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Effect of Interpregnancy Interval on Pregnancy Outcome Among Pregnant Women Attending Delivery At Belqas hospital

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Abstract:
Background: *Short interpregnancy intervals have an adverse effect on maternal and neonatal outcome.*
The aim of this study *was to explore the effects of interpregnancy interval on maternal health during labor and immediate postpartum period as well as neonatal outcome.*
Method: *a correlation design was adopted. The current study was conducted on 200 woman divided into four groups each group consists of 50 woman. Four tools were used to collect data; Structure Interviewing Schedule, delivery data, Postpartum Assessment Sheets and Neonatal Assessment Sheet.*
Results: *the present studyfindings revealed that, short IPI was a risk factor for preterm labor, premature rupture of membrane, abnormal presentation (breech) (P<0.0001), prolonged and obstructed labor (P=0.0008, & P=0.006) respectively, and postpartum hemorrhage related to atonic uterus (p= 0.018). Short IPI increased the baby risk to develop low birth weight, abnormal length, head and chest circumference, and had low scores in Ballard and Apgar score.*
Conclusion: *short IPI is associated with adverse effects on pregnancy outcome for women and neonate.*
Recommendation: *awareness programs are needed to raise women's' level of knowledge regarding the adverse effects of short interpregnancy intervals and identify the appropriate interpregnancy interval.*
Keywords: *Interpregnancy interval, pregnant woman, pregnancy outcome, short interpregnancy interval.*

I. Introduction

Interpregnancy interval period (IPI) is the period between the delivery of live birth and another conception. Short interpregnancy interval is estimated to be from less than 6 to less than 27 months **(DaVanzo,Hale, Razzaque, 2008)**. Pregnancy should be delayed for at least 24 months, but not longer than 59 months. After abortion or miscarriage, pregnancyshould be delayed for at least six months **(Ricci, & Kyle, 2009)**.

Short interpregnancy intervals are associated with multiple health and nutrition effects on both mother and child, several studies found that, short and long intervals between pregnancies are associated with an increased risk of several adverse pregnancy outcomes such as preterm delivery, small for gestational age, maternal anemia and rupture of uterus. However, most of researches in this area has focused on prenatal outcomes while, the effect of birth spacing on maternal health and mortality has received less attention**(Conde-Agudelo, Rosas-Bermudez, Castaño, & Norton, 2012)**.

Interpregnancy interval shorter than six months after a live birth may be a leading cause of induced abortion, miscarriage, and still birth, because the uterus needs time to recover after a previous pregnancy. Short interpregnancy intervals have been linked to increase the risk for preterm birth, low birth weight, small gestational age (SGA), dystocia and maternal morbidity and mortality. Early neonatal death, which attributes to most perinatal death, is caused by preterm birth and low birth weight. Stillbirth accounts to be 74.0% of all perinatal deaths **(Marge et al., 2010)**.

1.1. Operational Definition:

Interpregnancy interval (IPI) considered **very short** if the span of time between a live birth and the start of a next pregnancy was less than six months,**short** if the span of time between a live birth and the start of a next pregnancy was less than one year and **moderate** if the span of time between a live birth and the start of a next pregnancy was more than or equal to one year, but not exceed two years.

1.2. Significance of the Study:

World Health Organization (2013) reported that, in Egypt, 3.5% of women dierelated to the complications of pregnancy and childbirth.In 2013, about 860 women die from complications during pregnancy and childbirth.Neonatal mortality in Egypt is estimated to be 22.749 neonates**(World Health Organization, 2012)**.Short interpregnancy interval is associated with more adverse pregnancy outcome; it is a known risk factor for preterm birth **(DeFranco, Ehrlich, & Muglia, 2014)**.Information about how the short IPIs negatively affects maternal and neonatal outcome can help medical practitioners as well as the nurse and midwife are better tailor the advice they give to women about how long they should wait after one pregnancy before trying to become pregnant again. So, this study was conducted to identify the complication of short IPI on mother and baby.

1.3. Aim of the Study:

The aim of this study was to explore the effects of interpregnancy interval on maternal health during labour and immediate postpartum period as well as neonatal outcome.

1.4. Research Questions:

1. What is the personal profile of pregnant woman who has short/ moderate interpregnancy interval?
2. What are the causes of short pregnancy interval?
3. What is the adverse effect of interpregnancy interval on maternal health during labor?
4. What is the adverse effect of interpregnancy interval on maternal health during immediate postpartum period?
5. What is the effect of interpregnancy interval on neonatal outcome?

II. Material And Method

1.4. **Research Design:** A correlational design was adopted in the present study.

1.5. **Setting:** The present study was conducted at delivery unit affiliated to Belqas Hospital.

1.6. Study Sampling:

A purposive sample of 200 pregnant women was divided into four groups according to their interpregnancy interval; the first group consists of 50 pregnant women with IPI less than six months, the second group consists of 50 pregnant women with IPI from six months to less than12 months, the third group consists of50 pregnant women from 12 months to less than 18 months and the fourth group consists of 50 pregnant women from 18 month to 24 months.

1.7. Inclusion Criteria:

- Pregnant women who not exceeding para two.
- Age above 20 years and under 35 years.
- Outcome of previous pregnancy was live baby not abortion.
- Free from obstetrical problems and previous adverse outcome.
- Willing to participate in the study.

1.8. **Tool of Data Collection:** Four tools were used to collect the necessary data.

1.8.1. Tool (I): Structure Interviewing Questionnaire:

It was developed by the researcher to collect the needed data. It was included two parts:First part deals with personal data such as; age, education, occupation, residence; while, the second part concerns with obstetrical history such as; gravidity, parity and data about causes of short IPI.

1.8.2. Tool (II): Delivery Data Sheet(partograph):

It was standardized design don by world health organizatio to collect the necessary data about maternal condition during labor such as; cervical dilatation per hour; duration of stages of labor, maternal complications and gestational age.

1.8.3. Tool (III): Postpartum Assessment Sheet: It was developed by the researcher to collect the necessary data about postpartumconditions such as;postpartum blood loss, tone of uterus and breast feeding.

1.8.4. Tool (IV): Neonatal Assessment Sheet: It was consisted of three parts:

First part: it was included the neonatal weight, length, head and chest circumference immediately after birth. **Second part** (APGAR Score): it was developed by **Apgar(1952)**. The Apgar scale was determined by evaluating the newborn on five simple criteria on a scale from zero to two, then summing up the five values thus obtained. The resulting of Apgar score ranges from zero to 10. The five criteria are the appearance, pulse, grimace, activity and respiration. From each column in the table, the infant is given a score of zero, one or two, 0-3 indicates that the newborn condition is bad and need resuscitation, 4-6 indicates that the newborn condition is moderate and scoring 7-10 indicates that the newborn condition is good.
Finally, (Ballard Score): it was developed by **Ballard (1979)**. It assigns a score to various criteria; these criteria are divided into physical and neurological criteria. This scoring allows for the estimation of age in the range of 26 weeks-44 weeks. The New Ballard Score is an extension of the above to include extremely pre-term babies i.e. up to 20 weeks. The scoring relies on the intra-uterine changes that the fetus undergoes during its maturation. Whereas the neurological criteria depend mainly upon muscle tone, the physical ones rely on anatomical changes. The neonate (less than 37 weeks of age) is in a state of physiological hypotonic. This tone increases throughout the fetal growth period, meaning a more premature baby would have lesser muscle tone.

1.8.5. Content Validity and reliability:
Tool were submitted to a panel of five experts in the field of maternity nursing and obstetric medicine to test the content validity. Modification was carried out according to the panel judgment on clarity of sentences and appropriateness of content. A pilot study was carried out on 10.0% of the total sample to check clarity of items, determine the feasibility of the study and estimate the time of data collection and then modifications were made according to pilot study results. Sample included in the pilot was excluded from the study.

1.9. Field of Work:
Only one interviewer (the researcher) was responsible for collecting the data during the whole period of the study, which starts from the beginning of July, 2013 to the end of January, 2014.The researcher was attended to the previous mentioned hospital three times per week.

the researcher was introduced herself to each pregnant woman to give her trust, then all eligible women in labour with SIPI and OIPI were selected purposively basing on their age between 20 and 35 years old. All women with SIPI and OIPI who met the inclusion criteria and gave consent to participate were recruited into the study.Once the eligibility has been established; after explaining the study objectives and assuring the confidentiality, oral consent was obtained from each participant. Information about socio-demographic characteristics and obstetrical history was collected by interviewing questionnaire.

Grips procedure was done to know the presenting part, assess contraction (duration, severity) and PV examination to determine the duration of stage and cervical dilatation. If the mode of delivery was vaginal, while cesarean delivery, the causes of CS were identified.

Maternal complications during labor was observed, then postpartum blood loose were obtained from six hour to eight hour after delivery by observing the pads. Uterine contraction and funds level was assessed. The quality of breast feeding was observed.

Also, fetal outcomes including Apgar score at the 1^{st} and 5^{th} minutes. Newborn weight, length, head circumference and chest circumference were measured for newborn. Ballard score was done in the first two hours of birth for each newborn in the study.

1.10. Ethical Considerations:
This study was conducted under the approval of Port Said University. Permission was also obtained from the administrators of Belqas Hospital. Participants were given explanations about the purpose of the study, and they were also informed that they could withdraw from the study at any time before the completion of the study. Participants who agreed to complete in this study were asked to give an oral consent. Confidentiality of participants' information was assured and the data were accessed only by the investigators involved in the study.

1.11. Data Analysis:
Collected data were coded and tabulated using personal computer, then statistical package for social science (SPSS) version 20 was usedto analyse these data. ANOVA test was used to compare quantitative variables between groups as well as chi-square to compare qualitative variables .Significance level was considered at p value>0.5.

III. Results

Table (1): shows that, the mean age of pregnant women was (27.3±4.7, 26.2±3.2, 26.3±4.2, & 27.7±4.4) respectively for Group1, Group2, Group3 and Group4. Regarding education, secondary and university education among the four groups had the higher frequency. The majority of pregnant women were housewives. As regards to residence, more than half of pregnant womenwere live in rural areas. There were no statistically significance differences between groups regarding general characteristics.

Table (2):illustrates that, 42.0% of pregnant women in Group1, 48% in Group2, 56% of Group3 and 62% in Group4 were gravida two. Nearly one third (32.0% & 30.0%) of pregnant women in Group1and Group2 respectively were gravida three, compared to 26.0% and 18.0% of pregnant women in Group3 and Group4. While, 26.0%, 22.0%, 20.0%& 18.0% of pregnant women in Group1, Group2, Group3 and Group4 respectively were gravida four. There were no statistically significant differences between groups.

Table (3): manifests that, more than one third (38.0%) of pregnant women in Group1 was not used contraception methods, and 26.0% of them failed contraception methods. Also, more than one third (36.0%) of pregnant women in Group2 respond to husband desire and 28.0% of them were failed contraception. There were statistically significant differences ($X2=53.87$, $p>0.001$).

Table (4):it was noticed that, women with SIPI are more liable to have preterm neonates less than 37 weeks gestational age with a statistically significance ($X2=53.15$, $p<0.001$)& ($F=18.922$, $p<0.001$).

Table (5):illustrates that, SIPIwas a risk factor for prolonged labour, obstructed labour, preterm labour, premature rupture of membrane and bleeding with a statistically significance at ($p= 0.001$, $p= 0.006$. $p= 0.0001$, $p= 0.0001$, & 0.05) respectively.

Table (6):suggests that, women in group 1 and group 2 had a higher rate of maternal and fetal distress (30.0% & 14.0%) & (34.0% & 32.0%) compared with group 3 and group 4 ($p= 0.0001$).

Table (7): shows the maternal outcome during postpartum period, it was noticed that, short IPI was a causative factor for post-partum bleeding due to atonic uterus ($p= 0.018$ & $p= 0.029$).

Table (8):it was concluded that, short IPI had a negative effect on neonates such as low birth weight, abnormal length and abnormal head and abdomen circumference.

Table (9): shows that, neonates with short IPI are more risky to need resuscitation after birth ($p= 0.001$).

Table (10): clarifies Ballard score for neonates, it was noticed that short IPI may lead to small for gestational age ($p= 0.001$).

Table (1): Distribution of the Pregnant Women According to their Personal Data

Demographic Characteristics	Very short IPI <6 m (n=50)		Short IPI 6-<12 m (n=50)		Modret IPI 12-<18m (n=50)		Optimal IPI 18-24m (n=50)		X^2	P – value
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Age (year)										
>20-	25	50.0	23	46.0	30	60.0	35	70.0		
26-30	12	24.0	13	26.0	12	24.0	12	24.0		
< 35	13	26.0	14	28.0	8	16.0	6	12.0		
Mean±SD	27.3±4.7		26.3±4.2		27.3±4.7		26.2±3.2		F=1.025	0.383
Education										
Can't read &write	4	8.0	6	12.0	9	18.0	8	16.0		
Primary school	6	12.0	8	16.0	8	16.0	4	8.0	8.744	0.725
Preparatory school	10	20.0	11	22.0	11	22.0	7	14.0		
Secondary school	12	24.0	14	28.0	12	24.0	15	30.0		
University	18	36.0	11	22.0	10	20.0	16	32.0		
Occupation										
Employee	2	4.0	4	8.0	2	4.0	5	10.0	2.221	0.528
Housewife	48	96.0	46	92.0	48	96.0	45	90.0		
Residence										
Urban	21	42.0	12	24.0	16	32.0	18	30.0		
Rural	29	58.0	38	76.0	34	68.0	32	64.0	3.838	0.279
Income										
Enough	6	12.0	8	16.0	4	8.0	6	12.0	1.515	0.679
Not enough	44	88.0	42	84.0	46	92.0	44	88.0		

Table (2): Distribution of the Pregnant Women According to Gravidity and Parity

Variable	Very short <6 m (n=50)		short 6-<12 m (n=50)		Modret IPI 12-<18m (n=50)		Optimal IPI 18-24m (n=50)		X^2	P-value
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Gravidity										
Gravida two	21	42.0	24	48.0	28	56.0	31	62.0	4.762	0.575
Gravida Three	16	32.0	15	30.0	12	24.0	10	20.0		
Gravida four	13	26.0	11	22.0	10	20.0	9	18.0		
Parity										
Para One	28	56.0	31	62.0	38	76.0	41	82.0	10.19	0.017*
Para Two	22	44.0	19	38.0	12	24.0	9	18.0		

Table (3): Causes of Short Interpregnancy Interval among Pregnant Women.

Cause	Very short <6 m (n=50)		Short IPI 6-<12 m (n=50)		X^2	p-value
	Freq.	%	Freq.	%		
Husband desire	9	18.0	18	36.0	53.87	<0.001*
Didn't use contraception methods	19	38.0	7	14.0		
Failed contraception methods	13	26.0	11	22.0		
Seeking male child	9	18.0	14	28.0		

Table (4): Distribution of the Pregnant Women According to GestationalAge

Gestational age	Very short IPI <6 m (n=50)		Short IPI 6-<12 m (n=50)		Modret IPI 12-<18m (n=50)		Optimal IPI 18-24m (n=50)		Sig.	p-value
	Freq.	%	Freq	%	Freq.	%	Freq	%		
Labor Classification **Full Term** (37 - 40weeks'gestation)	21	42.0	35	70.0	47	94.0	50	100	F=53.15	<0.001**
Mean±SD	37.9±1.9		37.9±2.3		7.9±2.3		37.9±2.3			
Early Preterm Labor(28-32 weeks gestation)	4	8.0	0.0	0.0	0.0	0.0	0	0.0	F=18.922	<0.0001*
Late Preterm Labor (33-36weeks gestation)	25	50	15	30.0	3	6.0				
Mean±SD	35.2±1.7		35.9±1.0		36.8±1.1		0	0.0		

Table (5): Distribution of Pregnant Women in the Groups According to Maternal complications during Labor

Variable	Very short IPI <6 m		Short IPI 6-<12 m		Modret IPI 12-<18m		Optimal IPI 18-24m		Significance
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Prolonged labor	(n=20)		(n=22)		(n=23)		(n=22)		
Yes	8	40.0	8	12.0	5	21.7	1	4.5	X^2= 16.57 P=0.0008*
No	12	60.0	14	88.0	18	78.3	21	95.5	
Obstructed labor	(n=20)		(n=22)		(n=23)		(n=22)		
Yes	8	26.0	4	20.0	3	18.0	0	0.0	X^2=12.14 P=0.006*
No	12	74.0	18	80.0	20	82.0	22	100.0	
Preterm labor									
Yes	29	58.0	15	30.0	3	6.0	0	0.0	X^2=58.391 P<0.0001*
No	21	42.0	35	70.0	47	94.0	50	100.0	
PROM									
Yes	33	66.0	20	40.0	8	16.0	1	2.0	X^2=55.446 P<0.0001*
No	17	34.0	30	60.0	42	84.0	49	98.0	
Bleeding									
Yes	5	10.0	3	6.0	1	2.0	0	0.0	X^2= 13.53 p< 0.05*
No	45	90.0	47	94.0	49	98.0	50	100.0	

Table (6): Distribution of Pregnant Women in the Groups According to Maternal and Fetal Distress during Labor.

Variable	Very short IPI <6 m (n=50)		Short IPI 6-<12 m (n=50)		Modret IPI 12-<18m (n=50)		Optimal IPI 18-24m (n=50)		Significance
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Maternal distress									
Yes	15	30.0	7	14.0	6	12.0	3	6.0	X^2=94.282 P<0.0001*
No	35	70.0	43	86.0	44	88.0	47	94.0	
Fetal distress									
Yes	17	34.0	16	32.0	6	12.0	3	6.0	X^2=17.963 P<0.0001*
No	33	66.0	34	68.0	44	88.0	47	94.0	

Table (7): Distribution of Pregnant Women in Groups according to their Maternal Health during Immediate Postpartum

Variable	Inter-pregnancy interval								X^2	p-value
	Very short IPI <6 m (n=50)		Short IPI 6-<12 m (n=50)		Modret IPI 12-<18m (n=50)		Optimal IPI 18-24m (n=50)			
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Postpartum blood loss										
Moderate =500cc	28	56.0	33	66.0	40	80.0	43	86.0		
Severe >500cc	20	40.0	15	30.0	10	20.0	7	14.0		
Small < 500cc	2	4.0	2	4.0	0	0.0	0	0.0	15.37	0.018*
Tone of uterus										
Contracted	34	68.0	38	76.0	40	80.0	46	92.0		
Lax	16	32.0	12	24.0	10	20.0	4	8.0	9.042	0.029*
Feeding pattern										
Breastfeeding	24	48.0	28	56.0	34	68.0	40	80.0		
Artificial	26	52.0	22	44.0	16	32.0	10	20.0	12.61	0.006*

Table (8): Distribution of Neonatal Measurements in the Study Four Groups

variables	Very shortIPI <6 m (n=50)		Short IPI 6-<12 m (n=50)		Modret IPI 12-<18m (n=50)		Optimal IPI 18-24m (n=50)		Sig.	p-value
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Birth weight/Kg										
Low birth weight	37	74.0	31	62.0	26	52.0	20	40.0		
Normal Birth weight	13	26.0	19	38.0	24	48.0	30	60.0		
Mean±SD	2.2±0.9		2.2±1.2		2.6±0.9		2.7±0.3		F=4.39	0.005*
Length (cm)										
Normal	16	32.0	29	58.0	32	64.0	35	70.0	17.05	0.0007*

Abnormal	34	68.0	21	42.0	18	36.0	15	30.0		
Head circumference										
Normal	18	36.0	19	38.0	29	58.0	31	62.0		
Abnormal	32	64.0	31	62.0	21	42.0	19	38.0	10.79	0.019*
Chest circumference(cm)										
Normal	13	26.0	19	38.0	29	58.0	31	62.0		
Abnormal	37	74.0	31	62.0	21	42.0	19	38.0	17.39	0.0006*

Table (9): Apgar score among Pregnant Women in the Study Four Groups

Apgar Score	**Very short IPI <6 m (n=50)**		**Short IPI 6-<12 m (n=50)**		**Modret IPI 12-<18m (n=50)**		**Optimal IPI 18-24m (n=50)**		**X^2**	**P Value**
	Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**		
At 1st minute 7-10	8	16.0	15	30.0	27	54.0	38	76.0		
4-6	20	40.0	25	50.0	19	38.0	10	20.0		
0-3	22	44.0	10	20.0	4	8.0	2	4.0	50.97	<0.001**
Mean±SD	5.2±1.9		6.5±1.8		5.9±1.9		6.8±1.9			
At 5th minutes 7-10	14	28.0	19	38.0	30	60.0	42	84.0		
4-6	25	50.0	27	54.0	18	36.0	7	14.0		
0-3	11	22.0	4	8.0	2	4.0	1	2.0		
Mean±SD	6.9±2.3		8.4±2.1		8.6±1.9		8.6±1.9		52.10	<0.001**

Table (10): Ballard score among Neonates in the Study Four Groups

Pallard score	**Very short IPI <6 m (n=50)**		**Short IPI 6-<12 m (n=50)**		**Modret IPI 12-<18m (n=50)**		**Optimal IPI 18-24m (n=50)**		**Sig.**	**p-value**
	Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**		
SGA: (< 37 weeks' gestation) (-10-30) total score	29	58	15	30	3	6.0	0	0.0		
Mean±SD	35.2±1.7		35.9±1.0		36.8±1.1		36.8±1.1		53.15	<0.001**
AGA: (37 – 42 weeks gestation) (>30-45) total score	21	42	35	70	47	94.0	50	100		
Mean±SD	37.9±1.9		37.9±2.3		37.9±2.3		37.9±2.3		0.0	1.0
LGA: (>42weeks gestation) (46-50) total score	0	0.0	0	0.0	0	0.0	0	0.0		

IV. Discussion

The current study was aimed to explore the effects of inter-pregnancy interval on maternal health during labour and immediate postpartum period as well as neonatal outcome, this aim was achieved by the current study results and the research questions was answered also.

As results yielded by the current study, short IPI is a causal risk factor for early and late preterm birth. These findings were supported by **Eleanor, Siladitya, and Norman (2010)**,who were found that, pregnant women with an interpregnancy interval of less than six months were more likely to have preterm delivery (before 36 weeks). The present study findings were in disagreement with **Love,Smith, and Bhattacharya (2010)**, who did not found an associated between short IPI preterm deliveries. On the other hand, **Abdel-Hamed (2011)**, who was noticed that, more than half of the pregnant women with short IPI had premature labour. As well as **Shachar and Lyell (2012)**; this may be due to anemia, malnutrition and old age; all were predisposing factors for preterm labour.

The current study results were showed that, about three quarters of women with short IPI less than six months had abnormal presentation (cephalic presentation). These results were supported by **Armstrong (2011)**.

The present study findings were illustrated that, there was no statistically significant relation betweenshort IPI and fetal distress whereas (P= 0.94). In respect, **American Collegeof Obstetrics and Gynecology (2009)** stated that, nterpregnancy intervals of less than two and more than four years after increased the risk of fetal distresses. The present study revealed that, short IPI was accompanied by maternal complication during labour (prolonged and obstructed labour). Thus current result is in agreement with **Zhu,Grigorescu, and Le (2006)**, who concluded that; labour dystocia was associated with the short interpregnancy interval.

The current study results were suggested that, short IPI less than six months and from six to 12 month had increased the risk of PROM with statistically significance at (P<0.0001). The present study goes in the same line with **Lilungulu,Gumodoka, and Kihunrwa(2013)**, who observed that, there was an association between short IPI and PROM with a statistically significance at (p<0.01), it may be due to unresolved inflammation of the genital tract from the previous pregnancy**(Shachar, & Lyell, 2012)**.

As the present study findings; it was observed that, women with short IPI were more reliable to had postpartum hemorrhage (PPH) than others. These finding were supported by **(Lilungulu et al., 2013)**, who were found that, the risk of PPH was 5.8 higher among SIPI women compared to women of OIPI.

In the present study, there was a statistically significant increase of early neonatal complication such as preterm birth, low birth weight, and small for gestation among women with six and 12 months IPI when comparing with cases with 18 and 24 months. These results are in agreement with **Hussaini,Ritenour, and Coonrod (2013)** who reported that, there was an increased infant mortality due to preterm birth, low birth weight, and small for gestation among women with SIPI.

However, these findings were supported by **Howard,Harville, Kissinger, and Xiong (2013)** who stated that, better neonatal outcomes occur when the mother does not conceive within nine months of a previous birth. On the other hand, **Love et al. (2010)** did not found that, short IPI to be associated with an increased risk for adverse pregnancy outcomes such as preterm deliveries, LBW and growth.

The current study was in agreement with **Joseph and Samson (2012)**, who found an association between low birth weight and short IPI. In addition, **Mosha and Philemon (2012)** reported that, short IPI was one of factors that cause low birth weight. Interpregnancy intervals of < 12 months and ≥ 60 months were associated with low birth weight, preterm birth, and small for gestational age births **(Hefley, &Coonrod, 2014)**.

V. Conclusion

Short IPI has adverse effects on maternal and neonatal outcome. Short IPI was associated with many maternal complications such as; preterm labour, premature rupture of membrane, abnormal presentation, prolonged and obstructed labour, and atonic uterus, which caused PPH. Short IPI increased the baby risk to develop low birth weight, abnormal length, head and chest circumference, and has low scores in Ballard and Apgar score.

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