (68.57)	
Average	118	95 (44.39)	23 (16.43)	
Bad	6	4 (1.87)	2 (1.43)	
Very bad	1	1 (0.47)	0	
Have prenatal breastfeeding counselling or not				<0.001 ^b
Yes	140	68 (31.78)	72 (51.43)	
No	214	146 (68.22)	68 (48.57)	

Data are presented as n (%). ^a, Wilcoxon rank sum test was used for a ranked data; ^b, categorical variables were compared using the χ^2 test or Fisher's exact test.

“average”, respectively accounting for 47.74% (169/354) and 32.20% (114/354); the self-evaluation of breastfeeding habit concentrated on “good” and “average”, respectively accounting for 57.06% (202/354) and 33.33% (118/354); Only 39.55% (140/354) of mothers had prenatal breastfeeding counselling.

Compared to primiparae, multiparae's understanding level of knowledge of breastfeeding ($P<0.001$), and self-

evaluation of proficiency level of breastfeeding skill ($P<0.001$) were higher than that of primiparae; the self-evaluation of breastfeeding habit of multiparae was better than that of primiparae ($P<0.001$); more multiparae had prenatal breastfeeding counselling ($P<0.001$); no statistical difference existed between primiparae and multiparae in terms of the attitude and the social support situation of breastfeeding ($P>0.05$). See *Table 4*.

Discussion

In this study, the rate of exclusive breastfeeding of 1-, 3- and 6-month-old infants was 61.14%, 73.13% and 48.28%, respectively, and the average rate of exclusive breastfeeding of infants aged 0–6 months was 61.30%, higher than the rate of exclusive breastfeeding of infants under 6 months in low- and middle-income countries, which was 37% (3). The average rate of exclusive breastfeeding of infants aged 0–6 months in this study, 61.30%, reached the aim of the World Health Assembly (WHA), which was increasing the rate of exclusive breastfeeding of infants under 6 months in the world from 38% in 2012 to at least 50% (23) by 2025. The rate of exclusive breastfeeding was higher than the goal, may be related to fact that the samples in this study mainly concentrated on 1-month-old infants. The exclusive breastfeeding rate of 3-month-old infants was obviously higher than that of 1- and 6-month-old infants. It mainly due to the starting time of lactation for most puerperae was more than 2 h in this study. If the starting time of lactation was relatively late, the breast milk volume would be decreased (24). After the child was born, the appropriate amount of milk powder would be added due to the shortage of mother's milk. However, when the infant was 3 months old, the continuous suck of infants had a positive stimulation to the nipples and paced up the secretion of breast milk (25). The increase of breast milk of mothers enabled it to basically satisfy the milk demand of infants. Therefore, the rate of exclusive breastfeeding of 3-month-old infants increased significantly. After the 6-month of maternity leave, mothers came back to the work, reducing the frequency of breastfeeding obviously. The sucking rate decreased, and the volume of breast milk decreased, making the rate of exclusive breastfeeding of 6-month-old infants decrease. In this research, the main reason for not choosing exclusive breastfeeding was the demand for work and the lack of breast milk.

The understanding level of knowledge of exclusive breastfeeding of puerperae concentrated on “understanding” (49.7%) and “common understanding” (45.2%). The self-evaluation of proficiency level of breastfeeding skill concentrated on “skilled” (47.74%) and “average” (32.20%). The breastfeeding habit focused on “good” (57.06%) and “average” (33.33%). The knowledge of breastfeeding, the breastfeeding skill, and breastfeeding habit all need to be improved. Only 39.55% of mothers had prenatal breastfeeding counselling. The prenatal breastfeeding counselling can improve the proficiency level

of breastfeeding skill and the breastfeeding habits, and then extend the duration of exclusive breastfeeding (26). Medical workers can conduct the prenatal breastfeeding guidance appropriately and canonically to pregnant women during the process of prenatal examination. In addition, in this study, although the education level of primiparae was higher than that of multiparae, the understanding level of knowledge of exclusive breastfeeding and the proficiency level of breastfeeding skill of primiparae were lower than that of multiparae. The breastfeeding habit of primiparae was inferior to that of multiparae. The reason might be related to the accumulation of breastfeeding experience of firstborn and the time accumulation of breastfeeding knowledge of multiparae. What's more, more multiparae in this study had prenatal breastfeeding counselling, while primiparae were the first time to be a mother, thus lacking the experience of rearing newborn babies. This indicates that the publicity and education of knowledge of breastfeeding, breastfeeding skill, and breastfeeding habit should be carried out widely and deeply in all puerpera, especially in primiparae with higher education level. In this study, the main ways of mothers of acquiring knowledge of breastfeeding were ranked in descending order: the Internet (33.33%), the experience of relatives (33.05%), medical workers (29.38%), the previous experience of breastfeeding of themselves (26.27%), books, newspapers, and magazines (24.01%), and television and broadcast (2.26%), showing that in terms of the publicity of knowledge of breastfeeding, relatives, the Internet, and medical workers played a leading role, while significant gaps existed in the transmission of knowledge of breastfeeding through television and broadcast and other news media.

“Help mothers initiate breastfeeding within a half- hour of birth” is one of the *Ten Steps to Successful Breastfeeding* issued by WHO. The suck of newborn infants can have a positive stimulation to the nipples and pace up the secretion of breast milk, which is helpful to the advancing of the starting time of lactation (27). WHO proposed that infants should have skin-to-skin contact with mothers early and incessantly after the birth and that colostrum should be started within one hour after delivery so as to enhance the possibility of exclusive breastfeeding and to increase the total duration of breastfeeding (24). The starting time of lactation in this study was relatively late. The proportion of starting the lactation in 0–1, 2 and >2 h after the delivery was 26.84%, 25.42% and 47.74%, respectively. A large number of researches indicated that cesarean section can delay the starting time of breastfeeding and decrease the duration of breastfeeding (28–31). The number of

fetuses has a positive correlation with the starting time of breastfeeding, and there has no relation between gestational age, the birth weight and the starting time of breastfeeding (32,33). In this study, no statistical difference existed between firstborn and secondborn infants in terms of singleton/twins, way of delivery, preterm delivery or not, the sex of infants, age in month, and the birth weight. But the starting time of breastfeeding of secondborn infants was earlier than that of firstborns, this may attribute to the fact that multiparae had more prenatal breastfeeding counselling and relatively high understanding level of exclusive breastfeeding, so that they knew early initiation of breastfeeding was important to infants and their own health. Healthcare and medical institutions should help and encourage mothers to have early and incessant skin-to-skin contact with infants after the birth as soon as possible and help all the mothers enable infants to suck the nipples within the first hour after the delivery (5).

Studies proved that the company and support of fathers and families can effectively raise the rate of exclusive breastfeeding and extend the duration of breastfeeding (1,6,34,35). The nature of work support breastfeeding has a great effect on the improvement of breastfeeding. But if the work units lack the environment and condition of exclusive breastfeeding, the duration of breastfeeding will be decreased (36,37). The research results showed that maternity leave policy can effectively increase the rate of exclusive breastfeeding (6). In this study, the social support of exclusive breastfeeding was mainly from support of family, which accounted for 95.76% (339/354); the support from work and others only accounted for 4.24%. Clearly it can be seen that the support for breastfeeding from work is the direction of improving the rate of breastfeeding in the future. Under the condition that no statistical difference existed in the attitude of breastfeeding and the social support of breastfeeding between primiparae and multiparae, although primiparae had a lower understanding level of breastfeeding than multiparae, the rate of exclusive breastfeeding of firstborn infants was higher than that of secondborn infants, mainly because the age, pre-pregnancy BMI, antepartum BMI, complications of pregnancy of multiparae were relatively higher than that of primiparae, that is to say the physical condition of multiparae was poorer than that of primiparae. The physical condition will limit exclusive breastfeeding to some extent (6). Besides, Multiparae may be influenced and distracted by the first child, which is led to the cases of the primary caregiver of firstborns being mother/father were more than that of

secondborns in this study, and then decreased the rate of exclusive breastfeeding to a certain extent. The samples of this study were mainly chosen from 0–6-month-old infants who had physical examinations at the Children's Health Center of The Third Xiangya Hospital of Central South University during February 2019 to July 2019, and the research objects mainly concentrated on 1-month-old infants. The age of infants, the research time, and the research site all led to the selection bias of samples. In the future studies, the samples can be expanded, the survey can be conducted in more regions and can involve infants of more ages to decrease the influence of the selection bias of samples on the research results.

In short, the rate of exclusive breastfeeding of 0–6-month-old infants in this study reached the WHA's goal of improving the rate of exclusive breastfeeding in infants under 6 months to 50% (23). In the future, efforts may be made to improve the rate of exclusive breastfeeding by supporting breastfeeding in work, strengthening prenatal counseling of pregnant women, initiating breastfeeding of infants early after birth, and promoting the publicity and education of breastfeeding knowledge by means of Internet, books, newspapers, medical staff and other media, especially making up for the deficiency of news media such as television and radio. Primiparas with a high level of education are the key object of our publicity and education.

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Footnote

Reporting Checklist: The authors have completed the SURGE reporting checklist. Available at <https://tp.amegroups.com/article/view/10.21037/tp-22-327/rc>

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://tp.amegroups.com/article/view/10.21037/tp-22-327/coif>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Ethics Committee of The Third Xiangya Hospital of Central South University (No. Quai I 22107) and informed consent was taken from the mothers of all infants.

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