

## Nursing intervention for primiparous mothers regarding caring skills for their premature babies

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### Abstract:

**Background:** Premature birth is a source of severe stress for parents. In addition, preterm newborns are more likely to experience medical squeals and develop-mental delays. So the infant's optimal development outcome requires early intervention. **Aim:** To evaluate the effect of nursing intervention for Primiparous mothers regarding caring skills for their premature babies. **Subjects and Methods: Design** A quasi-experimental (pre-post-test) research design was used. **Setting** the study was applied at postpartum unit at Women's health Hospital, Assiut University. **Subjects:** A purposive sample of 100 primiparous mothers for pre and post-test. **Two tools** were used: Tool I, A structured interview questionnaire to collect data about mothers and their babies and tool II for mothers' knowledge regarding their caring skills. **Results:** The findings illustrated that there highly statistically significant differences were detected between the mothers' knowledge regarding caring skills for their preterm babies in the pre and post-test which only 14 % of the studied mothers had good knowledge in pretest which increased significantly to 82% in posttest and most source of mothers from family and relative rather than health teams. Moreover, there was positive correlation between mother's age, educational level and occupation with total knowledge. **Conclusion:** The current study's findings concluded that nursing interventions increased primiparous mothers' knowledge about how to care for their preterm babies in a positive way, with a positive correlation between their overall knowledge in the pre- and post-test and the most effective variables that influenced mothers' knowledge were their educational level, age, and occupation. **Recommendations:** Educational programs for primiparous mothers about caring for their preterm infants should be included in clinical routine care.

**Keywords:** Caring skills, Nursing intervention, Primiparous mothers, Premature babies.

### Introduction

A woman has a special challenge when her preterm infant is born, one for which she is insufficiently prepared (Lomotey et al., 2020). Preterm newborns face unique challenges that call for increased enduring commitment, ongoing education, and securing great support. Mother faces difficulties with tasks like feeding and supervision at home. When mothers lack knowledge and are unable to differentiate between their preterm babies' immediate and ongoing requirements, they are more susceptible to using inadequate coping mechanism (Green et al, 2021).

Preterm delivery, a critical perinatal health concern that affects people all over the world, is a major cause of neonatal morbidity and mortality and has long-term negative impacts on health (Sharma et al, 2023). According to the World Health Organization (WHO), preterm delivery accounts for 10.6% of all live births globally, with more than 84% occurring between 32 and 37 weeks of gestation (World Health Organization, 2015 & Chawanpaiboon et al, 2019).

According to the World health organization, an estimated 13.4 million babies were born preterm in 2020

(before 37 completed weeks of gestation). Preterm birth complications are the leading cause of death among children under 5 years of age, responsible for approximately 900 000 deaths in 2019. Three-quarters of these deaths could be prevented with current, cost-effective interventions **WHO (2022)**. Across countries, the rate of preterm birth ranges from 4–16% of babies born in 2020. In Egypt were delivered between 32 and 37 weeks gestation with increase annual rate of hospital admissions in NICUs **(Hassan et al., 2020)**.

Parents' needs are the primary focus of nursing care, and their involvement in the process is crucial. Mothers' presence and active involvement in their infants' care can enhance respiratory function, nutrition, weight gain, and reduce length of stay, care costs, and comorbidity, ultimately improving the infant's quality of life and influencing the children's future behavior and mental health **(Xiong et al, 2018)**.

Preterm babies are more likely to experience major health issues because neurodevelopment abnormalities can have an impact on numerous developmental processes, including nutrition, cognitive, and social development, including attachment and communication. Because of their unique needs, preterm newborns require care that is different from that of full-term infants **(Hee Chung, Chou & Brown 2020)**.

External influences can have a negative impact on a preterm infant's health and development both directly and indirectly by endangering the mother's or the primary caregiver's ability to provide the best cares **(Van Schalkwyk et al. 2020)**. Therefore, it is crucial for educated mothers to offer appropriate developmental conditions and

promote pleasant mother-infant relationships **(Festante et al. 2019)**.

### **Significance of the study:**

Because mothers are the ones most of responsible for taking care of their preterm infants, but because mothers are less knowledgeable about how to take care of their preterm infants, nurses today face a challenging task in addition to providing the best developmental care for a preterm infant: helping the mother navigate the uncertainties of motherhood and help her preterm infant feel like a real mother. Preterm women experience challenges at home, hospital readmission rates rise, and family life is affected despite receiving instruction from nurses **(Bowles et al., 2016)**. Mothers are not allowed to care for preterm infants in Egypt's majority of governmental hospitals due to safety and survival issues. Few researches in Egypt have looked at how educational initiatives affect mothers' awareness of and care for preterm infants. In Egypt there are few interactions between medical professionals and parents of premature infants **(El-Hadary et al., 2020)**. So, educational intervention is very much important for independent mothers' care.

### **Aim of the Study**

This study aimed to evaluate the effect of nursing intervention for primiparous mothers regarding caring skills for their premature babies.

### **Research Hypothesis**

**H0:** The nursing intervention has no significant effect on improving the primiparous mothers' knowledge regarding caring skills for their premature babies.

**H1:** The nursing intervention has significant effect on improving the primiparous

mothers' knowledge regarding caring skills for their premature babies.

## Methods

### Research Design

A Quasi-experimental research design was used for the current study by using pre- test and post- test for the same participant group.

### Study Setting

The study was conducted at the post-partum unit at Women's Health Hospital, Assiut University, Egypt. It is a large governmental hospital serves all cases from rural and urban areas from Assiut, consist of six floor, underground floor involve all clinics, first is administrative floor, second include postpartum unit, third include labour unit and intensive care unit, fourth floor consist of antenatal unit, fifth include gynecological unit and six floor is a private part.

### Study Subjects

A purposive sample of 100 primiparous mothers with their preterm infants who admitted to post-partum unit during the study period with the following inclusion and exclusion criteria:

**Inclusion Criteria:** The study subjects were included:-

- 1) primiparous mothers
- 2) with single viable preterm baby
- 3) Had gestational age less than 37 weeks.
- 4) Willing to participate in the study.

**Exclusion Criteria:** The study subjects were excluded preterm infant who:

- 1) Sever comorbidities enter in Neonatal intensive care unit.
- 2) Had a confirmed diagnosis of congenital anomalies.
- 3) Mothers with postpartum complications that inhibit

their participation in the care of their preterm infants.

- 4) Refused to participate in the study.

### Sample size:

The sample size was calculated after the pilot study conduction using the following formula:  $n = [DEFF * Np (1-p)] / [(d^2 / Z^2) * (1-p) + p * (1-p)]$  DEFF (Design effect) = 1, N (population) = 400, p (Hypothesized %) = 10% +/-5, d (tolerated margin of error) = 0.05, Z (level of confidence) = 1.96,  $\alpha$  (Alpha) = 0.05,  $n = [1 * 390 * 10\% +/- 5 (1 - 10\% +/- 5)] / [(0.05)^2 / (1.96)^2 - 0.05 * (390 - 1) + 10\% +/- 5 (1 - 10\% +/- 5)]$ , n= 100

### Tools of Data Collection

**Two tools** were used in this study:

#### **Tool I: A Structured interview questionnaire.**

This tool was designed and used by the researchers to collect data about the primiparous mother personal data, such as age, level of education, occupation, residence type of family and preterm infants' data as; sex, birth weight and gestational age.

**Tool two: A Structured tool for mothers' knowledge regarding the caring skills with their preterm infant:** It was adapted after a thorough review of literature from previous research by [Shibi, 2014]. It consisted of 20 multiple choice questions used to assess the caring skills of mothers for their preterm infants. Questions covered various aspects of caring skills such as preterm infants' definition (e.g. Definition of full term/months, average weight of newborn, definition of preterm infant, definition of low birth weight of neonate, common cause of preterm birth, Prevention of preterm birth), control (e.g. The most effective way of preventing infection in preterm infants), feeding (e.g. Which

provides first immunity to the preterm infants?, ideal feed to your preterm infant, numbers of feeds a preterm infant need per day), kangaroo care (e.g. Importance of kangaroo care, Which is helpful to produce more breast milk?).

### **Scoring system**

Each correct answer was given one mark and the wrong answer was given zero mark. The primiparous mothers' knowledge was considered accurate according to the literature. The maximum score was 20 and minimum score was zero. According to [Rashwan et al., 2014] the mothers' knowledge about practice was scored as follow: Poor = <50% (less than 10 score). Average = 50-65% (10 to less than 13 score). Good =  $\geq 65\%$  (13 score and more).

### **Validity and reliability of the study tools:**

**Validity:** The tools were reviewed by three experts of woman health and maternity nursing) to ascertain validity clarity, relevance, comprehensiveness, understanding and applicability of tools.

**Reliability** was determined by using Cronbach's Alpha test, which revealed that each of the tools consisted of relatively homogenous items which were 0.78 for tools two.

### **Administrative Design:-**

**Ethical issues:** The research proposal was approved by the ethical committee of the Faculty of Nursing, Assiut University. The necessary approval was obtained from the director of Women's Health Hospital to carry out the study. The study followed the common clinical research ethical principles. There was no risk for the study subjects from conducting the research. Informed consent was obtained from the primiparous mothers who were willing to participate in the study after explaining the nature and

purpose. Confidentiality and anonymity was assured. Study subjects told that they have the right to refuse to participate or withdraw from the study at any time.

### **Operational Design**

This included the pilot study and data collection phase.

**Pilot study:** The pilot study was applied to 10 primiparous mothers of preterm infants (10 %). It was done to assess the clarity and completeness of the tools and to determine the time involvement. According to the pilot study results; no modifications, omissions and/or additions were made. The mothers in the pilot study were included in the total sample.

### **Nursing educational intervention:**

#### **Assessment and planning phase:**

- The target group was met for obtaining the informed consent after explanation of the aim.
- The baseline data were collected by the study tools through interviewing each woman individually at the predetermined setting as a pre-intervention assessment.
- The researchers asked them to give comments on the questionnaire items in term of clarity and completeness.
- Each woman took about 30 minutes to complete the Questionnaire
- Interpretation of the collected information was accurately done for determining the individualized needs to be a base for giving the program contents accordingly.
- **The overall goal of the nursing intervention program** was to enrich the postpartum primiparous mother's knowledge regarding caring of their premature babies to improve their health status.

- Planning was achieved through equipping, acquiring knowledge and scheduling of program as: the teaching place, session's time and frequency, discussion, audiovisual aids, and handouts.
- It was composed of teaching the primiparous mothers the care of their preterm infants concerning several aspects: e.g. respiratory and cardiac support, thermoregulation, feeding methods, kangaroo care, and infection control.
- The teaching sessions were scheduled to be for small groups involve (2-3 mother per group) conducting one session for each small group.
- The meeting was scheduled 2 days per week with coordination with researches in the morning shift, from 9 am to 1 pm.
- The study was conducted from the beginning of February 2023 to the end of July 2023.

#### **Program Development:**

- The education program content was designed by the researchers based on an extensive review done for the recent, current, national and international related literature. The program content was accurately revised by the 3 experts from various academic specialties;

#### **Implementation phase:**

- The program was held in empty room in post-partum unit was quite, well ventilated and had a power supply for the researcher lab needed for program.
- Greeting firstly, participate motivation through oral expressions for

reinforcement, identifying the objectives, discussing the subject outline then getting feedback and facilitating inquires and discussions.

- The sessions were discussed in a simple Arabic language, repeated for each small group to cover the mother in all groups according to the schedule to be sure that all were given the same content.
- Each session took about 30-35 minutes for discussions clarifications and questions. Following that, study group participants were handed Arabic colored pictures booklet.

#### **Evaluation phase:**

It was done after two hours for doctor passing on mothers using tool II to complete the post-test was to assess the caring skills of mothers.

#### **Statistical design:**

Utilizing statistical software by SPSS 20, data analysis was carried out. Frequency and percentages were used to describe the qualitative variables, whereas range, mean, and standard deviation were used to describe the quantitative data. Pearson Correlation and the Chi-Square test were employed. P value less than 0.05 was deemed significant.

#### **Results**

**Table (1):** showed that 87.0% of the women were between the ages of 21 and 35, with a mean age of 29.35 4.1. Additionally, 76.0% of mothers were housewives and 52.0% had a secondary education. Additionally, 77.0% were from nuclear families and 69.0% lived in rural areas. According to their preterm data, 73.0% of the preterm infants were female. In terms of birth weight, it was discovered that 71.0% (mean 1625.9 515.5) had between 1000 and 2000 grams. Additionally, 70.0% of

Pregnancies were between 23 & 34 weeks gestational age (mean 34.35)

**Table (2):** Illustrated that in the pre- and post-test, there statistically significant differences were found in the mothers' knowledge of how to care for their preterm babies ( $P=0.001^{**}$ ) for all questions, respectively).

**Table (3):** The findings of the current study showed that the variations between the pre- and post-test were highly statistically significant. Age, education level, and occupation were shown to be the most significant factors at the 0.01 level in the link between mothers' overall knowledge of caring abilities for their preterm babies and their data from the pre- and post-test.

**Figure (1):** Revealed that about half of studied mothers 45 % got their knowledge from relatives and friends and 26% of mothers obtained the knowledge from the internet followed by 11% from television, while only 18% of mothers' sources of knowledge were health teams.

**Figure (2):** It was shown that only 14% of the mothers had good knowledge scores on the pretest, but that number improve to 82% on the posttest, and that less than one third of mothers had average knowledge, with a statistically significant difference between the two test ( $P=0.001$ ).

**Table (1): Distribution of the studied mothers and their babies according to personal data (N=100)**

Mothers' data	No	%
<b>Mother's Age/years</b>		
• Less than 20	3	3.0
• 21-35	87	87.0
• More than 35	10	10.0
<b>Age (mean <math>\pm</math> SD)</b>	<b>29.35<math>\pm</math>4.1</b>	
<b>Education of mothers</b>		
• Illiterate	11	11.0
• Primary	17	17.0
• Secondary	52	52.0
• University	20	20.0
<b>Occupation</b>		
• Housewife	76	76.0
• Working	24	24.0
<b>Residence</b>		
• Urban	31	31.0
• Rural	69	69.0

Type of family		
• Nuclear family	77	77.0
• Extended family	33	33.0
Sex		
• Male	27	27.0
• Female	73	73.0
Preterm data		
Birth weight/gm.		
• 1000-2000	71	71.0
• More than 2000	29	29.0
Birth weight's Mean	1625.9 ± 515.5	
Gestational age/weeks		
• 32-34	70	70.0
• 35-37	30	30.0
Gestational age's Mean	34.35 ± 2.5	

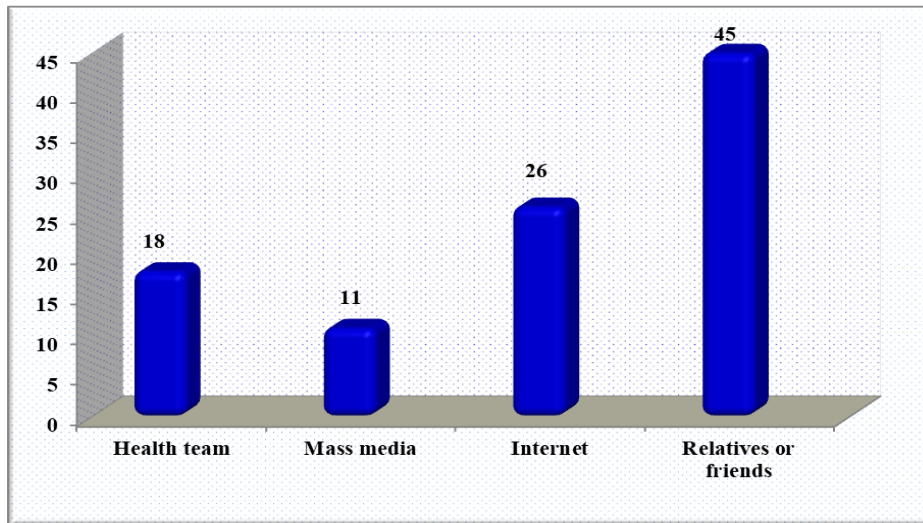
Table (2): Mothers' knowledge regarding caring skills for their preterm babies in the pre and post-test (N=100):

Knowledge	Correct knowledge regarding caring skills				
	Pretest		Posttest		P-value
	N(100)	%	N(100)	%	
1. Definition of full term/months	41	41.0	90	90.0	0.001**
2. Average weight of newborn	42	42.0	89	89.0	0.001**
3. Definition of preterm infant	33	33.0	94	94.0	0.001**
4. Definition of low birth weight neonate	35	35.0	92	92.0	0.001**

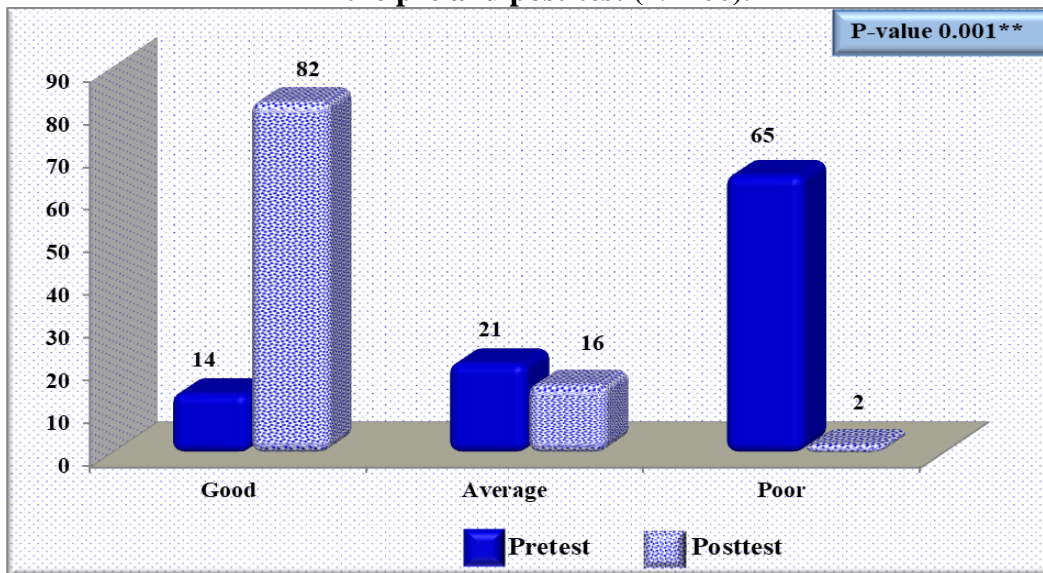
5. Common cause of preterm birth	36	36.0	93	93.0	<b>0.001**</b>
6. Prevention of preterm birth	22	22.0	78	78.0	<b>0.001**</b>
7. Why do preterm infants need special care?	25	25.0	86	86.0	<b>0.001**</b>
8. Which provides first immunity to the preterm infants?	30	30.0	92	92.0	<b>0.001**</b>
9. What is relevant to breastfeeding?	42	42.0	92	92.0	<b>0.001**</b>
10. Ideal feed to preterm infants	49	49.0	93	93.0	<b>0.001**</b>
11. Numbers of feeds a preterm infant need per day?	43	43.0	92	92.0	<b>0.001**</b>
12. When the mother is unable to feed following C.S the best feed for the preterm infant will be?	49	49.0	91	91.0	<b>0.001**</b>
13. How frequency will you breastfeed your preterm baby?	43	43.0	92	92.0	<b>0.001**</b>
14. Which is helpful to produce more breast milk?	52	52.0	90	90.0	<b>0.001**</b>
15. Importance of burping after feeding	39	39.0	89	89.0	<b>0.001**</b>
16. Importance of kangaroo care	53	53.0	88	88.0	<b>0.001**</b>
17. The most effective way of preventing infection in preterm infants	42	42.0	85	85.0	<b>0.001**</b>
18. Ways to preserve the temperature of the preterm baby	52	52.0	94	94.0	<b>0.001**</b>
19. What will happen if you are not changing the diaper?	62	62.0	92	92.0	<b>0.001**</b>
20. How much weights will preterm baby gain per day.	43	43.0	88	88.0	<b>0.001**</b>



**Fig (1): Sources of mothers' knowledge regarding caring skills for their preterm babies (N=100)**



**Figure (2): Mothers' total knowledge regarding their caring skills for their preterm babies in the pre and post-test (N=100).**



**Table (3): Correlation between mothers' total knowledge regarding caring skills for their preterm babies and their data in the pre and post-test (N=100)**

Personal data		Total knowledge about caring skills for their preterm infants	
		Pretest	Posttest
Age/ years	Pearson Correlation	.043	.267**
	Sig. (2-tailed)	.767	.007
Level of education	Pearson Correlation	.347*	.547**
	Sig. (2-tailed)	.014	.000
Occupation	Pearson Correlation	.547**	.530
	Sig. (2-tailed)	.000	.188
Living area	Pearson Correlation	.188	.082
	Sig. (2-tailed)	.062	.417
Type of family	Pearson Correlation	.013	-.048-
	Sig. (2-tailed)	.926	.637

## Discussion

Prematurity is still the leading cause of infant death around the world. New mothers require a lot of information in order to participate in the therapeutic process and receive supportive care. Similarly, lowering the mortality rate of premature infants is linked to raising the amount of care they require (AL-Mukhtar and Abdulghani, 2020). Support from nurses is crucial for mothers of premature infants. Mothers may reestablish their self-esteem as moms and learn more about the baby's care and treatment processes through nursing assistance (Mihae Im and Jina Oh, 2021).

The results of the current study revealed that more than two thirds of the participants were housewives, the majority lived in rural areas, had nuclear families, and ranged in age from 21 to 35 years (mean age: 29.354.1). While a majority of preterm infants were female and had birth weights between 1000 and 2000 grams

Findings of the current study are consistent with those Hassan et al. (2022), who found that friends and family members were the primary sources of information for mothers regarding the care of their infants. These findings were followed by those of the internet and the media. Only a small portion of mothers' sources of knowledge

were health teams. This finding is consistent with the current study and highlights the value of continuing nursing intervention for all mothers, especially primiparous in order to give them access to adequate and scientific knowledge.

The current study's findings showed that the mothers' knowledge of how to care for their preterm infants improved in a highly statistically significant way between the pre- and post-test, according to **Jang & Ju (2020)**, **Gomes et al., (2021)** & **Stephannie et al, (2021)** who illustrated that mothers' knowledge significantly increased after the program's implementation. This could be attributed to the educational intervention's success in enhancing the mothers' understanding of childcare techniques for preterm newborns, because it was a direct manner of training the mothers and because the mothers were motivated to continue providing their preterm infants with high-quality care.

The study's findings showed that the majority of mothers had poor knowledge about how to care for their preterm babies in the pretest but that this knowledge had significantly improved in the post-test following the implementation of the program, indicating the beneficial effects of the educational intervention on the mothers' knowledge regarding preterm infant care. This is in agreement with **Hashim & Ghanim (2021)**, **Jang & Ju (2020)**, and **Shin et al. (2018)**, which are concerned with the pretest and posttest of mother's knowledge on discharge care plans for preterm babies, revealed that during the pretest period, mothers had a low degree of awareness regarding caring for a preterm baby after they were released from the NICU. However, the results of the posttest showed that moms had a high degree of knowledge regarding how to care for preterm babies. The current study's findings,

in contrast to those of **Galeano & Carvajal (2016)**, revealed that home care for preterm newborns by moms was ineffective after education. This may be due to unplanned intensive educational intervention used, according to the researchers, any effective communication help mothers to become more knowledgeable about how to care for their preterm babies.

This finding was consistent with **Puthussery et al, (2018)** & **Hashim & Ghanim (2021)** that represents the mean score of mother's knowledge about discharge care plan in the pretest which was at low level, while in the posttest the mean score of mother's knowledge about discharge care plan was at high level. But **Khalesi et al., (2015)** represent that mothers had good level of knowledge about all preterm care as feeding, hand washing, vaccination, temperature measurement and maintenance, avoidance of baby kissing, being in crowded places and long trips in first days post baby discharge this agree with **Al dirawi et al., (2019)** represents that the mean score of good knowledge of items related to care of premature as breastfeeding ,infection prevention ,vaccination, jaundice , temperature regulation ,and umbilical cord care. Furthermore, the mean overall percentage of mothers 'knowledge of health caring for premature infants after discharge from NICU, while, **AL-Mukhtar, & Abdulghani, (2020)** discussed in their study that more than half of mothers had poor level of knowledge about premature baby care. So this finding could be due to the effectiveness of the educational program session which might increases the mother's knowledge about discharge care plan of preterm baby.

The present study show that the correlation between mothers' total knowledge regarding caring skills for their

preterm babies and their data in the pre and post-test revealed that most significant factors at the 0.01 level were age, level of education and occupation affect the mother knowledge. This finding agree with **Hashim & Ghanim (2021)** their findings revealed significant statistical difference between mothers knowledge at posttest and level of education but there are no significant statistical difference between mothers knowledge at posttest and their demographic characteristics like age, occupation and socioeconomic status.

This could be explained by that the enhancement of primiparous mothers' caring skills were giving them the important knowledge and were improving their caring skills abilities. So, the educational intervention helped in providing knowledge for preparing the mothers to provide the care to their preterm infants and the educational intervention was motivated the mothers to give better care to their preterm infants.

### Conclusion:

The current study's findings concluded that nursing interventions increased primiparous mothers' knowledge about how to care for their preterm babies in a positive way, with a positive correlation between their overall knowledge in the pre- and post-test and the most effective variables that influenced mothers' knowledge were their educational level, age, and occupation.

### Recommendations:

**Based on the results in this study, it is recommended that:-**

- Educational programs for primiparous mothers about caring for their preterm babies should be included in clinical routine care.
- Scientific knowledge should be established to support the all women to benefit preterm babies

and their families instead of unfamiliar knowledge from relatives. Which at present time there are no standardized protocols for follow-up care of preterm infants in Egypt

- In addition; adding a plan of care for improving the nurses' knowledge and practice regarding caring skills of mothers during care of their preterm infants.

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