



**ORIGINAL RESEARCH PAPER**

**Nursing Science**

**EVALUATION OF COMPARATIVE EFFICACY OF ERGONOMICALLY DEVELOPED BREAST FEEDING SUPPORTIVE DEVICE REGARDING SAFE AND COMFORT FEEDING AMONG THE PRIMIPARA MOTHERS ADMITTED IN SELECTED HOSPITALS - A RANDOMIZED CONTROLLED TRIAL- PILOT STUDY**

**KEY WORDS:** Breastfeeding, breastfeeding self-efficacy, mental well-being, ergonomically designed Device, Maternal health

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**ABSTRACT**

**Background:** A vital component of a baby's diet is breastfeeding, which gives them the vital nutrients and antibodies they need to grow and develop normally. Nonetheless, a lot of Primipara Mothers deal with difficulties that make it difficult for them to breastfeed successfully. These difficulties include physical pain, mental strain, and a lack of self-assurance in one's ability to nurse, a condition known as nursing self-efficacy. Many Mothers report experiencing physical discomfort, even pain, as a result of their inability to maintain optimal ergonomic position during breastfeeding. Furthermore, a mother's capacity to successfully breastfeed may be adversely affected by high levels of stress and low nursing self-efficacy. These problems may lead to an early end to nursing, depriving babies of all of its advantages. The study aims to develop an ergonomically designed supportive device for breastfeeding that addresses the challenges identified in previous research regarding positioning and attachment. This intervention aims to provide optimal support and guidance to mothers, particularly younger, primipara, and those with lower education levels, to facilitate proper attachment and positioning during breastfeeding, thus reducing the incidence of difficulties and promoting successful breastfeeding outcomes. **Methodology:** Using an extensive study design, a sample of Primipara Mothers will utilize the ergonomically designed device for a predetermined amount of time. Data was gathered and analyzed using quantitative techniques such as self-efficacy scores, mental health evaluations, and ergonomic assessments. By focusing on these areas, the study hopes to shed light on how ergonomic interventions might assist Primipara Mothers, which will eventually benefit both the mothers' and the newborns' health and well-being. **Conclusion:** The study concluded that the intervention positively impacted breastfeeding self-efficacy, mental well-being, and ergonomic posture in both groups, with the experimental group generally showing slightly greater improvements.

**INTRODUCTION:-**

Breastfeeding plays a crucial role in child development, and supports both the physical and cognitive growth of a child. The initial 1000 days, spanning from conception to the child's second year, offer a distinct window of opportunity for achieving optimal developmental milestones and laying the foundation for lifelong good health [1]. Exclusive breastfeeding for the first six months of life, followed by continued breastfeeding along with appropriate complementary foods until the age of two years, is the principal condition for ideal infant nutrition, ensuring both the comfort of the feeding experience and optimal development [2].

Globally, India holds the unfortunate distinction of having the highest under-five mortality rate, with 0.9 million deaths recorded in 2016 [3], attributable to an array of co-factors such as low economic status, poor sanitation and water, poor healthcare facilities, and lack of knowledge about exclusive breastfeeding [4,5]. The prevalence of exclusive breastfeeding depends on factors such as geographical location, cultural practices, and socio-economic conditions. Study reveals from 2005 and 2016, India reported an increased % of Exclusive breastfeeding prevalence by 9.0% (from 46.0 to 55.0%).<sup>8</sup>

Another study reveals the fact that approximately 55% of children aged 0-5 months were exclusively breastfed. The northeastern regions exhibited the highest prevalence at 61.7%, while the central region showed the lowest at 50.5% [6,7]. Education on natural feeding can enhance levels of breastfeeding self-efficacy in mothers, improve breastfeeding success rates, and prolong breastfeeding duration. Most common breastfeeding positioning that mothers hold The cradle hold position allows for close contact between the mother and baby, with the baby's body facing the mother's chest, and facilitates proper latch and feeding. Cross-cradle hold position for breastfeeding, the position

where the mother supports the baby with the arm opposite to the breast in use for feeding. This positioning offers the mother greater control over the baby's head and body, facilitating a more manageable process of guiding the baby to latch correctly. football hold, or rugby hold, the baby lies under the mother's arm on the same side as the breast being used for feeding. This position is helpful for mothers who've had a cesarean section or have large breasts, providing better visibility and control. In the side-lying position for breastfeeding, both the mother and baby lie on their sides facing each other, making it convenient for feeding and allowing for relaxation. In the reclining position for breastfeeding, the mother leans back comfortably while supporting her baby, making it a relaxed and comfortable posture for nursing [8].

Previously research pointed to the general factors influencing breastfeeding, evidenced by positioning and attachment. A cross-sectional study used observational checklists from the WHO to assess this. Findings indicate poorer positioning among primipara mothers compared to multipara mothers. The study suggests that younger mothers, primipara, and those with lower education levels require more support and guidance to achieve proper attachment and positioning during breastfeeding [9]. Ensuring good attachment and positioning during the first feeds can prevent most breastfeeding difficulties.

The study aims to assess the effect of an ergonomically designed device for breastfeeding that addresses the challenges identified in previous research regarding positioning and attachment. This device aims to provide optimal support and guidance to mothers, particularly younger, primipara, and those with lower education levels, to facilitate proper attachment and positioning during breastfeeding, thus reducing the incidence of difficulties and promoting successful breastfeeding outcomes.

**Aim:**

To evaluate the effectiveness of an ergonomically developed device aimed at improving breastfeeding self-efficacy, mental well-being, and ergonomic posture among Primipara mothers.

**OBJECTIVES:**

1. To assess changes in breastfeeding self-efficacy scores before and after the intervention in both control and experimental groups.
2. To examine changes in mental well-being scores before and after the intervention in both control and experimental groups.
3. To evaluate changes in ergonomic posture using the RULA method before and after the intervention in both control and experimental groups.
4. To compare the effectiveness of the intervention between the control and experimental groups in improving breastfeeding self-efficacy, mental well-being, and ergonomic posture.

**Methodology**

Following ethical committee permission, the trial was carried out between June 2023 and December 2023 in Wardha district. To assess the impact of an ergonomically designed device on mothers' ergonomic posture, mental health, and nursing self-efficacy, the present research used a randomized controlled trial (RCT) design. Both a conventional (control group) and an ergonomically designed device (intervention group) were included in the study. We obtained informed consent from each individual. Primipara Mothers who are currently breastfeeding or expressing milk, as well as those who have given birth within the last six months, met the inclusion criteria. Women with musculoskeletal disorders that impair posture or those with medical issues that make nursing inappropriate were excluded. Hospitals, maternity healthcare facilities, and support groups for breastfeeding were used to find participants. Advertisements, recommendations from medical professionals, and contacts with neighbourhood associations were all used to recruit new members. Through computer-generated randomization, participants were randomized at random to either the intervention group or the control group. Primipara Mothers in the intervention group received an ergonomically designed breastfeeding support device. For the duration of the study, they will utilize the device during each nursing session after receiving instruction from a lactation specialist on how to use it properly. Included in the control group were the mothers who would carry on with their customary pillow-feeding techniques. Healthcare practitioners will give them standard breastfeeding assistance and education. At baseline (before intervention) and post-intervention (three months following baseline), data will be gathered twice.

Baseline and postintervention assessments were conducted for mental health, ergonomic posture, and breastfeeding self-efficacy. The Breastfeeding Self-Efficacy Scale (BSES) was used to measure breastfeeding self-efficacy. The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) was used to assess mental well-being. The Ergonomic posture was evaluated using the Rapid Upper Limb Assessment (RULA) technique. The assessment was done on the shift in breastfeeding self-efficacy scores between pre- and post-intervention. Improvement in ergonomic posture and a shift in mental well-being scores as measured from pre-intervention to post-intervention. The data was analyzed using both quantitative and qualitative methods. The study intends to thoroughly assess the ergonomic device's efficacy in enhancing important nursing mother outcomes by adhering to this comprehensive methodology, offering evidence-based suggestions for clinical practice and commercial development.

**RESULTS**

**Table 1: Comparative Assessment Of BSES And Mental**

**Well-being In Primipara Mothers Using A Conventional Pillow (control group).**

	Con trol	N	Mean	Std. Deviation	Std. Error Mean	%	P- value
BSES	Pre	15.00	41.2000	2.24245	.57900	58.86	<0.01
	Post	15.00	56.2667	10.38176	2.68056	80.38	
Mental well being	Pre	15.00	34.7333	3.97252	1.02570	49.62	<0.01
	Post	15.00	58.9333	3.22195	.83190	84.19	

**Table 2: Comparative Assessment Of BSES And Mental Well-being In Primipara Mothers Using An Ergonomically Developed Supportive Device (interventional group).**

Experimental	N	Mean	Std. Deviati on	Std. Error Mean	%	P- value	
BSES	Pre	15.00	42	1.69031	0.43644	60.00	<0.01
	Post	15.00	49.4	2.84856	0.73549	70.57	
Mental well being	Pre	15.00	34.7333	3.97252	1.0257	49.62	<0.01
	Post	15.00	46.4667	2.58752	0.66809	66.38	

**Table 3: Comparative Assessment Of RULA for Comfort And Safety Outcomes Of Primipara Mothers.**

		Freque ncy	Group		Total	Chi	P- value
			Control	Experi mental			
Rul a	Acceptab le Posture	7	10	17	2.62	0.27	
		%	46.7%	66.7%	56.7%		
	Further Investiga tion Change may be needed	6	5	11			
		%	40.0%	33.3%	36.7%		
Total	Further Investiga tion Change Soon	2	0	2			
		%	13.3%	0.0%	6.7%		
Total	Freque ncy	15	15	30			
		%	100.0%	100.0%	100.0%		

**For The Control Group:**

Before the intervention, the mean BSES score was 41.20, with a standard deviation of 2.24. After the intervention, the mean score increased to 56.27.

Before the intervention, the mean mental well-being score was 34.73, with a standard deviation of 3.97. After the intervention, the mean score increased to 58.93.

The p-values for both BSES and mental well-being were less than 0.01, indicating a significant improvement post-intervention.

**For the experimental group:**

Before the intervention, the mean BSES score was 42, with a standard deviation of 1.69. After the intervention, the mean score increased to 49.4.

Before the intervention, the mean mental well-being score was 34.73, with a standard deviation of 3.97. After the intervention, the mean score increased to 46.47.

The p-values for both BSES and mental well-being were less than 0.01, indicating a significant improvement post-intervention.

The RULA method was used to assess ergonomic posture:

After the intervention, 46.7% of the control group and 66.7% of the experimental group achieved acceptable posture.

Further investigation for changes was needed for 40.0% of the control group and 33.3% of the experimental group.

A small percentage (13.3% for the control group and 6.7% for the experimental group) required changes soon.

Overall, the study suggests that the intervention positively impacted breastfeeding self-efficacy, mental well-being, and ergonomic posture in both groups, with the experimental group generally showing slightly greater improvements.

**DISCUSSION**

There are numerous benefits to breastfeeding for both mothers and babies. Human milk has significant nutrients that help to fortify an infant's immune system and shield it from a variety of infections, such as respiratory and diarrheal illnesses. Additionally, breastfeeding lowers hospital stays, formula expenditures, and healthcare costs. In Iran as well as throughout the world, rates of breastfeeding remain low despite the obvious medical advantages of human milk for infants. In America, Egypt, Pakistan, Saudi Arabia, Iraq, and Iran, the rates of EBF up to six months of age were 28, 53, 37, 31, 25, and 21%, respectively. In Angola, the rate was 11%. A meta-analysis conducted by Ranjbaran et al. examined 16 research and calculated that 49.1% of mothers exclusively breastfed their babies for the first six months after giving birth. Thus, national and international health and social agencies have been very interested in determining factors that can raise the prevalence of breastfeeding [9].

As the intervention was not a randomized controlled, double-blinded study, there are a few more things to take into account when applying the findings. First, statistical adjustments were made to the participant characteristics; as a result, variations in unmeasured parameters between the intervention and control groups may exist. Furthermore, since medical professionals had the opportunity to learn their clients' position in an intervention group if they so desired, their deliberate and inadvertent effect cannot be completely ruled out. Not with standing these drawbacks, the study is significant for the health of mothers and their children since it is the first to demonstrate how the effects of breastfeeding interventions on women can vary depending on the protocols used in various medical facilities.

**CONCLUSION:-**

The table presents data comparing the control and experimental groups across various measures before and after an intervention related to breastfeeding. For the Breastfeeding Self-Efficacy Scale (BSES), both the control and experimental groups showed significant increases in mean scores from pre- to post-intervention, with the experimental group displaying slightly higher mean scores post-intervention. Similarly, for Mental Well-being, both groups exhibited substantial increases in mean scores from pre- to post-intervention, with the experimental group again displaying slightly higher mean scores post-intervention. In terms of ergonomic assessment using the RULA method, both groups showed improvements in posture from pre- to post-intervention, with more participants achieving acceptable posture in the experimental group compared to the control group post-intervention. Overall, the findings suggest that the intervention had a positive impact on breastfeeding self-efficacy, mental well-being, and ergonomic posture, with the experimental group generally displaying slightly greater improvements compared to the control group.

The research highlights the important part that ergonomic adjustments can play in helping primipara mothers. Through enhancing self-assurance, psychological welfare, and bodily ease, these gadgets can assist moms in continuing to

breastfeed for longer periods and with more success, thus contributing to the health of both the mother and the child. To sum up, this study's ergonomic gadget holds the potential as a useful instrument to enhance nursing results. These devices can be extremely helpful in supporting successful breastfeeding and improving the general well-being of mothers and their newborns by solving major obstacles experienced by nursing mothers. Healthcare providers ought to think about using ergonomic support equipment in programs that educate and assist women who are nursing. To validate and build upon these findings, more extensive research with a wider range of populations and sample sizes is advised in the future. The efficacy and accessibility of ergonomic devices can be further improved with ongoing innovation in their design.

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