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Lactation Education as an Important Tool for Infant Nutrition and Maternal Health

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Abstract

Background: Numerous social and medical institutions encourage breastfeeding education and ensure that the WHO recommendations are followed. However, the postpartum period is associated with a great number of psychological challenges, which can contribute to the effectiveness of specific programs or invalidate their effects. Unfortunately, too many programs disregard the importance of the psychological aspects and mainly the underlying beliefs of the females on the education outcomes. It is crucial to consider lactation education from the perspective of the mothers as the target audience. Purpose: The current research focused on how the beliefs of young first-time mothers and their attitudes to different types of sessions influenced the well-being of these mothers and their kids. Methods: The current quantitative research analyzed and compared the perceived effects that different types of lactation education can have on mother's and infant's well-being. Results: According to the results, education with the psychological component was associated with higher scores and higher perceived benefits by first-time mothers. Factor 1 (Psychological Education Perception) reveals that factors were "Not Normally Distributed" ($p < 0.05$). Factors 2, 3, and 4 were Normally Distributed ($p > 0.05$). ANOVA Results for Normally Distributed Factors revealed no significant difference between groups for Factor 2,3,4. Kruskal-Wallis Test for Non-Normal Factors revealed a highly significant difference ($p < 10^{-160}$) for Factor 1. Conclusion: Generally, it becomes clear that psychological aspects have a strong impact on perceptions of education value. In contrast, education challenges, mental health benefits, and infant well-being perceptions do not depend on the presence or absence of any mental health training. This suggests that mothers who received psychological education perceived their learning experience as more valuable and were more motivated to accept the support and education and learn all relevant materials properly.

Keywords: *Anxiety, Breastfeeding, Depression, Development, Education, Lactation.*

Introduction

Doubtlessly, becoming a mother is a very complex process for any female. Transformations on the physiological and psychological levels are inevitable. Therefore, numerous health and social organizations support women in this complex period offering special education that must help to transition to the role of a mother. Overall, any example of lactation education focuses on lactation as a normal stage of the female body's development and promotes mothers' awareness that breast milk is a source of the irreplaceable nutrients that are crucial for the normal development of every child. Such wise, promotion of breastfeeding is common in many countries and is one of the crucial elements of preparation for motherhood [1]. The educational approaches are mostly associated with the basic instructions on breast management, positive effects for children and response to potential breast problems. The basic instructions on breast management, positive effects for children and response to potential breast

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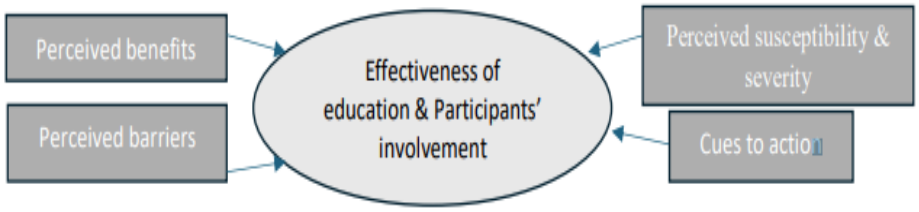
problems, details related to lactation, breastfeeding, breast cancer, mastitis, breast abscess, hyperlactation, nipple bleb and any other physiological aspects are found relatively easily [2, 3]. However, it seems that lactation education is mainly associated with the need to convince mothers to ensure breastfeeding rather than help them with any doubts and concerns that are so common in the postpartum period. The number of comprehensive educational programs that focus on the mental state of mothers is too limited.

The psychological aspects of lactation should not be overlooked, as the postpartum period represents a significant psychological transformation. As a new physiological state, it presents various challenges for many mothers, including difficulties with breastfeeding, stress, postpartum depression, and the need for emotional support due to a range of concerns. For many women, particularly those experiencing motherhood for the first time, it is common to feel overwhelmed by the demands of infant care and the physical changes in their bodies. Research has shown that the postpartum period is associated with an increased risk of mental health issues, such as postpartum anxiety and depression [4, 5]. These conditions affect up to 16% of women and can profoundly impact a mother's quality of life, her ability to care for her infant, and her relationships within the family [6]. The emotional burden experienced during this time is influenced by a variety of factors, including the behaviour of the partner, socioeconomic status, educational background, and other life experiences, underscoring the necessity for professional support.

A comprehensive, patient-centred approach to educating mothers about breastfeeding is essential in preparing young women for motherhood. However, maternal perspectives are often overlooked. Education for mothers should not be confined solely to physiological aspects; incorporating practices such as mindfulness, deep breathing, and self-care can help manage stress and enhance emotional resilience [7]. Numerous recommendations and programs emphasize the postpartum period as a transformative stage that reshapes mothers' physical and emotional needs, increasing their vulnerability to mental health challenges. One notable example is the emerging app-based CareMom program, which has gained popularity for its use of cognitive behavioral therapy to address various psychological challenges associated with adapting to motherhood [8]. However, such educational initiatives tend to be standardized rather than tailored to the specific needs of individual mothers. Furthermore, it remains unclear why some women successfully develop coping strategies for stress, mood swings, negative thoughts, loneliness, guilt, anxiety, sleep disturbances, self-esteem issues, social withdrawal, and role adjustment, while others struggle. Additionally, the extent to which young mothers are willing to engage with and comprehend the available educational materials remains uncertain. A review of the literature suggests that breastfeeding and lactation are primarily examined from the perspectives of healthcare professionals and broader societal benefits, with limited attention given to understanding the experiences and attitudes of young mothers themselves.

To get a better understanding of young mothers' beliefs, the Health Belief Model (HBM) deserves special attention as it explains how perceptions influence health-related behaviours and can engage them in psychological education [9]. It includes four major elements that must be considered when analyzing the effectiveness of education and participants' involvement. Perceived benefits, perceived barriers, perceived susceptibility & severity and cues to action [10]. Paying attention to benefits is important as mothers who see higher benefits of psychological education are more likely to value it. Perceived barriers are associated with fear of judgment or time constraints as demotivators of

participation. Perceived susceptibility & severity are meaningful since mothers who believed mental health impacts child well-being were more engaged. Finally, cues to action predict that exposure to psychological education can influence perceptions of stress management and emotional well-being. As this study measures perceived importance, benefits, and barriers, HBM can become a good framework for creating the relevant questionnaire and identifying meaningful factors. From Scheme 1, the impact of the factors becomes clear.



Scheme 1. Framework Representation

The current study aimed to discover how the beliefs of the young first-time mothers and their attitudes to different types of education influenced the well-being of these mothers and their kids at the same time, the perceived attitudes to psychological aspects of education were discovered. Thus, the following objectives were highlighted. The first objective of the study was to identify whether the mothers, who were aware of the psychological components in education perceived the relevant effects similarly or differently from those, who underwent education sessions without any psychological components. Second, relying on four major factors highlighted by the HBM model, the study aimed to identify whether the inclusion of the psychological component in education can be viewed as a lever to strengthen or weaken the perceived value of psychological education, perceived education challenges, perceived mental health benefits and perceived infant well-being benefits.

The current study is significant as it contributes to understanding the benefits and failures of the existing lactation education programs from the perspective of young first-time mothers as a target population. With the clear understanding that the effectiveness of education depends not only on the materials the sessions comprise but also on the learner's beliefs, the current study helps to realize how to improve the education programs regarding the insight of the target audience.

Materials and Methods

For the present study, the data set was obtained from 1076 females, who were randomly invited to participate with the help of the online survey platform Appinio. The inclusion criteria for the participants were such variables as female gender, age 18-25, possession of at least one child, participation in at least one education session for mothers, and living in the US. All ethical issues including the informed consent and ethical approval of the research were addressed in time [11]. As perceptions cannot be observed directly, they were measured indirectly with 16 statements and a 4-point Likert scale (From 1: "completely agree", to 4: "completely disagree"). These statements were associated with 4 major themes such as perceived importance of the psychological education (getting emotional support, ability to learn more about any details of becoming a mother, ability to talk to a knowledgeable person, feeling free to ask any relevant questions), challenges that the young mothers faced throughout education (resistance to share the personal information with the strangers, strong fears of judgements, tutors have never offered any practical exercises or skills, lack of time for training), perceived benefits of the psychological module on the

mothers' mental health (improved understanding of stress management techniques, learned to accept personal emotions and negative thoughts, improved sleep quality improved self-esteem), perceived value of the psychological module on the infants' treatment (importance of the mother's emotional stability for the general well-being of a child, new skills related to breastfeeding, babies became less whiny, more aware feeding approaches). No missing values were reported as the respondents had to fill out out all questionnaires to get the score. Apart from scoring from 1 to 4, the participants could also answer I don't know and get 0 scores. Such an answer was mostly interpreted as one that was caused by a lack of knowledge about the specific topic. All females were divided into two groups based on one question that indicated whether their education for mothers included information about the mothers' psychological health or not. Based on the answers, 708 females indicated the lack of such information and were considered as Group 1. The rest of the respondents (368) were labelled as Group 2.

To analyze the data, statistical analysis using SPSS (12.0.1) was conducted. Drawing parallel to the other studies investigating the perceived attitudes to education, ANOVA, Levene's test, Gabriel's post hoc and Kruskal-Wallis tests were made [12]. First, the factor analysis was conducted. For the factors that were normally distributed, the significant main effects of variables on each factor were identified using ANOVA. Besides, after Levene's test for homogeneity, Gabriel's post hoc tests were used. If factors had non-normal distributions Kruskal–Wallis nonparametric test was conducted.

Results

The basic information was obtained from 1076 participants, divided into Group 1 (No Psychological Education, n=708) and Group 2 (With Psychological Education, n=368). Responses to 16 statements were analyzed (4-point Likert scale + "I don't know" option scored as 0).

Overall, mothers who received psychological education perceived it as significantly more valuable (higher factor scores). Mothers without psychological education reported a lower perceived value of psychological education. Table 1 represents the average factor scores for Group 1 and Group 2.

Table 1. Average Factor Scores

Factor	**Group 1 (No Psychological Education)**	**Group 2 (With Psychological Education)**
Perceived Value of Psychological Education	2.8	3.6 (Significant)
Education Challenges	3.1	3.0
Mental Health Benefits	2.9	3.0
Infant Well-Being Benefits	3.0	3.1

From the indicated findings, it is obvious that mothers from Group 2 found psychological education much more valuable compared to the mothers from Group 1 (3.6 vs. 2.8, $p < 10^{-160}$).

Perceived education challenges did not vary considerably (~3.0-3.1, $p = 0.89$). Perceived mental health benefits and infant well-being were slightly higher for Group 2 but not significantly different. The other Factors 2, 3, and 4 have overlapping distributions, confirming no significant differences.

The results of the factor analysis are presented further. Overall, based on the factor analysis, it became clear that Factor 1

(Perceived Value of Psychological Education) showed a clear and significant difference, meaning mothers in Group 2 (who received psychological education) found the sessions much more valuable.

Factors 2, 3, and 4 did not show significant differences, suggesting that while education may help individual mothers, it did not dramatically shift perceived mental health benefits or infant well-being at the group level. Table 2 represents a detailed review of the factor analysis results.

Table 2. Factor Analysis Results

Factor	**Key Contributing Statements (Highest Loadings)**	**Interpretation**	**Significant Difference Between Groups?**
Factor 1: Perceived Value of Psychological Education	Stress Management (0.61), Accepting Emotions (0.63), Sleep Quality (0.60), Self-Esteem (0.60), Mother's Stability (0.56), Baby Behavior (0.52), Feeding Approaches (0.53)	Mothers who received psychological education valued it more for emotional regulation and parenting skills.	Yes ($p < 10^{-160}$)
Factor 2: Education Challenges	Sharing Personal Info (0.18), Fear of Judgement (0.16), No Practical Skills (0.24), Lack of Time (0.25)	Common challenges like fear of judgment, lack of practical exercises, and time constraints were reported in both groups.	No ($p = 0.89$)
Factor 3: Perceived Mental Health Benefits	Stress Management (0.04), Accepting Emotions (-0.00), Sleep Quality (-0.09), Self-Esteem (-0.00)	Participants in both groups reported similar mental health improvements.	No ($p = 0.44$)
Factor 4: Perceived Infant Well-Being Benefits	Mother's Stability (0.06), Breastfeeding Skills (-0.01), Baby Behavior (-0.06), Feeding Approaches (0.01)	No significant difference in perceptions of how psychological education affects infant well-being.	No ($p = 0.78$)

A normality Check (Shapiro-Wilk Test) was conducted for

Factor 1 (Psychological Education Perception) reveals that factors were "Not Normally Distributed" ($p < 0.05$).

Factors 2, 3, and 4 were Normally Distributed ($p > 0.05$).

ANOVA Results for Normally Distributed Factors revealed no significant difference between groups ($p = 0.89$) for Factor 2 (Education Challenges); no significant difference ($p = 0.44$) for Factor 3 (Mental Health Benefits); no significant difference ($p = 0.78$) Factor 4 (Infant Well-Being Perceptions)

Kruskal-Wallis Test for Non-Normal Factors: revealed a highly significant difference ($p < 10^{-160}$) for Factor 1(Psychological Education Perception).

All in all, from the results, one can conclude that psychological education had a strong impact on perceptions of education value (Factor 1). At the same time, no significant differences in other factors (education challenges, mental health benefits, infant well-being perceptions) were proven.

This suggests that mothers who received psychological education perceived their learning experience as more valuable, but this did not strongly influence reported benefits.

Discussion

The current study discovered how the beliefs of young first-time mothers and their attitudes can influence their well-being and that of their infants. It revealed that the mothers, who had some type of psychological education perceived the importance of lactation education differently from those who underwent education sessions without any psychological components. However, the perceived barriers, Second, relying on four major factors highlighted by the HBM model, the study aimed to identify whether the inclusion of the psychological component in education can be viewed as a lever to strengthen or weaken the perceived value of psychological education, perceived education challenges, perceived mental health benefits and perceived infant well-being benefits for mothers and kids were not significantly different throughout the groups.

The results are consistent with some other studies related to the topic of mother's education The researchers agree that the positive effects of lactation education are strongly predetermined by self-efficacy and positive attitude of the females to the education [13, 14]. With the deeper realization that individual motivation is crucial to promote better or worse results, the researchers highlight solid reasons to discover the women's attitudes to the existing programs, their beliefs and perceptions. Based on the current findings, one can support the highlighted idea as the mothers who received psychological education stood out as those, who emphasized the higher value of education benefits. Thus, the current research proved the reverse direction in the correlation between the same subjects. The results seem a bit controversial as the perceived value of the studies seems to be different while the actual impacts on the mothers' and infants' health do not show significant differences. This finding can seem questionable and diminish the value of the psychological component. However, in this case, the subjectiveness of the responses can provide non-objective data regarding the actual results. Thus, the next study can offer the evaluation of the education results based on some standardized knowledge and behaviour evaluation scales.

Some researchers emphasized that specific groups of mothers deserve special attention. Among such, one should consider those, who study at the universities [15, 16]. Also, the evidence suggests that various social factors cannot be disregarded when analyzing attitudes to lactation and breastfeeding [17, 18]. Also, external factors, be it the pandemic, a child's inborn health problems [19] or any other life situation can transform the perception and needs of young mothers [20]. Therefore, the current study neglected many of the participants' features that could have influenced their beliefs and reactions. For the next study, investigating more details such as the actual mental state of the mother, education level, geographic location, family and others are recommended.

Equations

Factor Analysis (Exploratory Factor Analysis - EFA)

(1) $X_i = \lambda_1 F_1 + \lambda_2 F_2 + \lambda_3 F_3 + \lambda_4 F_4 + \epsilon_i.$

Normality Test (Shapiro-Wilk Test)

(2) $W = \frac{\left(\sum a_i x_{(i)}\right)^2}{\sum (x_i - \bar{x})^2}.$

Homogeneity of Variance (Levene's Test)

(3) $W = \frac{\sum N_k (Z_{k\cdot} - Z_{\cdot\cdot})^2}{\sum\sum (Z_{ik} - Z_{k\cdot})^2}.$

ANOVA (Analysis of Variance)

(4) $F = \frac{MS_{between}}{MS_{within}}$.

Kruskal-Wallis Test

(5) $W = \frac{12}{N(N+1)} \sum \frac{R^2_k}{n_k} - 3(N+1)$.

Conclusion

The current study helped to understand the experiences of the young females involved in lactation education with an additional focus on the psychological component. Generally, it becomes clear that psychological aspects have a strong impact on perceptions of education value. In contrast, education challenges, mental health benefits, and infant well-being perceptions do not depend on the presence or absence of any mental health training. This suggests that mothers who received psychological education perceived their learning experience as more valuable and were more motivated to accept the support and education and learn all relevant materials properly. Such, personal well-being and infant development can be potentially promoted through improved beliefs about the value of education, which becomes possible by changing the education plan. With the obligatory addition of the psychological component to the education plan, the participants will become more involved in studies, thus, getting more relevant and important knowledge on motherhood. This knowledge is key to numerous positive impacts on the families' well-being from short- and long-term perspectives.

Based on the research limitations, several ideas for future studies can be offered. The current study neglected many of the participants' features that could influence their beliefs and reactions. For the next study, investigating more details such as the actual mental state of the mother, education level, geographic location, family and others can be meaningful to make the future education plans even more personalized and effective.

Conflict of Interest

No conflict of interest is predicted. No professional relationship is likely to have an impact on the study findings.

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