"A CROSS SECTIONAL STUDY TO ASSESS THE TIME OF RESUMPTION AND PREDICTORS OF PUERPERAL MENSTRUATION AMONG POSTNATAL MOTHERS AT SELECTED RURAL AREAS OF BELAGAVI, KARNATAKA"

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ABSTRACT

BACKGROUND: Puerperal menstruation is the term used to describe the return of menstrual cycles following childbirth, which signifies that postnatal women are once again fertile. Women's menstrual resuming times vary greatly and are impacted by a number of biological and sociodemographic factors. In the absence of prompt postpartum family planning, an early return of menstruation raises the chance of unwanted pregnancies. Therefore, it is crucial to comprehend the factors that influence puerperal menstruation in order to create maternal health interventions that will improve reproductive outcomes. Numerous obstetric, reproductive, and sociodemographic factors influence this physiological occurrence. Although lactation is a major factor in postponing the onset of menstruation, there are differences based on maternal age, parity, breastfeeding habits, and personal health issues. Enhancing awareness among women during the puerperal stage, guiding family planning strategies, and improving maternal health outcomes all depend on an understanding of these impacting elements. In order to enhance evidence-based nursing care and health education, this study focuses on identifying important variables linked to the resumption or delay of menstruation among postpartum women.

METHODS: 400 Postpartum women from particular rural areas of Belagavi, Karnataka, participated in a cross-sectional descriptive study. The goal of the study was to evaluate when menstruation resumed and how it related to specific factors. Postpartum women who satisfied the inclusion requirements and were chosen using purposive sampling method. A standardised questionnaire that asked about menstrual history and demographic traits, was used to gather data. To ascertain the relationship between variables, the gathered data was examined using both inferential statistical tests and descriptive statistics like frequency and percentage. At $p < 0.05$, statistical significance was taken into consideration.

RESULTS: Young mothers (18–24 years old: 41.9%), people living below the poverty line (100%), and nuclear households (83.9%) had the highest rates of early menstrual resumption. At six weeks postpartum, 31 mothers (8%) started menstruating again, and 369 mothers(92%) showed delayed menstrual resumption. Primiparous mothers (67.7%), normal vaginal birth (100%), early return to work and resuming sexual activity (61.3%) and intrapartum factors like induction of labor (38.7%) and manual removal placenta.(45.2%) were more likely to cause early resumption. Delayed menstruation was mainly seen in mothers with inadequate spacing

(81.3%) and strong exclusive breastfeeding (97.8%).It was also associated with delayed sexual activity (71.3%), low return to work (16.5%), and frequent breastfeeding (>6 times/day). At six weeks postpartum, Age, education, occupation, family type, and household size all showed significant correlations ($p < 0.05$). Key words: Postnatal period, Resumption of menstruation, Predictors of puerperal menstruation, Breastfeeding.

CONCLUSION: The results also imply that sociodemographic factors age, education, occupation, family type, and household size. obstetrical factors like primiparous mother, induction of labour, manual removal of placenta and breastfeeding practices, and other predictors like such as sexual activity of mother and woman who been out for work, These findings support early resumption of menstruation. So the study concludes puerperal menstruation is influenced by both biological and socio-environmental factors.

KEY WORDS:

Postnatal period, Resumption of menstruation, Predictors of puerperal menstruation, Breastfeeding.

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INTRODUCTION

"Birth is about creating mothers, not just newborns." — Barbara Katz Rothman

The postpartum phase, which signifies the end of pregnancy, begins after the baby is born. During about six-week puerperium, we need to closely monitor the variations that take place in the woman's body. These conditions mainly involve the commencement of breastfeeding, endocrine changes as the placenta is removed, and the restoration of the mother's organs to roughly their pre pregnancy sizes and capabilities. Early in the puerperium, consideration should be given to contraception and the appropriate time to begin sexual activity. However, how new mothers are supposed to behave during this period may vary depending on regional cultural or religious traditions.[1]

After giving birth, a woman's puerperal stage is a crucial time in her life. The body progressively reverts to its pre-pregnancy state during this period. Despite being crucial to a woman's reproductive health, this phase frequently gets less attention than pregnancy and childbirth.[2]

From a public health standpoint, knowing when postpartum menstruation occurs is essential. Unwanted pregnancies, puerperal infections, and short birth intervals are major causes of health issues for mothers, newborns, and children, particularly in underdeveloped nations. Understanding the key hotspot locations and time of resumption will facilitate the evaluation of the varied cultural breastfeeding practices and other proximal determinants of post-partum menstruation resumption.[3]

The experiences of women with vaginal bleeding following childbirth differ greatly. Most women have moderate to heavy bleeding during the first several days after giving birth, however some may have very little blood loss. Typically, the bleeding

during this initial phase has a vivid red colour. The bleeding progressively lessens and the colour changes over the next few days and weeks. As healing advances, it may take on a cream, light pink, pinkish-red, or brownish-red hue, this process collectively called as lochia. It is important to differentiate this typical postpartum bleeding from the resumption of menstruation because it is a component of uterine involution.[4]

Delaying the return of menstruation is a major benefit of breastfeeding. Increased prolactin levels during nursing prolong the duration of postpartum amenorrhoea and prevent ovulation. Consequently, compared to non-nursing women, breastfeeding women typically have a lengthier delay in the resumption of menstruation. The early resumption of menstruation following childbirth may also be influenced by a number of other factors. Younger mother age, parity, short birth intervals, early family planning use, manual placenta removal, greater socioeconomic and educational status, and infant mortality are a few of these, according to An Adjunct research of the Japan Environment and Children's Study.[5]

Long-term nursing suppresses the generation of reproductive hormones, extending the postpartum anovulatory phase. Breastfeeding behaviours are also impacted by taboos, cultural beliefs, social norms, and socioeconomic reasons in many traditional countries. As a result, various people and socioeconomic groups may have quite variable menstruation resumption times.[6]

At ESUT Parklane, Enugu, Nigeria, A cross-sectional study was carried out between May 2015 and December 2018. To evaluate for resumption of puerperal menses and its predictors. Study revealed that One in three women started menstruating again within six weeks of giving birth. The primary predictor of early menstruation resumption was shown to be early family planning initiation, whereas manual placenta removal and exclusive nursing were beneficial variables.[2]

Although postpartum menstruation resumption is vital for reproductive health, few research have examined its timing and related characteristics among postpartum females in rural India. The resumption of menstruation may be impacted by regional variations in breastfeeding habits, cultural customs, and mother traits. In order to help plan suitable maternal health interventions and counselling techniques, the current study aims to evaluate the period of resumption and predictors of puerperal menstruation among postnatal mothers.[10]

Materials and Methods:

A quantitative, non-experimental cross-sectional study was conducted among 400 postnatal mothers in selected rural areas of Belagavi, Karnataka, including Kakati, Kinaye, and Vantamuri. The study participants were women within six weeks postpartum who had delivered a live or stillborn infant after 20 weeks of gestation and were attending Primary Health Centers for immunization services. A purposive sampling technique was used to select the participants.

Data were collected through face-to-face interviews using a structured questionnaire adapted from Eleje GU et al. (2015) and modified to suit the local context. The tool included sections on socio-demographic variables, resumption of menstruation,

obstetric history, breastfeeding practices, and infant-related factors. Content validity of the tool was established through expert review. Prior to the study, a literature review was conducted using electronic databases such as PubMed, Google Scholar, and library sources.

The collected data were coded and entered into a master sheet for analysis. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize the data, while inferential statistics including Chi-square test and Fisher's exact test were applied to determine associations between variables. Statistical significance was considered at $p < 0.05$. Inclusion criteria included postpartum women within six weeks of delivery who met the study requirements, while women with HIV, uterine rupture, peripartum hysterectomy, psychological disorders, or those unwilling to participate were excluded from the study.

RESULTS AND DISCUSSION:

Results are explained in following sections

Section 1: Distribution of postnatal mothers by Socio-Demographic Variables

Table 1 **n=400**

		MENSES GROUP		NON MENSES GROUP	
		n	%	n	%
Age	18-24	13	41.9	96	26.0
	25-29	11	35.5	108	29.3
	30-34	0	.0	80	21.7
	>=35	7	22.6	85	23.0
RELIGION	Hindu	24	77.4	246	66.7
	Muslim	7	22.6	83	22.5
	Christian	0	.0	30	8.1

	Other	0	.0	10	2.7
EDUCATION	No schooling	7	22.6	23	6.2
	Primary	0	.0	0	.0
	Secondary	12	38.7	108	29.3
	Higher secondary	12	38.7	188	50.9
	Graduate	0	.0	50	13.6
OCCUPATION	Housewife	24	77.4	286	77.5
	Labor	0	.0	20	5.4
	Service	0	.0	60	16.3
	Business	7	22.6	3	.8
	Other	0	.0	0	.0
SOCIOECONOMIC STATUS	yes/ below poverty line	31	100.0	329	89.2
	No/ above poverty line	0	.0	40	10.8
FAMILY TYPE	Nuclear	26	83.9	241	65.3
	Joint	5	16.1	128	34.7
HOUSEHOLD SIZE	3 people	5	16.1	22	6.0
	4 people	11	35.5	44	11.9
	5 people	10	32.3	95	25.7
	6 people	5	16.1	75	20.3
	7 people	0	.0	75	20.3
	8 people	0	.0	39	10.6
	9 people	0	.0	19	5.1

Table 1 shows the distribution of postpartum mothers based on sociodemographic factors in the menses and non-menses groups. Early resumption of menstruation (8%) was more common among younger mothers aged 18–24 years (41.9%), those belonging to Hindu religion (77.4%), with lower educational status, and from below poverty line families (100%). Most mothers in the menses group were housewives (77.4%) and lived in nuclear families (83.9%). In contrast, the non-menses group (92%) had a more even age distribution, higher educational levels, and

slightly better socioeconomic status, with a majority also being housewives but with more diversity in occupation. Overall, early menstruation resumption was more prevalent among younger, less educated, economically weaker mothers from nuclear families, while delayed resumption was associated with higher education and comparatively stable socioeconomic conditions.

The study showed that younger, less educated, and socioeconomically weaker mothers were more likely to resume menstruation early, similar to findings by Nath et al. (1993).

Section 2: Distribution of participants by resumption of menstruation

Table 2 **n=400**

		MENSES GROUP		NON MENSES GROUP	
		n	%	n	%
Has menstrual bleeding returned since delivery?	Yes	31	100	00	00
	No	00	00	369	100
Time from delivery to resumption (weeks)	6	31	100.0	0	.0
	menses not resumed	0	.0	369	100.0
was bleeding confirmed as menstruation or Lochia	Yes	31	100.0	0	.0
	No	0	.0	0	.0
	menses not resumed	0	.0	369	100.0
Bleeding Pattern	Regular as before	26	83.9	0	.0
	Irregular	5	16.1	0	.0
	Spotting only	0	.0	0	.0
	menses not resumed	0	.0	369	100.0
Bleeding Volume	Less	5	16.1	0	.0
	Same	0	.0	0	.0
	More	26	83.9	0	.0

	menses not resumed	0	.0	369	100.0
Duration of bleeding	<5 days	5	16.1	0	.0
	>5 days	26	83.9	0	.0
	menses not resumed	0	.0	369	100.0

The features of menstrual resumption in postpartum women are detailed in Table 2. In contrast to none of the mothers in the non-menses group, all mothers in the menses group (8%) indicated that their periods had resumed. All mothers experienced menstruation at six weeks postpartum, indicating an early return, and the time of resumption was consistent. In every instance, the blood was verified to be menstrual. While 16.1% of women had irregular cycles, the majority (83.9%) reported regular bleeding patterns similar to those before to pregnancy. Regarding bleeding volume, 16.1% reported less bleeding, whereas the majority (83.9%) reported higher bleeding than previously. In terms of duration, the majority of mothers (83.9%) reported bleeding that lasted longer than five days, indicating that early postpartum menstruation was typically heavier and lasted longer.

Similar findings by Godfrey U. Eleje et al. (2020) reported early resumption of menstruation influenced by factors like age, parity, and breastfeeding.[2] However, the present study contrasts with Huffman et al. (1998), highlighting that strong breastfeeding practices are associated with delayed postpartum menstruation.[9]

Section 3: Distribution of participants by potential predictor variables

Table 3
n=400

		MENSES GROUP		NON MENSES GROUP	
		n	%	n	%
OBSTETRIC AND REPRODUCTIVE HISTORY					
Gravida (number)	First pregnancy	21	67.7	69	18.7
	Second pregnancy	5	16.1	125	33.9
	Third pregnancy	5	16.1	145	39.3
	Fourth pregnancy or more	0	.0	30	8.1

Para (number of births more than equal 20 weeks)	First delivery	21	67.7	69	18.7
	Second delivery	5	16.1	155	42.0
	Third delivery	5	16.1	135	36.6
	Fourth delivery or more	0	.0	10	2.7
Number of living children	One child	26	83.9	74	20.1
	2 children	0	.0	150	40.7
	3 children	5	16.1	135	36.6
	4 children or more	0	.0	10	2.7
History of abortion	No history	31	100.0	329	89.2
	Once	0	.0	30	8.1
	2 times or more	0	.0	10	2.7
Complications during pregnancy	Yes	0	.0	0	.0
	No	19	61.3	291	78.9
	Preeclampsia/eclampsia	0	.0	0	.0
	Gestational diabetes	7	22.6	43	11.7
	APH	0	.0	10	2.7
	Gestational hypertension	5	16.1	15	4.1
	Anaemia	0	.0	10	2.7
Iron and folic acid uptake during pregnancy	Yes	31	100.0	369	100.0
	No	0	.0	0	.0
Blood transfusion required	Yes	0	.0	0	.0
	No	31	100.0	369	100.0
Gestational age at delivery	Preterm	5	16.1	125	33.9
	Term	26	83.9	244	66.1
	Post term	0	.0	0	.0
Mode of delivery for last birth	Normal Vaginal	31	100.0	279	75.6
	Assisted delivery	0	.0	0	.0
	LSCS	0	.0	90	24.4

Intrapartum factors	induction of labour	12	38.7	18	4.9
	Manual removal of placenta	14	45.2	36	9.8
	Episiotomy	0	.0	60	16.3
	None	5	16.1	255	69.1
Postpartum complications	No	29	93.5	363	98.4
	Postpartum haemorrhage	0	.0	1	.3
	Severe infection	2	6.5	4	1.1
	Perineal tear	0	.0	1	.3
Pregnancy spacing since last delivery	Yes	21	67.7	69	18.7
	No	10	32.3	300	81.3
INFANT AND BREASTFEEDING PRACTICES					
Infant outcome	Alive	26	83.9	365	98.9
	Stillbirth	5	16.1	4	1.1
Infant age (weeks) at interview	Infant not alive	5	16.1	0	.0
	6^{th} week	19	61.3	226	61.2
	7^{th} week	7	22.6	143	38.8
Weight of the baby	Infant not alive	5	16.1	0	.0
	<2.5 Kg	0	.0	150	40.7
	>=2.5 Kg	26	83.9	219	59.3
Currently breastfeeding	Infant not alive	5	16.1	0	.0
	Yes	26	83.9	369	100.0
	No	0	.0	0	.0
Type of feeding	Infant not alive	5	16.1	0	.0
	Exclusive breastfeeding (EBF)	23	74.2	361	97.8
	Predominant breastfeeding	1	.03	3	.08
	Mixed feeding	1	.03	3	.08
	Formula feeding only	1	.03	2	.05

Frequency of breastfeeding 24 hrs (approx.)	Infant not alive	5	16.1	0	.0
	<6 times	0	.0	1	.3
	6-8 times	26	83.9	218	59.1
	>8 times	0	.0	150	40.7
Supplementary feeding started (age in weeks)	Infant not alive	5	16.1	0	.0
	Yes	0	.0	1	.3
	No	26	83.9	368	99.7
Use of pacifier / bottle	Infant not alive	5	16.1	0	.0
	Yes	0	.0	1	.3
	No	26	83.9	368	99.7
ASSOCIATED PREDICTOR FACTORS					
Exclusive breastfeeding since delivery	Infant not alive	5	16.1	0	.0
	Yes	23	74.2	361	97.8
	No	3	9.7	8	2.2
Demand feeds only (including day and night)	Infant not alive	5	16.1	0	.0
	Yes	22	71.0	231	62.6
	No	4	12.9	138	37.4
Return of sexual activity since delivery	Yes	19	61.3	106	28.7
	No	12	38.7	263	71.3
Smoking/tobacco use (current)	Yes	0	.0	0	.0
	No	31	100.0	369	100.0
Alcohol (current)	No	31	100.0	369	100.0
	Yes	0	.0	0	.0
Maternal BMI (weight kg / height m) at interview calculated	Underweight	5	16.1	4	1.1
	Normal	5	16.1	217	58.8
	Overweight/obese	21	67.7	148	40.1
	Yes	0	.0	50	13.6
	No	31	100.0	319	86.4

Anaemia status postpartum (Hb <11 g/dL)	Unknown	0	.0	0	.0
Return to work outside home	Yes	19	61.3	61	16.5
	No	12	38.7	308	83.5
Knowledge about lactational amenorrhea method (LAM)	Yes	19	61.3	171	46.3
	No	12	38.7	198	53.7

Table:3 The results show that primigravida women with single parity and one live child (83.9%) and appropriate pregnancy spacing (67.7%) were more likely to experience early menstrual resumption. Notable contributing factors included term births (83.9%), normal vaginal delivery (100%), and intrapartum procedures such manual placenta removal (45.2%) and labour induction (38.7%). Furthermore, there was no history of abortion (100%) and gestational disorders such as diabetes (22.6%) and hypertension (16.1%). Mothers who breastfed 6–8 times a day (83.9%) and had kids weighing ≥2.5 kg (83.9%) had early menstrual returns. Additionally, related predictors like demand feeding (71%), early return of sexual activity (61.3%), overweight status (67.7%), absence of postpartum anaemia (100%), lack of exclusive breastfeeding (9.7%), and knowledge of lactational amenorrhoea method (61.3%) all point to a combination of biological, behavioural, and lifestyle factors that contribute to early menstrual resumption.

On the other hand, multiparous women, especially those with two (40.7%), inadequate pregnancy spacing (81.3%), a larger percentage of mothers had caesarean sections (24.4%) were more likely to experience delayed menstrual resumption. A significant protective factor was strong adherence to exclusive breastfeeding (97.8%) and frequent feeding (>8 times/day: 40.7% and 6–8 times/day: 59.1%). Furthermore, this group was more likely to have normal BMI (58.8%), postpartum anaemia (13.6%), a delayed return to sexual activity (71.3%), and a reduced return to work (16.5%). Long-term postpartum amenorrhoea was largely caused by extended exclusive breastfeeding and decreased exposure to physiological and lifestyle variables.

The findings are consistent with Eleje et al. (2020), showing that exclusive breastfeeding and factors like parity and obstetric history influence early resumption of menstruation.[2] However, the results contrast with Vekemans (1997), which reported that strict exclusive breastfeeding can effectively delay ovulation and menstruation.[8]

Section 4: Association between the time of resumption of menses among postnatal mothers with selected demographic variables

Table 4: **n=400**

Time from delivery to resumption (weeks)		6th week		Non menses group		Chi-square (Sig.)
		n	%	n	%	
Age	18-24	13	41.9	96	26.0	9.754 (.021) *
	25-29	11	35.5	108	29.3	
	30-34	0	0.0	80	21.7	
	>=35	7	22.6	85	23.0	
Religion	Hindu	24	77.4	246	66.7	2.973 (0.361)
	Muslim	7	22.6	83	22.5	
	Christian	0	0.0	30	8.1	
	Other	0	0.0	10	2.7	
Education	No schooling	7	22.6	23	6.2	14.540 (0.001) *
	Primary	0	0.0	0	0.0	
	Secondary	12	38.7	108	29.3	
	Higher secondary	12	38.7	188	50.9	
	Graduate	0	0.0	50	13.6	
Occupation	Housewife	24	77.4	286	77.5	32.629 (<0.05) *
	Labour	0	0.0	20	5.4	
	Service	0	0.0	60	16.3	
	Business	7	22.6	3	.8	
	Other	0	0.0	0	0.0	
Socioeconomic status	yes/ below poverty line	31	100.0	329	89.2	3.743 (0.058)
	No/ above	0	0.0	40	10.8	

	poverty line					
Family type	Nuclear	26	83.9	241	65.3	4.438 (0.035) *
	Joint	5	16.1	128	34.7	
Household size	3.00	5	16.1	22	6.0	26.838 (<0.05) *
	4.00	11	35.5	44	11.9	
	5.00	10	32.3	95	25.7	
	6.00	5	16.1	75	20.3	
	7.00	0	0.0	75	20.3	
	8.00	0	0.0	39	10.6	
	9.00	0	0.0	19	5.1	

*<0.05 significance is obtained by fisher exact test

Using the chi-square test, Table 4 illustrates the relationship between the resumption of menstruation at six weeks postpartum and a few sociodemographic factors. Age was found to have a statistically significant relationship ($\chi^2 = 9.754$, $p = 0.021$), with younger mothers (18–24 years old: 41.9%) having a greater early resuming. Education was extremely significant ($\chi^2 = 14.540$, $p = 0.001$), suggesting that mothers who had less education were more likely to start menstruating again sooner. Additionally, there was a significant correlation between occupation and the percentage of working moms in the menses group ($\chi^2 = 32.629$, $p < 0.05$). Significant correlations were found with household size ($\chi^2 = 26.838$, $p < 0.05$) and family type ($\chi^2 = 4.438$, $p = 0.035$), indicating that nuclear families and smaller households are associated with an earlier menstrual return. However, religion ($\chi^2 = 2.973$, $p = 0.361$) and socioeconomic status ($\chi^2 = 3.743$, $p = 0.058$) were not significantly associated, although a slight trend was noted with socioeconomic status.

Similar study found a significant association between menstruation resumption and factors like age, education, occupation, and family characteristics, supported by Belay and Asratie (2022).[3] However, it contrasts with Bongaarts' findings, where higher socioeconomic status was linked to earlier resumption, highlighting variations in influencing factors.[10]

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