

EFFECTIVENESS OF THE *MOM UUNG* BREASTMILK BOOSTER SUPPLEMENT IN ENHANCING BREASTMILK PRODUCTION AMONG WORKING AND NON-WORKING MOTHERS

Trias Mahmudiono ^{1,2*}, Qonita Rachmah ¹, Azizah Ajeng Pratiwi ¹, Alinda Rahmani ²,
Eka Anisah Yusryana ², Natasya Ayu Andamari ³, Asri Meidyah Agustin ¹

¹Department of Nutrition, Faculty of Public Health, Universitas Airlangga, Surabaya

²Research Group Center of Health and Nutrition Education, Counselling,
and Empowerment, Surabaya³Bunda General Hospital, Jakarta

Email: trias-m@fkm.unair.ac.id

ABSTRACT

Breastfeeding provides optimal nutrition for infants and offers significant health benefits to both mother and child. However, challenges such as perceived low milk production and workplace constraints hinder breastfeeding practices among mothers. This study evaluates the effectiveness of the Mom Ung Breastmilk Booster Supplement (BBS) in enhancing breastmilk production among working and non-working mothers. Using a cross-sectional design, data were collected from 665 breastfeeding mothers in Indonesia via a validated online questionnaire. Mothers who consumed X BBS reported increased breastmilk volume, breastfeeding frequency, and pumping efficiency, with significant improvements observed in both working and non-working groups ($p < 0.001$). Non-working mothers demonstrated higher breastmilk production compared to working mothers. Key barriers identified included perceived low milk supply (30.3%) and work-related time constraints (11.6%). The study highlights the potential of X BBS to support breastfeeding practices and underscores the need for workplace policies that promote breastfeeding. Further research is recommended to validate these findings and objectively assess the impact of BBS on breast milk quantity and quality.

Keywords: Breastmilk, Supplement efficacy, Mother's employment, Breastmilk Booster Supplement

INTRODUCTION

Breast milk provides optimal nutrition for infants and offers significant health benefits to both mother and child. The World Health Organization (WHO) advocates for exclusive breastfeeding during the first six months of life to support infant development and strengthen immunity (UNICEF 2011). In 2025, the World Health Assembly targeted a 50% exclusive breastfeeding rate. Unfortunately, even though the prevalence of exclusive breastfeeding increased by 10% over the last decade and reached 48% in 2023 (UNICEF, WHO, 2023), many mothers struggle to maintain adequate milk production, often resulting in early supplementation with formula milk (Monge-Montero et al., 2024).

To address lactation challenges, breast milk booster supplements (BBS) containing galactagogues, vitamins, and minerals have emerged on the market (McBride GM et al, 2021). While these supplements aim to enhance milk

production, their effectiveness varies and requires further investigation.

A qualitative study found that perceived milk production is crucial for improving breastfeeding adequacy among mothers, and the use of herbal galactagogues can positively impact mothers' physiological responses to breastfeeding (Sim et al. 2015). Additionally, a meta-analysis indicated that interventions aimed at enhancing mothers' self-efficacy are beneficial for breastfeeding practices (Galipeau et al. 2018). However, few studies evaluate the perceived efficacy of breastfeeding among mothers with different employment statuses.

Working mothers often face challenges with breastfeeding, including workplace constraints and stress that can affect lactation (Vandenplas Y, & Basrowi RW, 2024). Though non-working mothers may have more flexibility, they too can experience difficulties due to limited support or biological factors (Ahmad et al. 2022). Understanding how

breast milk booster supplements perform across these different maternal groups is essential for developing targeted support strategies.

This research evaluated the effect of a commercial BBS on the breastmilk volume and frequency among working and non-working mothers. We also assessed the reasons and barriers to breastfeeding among mothers. The findings will help inform evidence-based recommendations for supporting successful breastfeeding across diverse maternal populations in Indonesia.

METHODS

This quantitative cross-sectional study evaluates the effectiveness of the *Mom Ung BBS* on breastmilk production and examines the factors influencing its consumption among breastfeeding mothers in Indonesia. The data collection was conducted from October to November 2024. *Mom Ung BBS*, hereafter referred to as X BBS, is a commercial supplement that has been available in the Indonesian market for over five years. X BBS contains several known galactagogues such as *Moringa oleifera*, *Sauropus androgynous*, and *Channa striata* extract.

The study utilized a self-administered online questionnaire, which was validated prior to distribution to respondents. The inclusion criteria for this study comprised breastfeeding mothers who consume BBS, Indonesian citizens, and those who completed the questionnaires. In contrast, the exclusion criteria included respondents who were consuming other supplements that interfere with breastfeeding production or had not provided sufficient data. Subjects were recruited using non-probability accidental sampling techniques. In total, 1,157 subjects completed the questionnaire. After cleaning the data and excluding individuals who had never taken any breastmilk booster supplements, as well as those with missing information, 665 subjects were included for further statistical analysis.

The research questionnaire included questions about maternal characteristics such as age, latest educational attainment, and employment status. It also covered the order of breastfeeding, duration and method, as well as calculating weight and height. Additionally, the questionnaire addressed

the reasons for X BBS consumption, any problems encountered during breastfeeding, and the characteristics of X BBS consumption, including the current status, duration, frequency, and dosage of X BBS consumed. Finally, it evaluated the perceived effects of X BBS consumption, including the average daily breast milk volume produced, the frequency of direct breastfeeding (DBF) and pumping each day, the daily volume of breast milk pumped, and the duration of DBF per day.

Respondents reported their height and weight measurements based on data collected at least one month prior. This information was used to calculate the Body Mass Index (BMI), which was then classified according to the WHO's global BMI classification (Indonesia's Ministry of Health 2019; WHO Expert Committee 1995; World Health Organization and Regional Office for the Western Pacific 2000). Maternal height data were also utilized to classify maternal short stature, using a cutoff of less than 145 cm (Toh-Adam, et al. 2012). Respondents reported the effects of BBS consumption based on their average daily measurements. Daily intake was assessed using a day food diary record.

Data were analyzed descriptively, using frequency counts for categorical data and means and standard deviations for numerical data. A chi-square test and an independent t-test were used to examine the relationships between variables, with a significance level set at $p < 0.05$. Data analysis was conducted using SPSS version 27 (IBM Corp, NY). Ethical approval for this study was obtained from the Institutional Review Board (IRB) at the Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia. This approval was following the Helsinki protocol (Reg No. 1032/HRECC. FODM/X/2024).

RESULTS AND DISCUSSIONS

This study analysed 655 respondents, with a mean age of 28.45 ± 4.0 years. Table 1 presents maternal characteristics based on daily breast milk production. Most breastfed mothers were 21-30 years old (70.8%). Most of the respondents in this study (60.8%) had higher education, and at the time the study was conducted, 58.4% of

respondents were not working. Non-working mothers reported significantly higher breast milk production (855 ml) than working mothers (807.5 ml). This was in line with previous studies by (Khaliq A et al. 2017; Mirkovic et al. 2014). Evidence from the Singapore National Breastfeeding Survey suggests that working mothers were more likely to stop breastfeeding earlier than non-working mothers, with median durations of 8 and 9 weeks, respectively (Ong et al., 2005). Similarly, a study in the United States found that working mothers faced challenges combining breastfeeding and employment, often lacking support from coworkers and managers (Cripe 2017). One study identified four primary work-related factors impacting breastfeeding practices: 1) workplace environment, 2) commuting, 3) employment benefits, and 4) labour intensity time. Mothers facing challenges in one or more of these areas were more likely to reduce or discontinue breastfeeding (Chen et al., 2019).

Almost 60% of mothers breastfed their first child, and 32.3% breastfed their second child. In line with the order of breastfeeding children, 41.8% of respondents breastfed their child for less than 6 months. This showed that most were new mothers in the early stages of their breastfeeding experience. Multiparas often use the same infant feeding techniques with successive children. Those who have more than one child, however, are less likely to start breastfeeding than first-time mothers. If start is supported, multiparas who do commence typically breastfeed for more extended periods than first-time moms, indicating significant public benefits (Schafer et al. 2017). This explanation of health supports the findings of this study.

Almost half of the mothers practised full direct breastfeeding (DBF) (49.7%), followed by a combination of DBF and breast pumping (38.3%). In principle, breast milk production is determined by the release of the hormones prolactin and oxytocin. Nipple sucking will stimulate the nerve to send messages to the brain to release prolactin and oxytocin into the bloodstream. Prolactin causes the breast to produce milk, and then oxytocin stimulates the let-down reflex to release the milk from the breast (Australian Breastfeeding Association, 2022). Thus, DBF or pumping — either mechanical or hand pumping — can

Table 1. Characteristics of the Respondents based on Breastmilk Production in a Day

Characteristics	<500 ml		>500 ml		p- value
	n	%	n	%	
Age					
< 20 years	11	1	8	0.7	0.962
21-30 years	474	41.4	337	29.4	
31-40 years	177	15.5	132	11.5	
>40 years	3	0.3	3	0.3	
Education					
High school	256	22.4	193	16.9	0.558
Higher education	409	35.7	287	25.1	
Occupation					
Working	308	26.9	168	14.7	<0.001*
Non-working	357	31.2	312	27.2	
Order of Breastfeeding Child					
1 st child	402	35.1	253	22.1	0.23
2 nd child	199	17.4	171	14.9	
3 rd child	37	3.2	43	3.8	
4 th child	14	1.2	6	0.5	
5 th child	2	0.2	0	0	
Others	11	1	7	0.6	
Duration of Breastfeeding					
<6 months	306	26.7	173	15.1	<0.001*
6-12 months	195	17	171	14.9	
13-18 months	61	5.3	72	6.3	
18-24 months	103	9	64	5.6	
Method of Breastfeeding					
DBF	280	24.5	289	25.2	<0.001*
Pumping	84	7.3	51	4.5	
Combination of DBF-Pumping	300	26.2	139	12.1	
Combination of DBF-Formula Milk	1	0.1	1	0.1	
Mother's BMI					
Underweight	51	4.5	42	3.7	0.365
Normal	342	29.9	261	22.8	
Overweight/ Obese	272	23.8	177	15.5	
Mothers Short Stature					
Normal (>145 cm)	643	56.2	465	40.6	0.863
Short Stature (<145 cm)	22	1.9	15	1.3	

*significantly different (p-value <0.05)

High school: elementary school until senior high school; Higher education: Diploma and university; DBF: Direct Breastfeeding; BMI: Body Mass Index

stimulate breast milk production. However, pump usage may cause localised inflammatory alterations and be associated with substantial pain ratings (Giugliani 2014), which could affect breastfeeding activity and breastmilk production. This study revealed that mothers who used only the DBF method produced more breast milk than those who used the pumping method. Hence, mothers who do pumping are encouraged to understand the breast-pump method to reduce pain and improve nursing outcomes.

Based on maternal anthropometric status, most mothers had normal BMI (52.7%) and normal stature (96.8%). No significant differences were found in terms of breast milk quantity between different nutritional statuses, although normal BMI mothers tend to produce more milk than overweight/obese mothers. Previous studies have found that obese women are less likely to intend to breastfeed and that maternal obesity seems to be associated with a decreased initiation of breastfeeding, a shortened duration of breastfeeding, a less adequate milk supply and delayed onset of lactogenesis II, compared with their normal weight counterparts (Bever Babendure et al. 2015; Turcksin et al. 2014). Lower breastfeeding rates in obese mothers are linked to hormonal imbalances (Michalakis et al., 2013; Hapon et al., 2003), insufficient glandular tissue (Flint et al., 2005), and psychosocial barriers. Hauff et al. (2014) found that obese women had less support, fewer breastfeeding role models, and lower confidence, leading to earlier cessation despite similar intentions.

Table 2 shows several reasons why mothers breastfeed. The study results showed that the motives behind breastfeeding practices among respondents were dominated by the child's health (85%) and followed by advice from health workers (35.2%). Breastfeeding is well-recognised for its positive impact on infant health, offering essential energy and nutrients necessary for normal growth (World Health Organization, 2018). It also enhances infant immunity, helping to protect against diarrhoea and prevalent childhood illnesses like pneumonia (World Health Organization, 2023). Furthermore, breast milk contains a unique microbiome that contributes to improved gut health in infants (Lyons et al., 2020). Breastfeeding

Table 2. The Reason of Breastfeeding

Reason of Breastfeeding	n	%
Child health	973	85.0
Health workers advice	403	35.2
Previous experience	284	24.8
Influencers' advice	49	2.3
Maternal health	32	28.6
Others (religious values, mother-child bonding)	115	10.0

offers numerous benefits not only for the child's health but also for the mother's well-being; it can lower the mother's risk of developing breast and ovarian cancer, type 2 diabetes, and hypertension (Center for Disease Control and Prevention, 2023).

Research indicates that most respondents possess a solid understanding of the advantages of breast milk. Health workers play a vital role in advising mothers on breastfeeding practices. Healthcare providers can help mothers enhance their self-efficacy in breastfeeding their children (Brockway et al., 2017). The data revealed that respondents generally have a favourable level of trust in healthcare practitioners, particularly obstetricians and midwives. Notably, 10% of respondents cited religious values and the enhancement of the mother-child bond as reasons for breastfeeding. This demonstrates that motivations for breastfeeding extend beyond health advantages to include spiritual and psychological factors. Recognizing these diverse reasons for breastfeeding is essential for promoting breastfeeding initiatives within the community.

Several barriers can impede breastfeeding, potentially reducing its effectiveness. Our findings indicate that the most significant obstacles reported by respondents were perceived low breastmilk production (30.3%) and time constraints resulting from work commitments (11.6%). Mothers who believe that their breast milk supply is inadequate may experience increased stress and negative emotions, which can further impact breast milk production. A qualitative study highlights that mothers could benefit from enhanced guidance from healthcare providers regarding breastfeeding education, including topics such as the duration of breastfeeding, aspects of breastmilk production related to pumping, and recognizing signs of a baby's hunger and satiety, enabling them to make

better assessments of their milk supply (Yamada et al., 2019). While working can be a barrier, workplace policies to improve breastfeeding should be encouraged. These include ensuring adequate paid maternity leave, offering flexible return-to-work options, providing regular breastfeeding breaks during work hours, and having adequate facilities for nursing (World Health Organization, 2023).

In conjunction with the results of breastfeeding barriers, where mothers perceived a low milk supply, consumption X BBS is increasing. Table 4 presents the characteristics of BBS consumption among respondents. Eighty-

two percent of mothers still consumed X BBS for more than six months. Few consumed more than one X BBS, with mostly consumed X BBS on an everyday basis (76.2%) for up to 2 pills/day (74.8%). Consuming BBS may have potential benefits for breastfeeding, such as enhancing mothers' self-efficacy to breastfeed, improving mothers' perception of having an 'enough milk supply', and improving the nutritional value of the produced milk.

Table 5 summarizes the perceived effects of X BBS consumption on the average volume of breastmilk, frequency of direct breastfeeding (DBF), frequency of pumping, breastmilk production from pumping, and changes in DBF duration among working and non-working mothers. The study found that both groups exhibited improvements across all measured variables, indicating that X BBS consumption positively influenced overall breastmilk volume, volume from pumping, and the frequency and duration of both DBF and pumping on a daily basis.

Notably, working mothers demonstrated a marked increase in breastmilk volume production. However, non-working mothers reported higher frequencies and longer durations of DBF and pumping. Numerous barriers were identified that hindered working mothers from continuing breastfeeding.

A comparative study revealed that a higher proportion of working mothers were unable to sustain exclusive breastfeeding for six months, with only 38% continuing to breastfeed after returning to work (Ashoka, 2006). Factors such as the length of maternity leave, employment status, work schedules, flexibility in working hours, availability of nursing breaks, the presence of lactation rooms at the workplace, proximity of the workplace to home, and general workplace support were found to significantly affect breastfeeding continuation among working mothers (Muda et al., 2016; Chen et al., 2019). Interestingly, even among non-working mothers, some chose to express breastmilk through pumping as a means of maintaining milk supply (Loewenberg et al., 2017).

The consumption of X BBS has been shown to improve breastmilk volume as well as

Table 3. Barrier to breastfeeding

Breastfeeding barriers	n	%
Low breastmilk production	347	30.3
Baby's difficulty breastfeeding	80	7.0
Time constraints due to working time	133	11.6
Mother's health problems or pregnancy before breastfed termination	9	0.8
Others	55	4.8

Table 4. Characteristics of X BBS Consumption

Characteristics of X BBS Consumption	n	%
Status of X BBS Consumption		
Still consumed	945	82.5
Stop consumed	200	17.5
Duration of X BBS Consumption		
<1 month	78	6.8
1-3 months	296	25.9
4-6 months	239	20.9
> 6 months	532	46.5
Consuming Other BBS		
Yes	281	24.5
No	864	75.5
Frequency of X BBS Consumption		
Everyday	872	76.2
2-6x/week	164	14.3
1-3x/week	61	5.3
Only once, and now stop consuming	48	4.2
Dosage of X BBS Consumption		
0 pill	3	0.3
1 pill	180	15.7
2 pills	857	74.8
3 pills	98	8.6
4 pills	7	0.6

Table 5. The Effect of X BBS among Non-Working and Working Mothers
*significantly difference

Variables	Non-Working Mother					Working Mother				
	Before		After		p-value	Before		After		p-value
	mean	SD	mean	SD		mean	SD	mean	SD	
Average of breastmilk volume (ml)	715	455	855	299	<0.001*	314	450.0	807.5	272.25	<0.001*
Frequency of DBF (times/day)	7.89	3.78	9.9	2.87	<0.001*	7.4	4.672	8.97	4.08	<0.001*
Frequency of Pumping (times/day)	9.75	5.61	10.33	4.85	<0.001*	6.07	5.215	7.17	4.256	<0.001*
Breastmilk Production from Pumping (ml)	283	224.0	371	448.1	<0.001*	156	158.2	252	145.9	<0.001*
Changes in DBF Duration (minutes)	17.1	12.82	20.4	10.53	<0.001*	17.2	11.64	19.7	10.01	<0.001*

breastfeeding frequency, including both direct breastfeeding (DBF) and pumping. The known galactagogues contained in *X BBS*—*Moringa oleifera*, *Sauropus androgynus*, and *Channa striata* extract—have demonstrated positive effects on breastfeeding activity. However, the effect of specific BBS could vary between individuals depending on many factors such as physiological factors, maternal nutritional status, breastfeeding frequency, etc.

A randomised-controlled trial of *Moringa* leaf supplementation among postpartum women revealed that 900 mg/day *moringa* leaf could not significantly enhance the volume of breast milk; nonetheless, the group that received *Moringa* leaf produced 47% more breast milk than the control group (Fungtammasan & Phupong, 2022). The galactagogue effects of *Moringa oleifera* and *Sauropus androgynus* in enhancing milk production are believed to be mediated through increased serum prolactin levels (Raguindin et al., 2014; Primadhani, 2021). Additionally, *Channa striata* is a rich source of animal protein, which plays an important role in the synthesis of prolactin hormone (Rossa et al., 2024). Although the exact mechanism of galactagogue herbs is mostly unclear, a review by Westfall (2003) found that common herbs were oxytotic, could stimulate the growth of breast tissue directly, promote blood flow to the breasts, and could significantly increase milk production. Nevertheless, the recommended intake of *Moringa*, *Sauropus* leaves, and *Channa striata* to effectively support breastmilk production may be difficult to achieve due to their strong taste

and required quantities. Therefore, consuming these ingredients in the form of an extract-based supplement may offer a more practical and acceptable alternative. This study highlights mothers’ perceived benefits of consuming X BBS, which can help health professionals and educators improve breastfeeding practices within the community. One of the strengths of this study is its relatively large sample size, allowing for more reliable conclusions regarding the perceived effects of BBS. Since we measured habit and duration of BBS consumption that already happened in the past, this study is subject to potential recall bias. Although the samples were collected accidentally and may not be generalizable to the entire population, the study still provides valuable insights into mothers’ behaviors related to breastfeeding.

Studies assessing the effects of breast milk booster supplementation have been very limited, especially in Indonesia; therefore, this pilot study is novel and has potential for expansion into an interventional study. However, we also noted some limitations. Firstly, the effect of BBS consumption was not tracked alongside dietary intake data; therefore, the authors were unable to conclude whether dietary intake plays a role in the positive effect of BBS. Nonetheless, balanced nutritional intake should be prioritized during the breastfeeding period, and mothers could consume BBS as recommended. The effective dose of each BBS varies depending on its content, the mother’s nutritional and health status, and many other factors that were not assessed in our study.

Secondly, since the data was self-reported, the risk of bias or inaccurate data may be present. However, we controlled for this during data collection by using a confirmation question to check for consistency, pre-testing the questionnaire before the survey began, and informing participants that their responses were anonymous or confidential.

CONCLUSION

In conclusion, this study showed that consuming *Mom Ung* BBS positively influences mothers' perceptions of breastmilk quantity, breastfeeding frequency, and duration, among both working and non-working mothers. Further research is needed to objectively measure the effects of the *Mom Ung* BBS on breastmilk quantity and quality, as this is essential to support the hypothesis.

AUTHOR'S CONTRIBUTION

T.M. conceptualized the study, contributed to the study design, and supervised the overall research process. Q.R. and A.A.P. contributed to the study design, conducted data analysis, and drafted the manuscript. A.R. conducted data analysis, drafted the manuscript. E.A.Y. assisted with data management. N.A.A. reviewed the manuscript. A.M.A. contributed to data entry and collection. All authors have read and approved the final manuscript.

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Declaration of Competing Interest

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