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Factors Associated With Postpartum Maternal-Infant-Bonding

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Abstract: **maternal-infant bonding (MIB) is a vital process which has tremendous implications for both mother and infant. It is one of the most challenging experiences in a woman's life and although most women navigate the process successfully, a small percentage may develop impaired relationships with their infants. MIB may affected by many factors. Identifying such factors enable healthcare staff to detect those mothers with bonding difficulties. Objectives: To identify factors associated with postpartum MIB. Methods: a descriptive study that included a convenience sample of 360 postnatal women attending El Shatby and Dar- Ismail Maternity hospital in Alexandria, free of any medical condition and willing to participate in the study. A structured validated interview questionnaire was used to collect socio-demographic characteristics, reproductive history and the MIA Scale. Results: A 6 weeks after delivery, 345(95.8%) and 15(4.2%) of mothers respectively had normal and abnormal bonding. Normal mother bonding was significantly more among educated (85.2%) , employed(78.9%), highly socially supported(38.3%), primigravidous (24.3%) and primiparous (34.8%) mothers having urban residency(84.3%), full-term(90.4%) breast fed(56.5%) boy (60.9%), planned pregnancy(84.3%) and no history of abortion(65.2%) ($p<0.001$).While abnormal bonding was significantly frequent among illiterate (60%), housewives (100%), low socially supported(20%) & primigravidous (100%)who gave birth to premature (6.1%)& bottle fed (80%), girls(40%) respectively and had unplanned pregnancy(100%) ($p<0.05$). Conclusion: Bonding is significantly associated with maternal and infant factors. Maternal factors include women education, occupation, residence, social support, gravidity, parity, abortion and pregnancy planning status, whereas infant related factors included infant gender, feeding pattern, maturity and type of care received.**

Keywords: **Maternal infant bonding, postpartum, factors associated.**

1. INTRODUCTION

The postpartum period is popularly termed the fourth trimester of pregnancy**.** The postpartal period, or puerperium**,** refers to the 6-8 weeks period after childbirth**.** It is a time of maternal changes that are both retrogressive involution of the uterus and vagina and progressive production of milk for lactation, restoration of the normal menstrual cycle**,** and beginning of a maternal role. **(Pillitteri A. 2013).**

The developmental process of maternal role is one of the most challenging experiences in a woman's life and although most women navigate the process successfully, a small percentage may develop impaired relationships with their infants. **(Brockington IF 2004).**

The postpartum period is the most sensitive period of life for development of mother-child interaction and bonding**.** In addition it is an intense experience for both mother and baby and sets the foundation for future interactions. **(Dewhurst, J.**

(2012). Maternal–infant bonding is the development of the reciprocal relationship between the mother and her infant **(Bennington L. 2010).**

It is a natural phenomenon that is described as a gradual process of emotional involvement which begins after birth, it is assumed to be an adaptive mechanism that is biologically driven mainly by oxytocin**. (Sroufe L. 2005).** Maternal oxytocin circulation can predispose women to bond and show bonding behavior**. (Nagasawa M, Okabe S, Mogi K, Kikusui T 2012.).**

Bonding process has tremendous implications for both mother and infant and is also encouraged by physical contact between them**.** The first minutes**,** hours and days following delivery represent a very sensitive and critical period for bonding**.** During this process the baby and the mother become intimately involved with each other through behaviors and stimuli that provoke further interactions **(Mills-Koonce W, Gari J, Propper C, Sutton K. 2007).**

Researches had shown that the strongest foundation for bonding occurs at the first hour after birth. **(Benoit D. 2004).** These feelings may begin in-utero, immediately after birth or may develop later. **(Pairman S, Tracy S, Thorogood C, Pincombe J. 2015).** On the other word mother-infant bond is enhanced by early and continuous contact. **(Jeannette c, Klaus M. 2004).**

Attachment and bonding are terms used to describe the mother-infant tie to each other or a two-way interaction between a child and their mother or caregiver. **(Sullivan,R,. Perry, ,R., Aliza Sloan,A., Kleinhaus,K., Nina Burtchen,N. 2011)** Klaus and Kennell describe the tie of mother to her baby as *bonding* and the tie of baby to mother as *attachment*. Attachment and bonding refer to the same phenomenon: the tie of mother and child to each other. **(Osuji B. 2014).**

The process of bonding **begins** during pregnancy and it continues to specify after the birth of the child **(Beiranvand S, Moghadam Z, Salsali M, Majd H, Birjandi M, Khalesi Z. 2017).** The attachment between an infant and the mother is necessary for social and emotional development, positive parenting behaviors, and improved cognitive ability of a child. **(Planalp, M,. and Rieker, J. 2013).**

Several theories offered descriptions of how bonding during the first postpartum hour lays the foundation for the attachment process that continues throughout childhood. Klaus and Kennell, in their studies of maternal-infant bonding just after birth in preterm and full-term babies, suggest that a mother's interaction with her baby and the baby's ultimate development may be greatly influenced by many factors early and extended contact just after birth **(Baber K. 2015).**

Developmental Sequence in Maternal-infant Bonding is the result of a developmental sequence which occurs in both the child and the mother. For the child the development of a focused relationship with an adult is a long and continuous process with major milestones in infancy. **(Malik, F., & Marwaha,R,. 2020).**

The quality of this bonding can be influenced by several maternal and infant related factors. The infant factors refer to stable and distinguishable patterns of behavior- regular sleep, periodic sleep, alert inactivity, waking activity and crying. Mothers' contribution to this bonding process by many factors specific to her, these factors occurring both during and after pregnancy; mothers' health and psychological adjustment, social support, maternal fatigue, type of birth, and their confidence in parenting abilities. Those factors may influence the development of bonding between a woman and her baby and these will determine how she will handle and respond to her infant in early infancy and continue over the next few years **(Klier C. 2006).**

Identification of "Bond Risk Factors" and understanding the mother-infant bonding process as well as the variables related to both the infant and the mother which influence it, the family physician and midwives can attempt to identify the mother at risk of bonding problems **(Janneke A, Charlotte M, and Catharina H. 2012)**

Researchers and health professionals have pointed out the importance of studying bonding among parents, especially from mothers' perspective not only from infant one. Mothers' emotional involvement is a decisive element to the quality of care and interaction provided by them. It is of critical importance for establishing a successful relationship and mutual understanding between the mother and her infant. The determinant factors associated with maternal infant bonding can influence infant development as well identifying such factors enable healthcare staff to detect those mothers experiencing bonding difficulties and in need of individualized attention during postpartum period **.(Cassidy,J &Shaver,P. 2016).**Accordingly, this study aims to investigate factors associated with postpartum maternal infant bonding.

AIM OF THIS STUDY

Identify factors associated with postpartum maternal infant bonding.

RESEARCH QUESTION

What are the factors associated with postpartum maternal infant bonding?

2. MATERIALS AND METHOD

Research design:

A descriptive research design was utilized in this study.

Setting:

This study was conducted at:

Family planning and gynecological clinics affiliated to 2 hospitals in Alexandria namely;

a. El-Shatby Maternity University Hospital affiliated to Alexandria University.

b. Dar- Ismail Maternity Hospital affiliated to Ministry of Health.

Subjects:

- A convenience sample of 360 postpartum women attended the previously mentioned settings 180 subject from each of the previously mentioned settings was included in the study.

Tools:

Two tools were used in this study to collect the necessary data as follow:

Tool one: Factors associated with postpartum maternal-infant bonding. It consisted of two main parts:

First part: Postpartum women's basic Socio-demographic and reproductive history structured interview schedule:

This part was developed by the researcher. It included 4 sections:

- Socio-demographic characteristics such as: the woman's age, level of education, employment status, residence, family type, crowding index and income. It also included data about woman's marital status, husband's age and husband's level of education.
- Reproductive history included: woman's gravidity, parity, previous abortions /stillbirths, number and sex of living children. History of previous pregnancy, delivery and presence of any associated complication.
- Current postpartum status such as: general physical condition, time of initiation of breast feeding and presence of any associated postpartum complications.
- Newborn data such as: sex, birth weight, gestational age, condition at birth**,** current weight and vaccinations.

Second part: Assessment of Postpartum women Social Support Interview schedule:

It was developed by the researcher to assess different aspects of social support specifically relevant to postpartum period after review of relevant and recent literature.

This tool consists of 24 items and was constructed to yield 4 dimensions of perceived social support. (Support from Husband, Parent, Parent-in-law and other family and friends) each of them 6 items.

The subject response to each item was categorized according to a 3 point scale as the following values**:** never = 1, sometimes = 2, very often =3. The total score was range from 24 to 72, with high values indicating higher level of social support as follows:

- High social support: > 56.

- Moderate social support: 40- 56.
- Low social support: < 40.

Tool two: Postpartum Bonding Questionnaire (PBQ)

The Postpartum Bonding Questionnaire was originally developed by **(Brockington et al 2006)** and was adopted by the researcher (Wittkowski, A., Williams, J., & Wieck, A. 2010). It consists of 25 statements: 8 positive statements and 17 negative statements (Van Bussel, J. C., Spitz, B., & Demyttenaere, K. 2010). It divided into 4 subscales:

Scale 1: Related to general factors termed impaired bonding; consists of 12 statements

Scale 2: rejection and anger; consists of 7 statements

Scale 3: anxiety about care; consists of 4 statements

Scale 4: risk of abuse; consists of 2 statements

Each statement will be responded by the subjects according to a 5 point likert scale Always = 0, very often=1, quite often= 2, sometimes = 3, rarely = 4, and never =5. Score will be reversed for negative statement. Scaling: Always = 5, very often=4, quite often= 3, sometimes = 2, rarely = 1, and never= 0.The total score ranged from 0 to 125, with high values indicating bonding disorder as follows:

- Normal Mother bonding ≤ 58
- Abnormal Mother bonding >58

METHOD

The study was conducted according to the following steps:

1. An official letter from the Faculty of Nursing, University of Alexandria was directed to the responsible authorities of the study settings to obtain their permission to conduct the study.

2. Tools one was developed by the researcher based on extensive review of recent, current & relevant literature. While tool two was adopted and modified translation in to Arabic by the researcher.

3. Tools were tested for content validity by a jury of five experts in the related field.

4. Tools were also being tested for their reliability using Cronbach's alpha test.

5. A pilot study was carried out on 10% of the sample 36 subjects (These subjects were excluded from the study) in order to assure feasibility of the study, test the clarity and applicability of the tools and to identify obstacles that might interfere with the process of data collection.

Result of the pilot study

After conducting the pilot study, it was found that the sentences of the tool one part two and tool two were clear and relevant; however few words had been modified. Following this pilot study the tools were revised, reconstructed and been ready for use.

6. Each subject was individually interviewed using the study tools by the researcher after explaining the purpose of the study. The duration of each interview ranged between 20-40 minutes. Three times per week were specified for data collection over a period of 10 months, started from the beginning of February till end of November 2018. An average of 4 to 7 interviews was performed per day.

7. **Statistical analysis**: The collected data was revised, categorized, coded, computerized, tabulated and analyzed using Statistical Package for Social Sciences (SPSS) version 20. The given graphs were constructed using Microsoft excel software version 2013. Appropriate tests such as arithmetic mean, Monte Carlo, Fisher Exact, Student t- test and Chi-square (χ^2) at 0.05 level of significance were used.

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Ethical considerations:

For each recruited subject the following issues were considered: Informed oral consent after explanation of research purpose, keep her privacy, anonymity and right to withdraw at any time as well as assuring confidentiality of her data.

3. RESULTS

Table (1): Number and distribution of the study subjects according to their Socio-demographic characteristics (n=360)

Socio-demographic characteristics	No.	%
Age		
<20	18	5.0
20-30	168	46.7
>30	174	48.3
Level of education		
Illiterate/read & write	27	7.5
<Secondary	39	10.8
≥Secondary	294	81.7
Occupations		
Not Working	246	68.3
Working	114	31.7
Type		
Employee	90	78.9
Teacher	15	13.2
Others	9	7.9
Marital status		
Married	360	100.0
Residence		
Rural	60	16.7
Urban	300	83.3
Family type		
Nuclear	288	80.0
Extended	72	20.0
Income		
Enough	318	88.3
Not Enough	42	11.7
Crowding Index		
Not crowded <2	228	63.3
Crowded > 2	132	36.7
Husband's age		
<30	117	32.5
30-40	189	52.5
>40	54	15.0
Husband's level of education		
Illiterate/read & write	6	1.7
<Secondary	36	10.0
≥Secondary	318	88.3
Husband's employment		
Not work	3	0.8
Worker	102	28.3
Employee	177	49.2
Others	78	21.7

Table (1): Shows the Socio-demographic characteristics of the study's subject; about half of the study subjects aged either from 20-30 years old (46.7%) or more than 30 years old (48.3%) only (5%) of them aged less than 20 years old.

Most of study subjects (81.7%) had secondary or more than secondary education; (10.8%) had less than secondary education while only (7.5%) were illiterate or just read and write. More than two– thirds of them were not working (68.3%) and less than one–third (31.7%) were working mainly as employee (78.9%). Considerable percent (83.3% and 80%) of study subjects dwelling urban area within nuclear families respectively. About (88.3%) of them perceived their monthly income as adequate and less than two- thirds (63.3%) of them living in non–crowded houses.

More than half of the study subject's husband aged either from 30-40 years old (52.5%) or less than 40 years old (32%) only (15.5%) of them aged more than 40 years old. A large proportion of study subjects' husbands (88.3%) had secondary education or above and about one -half of them (49.2%) worked as employee.

Table (2): Number and distribution of the study subjects according to their Reproductive characteristics (n=360)

Reproductive characteristics	No.	%
Gravidity		
Primigravida	99	27.5
Multigradida	261	72.5
Parity		
1	135	37.5
2	108	30.0
≥ 3	117	32.5
Number of abortion		
0	240	66.7
1	102	28.3
≥2	18	5.0
Still birth		
0	342	95.0
1	12	3.3
2	6	1.7
Sex of living children		
Male	147	40.8
Female	72	20.0
Both	141	39.2
Number of living children		
One	126	35.0
Two	105	29.2
Three or more	129	35.8
Period from last labor		
First time	138	38.3
< 2 years	78	21.7
≥2 year	144	40.0
Pregnancy complications *		
Non	237	65.8
Anemia	71	19.7
Hypertensive disorder	63	17.5
Bleeding	18	5
Vaginal infection	18	5
Gestational diabetes	9	2.5
Previous labor complications		
Non	315	87.5
Dystocia	33	9.2
Bleeding	9	2.5
Laceration	3	0.8

* More than one response

Table (2): Reveals number and distribution of the study subjects according to their Reproductive characteristics (n=360)

More than one – quarter (27.5%) of the study subjects was primipara and near three –quarters (72.5%) of them were multipara. Two– third (66.7%) of study subjects had no history of abortion history, and (28.3%) had once abortion while only (5%) had twice or more abortions. Most of study subjects (95%) had no history of still birth**.**

About an equal proportion of them (35% & 35.8 %) had either one or three or more living children respectively more than one quarter (29.2%) had 2 children. According to Period from last labor (37.5%) had first delivery, slightly more than one fifth (22.5%) give this birth in less than 2 years from last labor, and two fifth (40%) has last delivery from 2 years or more ago.

About two – fifths (40.8%) of the study subjects had males children, one – fifth (20%) had females children, while (39.2%) of them had both sex. (34.2%) of the study subjects suffered complication with pregnancy mainly anemia

(19.7%), hypertensive disorders (17.5%), bleeding (5%), vaginal infection (5%) and Gestational diabetes (2.5%). only (12.5%) of them had complication with previous labour such as Dystocia (9%) , bleeding (2.5%) and laceration (0.8%).

Table (3): Number and distribution of the study subjects according to their last pregnancy status (n=360)

last pregnancy status	No.	%
Pregnancy planning		
Planned	306	85.0
Un Planned	54	15.0
Weeks of gestation		
Min. – Max.	33.0 – 41.0	
Mean ± SD.	37.38 ± 1.34	
Antenatal visit		
N = 318		
<4visit	114	35.8
≥4visit	204	64.2
Last pregnancy complications*		
None	201	55.8
Anemia	105	29.2
Hypertensive disorder	93	25.8
Vaginal infection	21	5.8
Gestational diabetes	3	0.8
Place of delivery		
Home	15	4.2
General hospital	261	72.5
Private hospital	81	22.5
Private clinic	3	0.8
Delivery type		
Normal vaginal delivery	102	28.3
Cesarean section	258	71.7
Delivery outcome		
Full term	327	90.8
Pre term	21	5.8
Post term	12	3.4
Delivery complications		
No	342	95.0
Bleeding	15	4.16
Prolonged labor	3	0.84

* More than one response

Table (3): portrays number and distribution of the study subjects according to their last pregnancy status (n=360)

It was observed that (85%) of pregnancies were planned, the mean of gestational weeks was (37.38 ± 1.34).A large proportion of the study subject's (88.3%) had antenatal follow up and about two- thirds (64.2%) of them had four or more antenatal visits. (44.2%) of them suffered antenatal complication, especially anemia (29.2%), hypertensive disorder (25.8%), bleeding (5.8%) and Gestational diabetes (0.8%).About three – quarters (71.7%) had a caesarean delivery and had birth at general hospitals (72.5%).Most of study subjects (90.8%) had full term delivery and only (5%) of them had complication during last delivery as bleeding (4.16%) and prolonged lobor (0.83%)

Table (4): Number and distribution of the study subjects according to their Infant condition and feeding patterns (n=360)

Newborn characteristics	No.	%
Newborn gender		
Male	219	60.8
Female	120	33.3
Both	21	5.8
No of newborn		
Single	339	94.2
Twines or more	21	5.8

Newborn weight (k.g) Min. – Max. Mean ± SD.	2.0 – 4.80 3.07 ± 0.54	
Birth order First Second or more	129 231	35.8 64.2
Condition at birth Normal Incubated	327 33	90.8 9.2
Condition at 6 week Good health Respiratory problems Others	342 6 12	95.0 1.7 3.3
Vaccination by 6 weeks Completed Not Completed	348 12	96.7 3.3
Feeding pattern Breast feeding Bottle feeding Both	198 39 123	55.0 10.8 34.2
Initiation of breast feeding (n=321) 1st 2hours >2hours	137 184	42.7 57.3
Reason for late breastfeeding n=184		
Related to mother* Cesarean section Fatigue Nipple problem	145 123 33	78.8 66.8 17.9
Related to new born* Refuse breast feeding Respiratory problems Preterm baby Cardiac problems Cleft lip Nasal atresia	30 15 12 9 6 6	16.3 8.1 6.4 4.9 3.2 3.2
Feeding pattern On demand Schedule	354 6	98.3 1.7

* More than one response

Table (4): Shows the infant condition and feeding patterns of the study's subject; Most of study subjects had single newborn (94.2%); (60.8%) of them were male, one third was female (33.3%) while the rest of them (5.8%) had twin with both sex of new born.

Regarding birth order, more than one third (35.8%) was the first baby. Most of newborn (94.8%); born in good general health, their mean weight 3.07 ± 0.54.

As regard, infant condition when aged 6 weeks (95%) were in good health and (96.7%) completed their vaccination.

More than half of the study subjects (55%) breast fed their babies, only (10.8%) used bottle feeding while (34.2%) of them had combination of both breast and bottle feeding, (98.3%) used on demand feeding pattern.

Slightly more than two fifths (42.7%) of study subjects initiated breast feeding within 1st two hours of delivery while more than half of them (57.3%) initiated breast feeding after 2 hours. Common reasons for late initiation of breast feeding related to mothers were Cesarean section (78.8%), fatigue (66.8%) and nipple problem (17.9%); reasons related to newborns were: refusing breast feeding (16.3%), respiratory problem (8.1%) or cardiac problem (4.9%), preterm (6.4%), cleft lip and nasal atresia (3.2%).

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Figure (1) Number and distribution of the study subjects according to sub score of social Support (n=360)

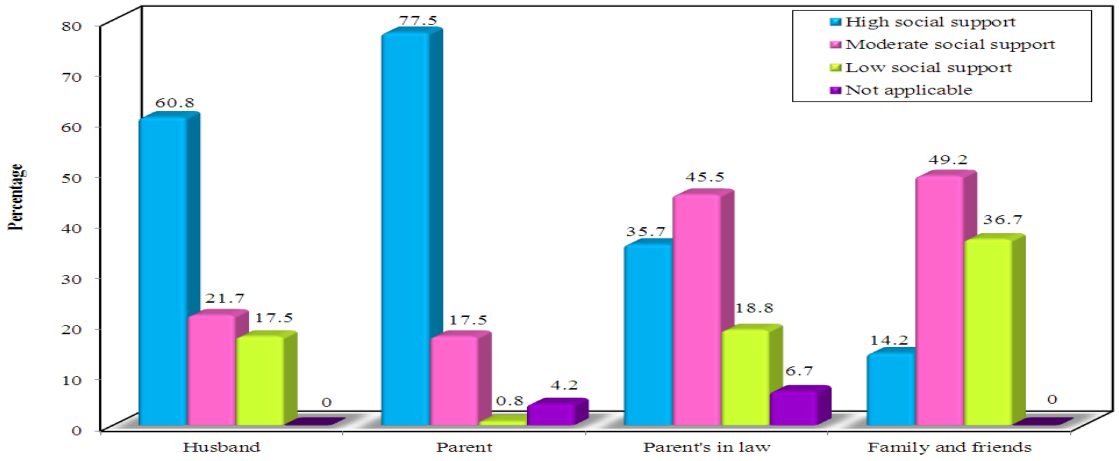

Figure (1) represents that

According to their social Support received from Husband;

More than half of the study subjects (60.8%) have high Social Support or more than one fifth (21.7%)have moderate Social Support only (17.5%) have low social support.

According to their social Support received from Parents; Most of the study subjects (77.5%) have high Social Support ,less than one fifth (17.5%)have moderate Social Support while only (0.8%) have low social support.

According to their social Support received from Parents)-in-law;

More than one third of the study subjects (35.7%) have high Social Support, nearly half of the study subjects (45.5%) have moderate Social Support while less than one fifth only (18.8.8%) have low social support.

According to their social Support received from other family or friends

Only (14.2%) have high Social Support, Nearly half of study subjects (49.2%) have moderate Social Support while more than one third (36.7%) have low social support.

Figure (2):Number and distribution of the study subjects according to total score of social Support (n=360)

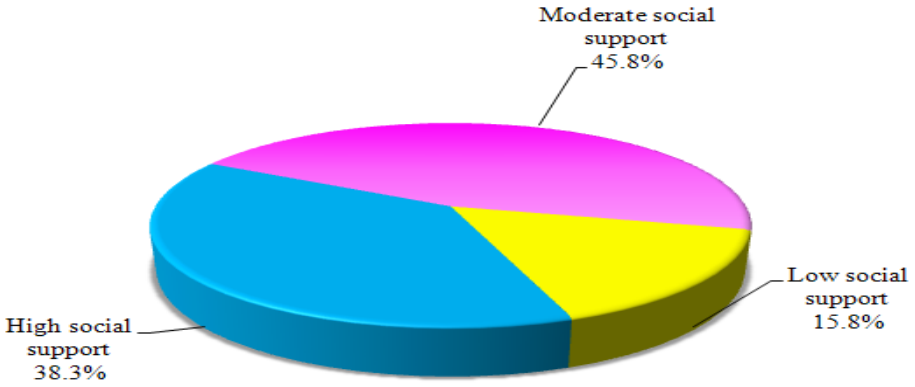

Figure (2) represents the total score of social Support

Less than of one half study subjects (45.8%) have moderate Social Support, more than one third (38.3%) have moderate Social Support while only (15.8%) have low social support.

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Figure (3): Number and distribution of the study subjects according to sub score Postpartum Bonding (n=360)

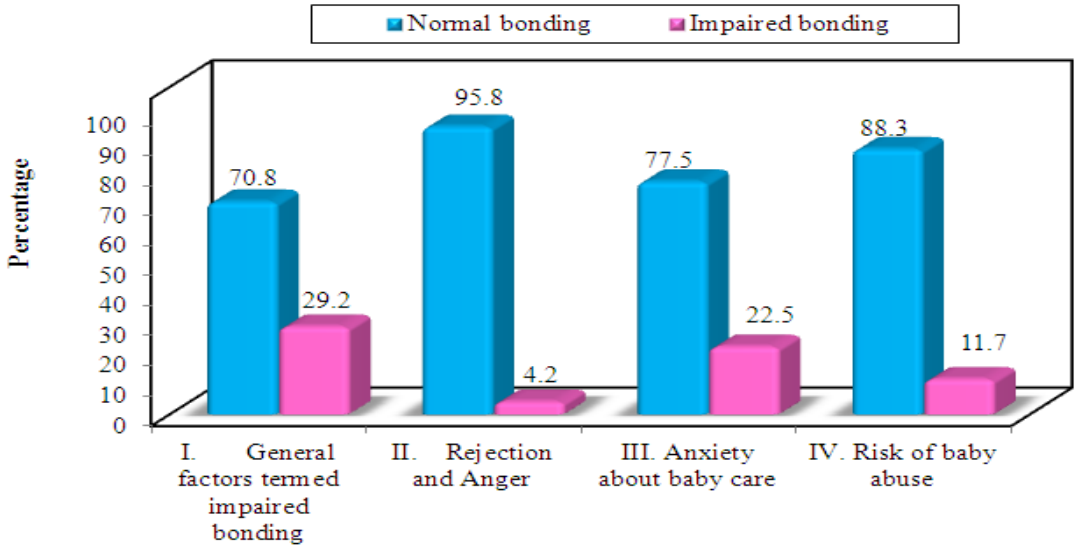

Figure (3) represents that

(A)According to Factors termed impaired bonding; More than two thirds study subjects (70.8%) had normal bonding process; while (29.2%) had bonding disorder problems**.**

(B) According to Factors termed rejection and anger; Most of the study subjects (95.8%) had normal bonding process with no rejection or anger; while (4.2%) had impaired bonding with rejection and anger.

(C) According to factors termed anxiety about baby care; More than three-quarter of study subjects (77.5%) had normal bonding process with confident and not anxious about care ; while more than one fifth (22.5%) had Impaired bonding with anxious about care**.**

(D) According to factors termed risk of baby abuse; Most of the study subjects (88.3%) had normal bonding process with good care of baby; while only (11.7%) had impaired bonding with risk of baby abuse.

Table (5): Relation between overall bonding and the study subjects Socio-demographic factors (n=360)

	Normal Mother bonding ≤ 58 (n=345)		Abnormal Mother bonding>58 (n=15)		χ^2	p
	No.	%	No.	%		
Age						
< 20	9	2.6	9	60.0		
20-30	162	47.0	6	40.0	102.410*	<0.001*
> 30	174	50.4	0	0.0		
Level of education						
Illiterate/read & write	18	5.2	9	60.0		MCp=
< Secondary	33	9.6	6	40.0	55.845*	<0.001*
≥ Secondary	294	85.2	0	0.0		
Occupations						
Not Working	231	67.0	15	100.0		FEp=
Working	**114**	**33.0**	**0**	**0.0**	7.253*	0.004*
Type						
Employee	90	78.9	0	0.0		
Teacher	15	13.2	0	0.0	–	–
Others	9	7.9	0	0.0		
Marital status						
Married	345	100.0	15	100.0	–	–

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Residence						
Rural	54	15.7	6	40.0	6.136*	FE p= 0.025*
Urban	291	84.3	9	60.0		
Family type						
Nuclear	282	81.7	6	40.0	15.652*	FE p= 0.001*
Extended	63	18.3	9	60.0		
Income						
Enough	306	88.7	12	80.0	1.055	FE p= 0.399
Not Enough	39	11.3	3	20.0		
Crowding Index*						
Not crowded <2	213	61.7	15	100.0	9.062*	0.003*
Crowded > 2	132	38.3	0	0.0		
Husband's level of education						
Illiterate/read & write	6	1.7	0	0.0	25.096*	MC p= <0.001*
<Secondary	27	7.8	9	60.0		
≥Secondary	312	90.4	6	40.0		
Husband's employment						
Not work	3	0.9	0	0.0	19.324*	MC p= <0.001*
Worker	93	27.0	9	60.0		
Employee	177	51.3	0	0.0		
Others	72	20.9	6	40.0		

χ^2: **Chi square test** MC: **Monte Carlo** FE**: Fisher Exact**

*: Statistically significant at $p \leq 0.05$

Table (5) denotes the **Relation between overall bonding and subjects Socio-demographic factors**. The table showed that, there is statistically significant relation between total score of bonding and their socio demographic characteristics as: age, level of education, occupation, Husband's level of education and Husband's employment of the study subjects as (P=0.001, P=0.001, P=0.004, P=0.001, P=0.001).

Table (6): Relation between overall bonding and the study subjects Reproductive history (n=360)

A. Previous pregnancy	Normal Mother bonding ≤ 58 (n=345)		Abnormal Mother bonding>58 (n=15)		χ^2	p
	No.	%	No.	%		
Gravidity						
Primipara	84	24.3	15	100.0	41.265*	FE p= <0.001*
Multipara	261	75.7	0	0.0		
Parity						
1	120	34.8	15	100.0	24.750*	MC p= <0.001*
2	108	31.3	0	0.0		
≥ 3	117	33.9	0	0.0		
Number of abortion						
0	225	65.2	15	100.0	8.121*	MC p= 0.012*
1	102	29.6	0	0.0		
≥ 2	18	5.2	0	0.0		
Still birth						
0	327	94.8	15	100.0	0.110	MC p= 1.000
1	12	3.5	0	0.0		
2	6	1.7	0	0.0		
Sex of living children						
Male	138	40.0	9	60.0	10.669*	0.005*
Female	66	19.1	6	40.0		
Both	141	40.9	0	0.0		
Number of living children						
One	111	32.2	15	100.0	29.068*	<0.001*
Two	105	30.4	0	0.0		
Three or more	129	37.4	0	0.0		

Pregnancy complications						
No	225	65.2	12	80.0	1.397	0.237
Yes	**120**	**34.8**	**3**	**20.0**		
Anemia	68	19.7	3	20.0	0.001	^{FE}p= 1.000
Bleeding	15	4.3	3	20.0	7.414*	^{FE}p=0.033*
HTN during pregnancy	57	16.5	0	0.0	2.944	^{FE}p=0.142
Gestational diabetes	9	2.6	0	0.0	0.401	^{FE}p=1.000
Vaginitis	18	5.2	0	0.0	0.824	^{FE}p=1.000
Previous labor complications						
No	300	87.0	15	100.0	2.236	^{FE}p=0.233
Yes	**45**	**13.0**	**0**	**0.0**		
Bleeding	9	2.6	0	0.0	0.401	^{FE}p=1.000
Laceration	3	0.9	0	0.0	0.132	^{FE}p=1.000
Vaginitis	12	3.5	0	0.0	0.540	^{FE}p=1.000
Prolonged labor	6	1.7	0	0.0	0.265	^{FE}p=1.000
Abnormal fetus presentation	12	3.5	0	0.0	0.540	^{FE}p=1.000
Abnormal placenta attached	15	4.3	0	0.0	0.681	^{FE}p=1.000
Weak contractions	9	2.6	0	0.0	0.401	^{FE}p=1.000

χ^2: **Chi square test** MC: **Monte Carlo** FE**: Fisher Exact**

*: Statistically significant at $p \leq 0.05$

Table (6) denotes the **Relation between overall bonding and the study subjects Reproductive history.** It illustrates that there was a statistically significant relation between total score of bonding and their Reproductive history as: Gravidity, Parity, Sex of living children and Number of living children of the study subjects as (P=0.001, P=0.001, P=0.001, P=0.001).

Table (7): Relation between overall bonding and the study subjects Reproductive history (n=360) "continue"

B .Current pregnancy	Normal Mother bonding ≤ 58 (n=345)		Abnormal Mother bonding>58 (n=15)		Test of sig.	p
	No.	%	No.	%		
Pregnancy planning						
Planned	291	84.3	15	100.0	χ^2=	^{FE}p=
Un Planned	54	15.7	0	0.0	2.762	0.141
Pregnancy weeks						
Min. – Max.	33.0 – 41.0		37.0 – 37.0		5.328*	<0.001*
Mean ± SD.	37.39 ± 1.36		37.0 ± 0.0			
Newborn gender						
Male	210	60.9	9	60.0	χ^2=	
Female	114	33.0	6	40.0	1.124	0.570
Twins	21	6.1	0	0.0		
Antenatal visit						
< 4visit	111	36.3	3	25.0	χ^2=	^{FE}p=
> 4visit	195	63.7	9	75.0	0.638	0.548
Pregnancy complications						
No	192	55.7	6	40.0	χ^2=	0.233
Yes	153	44.3	9	60.0	1.423	
Last pregnancy complications						
None	96	27.8	9	60.0	χ^2=7.203*	^{FE}p=0.016*
Anemia	36	10.4	3	20.0	χ^2=1.362	^{FE}p=0.214
Bleeding						
HTN during pregnancy	15	4.3	0	0.0	χ^2=0.681	^{FE}p=1.000
Eclamcia	3	0.9	0	0.0	χ^2=0.132	^{FE}p=1.000
Gestational diabetes	21	6.1	0	0.0	χ^2=0.970	^{FE}p=1.000
Vaginitis	3	0.9	0	0.0	χ^2=0.132	^{FE}p=1.000
Place of delivery						
Home	15	4.3	0	0.0	χ^2=	^{MC}p

General hospital	255	73.9	6	40.0	23.766*	<0.001*
Private hospital	75	21.7	6	40.0		
Other	0	0.0	3	20.0		
Delivery type						
Normal vaginal delivery	102	29.6	0	0.0	χ^2=	FEp=
Cesarean section	243	70.4	15	100.0	6.188*	0.008*
Delivery outcome						
Full term	312	90.4	15	100.0		MCp=
Pre term	21	6.1	0	0.0	χ^2= 0.277	0.772
Post term	12	3.5	0	0.0		
Delivery complications						
No	327	94.8	15	100.0	χ^2=	FEp=
Yes	**18**	**5.2**	**0**	**0.0**	0.824	1.000
Bleeding	15	4.3	0	0.0	χ^2=0.681	FEp=1.000
Prolonged labor	3	0.9	0	0.0	χ^2=0.132	FEp=1.000
Laceration	0	0.0	0	0.0	–	–

χ^2: **Chi square test** MC: **Monte Carlo** FE: **Fisher Exact** **t: Student t-test**

*: Statistically significant at $p \leq 0.05$

Table (7) denotes the **Relation between overall bonding and the study subjects Reproductive history.** It illustrates that there was no statistically significant relation between total score of bonding and their Reproductive history as: newborn gender and pregnancy complication of the study subjects as (P=0.570, P=0.233).

Table (8): Relation between overall bonding and the study subjects Newborn data

	Normal Mother bonding ≤ 58 (n=345)		Abnormal Mother bonding>58 (n=15)		χ^2	p
	No.	%	No.	%		
Newborn gender						
Male	210	60.9	9	60.0		
Female	114	33.0	6	40.0	1.124	0.570
Twins	21	6.1	0	0.0		
No of newborn						
Single	324	93.9	15	100.0	0.970	FEp =
Twines or more	21	6.1	0	0.0		1.000
Newborn weight (k.g)						
Min. – Max.	1.80 – 4.20		2.40 – 4.80		t = 1.484	0.160
Mean ± SD.	3.05±0.49		3.48±1.12			
Birth order						
First	114	33.0	15	100.0	28.028*	FEp =
Second or more	231	67.0	0	0.0		<0.001*
Condition at birth						
Not Hospitalized	312	90.4	15	100.0	1.580	FEp =
Hospitalized	33	9.6	0	0.0		0.379
Rooming of baby						
Room in	315	91.3	15	100.0	1.423	FEp =
Room out	30	8.7	0	0.0		0.624
Condition at 6 week						
Good health	327	94.8	15	100.0		
Respiratory complication	6	1.7	0	0.0	0.824	1.000
Others	12	3.5	0	0.0		
Vaccination						
Taken	339	98.3	9	60.0	65.307*	<0.001*
Not taken	6	1.7	6	40.0		
Feeding pattern						
Breast feeding	195	56.5	3	20.0		
Bottle feeding	39	11.3	0	0.0	14.805*	<0.001*
Both	111	32.2	12	80.0		
Initiation of breast feeding (n=332)						
1st 2hours	138	43.4	0	0.0	11.116*	FEp =

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>2hours	180	56.6	15	100.0		<0.001*
Reason for late breastfeeding						
No	30	8.7	0	0.0	1.423	FE p =
Yes	315	91.3	15	100.0		0.624
Reason related to mother (n = 264)*						
Cesarean section	249	72.2	15	100.0	5.692*	FE p 0.014*
Fatigue	210	84.3	15	100.0	2.757	0.138
Drugs obstacle feeding	147	59.0	15	100.0	10.013*	0.001*
Nipple problem	30	12.0	0	0.0	2.039	0.231
Reason related to new born(n = 264)*						
Refuse breast feeding	24	9.6	6	40.0	12.948*	FE p 0.003*
Respiratory problems	15	6.0	0	0.0	0.958	1.000
Cardiac problems	9	3.6	0	0.0	0.561	1.000
Cleft lip	6	2.4	0	0.0	0.370	1.000
Nasal atresia	0	0.0	0	0.0	-	-
Preterm baby	6	2.4	0	0.0	0.370	1.000
Feeding pattern						
On demand	339	98.3	15	100.0	0.265	FE p =
Schedule	6	1.7	0	0.0		1.000

χ^2: Chi square test FE: Fisher Exact t: Student t-test

*: Statistically significant at $p \leq 0.05$

Table (8) denotes the Relation between overall bonding and the study subjects Newborn data. It illustrates that there was a statistically significant relation between total score of bonding and their Newborn data as: feeding pattern and time of initiation of breast feeding of the study subjects as (P=0.001, P=0.001).

Table (9): Relation between overall bonding and the study subjects Postpartum women Social Support

	Normal Mother bonding ≤ 58 (n=345)		Abnormal Mother bonding>58 (n=15)		χ^2	p
	No.	%	No.	%		
Husbands support						
Low support	60	17.4	3	20.0		MC p
Moderate support	66	19.1	12	80.0	30.973*	<0.001*
High support	219	63.5	0	0.0		
Mean ± SD	14.04±3.64		11.20±2.01		t = 5.133*	<0.001*
Parents' support						
Low support	3	0.9	0	0.0		MC p =
Moderate support	60	18.2	3	20.0	0.671	0.776
High support	267	80.9	12	80.0		
Mean ± SD	15.66±2.22		16.0±3.21		t = 0.562	0.575
Parent(s)-in-law support						
Low support	63	19.6	0	0.0		MC p =
Moderate support	144	44.9	9	60.0	4.068	0.131
High support	114	35.5	6	40.0		
Mean ± SD	12.91±3.37		14.40±2.67		t = 1.690	0.092
Family or friends support						
Low support	126	36.5	6	40.0		MC p
Moderate support	177	51.3	0	0.0	30.953*	<0.001*
High support	42	12.2	9	60.0		
Mean ± SD	10.83±2.82		13.0±4.34		t =1.921	0.075
Level of social support						
Low support	54	15.7	3	20.0		
Moderate support	159	46.1	6	40.0	0.299	0.861
High support	132	38.3	6	40.0		
Mean ± SD	51.86±9.48		54.60±11.37		t =1.087	0.278

Table (9) denotes the Relation between overall bonding and the study subjects postpartum women Social Support received. It illustrates that there was a statistically significant relation between total score of bonding and their Social Support received from husband of the study subjects as (P=0.001).

4. DISCUSSION

A woman's transition to the role of mother is one of the most significant developmental processes in the human experience. Although most women successfully develop a healthy relationship with their infants, a minority show difficulty with the process. **(Reck,C et al. 2006).**

The mother-infant bonding **M I B** has been shown to be of the active postpartum procedures. **(Ghahremani S et al 2019).**Impaired maternal bonding can result in a higher risk of abusive parenting, poor mother-infant interaction and children's behavioral problems **(Kitamura T 2013).** However; most of the previous research has been conducted in Western countries. So, this study aims to identify factors associated with postpartum maternal-infant-bonding

The Postpartum maternal-infant-Bonding

Mother-infant bonding has attracted the attention of clinicians for several decades. The methods for the assessment of mother-infant bonding in the postnatal period vary from video observation to clinical report. In recent years, some instruments have been developed to evaluate mother-infant bonding such as postpartum bonding questionnaire **(PBQ)**. **(ÖrünE , Yalçın S, Mutlu B 2013).**

Based on **(PBQ)** assessment, the total score of postpartum maternal bonding of the present study revealed that most of study subjects had normal maternal bonding. This result is in harmony with the results of (**Abbas S I et al., 2018)** who studied factors associated with postnatally maternal infant attachment in Taif, Saudi Arabia, reported that most of the subjects were positively attached to their infants. Also, **(Rizk S, 2012)** who studied Factors associated with maternal-infant attachment one month postnatally, reported that about half of the mothers had positive attachment to their infants 1 month postnatally.

Bonding and other the maternal factors

The mother's contribution to this attachment process to her infant is affected by many factors specific to her and will determine how she will handle and respond to her infant.

There is many factors affect this bonding as maternal age; this result found that the young mothers had obstacles to confirm bonding process. On other hand, results prove that the advanced age of mother had a significant relation with normal bonding process **almost half of them**. This result are Similar with the results of three other different studies first was: **(Gulturk E, Korukcu O and Kukulu K 2018)** studied, Identifiation of Factors Affecting Mother-Infant Bonding in Advanced Maternal Age; they found that advanced age positively affected maternal bonding. Where the mother's age increases even one-age, the probability of her bonding with her infant rises.

Second: with **(Fatawati A, Rach I and Budiati T 2018).** who studied; The influence of adolescent postpartum women's psycosocial conditiom on maternal infant bonding, stated that results of adolescent mothers showed that most mother-infant bonding was poor.

Finally **(Moussa S, Osama Refaat O, Emad M, Khoweiled A, Goueli T and Ezza M2012).** studied Correlates of antenatal bonding: an Egyptian Study, showed that maternal bonding tended to be associated with older age of mothers

On other hand, this present findings contradict with the results of the study of **(Kinsey C, Roberts K, Zhu J, Kjerulff K 2014)** who concluded that the maternal bonding scores of young mother found to be higher than those of mothers in the age group 30 and above.

Also **(Ozturk R, Saruhan A 2013)** identified the mother's age as a significant variable found that advanced age was associated with low maternal bonding.

This study illustrates that there was statistically significant relation between total score of bonding and their Reproductive history of the study subjects. This finding is in agreement with the finding of **(Rizk S, 2012)** who found that positive

significant correlation between total score of attachment and their history Reproductive. Positive attachment was common among primigravida and primipara who didn‟t experience abortion before

On other hand, this present findings contradict with the results of the study of (**Abbas S I et al., 2018)** who found that the study of had no statistically significant relation between total score of attachment and their history Reproductive. Some factors, including social support, being a full-term baby, breastfeeding, pregnancy planning, and history of abortion, showed no significant effect on attachment

The present study revealed that there was no statistically significant relation between total score of bonding and pregnancy planning. Also, among reviewed researches, some studies have reported that there was a significant difference in attachment scores of mothers with wanted and unwanted pregnancy. This contradicts when mothers reported wanted pregnancy; they were more likely to obtain a higher score of attachment. **(Darvishvand M, Rahebi S , Khalesi Z. 2018).**

The present study revealed that less than one third of study subjects had normal vaginal delivery and about the three – quarters had a caesarean delivery. As expected, analysis showed a significant relationship between type of delivery and bonding process the bonding level increased in mother who gives birth with normal vaginal delivery rather than who gives birth with caesarean delivery due to fatigue and felling pain after surgery.

These findings one in line with **(Ebrahimi1 E, et al 2020)** who conducted a study titled Attachment Behaviors in Physiological Birth Versus Cesarean Section. They demonstrated that the scores of mother infant attachment in the physiologic delivery were significantly higher than those of the cesarean section.

Also, **(Cetisli N, Arkan G, ToP E 2018)** studied maternal attachment and breastfeeding behaviors according to type of delivery in the immediate postpartum period. They found Mothers who delivered their babies by cesarean section had problems related to maternal attachment and breastfeeding more often than those who delivered vaginally.

On contrary these findings are in disagreement with **(Souza L, Soler Z, Santos M and Sasaki N2017)** studied Puerperae bonding with their children and labor experiences. They said, unlike what the researchers expected, the type of current labor did not signifiantly influence any MIBS domain.

Moreover, the findings of the current study showed that there was not statistically significant relation between total score of bonding and their postpartum Minor discomfort.

These finding is in agreement with **(Souza L, Soler Z, Santos M and Sasaki N2017).** They report, pain during delivery and early postpartum did not signifiantly inflence the mother-and-child bond; however, studies have shown that if labor is diffiult and involves more pain, the mother-child relationship will change signifiantly.

As regard to social support received this result revealed that there is a significant relationship between the total score of MIB and presence of a social support. Less than of one half study subjects have moderate Social Support, more than one has high Social Support while only (15.8%) have low social support.

This result is confirmed by other studies, **(Afolabi, O, Bunce, L, Lusher J & Banbury S.**2017**)** studied Postnatal depression, maternal-infant bonding and social support: A cross-cultural comparison of Nigerian and British mothers. The study found the interaction of social support significantly predicts maternal infant bonding.

The present findings contradict with the results of the study of **(Rizk S, 2012)** who found that less than two thirds (61.1%) of the subject were socially supported.

To be more determined the present study revealed that positive relation between husband social support and higher level of bonding about two thirds of the subject received high social support from their husbands.

This finding is consistent with **(Takubo Y, Nemoto T, Obata Y, Yoko Baba, Yamaguchi T, Katagiri N, Tsujino N , Kitamura T, and Mizuno M.2019).** who conducted a study titled Effectiveness of Kangaroo Care for a Patient with Post part um Depression and Comorbid Mother-Infant Bonding Disorder. They concluded that Support from the woman's partner and social support during pregnancy and the postpartum period are significantly correlated with bonding

Bonding and the infant factors

Maternal-infant bonding is the result of a developmental sequence which occurs in both the child and the mother. For the child the development of a focused relationship with an adult is a long and continuous process with major milestones in infancy. This sensitive period has an emotional consequence on the mother's understanding of the newborn infant, enhancing bonding. **(Widstrom A, Brimdyr B , Svensson K , Cadwell K and Nissen E. 2019).**

The current results showed that there was a statistically significant relation between total score of bonding and their Newborn data as: feeding pattern and time of initiation of breast feeding

The result agreement with **(Darvishvand M, Rahebi S and Khalesi Z. 2018).** that found early contact and breastfeeding enhances MIB because it develops a close contact between the mother and her infant. On the contrary **(Hairstonb I, Handelzalts J, Inbar T and Kovo M 2019)** who studied Mother-infant bonding is not associated with feeding type: a community study sample. Who reported breastfeeding was not associated with the quality of mot her-infant bonding breastfeeding may not be a central factor in mother-infant bonding.

Maternal-infant bonding is an extremely important issue that begins in early infancy and continuous throughout the life of the baby. It is important to detect factors that will affect the maternal-infant bonding include maternal factors, infants factors and sociocultural factors.

5. CONCLUSION

Based on the findings of the present study, it could be concluded that:

Mother–infant bonding (MIB) was associated with some factors; namely maternal age, occupation, education level, residence, number of pregnancy, number of abortion, number of children, including the family income, the type of delivery, the type of feeding (breast or bottle-fed), the maturity of the baby (full term or premature), the care received by the baby (whether routine care or specific medical care), and whether the pregnancy is planned or not, The emotional condition of the mother is one of the main factors which affect bonding through prenatal period and postnatal and social factors on maternal-infant bonding

6. RECOMMENDATIONS

Based on the detections of this study, the next recommendations are suggested:

1) The issue of maternal infant bonding is recommended to be included within maternity nursing curricula at different nursing educational institutes.
2) Antenatal and postpartum maternity nurse better included within their client's assessment.
3) According to their assessment, they are advised to reinforce factors enhance maternal – infant bonding.

For further researches

- Replication of the same study in different Egyptian governorates especially rural and Upper Egypt to compare and validate the present study findings.
- Investigate barrier against achieving bonding.
- Longitudinal study to assess bonding during pregnancy, postpartum and first year of infant age.

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