

Breastfeeding Knowledge, Attitude, Self-Efficacy, and Social Support Among Mother of Macrosomia in China

Man Xia

Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University <https://orcid.org/0000-0002-7567-3547>

Jinfeng Liu

Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University

Rong Huang (✉ huangrong_1986@51mch.com)

Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University <https://orcid.org/0000-0001-7240-1389>

Research

Keywords: Macrosomia, Exclusive breastfeeding, Breastfeeding knowledge, Breastfeeding attitude, Breastfeeding self-efficacy, Breastfeeding social support

Posted Date: July 28th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-736404/v1>

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Abstract

Background: Breastfeeding knowledge, attitude, self-efficacy, and social support are affective of a mother's confidence in breastfeeding which are influencing factors of breastfeeding ways. Knowledge, attitude, self-efficacy, and social support play important and positive role in promoting breastfeeding behavior in macrosomia.

Methods: Collect breastfeeding knowledge, attitude, self-efficacy, and social support scale of 332 mothers of macrosomia, state the current breastfeeding condition macrosomia in China, investigate the influencing factors of breastfeeding way. Using t test for continuous variables and chi-squared or Fisher's exact test for categorical variables.

Results: The study collected Breastfeeding knowledge, attitude, self-efficacy, and social support scale of 332 mothers of macrosomia (148 from breastfeeding group and 184 from non-breastfeeding group). Compared with mothers in control groups, mothers in breastfeeding groups had significantly higher knowledge score, and most of the high-scoring items on the knowledge scale pertained to maternal breastfeeding benefits. Although the attitude had no significant difference between the two groups, most majority of participants (71.4% and 73.2%, respectively) perceived breastfeeding could increase the intimacy of mother and infant (95.41% and 94.75%, respectively). Breastfeeding ways were great influence by self-efficacy. Over half of participants (55.41% and 53.26%, respectively) stated that they "have more than 3 friends who can get support and help," although up to 95% in both groups supported from family members.

Conclusion: This study state that knowledge, attitude, self-efficacy and social support are influencing factor that to improve breastfeeding rates of macrosomia, which promote the breastfeeding outcomes.

Background

There are three ways to feed infants include breastfeeding, mixed feeding and artificial feeding, while breast milk is the best natural food for babies have been well established [1]. In the worldwide, breastfeeding is an important way to promote healthy infant diets [2]. In developed countries, where consist breastfeeding at least 4 months, believe that breastfeeding can effectively reduce the risk of infant diarrhea, pneumonia, childhood obesity and allergic diseases [3, 4]. Based on the estimated of the United Nations Children's Fund (UNICEF), consist exclusive breastfeeding over six months can effectively reduce mortality rates of under-five by 13%. In addition to health benefits, breastfeeding has significant economic benefits of family, potential savings from breastfeeding alone have been release part economic burden [5].

In the worldwide, six months of exclusive breastfeeding varies, less than half babies at the age of 6 months were breastfeeding exclusively in India [6]. Currently, research on breastfeeding with special birth weights is mostly focused on low weight infants, but the breastfeeding condition of macrosomia are rare reported [7]. Breastfeeding in the first six months of life varies depending on complicated factors, especially in macrosomia [8]. The rate of macrosomia varies from 2.5 to 8.7 % depending on where the baby is born in China [9–11]. The probability of overweight and obesity in macrosomia is greater than that of normal weight babies [12]. However, there is no clear definition of how to breastfeed in macrosomia. This study aims to explore the feeding status of macrosomia and its influencing factors.

The behavior of breastfeeding is mainly dominated by the mother, which means that the mother has the time, energy, ability and confidence to persist in completing breastfeeding [13, 14]. There are many factors that affect

breastfeeding, such as the age of the mother, the number of childbirths, education level and family income [15, 16]. In recent years, studies have also shown that changes in knowledge, belief, and behavior play an important and positive role in promoting breastfeeding behavior [17, 18].

This study collected 332 valid questionnaires from the Shanghai First Maternity and Infant Hospital from January 28, 2019 to January 29, 2020, including the general questionnaire of mothers, attitude scale, knowledge scale, self-efficacy scale, social support scale, tracking return visits to breastfeeding time, collecting 332 effective return interviews, analyzing the influencing factors of abandoning breastfeeding, aiming to explore the current status of breastfeeding in macrosomia, and assess the influencing factors further research will provide a reference for formulating effective intervention measures to support breast milk for macrosomia.

Methods

Study design and participants

Researching in a random sampling method, select the mothers of macrosomia between January 28, 2019 and January 29, 2020 as the research subjects to conduct a telephone follow-up questionnaire survey. Inclusion criteria: the mothers with a birth weight greater than or equal to 4000g; no breastfeeding contraindications for mothers and infants; barrier-free communication between mothers; informed consent was obtained and volunteered to participate in this survey. Exclusion criteria: exclude mothers who suffer from mental illness or cognitive impairment, cannot communicate with each other, and are unwilling to cooperate. Exclusion criteria: For the questionnaire missing more than 5% of the data, and there are important data that cannot be traced; the mothers who cannot complete the intervention program with poor compliance

Collect data by questionnaire surveys on the survey subjects. The questionnaires mainly include: general questionnaire of mothers, attitude scale, knowledge scale, self-efficacy scale, social support scale. Questionnaire survey by telephone follow-up after 6 months.

Design the "Mother General Information Questionnaire", include: mother's age, education level, number of childbirths, childbirth methods, baby weight, family income.

Breastfeeding knowledge scale: using the breastfeeding knowledge scale reported by Abbass-Dick [19]. The scale has two dimensions: the advantages and skills of breastfeeding with 17 items, of which 11 items are the advantages of breastfeeding (4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15), 6 items are breastfeeding skills (1, 2, 3, 16, 17), each item is 1 point, the total score is 0–17. The score is higher, the better the mother's knowledge of breastfeeding. The Cronbach's α coefficient of this scale is 0.7.

Breastfeeding attitude scale: This scale was compiled by Ellen, translated and revised by Froh [20]. The original scale has 17 items, and all item scoring of Likerts 5-level, of which 9 items are reversed scales. The total score is 17–85. The higher the breastfeeding satisfaction with higher score. The scale can be used to evaluate breastfeeding behavior, especially breastfeeding satisfaction, to explore the factors which affect breastfeeding satisfaction, and to predict maternal feeding methods and duration. The Cronbach's α coefficient is 0.74.

Breastfeeding self-efficacy scale which was translated and revised by Hu Lianzhen from Taiwan in 2003 [21]. Dennis revised the breast-feeding self-efficacy scale, deleting some items and conducting psychological tests in 2003. The scale is used to measure the breastfeeding confidence of mothers. There are 14 items in total, including

skills and inner mind. There are 9 questions in the skill dimension (1, 4, 5, 6, 8, 10, 11, 13, and 14 questions), which mainly measure the confidence of breastfeeding skills, which of 5 questions in the inner dimension (2, 3, 7, 9, 12), mainly measuring attitudes and beliefs about breastfeeding. All items are graded likerts 5 (each item is divided into 5 levels of "no confidence at all", "no confidence", "sometimes confident", "confident", and "very confident"). The total score is 14–70 points, the higher the score, the higher the breastfeeding self-efficacy. The coefficient is 0.94 (n = 667). The reliability and validity of the scale is good. This study used this questionnaire to investigate the self-efficacy of breastfeeding during the hospitalization period and 6 months after delivery.

Social support scale: the scale was designed by Boateng [22]. The reliability is 0.92. The scale has 10 items, including three dimensions: subjective support (1, 3, 4, 5) objective support (2, 6, 7) and utilization of social support (8, 9, 10). The scores of the three dimensions can also be scored separately, the higher the score, the better the social support status.

Statistical analysis

Comparisons between breastfeeding group and non-breastfeeding group of patients were made with t test for continuous variables and chi-squared or Fisher's exact test for categorical variables. Univariate and multivariate logistic regression analyses were used to ascertain the strength of association of maternal variables (age, education, primiparity, delivery times, breast feeding intention) with breastfeeding rate. Significance was established at a p value of 0.05. SPSS 22.0 statistical software was used to analyze the data.

Results

Sample characteristics

The study sample consisted of 332 mothers of macrosomia (148 from breastfeeding group and 184 from non-breastfeeding group) (table 1), with a response rate of 100%. In breastfeeding group, the mean age is 30.92 ± 4.07 , and mean age is 30.92 ± 4.07 in non-breastfeeding group, with no significant differences between the groups (Table 1). The samples delivery times are no significant differences between the groups (Table 1). However, compared with two or more deliveries patients, the breastfeeding rate of patients with single delivery was 44.04%, which shows that 10% higher than two or more deliveries patients. The education background are no significant differences between the groups (Table 1). Meanwhile, the breastfeeding rate of patients with bachelor degree or above was 41.67%, and that of patients with other education was 48.57%, which shows that the education level is inversely proportional to the breastfeeding rate. There was no significant difference in monthly income between the two groups (Table 1.).

Breastfeeding knowledge, attitude, self-efficacy and social support scores in the study

Knowledge scores ranged between 11 and 17 in the over-all sample, with the mean score (14.87 ± 1.59), and the midpoint of the knowledge scale is 36.75% (39.86% in breastfeeding group and 34.78% in Non-breastfeeding) (Table 2). The mean score of breastfeeding group was 15.11 ± 1.13 , and that of non-breastfeeding group was 14.67 ± 1.84 , which was significant difference between the two groups, $P < 0.05$. There was no difference in breastfeeding skills between the two groups, however, the advantages of breastfeeding shown a significant difference between the two groups (11.04 ± 0.91 in breastfeeding group and 10.36 ± 1.85 in Non-breastfeeding), $P < 0.01$. Most of the high-scoring items on the knowledge scale pertained to maternal breastfeeding benefits. For example, 98.65% and 94.57% of participants in breastfeeding group and non-breastfeeding group, respectively,

were aware of the decreased risk of ovarian cancer or mammary gland diseases with breastfeeding. Similarly, more than 80% of the participants (90.54% in breastfeeding group and 80.43% non-breastfeeding group) believed that "breastfeeding can prevent infant rickets". However, part of participants in non-breastfeeding group lacked knowledge of nutrition of breast milk, such as breast milk can fully meet the nutritional needs of 6-month-old babies without adding any food and beverages. In addition, only 69.57% of non-breastfeeding participants believed that "breastfeeding can prevent childhood obesity," while 91.89% of breastfeeding participants convinced that.

Attitude scores ranged between 49 and 73 in the overall population, with a mean score of 62.25 ± 5.46 and with 47.89% of study participants scoring above the midpoint of the scale (43.24% in breastfeeding group and 44.57% in Non-breastfeeding) (Table 2). The Cronbach's α reliability estimate was 0.63. The mean score of attitude scale in breastfeeding group was 63.35 ± 4.07 , and that of non-breastfeeding group was 61.37 ± 6.25 , which was no significant difference between the two groups, $P > 0.05$. The most majority of participants (71.4% and 73.2%, respectively) perceived breastfeeding could increase the intimacy of mother and infant (95.41% and 94.75%, respectively). However, over half participants (68.92% and 59.35%, respectively) perceived "Milk powder to facilitate breast milk recovery". Although most participants were aware of the long-term benefits of breastfeeding, approximately 36.49% of breastfeeding group and 22.83% of non-breastfeeding participants believed "Milk powder is more convenient". Only less participants (6.76% and 9.78%, respectively) believed that women should not breastfeed in public. In addition, more than 90% of participants (96.37% in breastfeeding group and 97.12% in non-breastfeeding group) stated that drinking alcohol occasionally is not suitable for breastfeeding.

Scores pertinent to perceived self-efficacy ranged between 14 and 70 for the overall population. The Cronbach's α reliability estimate was 0.50. The total mean score was 46.39 ± 10.72 , with 50.00% of participants scoring above the midpoint (Table 2). On the self-efficacy scale, the mean score of breastfeeding group was 50.50 ± 10.60 , and that of non-breastfeeding group was 46.91 ± 11.87 , which was significant difference between the two groups, $P < 0.05$. Among the self-efficacy scale, the number of breast-feeding group with $56 \leq \text{score} < 70$ was 36.49%, which was significantly higher than that of non-breastfeeding group (23.91%). Most low-scoring items (which reflect a negative confidence toward breastfeeding) pertained to make sure the baby get enough breast milk. The minority of participants stated they could ensure breast milk supply is adequate (47.30% and 42.39%, respectively). Furthermore, only approximately 32.43% of non-breastfeeding participants stated that they could ensure the baby is getting enough breast milk. In addition, close to half of participants stated they always satisfied with breastfeeding situation (47.30% and 38.04%, respectively).

Social support scores ranged between 31 and 54 in the overall sample. The Cronbach's α reliability estimate was 0.64. The total mean score (45.27 ± 4.53) exceeded the midpoint of the scale, with 45.18% of participants scoring above the midpoint (Table 2). Over half of participants (55.41% and 53.26%, respectively) stated that they "have more than 3 friends who can get support and help," although up to 95% in both groups supported from family members. In addition, 52.70% of breastfeeding participants often ask for help from family members, friends and organizations when they are in trouble, while only 39.13% in non-breastfeeding participants always ask for help.

With respect to both group differences, the mean knowledge score (15.11 ± 1.13 in breastfeeding group and 14.67 ± 1.84 in non-breastfeeding group) and the proportion of subjects scoring above the midpoint of the knowledge scale (39.86% vs. 34.78%) were significantly higher among participants from breastfeeding group than among those from non-breastfeeding group. In contrast, mean attitude score (63.35 ± 4.07 in breastfeeding group vs. 61.37 ± 6.25 in non-breastfeeding group) and the proportion of subjects scoring above the midpoint of the scale (43.24% vs. 44.57%) were significantly higher among participants from breastfeeding group than among those

from non-breastfeeding group (Table 2). No significant differences were noted with respect to self-efficacy and social support.

Association between knowledge, attitude, self-efficacy and social support

Significantly higher knowledge scores were observed among participants with young women (15.19 ± 0.99 vs. 14.67 ± 1.67 , $p < 0.05$) (Table 3). And there was no significant difference in knowledge among respect of delivery times, educational background and monthly household income. Mean attitude scores were significantly higher among breastfeeding participants who have higher education background (64.13 ± 3.98 vs. 62.44 ± 4.00 , $p < 0.05$) (Table 3), while there was no significant difference in attitude scale among respect of age, delivery times and monthly household income. Mean self-efficacy scores were significantly higher among breastfeeding participants who have delivery twice and above (43.88 ± 8.25 vs. 49.15 ± 9.77 , $p < 0.001$) (Table 3), and there was no significant difference in self-efficacy scale among respect of age, educational background and monthly household income. No significant differences were noted in social support with respect to age, delivery times, educational background and monthly household income.

Correlation analysis showed that, the knowledge to breastfeed was significantly negatively correlated with age, whereas in other characters these associations did not reach statistical significance (Table 3). On the other hand, breastfeeding behavior was found to be significantly positively correlated with educational background, implying that a more positive breastfeeding with young women who have high educational background. In both groups, behavior to breastfeeding was not associated with social support to breastfeed, but a significant association was found between delivery times and self-efficacy in breastfeeding.

Discussion

This study explored the impact of breastfeeding knowledge, attitude, self-efficacy and social support in breastfeeding behavior among mother of fetal macrosomia. By providing further understanding of factors that may modulate breastfeeding behavior of fetal macrosomia, this study helps in choice the mode of macrosomia infant-feeding. The available evidence suggests that breastfeeding is the best way to feed, infant-feeding decisions are highly dependent on the mother, while many factors were barriered breastfeeding [23–25]. Thus, the investigation of breastfeeding knowledge, attitude, self-efficacy, and social support of macrosomia women may explore the influencing factors of breastfeeding and provide valuable insights on the infant-feeding choices in the overweight child.

The study showed that the participants had significantly higher levels of breastfeeding knowledge with relevant reports. More importantly, the study showed that participants had a high level of breastfeeding knowledge, with 36.75% participants scoring above the midpoint of the knowledge scale. Most majority of participants believed that the earlier start breastfeeding is the better which is consistent with evidence from previous studies [26]. In a longitudinal study ($n = 477$), the amount of breast milk produced by mothers was one of the common factors influencing breast-feeding [27]. Similarly, it has been reported that insufficient breast milk is one of the common reasons for unsuccess of breastfeeding [28]. In this study, most breastfeeding mothers (91.89%) believed that breastfeeding could reduce infant obesity. However, due to the higher probability of overweight or obesity in macrosomia, more than half of mothers did not choose exclusive breastfeeding.

Mother's attitude towards breastfeeding is a key factor for the success of breastfeeding [29]. In this study, more than half participants believed that milk powder feeding is more facilitate to recover the work, and 68.92% of the

participants in the breast-feeding group confirm that, which is consistent with the results of previous studies. Meanwhile, 65.53% of the participants believed that milk powder was more convenient compared with breastfeeding. In addition, the attitude score of the participants with higher education is significantly higher than that of the participants with lower education, which indicates that the cultural knowledge has a positive attitude of breastfeeding, especially in the breastfeeding of macrosomia, the higher education level with more positive attitude of breastfeeding.

In line with previous studies showing that social support, including family members, friends and colleagues, effectively reduce improve attitude, and promote the success of breastfeeding [30]. Social support not only affects attitude and confidence of mothers, but also motivates to insist breastfeeding in trouble [31]. More than 90% of the participants were able to obtain family support, meanwhile, being able to obtain financial help and psychologically comforting in trouble.

Efficacy and breastfeeding ratio, which is agreement with previous study [32]. Adequate milk supply is an important factor to promote breastfeeding successful, and good control of the breastfeeding situation can increase the mother's confidence in breastfeeding, which making the breastfeeding rate higher [33, 34]. Research has shown that improving the attitude and confidence can not only significantly improve the breastfeeding intention, but also prolong the duration of breastfeeding, which control breastfeeding easier [35, 36]. In addition, family monthly income is closely linked with self-efficacy, middle-income families significantly higher than that of high-income and low-income families ($p < 0.05$). This may be related to the degree of social support, especially from family members.

Breastfeeding of macrosomia is not only related to the age, delivery times, educational background and monthly family income of mother [37, 38]. Meanwhile, the knowledge, attitude, social support and self-efficacy are interacted with each other. Previous research has shown that breastfeeding can reduce the incidence of infant obesity, which is mainly related to the components of breast milk [39, 40]. However, it has been reported that breastfeeding of macrosomia is a driving factor for excessive weight gain [41]. In order to avoid excessive weight gain of macrosomia, supplementary feeding can be appropriately increased. In this study, the breastfeeding rate of giant infants was 44.58%, which was significantly lower than that of normal-weight fetuses, and only 38.71% of macrosomia were exclusively breastfeeding over 4 months, which was contrary to normal fetuses.

This study has obvious limitations. First of all, the study selected macrosomia in Shanghai as research targets, which has obvious regional characteristics, limits the possibility of predicting breastfeeding and hardly extended to other populations. In addition, although the influence factors such as age, delivery times, educational background, and monthly family income may affect the breastfeeding behavior of macrosomia, the mother's knowledge, attitude, social support and self-efficacy as important predictors may change the infant-feed mode of macrosomia by modern media and change the breastfeeding way. Finally, studies have shown that fathers may decide the mode of infant-feeding, especially in region with sex differences.

Conclusion

Despite the limitations of the study, the findings presented in this study provide valuable insight on breastfeeding knowledge, attitude, self-efficacy, and social support in the population of macrosomia women, providing further understanding of characters and determinants of breastfeeding in overweight child. This study state that knowledge, attitude, self-efficacy and social support promote the breastfeeding outcomes. This study highlights

difference in knowledge, attitude and self-efficacy that pertain mainly to convenience of feeding, adequacy of breast milk, the effects of work, and infant-feed mode. While calling for breastfeeding and explore influence factors in guiding breastfeeding behavior, the results of this study may predict the infant-feed mode of macrosomia and contribute to scientific feeding of macrosomia.

Declarations

Acknowledgements

The authors gratefully acknowledge the support of the Shanghai First Maternity and Infant Hospital, Tongji University School of Medicine.

Authors' contributions

Man Xia designed the breastfeeding questionnaires, collected the data, performed statistical analyses, and drafted the initial manuscript, reviewed and revised the manuscript. Rong Huang and Jinfeng Liu supervised data collection, reviewed the manuscript for important intellectual content.

Funding

This paper is a result of the project 2019B06, supported by Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University.

Availability of data and materials

Data will be available from the corresponding author upon reasonable request.

Ethics approval and consent to participate

Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai 200092, China.

Consent for publication

Not applicable.

Competing interests

The authors have declared that there are no competing interests.

¹Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai 200092, China.

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Tables

Table 1. Mother's demographics (mean § standard deviation)

Characteristic	Number (percent)			P
	Total (n=332)	Breastfeeding (n=148)	Non-breastfeeding (n=184)	
Age (yr)				
23-35	286 (86.14%)	124 (83.78%)	162 (88.04%)	0.264
36-48	46 (13.86%)	24 (16.22%)	22 (11.96%)	
Delivery times				
=1	218 (65.66%)	96 (64.86%)	122 (66.30%)	0.099
≥2	114 (34.34%)	52 (35.14%)	62 (33.70%)	
Delivery method				
Vaginal delivery	196 (59.04%)	102 (68.92%)	94 (51.09%)	0.001
Caesarean section	136 (40.96%)	46 (31.08%)	90 (48.91%)	
Educational background				
Bachelor or above degrees	192 (57.83%)	80 (54.05%)	112 (60.87%)	0.211
Other qualifications	140 (42.17%)	68 (45.95%)	72 (39.13)	
Monthly household income				
High	278 (83.73%)	130 (87.84%)	148 (80.43%)	0.080
Average	42 (12.65%)	12 (8.11%)	30 (16.30%)	
Low	12 (3.61%)	6 (4.05%)	6 (3.26%)	

Table 2. The scores of mean knowledge, attitude, self-efficacy, social support and proportion of subjects scoring above the midpoint of the scale

Score	Total	Breastfeeding	Non-breastfeeding
Knowledge			
Mean ± SD	14.87±1.59	15.11±1.13	14.67±1.84
No. (%) above midpoint	122 (36.75%)	59 (39.86%)	64 (34.78%)
Attitude			
Mean ± SD	62.25±5.46	63.35±4.07	61.37±6.25
No. (%) above midpoint	159 (47.89%)	64 (43.24%)	82 (44.57%)
Self-Efficacy			
Mean ± SD	46.39±10.72	45.73±9.14	46.91±11.84
No. (%) above midpoint	166 (50.00%)	62 (41.89%)	90 (48.91%)
Social support			
Mean ± SD	45.27±4.53	45.71±3.98	44.91±4.91
No. (%) above midpoint	150 (45.18%)	72 (48.65%)	78 (42.39%)

Table 3. Knowledge, attitude, attitude, self-efficacy, and social support to breastfeed according to sociodemographic characteristics and exposure to breastfeeding among study participants

Score	Knowledge		Attitude		Self-Efficacy		Social support	
	Mean ± SD	P	Mean ± SD	P	Mean ± SD	P	Mean ± SD	P
Age (yr)								
23-35	15.19±0.99		63.60±3.99		46.11±9.03		45.92±3.88	
36-48	14.67±1.67		62.08±4.48		43.75±10.06		44.67±4.56	
		<0.05		0.095		0.248		0.159
Delivery times								
=1	15.19±0.89		63.48±4.41		43.88±8.25		45.85±4.03	
≥2	14.96±1.47		63.12±3.38		49.15±9.77		45.46±3.90	
		0.245		0.605		<0.001		0.568
Delivery method								
Vaginal delivery	15.04±1.11		63.51±4.11		46.98±9.23		46.12±4.01	
Caesarean section	15.26±1.13		63.00±4.06		42.96±9.04		44.83±4.07	
		0.296		0.482		0.127		0.067
Educational background								
Bachelor or above degrees	15.10±1.33		64.13±3.98		46.20±9.67		46.28±3.91	
Other qualifications	15.12±0.84		62.44±4.00		45.18±8.52		45.06±3.98	
		0.924		<0.05		0.499		0.064
Monthly household income								
High	15.08±1.13		63.54±3.83		45.09±8.72		45.69±3.97	
Average	15.50±0.80		61.50±5.39		52.17±11.04		46.17±4.53	
Low	15.00±1.55		63.00±5.87		46.67±10.78		45.33±3.61	
		0.450		0.247		<0.05		0.900