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Study of Associations between Postnatal Follow-Up and the Incidence of Postpartum Complications - Prospective Cohort Study at the Souissi Maternity Hospital in Rabat

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ABSTRACT

Aim of the study: This research aimed to study the existence of associations between postnatal follow-up and the incidence of postpartum complications among women who have given birth at the Souissi Maternity Hospital in Rabat. **Materials and Methods:** This is a prospective longitudinal cohort study carried out during a period of 9 months from March to November 2018, at the Souissi maternity hospital in Rabat. Including all the women who received prenatal care, and who had a pregnancy without complications, the number of recruited was 1009 cases. With a response rate of 93.36% and by using a mixed questionnaire, the number of surveyed was 942 cases, subdivided into two groups. The group of women did not follow up with 459 cases, and the group of women followed up during postpartum with 483 cases. **Results:** This study showed the existence of associations between the occurrence of the following complications and the under-use of postnatal follow-up: early genital hemorrhage [RR=4.209, 95% CI [2.471-7, 171], <0.001]; urinary tract infection [RR=6.915, 95% CI [3.999-11.956], <0.001]; breast engorgement [RR=6.092, 95% CI [3.808-9.746], <0.001]; breast lymphangitis [RR=8.418, 95% CI [3.638-19.481], <0.001]; return of hemorrhagic layers [RR=3.040, 95% CI [2.000-4.620], <0.001]; and postpartum depression [RR=1.867, 95% CI [1.225-2.845], 0.003]. **Conclusion:** The cross-study of reported complications among the women who have given birth included in this research presented that the risk of postpartum complications is higher in unattended women than in those with postnatal follow-up. Certifying, therefore, the importance of promoting postnatal follow-up to deal with postnatal complications, and act on the reduction of maternal morbidity and mortality in Morocco.

INTRODUCTION

Under the aegis of the reproductive health right proclamations, and in the face of the alarming figures of maternal mortality and morbidity, international organizations have declared orientations whose implementation has made it possible to halve the maternal mortality ratio on a global scale between 1990 and 2015 [1].

However, while this global reduction is significant, developing countries still have very high ratios. The World Health Organization has stated in its Global Strategy for Women that 99% of maternal deaths occur in developing countries, more than half of them in Africa and almost a third in South Asia [2]. Indeed, this gap is illustrated by a maternal mortality rate of 239 deaths per 100,000 births in developing countries, compared to 12 deaths per 100,000 in developed countries [3]. The United Nations Children's Fund has reported the importance of giving priority to African and Asian countries in the actions carried out by international organizations working on maternal health [4].

As a developing country, Morocco is no exception. Despite the actions taken to reduce maternal mortality, the Moroccan Ministry of Health has not been able to achieve the goals set for the end of 2015, namely to reduce maternal mortality to 50 deaths per 100,000 live births [5]. Indeed, the national survey on population and family health for 2017 revealed that the maternal mortality rate is 72.6 deaths per 100,000 live births [6].

According to the results of the Confidential Maternal Deaths Survey, 73% of maternal deaths are preventable if action is taken on the direct causes of maternal deaths. Mostly haemorrhage was associated with 58% of these deaths and infections were reported in 8% of cases [7]. Notably, through the improvement of the overall taking charge of women in pre and post-partum, indeed, described as the weak link in obstetric care in Morocco, poor surveillance during postpartum has been associated several times with maternal deaths. Moreover, this survey revealed that only 5.4% of the women who died received consultations that were adequate in number and quality [8].

For its part, the 2017 National Population and Family Health Survey found that in the five years before the survey, only 21.9% of births received postnatal care [9]. Evidence that at the national level, women who have given birth underutilize postnatal services; however, several studies have shown that maternal morbidity decreases when the mother is monitored in the postpartum period [10]. To reduce maternal morbidity, several international instances have

emphasized the importance of including the taking charge of women in childbirth as part of the continuum of care covering the 42 days of the postpartum period [4].

Because of these findings, and the social and economic consequences of maternal mortality [11], this study aimed to study the existence of associations between postnatal follow-up and the incidence of postnatal complications among women who have given birth at the Souissi Maternity Hospital in Rabat.

MATERIAL AND METHOD

This is a descriptive prospective longitudinal cohort study carried out during a period of 9 months from March to November 2018, at the Souissi maternity hospital in Rabat.

2.1 Criteria for inclusion

Women who received prenatal care, who had an uncomplicated pregnancy, who had just given birth at the Souissi maternity hospital in Rabat, and who expressed their agreement to participate in this study, regardless of their age and origin, were included in this study.

2.2 Exclusion Criteria

Excluded from this study were women who have given birth with high-risk pregnancies, women who withdrew from the study during the specified observation period, and those who refused to participate in the survey.

2.3 Data collection

This study conducted through a mixed questionnaire on:

- Socio-demographic data of the births, such as age; provenance; the level of education of the women; medical coverage.
- Medical information: parity; term of pregnancy; mode of delivery; delivery process.
- Data on postnatal complications: These concern symptoms indicative of these complications, having been verified according to contacts with the women who have given birth, according to the following schedule:
- At 12 hours of hospitalization.

- A 24-hour hospital stay.
- At 9 days after delivery.
- At 42 days postpartum.

Contact with the surveyed was either direct or by telephone, depending on the case.

To have the same investigator, we recruited during working hours.

The study was completed by analyzing and extracting additional information using the medical documents of the women who had given birth.

2.4 Ethical Considerations

The Ethics Committee of the Faculty of Medicine and Pharmacy in Rabat and the administration of the Souissi Maternity Hospital in Rabat have given their approval for the conduct of this study. Informed consent was obtained from each woman giving birth at the time of entry into the study. Participation in the study was free of charge, respecting confidentiality and anonymity.

2.5 Some definitions

2.5.1 Postnatal period

By the postnatal period, this work considered the period from the end of childbirth to 42 days postpartum.

2.5.2 Women who have given birth unattended Durant postpartum

For this study, the women who have given birth not followed are those who did not consult during the postpartum period except in the case of a postpartum complication.

2.5.3 Women with postpartum follow-up

For this study, women with postpartum follow-up are those who consult during postpartum even in the absence of any postnatal complications or even before the onset of a complication among them.

2.5.4 Postpartum complications

This study grouped postpartum complications into five categories, namely: hemorrhagic complications; infectious complications; breast complications; thromboembolic complications; and psychological complications.

2.5.5 The woman who have giving birth study level

In order to analyze the woman who has given birth study level, this work has subdivided the levels of study into eight categories; Illiterate; M'Cid or Koranic school; Primary; Secondary; High school; Superior 1st cycle; Superior 2nd cycle; Superior 3rd cycle.

2.6 Statistical analysis

The data collected were coded and subjected to computerized analysis using SPSS V20 software. Quantitative variables were expressed as means and standard deviations, and qualitative variables as percentages. The comparisons used were the Student t-test for quantitative variables and the Pearson Chi2 test for qualitative variables. P values less than 0.05 were considered statistically significant. The significance of each variable association was assessed using relative risk (RR) values and its probability ($PX^2 < 0.05$), with the calculation of the 95% confidence interval (95% CI). The null hypothesis = there is independence between the onset of postnatal complications and the failure to follow up women who have given birth during the postnatal period. The alternative hypothesis = there is a dependence between the onset of postnatal complications and the failure to follow up women who have given birth during the postnatal period.

RESULTS

3.1 Study Flow Chart

Between March and November 2018, the Souissi maternity hospital in Rabat realized 13041 deliveries. 1009 cases were recruited; i.e. 7.73% of the number of deliveries recorded during the study period. Among the parturient included, there were 29 cases of loss of sight; i.e. 2.87% of the recruited, and 38 births refused to continue the study; i.e. 3.77% of the sample. As a result, the number investigated was 942 cases; divided into two groups. Group of women who did not consult during postpartum (n=459 cases), and a group of women who consulted during this period (n=483 cases). (**Figure 1**)

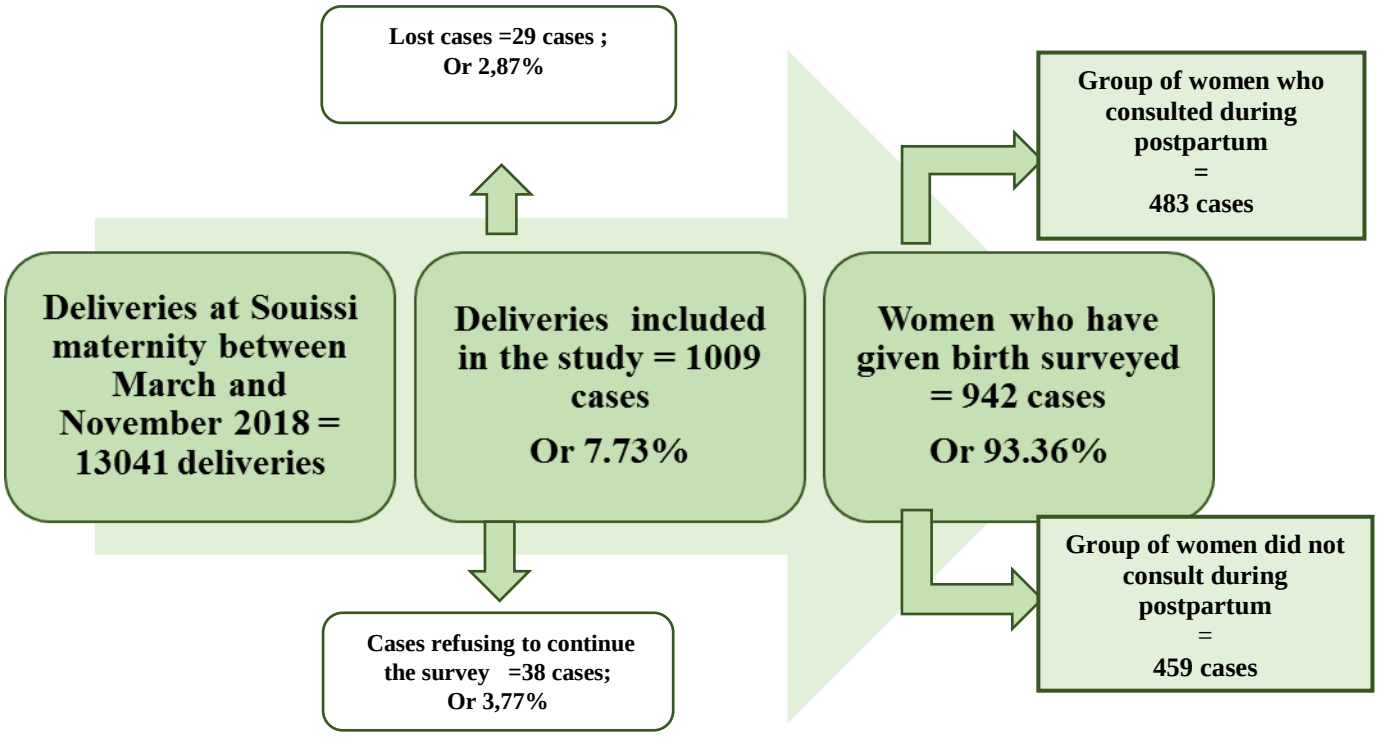

Figure No. 1: Summary of the flow of case participating in the study

3.2 Socio-demographic characteristics of women included in this study

According to the results of the survey of 942 women who met the inclusion criteria, the first group age average was 24.04± 4.66, with 69.72% belonging to the age group [20 years, 30 years]. The origin of this group was urban in 46.2% and rural in 41.6%. The study level of these women was a primary school in 40.7% and college in 36.4%. 71% said they had medical coverage. Also, the results showed that the second group average age was 25.78± 4.67, with 75.98% having age between [20 years, 30 years]. The origin of the second group was urban in 68.9% and rural in 29%. The study level of this group was the high school in 33.5%, college in 28.2%, and higher in 18.4%. They had medical coverage in 87.4%. (**Table 1**)

Table No. 1: Socio-demographic characteristics of the women included in this study

	Unfollowed cases n= 459		Followed cases n= 483	
Variables	**Effective**	**Percentage (%)**	**Effective**	**Percentage (%)**
Age range (mean± SD)	24,04± 4,66		25,78± 4,67	
< 20 years	73	15,9	27	5,59
[20 years , 30 years[	320	69,72	81	16,77
[30 years, 40 years]	64	13,94	367	75,98
>40 years	02	0,46	08	1,66
Provenance				
Urban	212	46,2	333	68,9
Rural	191	41,6	140	29,0
Suburban	56	12,2	10	2,1
Sudy level of the woman giving birth				
Illiterate	21	4,6	01	0,2
M'Cid or Koranic school	00	00	00	00
Primary	187	40,7	83	17,2
College	167	36,4	136	28,2
High school	66	14,4	162	33,5
Superior 1st and 2nd cycles	16	3,5	89	18,4
Superior 3rd cycles	02	0,4	12	2,5
Availability of medical coverage				
Yes	326	71,0	422	87,4
No	133	29,0	61	12,6

3.3 Medical Information of the women included in this Study

The women who did not consult were second pares in 73.2%. Their average weight was 74.49± 8.67, with 58.39% of cases weighing between [80 kg, 90 kg]. They had a full-term birth in 54.7%, and over-term in 38.8%. They delivered vaginally in 100% of cases. Their deliveries were uncomplicated in 85.6%. The average number of days of hospitalization for this group was 1.87± 0.38, with 2 days in hospital in 83.7% of cases. These women had eutrophic newborns in 87.8%, and male newborns in 51.2%. While followed births were primiparous in 79.3%. Their average weight was 74.95± 7.39, with 62.32% of cases weighting between [80 kg, 90 kg]. They had a full-term pregnancy in 54.9% and over-term in 41.4%. They had a vaginal delivery in 82.2%. They had a eutocic delivery in 92.1%. The average number of days of hospitalization for these women was 1.87± 0.34, with 86.7% of them spending 2 days in the hospital. The second group had a eutrophic baby in 85.3%, and a male baby in 51.1%. (**Table 2**)

Table No. 2: Medical Information of women included in this Study

	Unfollowed cases n= 459		Followed cases n= 483	
Variables	**Effective**	**Percentage (%)**	**Effective**	**Percentage (%)**
Parity				
Primipare	84	18,3	383	79,3
2nd P	336	73,2	78	16,1
3rd P	28	6,1	15	3,1
⩾4 P	11	2,3	07	1,4
Women Weight (mean± SD)	74,49± 8,67		74,95± 7,39	
< 60kg	4	0,87	00	00
[60 kg, 80kg [	182	39,65	145	30,02
[80 kg, 90 kg]	268	58,39	301	62,32
>90 kg	5	1,09	37	7,66
Pregnancy Term				
Premature delivery	30	6,5	18	3,7
Term delivery	251	54,7	265	54,9
Term overrun	178	38,8	200	41,4
Birth Process				
Uncomplicated	393	85,6	445	92,1
With complication	66	14,4	38	7,9
Delivery mode				
vaginal delivery	459	100	397	82,2
Cesarean	00	00	86	17,8
Number of hospital days (mean± SD)	1,87± 0,38		1,87± 0,34	
1 day	67	14,6	64	13,3
2 days	384	83,7	419	86,7
3 days	08	1,7	00	00
Weight of newborns				
Hypotrophic	37	8,1	64	13,3
Eutrophic	403	87,8	412	85,3
hypertrophic	19	4,1	07	1,4
Sex of newborns				
Female	224	48,8	236	48,9
Male	235	51,2	247	51,1

3.4 The complications cumulative incidence in the postpartum period among both groups

3.4.1 The complications cumulative incidence recorded from the hospital output to the 9th day of postpartum

According to the results of this study, during a 9-month period, new mothers who are not followed up between hospital output and the 9th day of postpartum have a risk of having:

early genital hemorrhage in 13.9%; endometritis in 11.3%; pelvic peritonitis in 0.4%; urinary tract infection in 20%; breast engorgement in 24%; breast lymphangitis in 10.5%; baby blues in 1.1%. Whereas, during a 9-month period, among followed women between hospital output and 9th day of postpartum there is a risk to develop: early genital hemorrhage in 9.49%; endometritis in 5.52%; pelviperitonitis in 0.21%; urinary tract infection in 11.25%; breast engorgement in 13.7%; breast lymphangitis in 5.73%; and baby blues in 1.17%. (**Table 3**)

Table No. 3: Cumulative incidence of recorded complications from hospital output to 9th of postpartum

			Unfollowed cases n= 459	Followed cases n= 483	Total
Between hospital output and the 9th day of postpartum	**Hemorrhagic complications**				
	Early genital hemorrhage	CI	13.9%	3,3%	9,49%
	Thromboembolic complications				
	Thrombophlebitis of the lower limbs	CI	00%	00%	00%
	Pulmonary embolism	CI	00%	00%	00%
	Infectious complications				
	Endometritis	CI	11,3%	00%	5,52%
	Pelvic peritonitis	CI	0,4%	00%	0,21%
	Generalized peritonitis	CI	00%	00%	00%
	Sepsis	CI	00%	00%	00%
	Urinary tract infection	CI	20%	2,9%	11,25%
	Breast complications				
	Breast engorgement	CI	24%	3,9%	13,7%
	Breast lymphangitis	CI	10,5%	1,24%	5,73%
	Psychological complications				
	Baby-blues	CI	1,1%	1,2%	1,17%

3.4.2 The complications cumulative incidence recorded among women from day 9 to day 42 of postpartum.

During a 9-month period, new mothers who are not followed between the 9th and 42nd day of postpartum have a risk of the return of hemorrhagic layers in 17%; of urinary tract infection in 9.4%; of breast engorgement in 6.5%; of lymphangitis in 3.5%; of acute mastitis in 0.7%; of postpartum depression in 12%; and postpartum psychosis in 1.3%. Whereas, for a 9 months période, the women followed between the 9th and 42nd day of postpartum have a risk of the return of hemorrhagic layers in 11.15%; of urinary tract infection in 5.63%; of breast engorgement in 3.4%; of lymphangitis in 1.7%; of acute mastitis in 0.32%; of postpartum depression in 9.13%; and postpartum psychosis in 1.38%. (**Table 4**)

Table No. 4: Cumulative incidence of recorded complications between days 9 and 42 of postpartum.

		Unfollowed cases n= 459	Followed cases n= 483	Total
Between the 9th and 42nd day of postpartum	**Hemorrhagic complications**			
	Return of hemorrhagic layers CI	17%	5,6%	11,15%
	Thromboembolic complications			
	Deep vein thrombosis CI	00%	00%	00%
	Pelvic Thrombophlebitis CI	00%	00%	00%
	Cerebral venous thrombosis CI	00%	00%	00%
	Infectious complications			
	Urinary tract infection CI	9,4%	2,1%	5,63%
	Breast complications			
	Breast engorgement CI	6,5%	0,4%	3,4%
	Breast Lymphangitis CI	3,5%	00%	1,7%
	Acute mastitis CI	0,7%	00%	0,32
	Psychological complications			
	Postpartum depression CI	12%	6,4%	9,13%
	Postpartum psychosis CI	1,3%	1,4%	1,38%

3.5 Comparison of cohort socio-demographic characteristics among unfollowed women and those followed

The comparison of the cohort socio-demographic characteristics showed that the average age of the unfollowed women was 24.04 ± 4.66, with 69.72% between [20 years, 30 years]. While, the average age of followed women was 25.78 ± 4.67, with 75.98% between [30 and 40 years]. The urban origin was 46.2% in the group of unfollowed women and 68.9% in the group of the followed women. The study level of unfollowed women was a primary school in 40.7%, while the study level of the followed women was a secondary school in 33.5%. 71% of the unfollowed women had medical coverage, compared to 87.4% of the followed women. (**Table 5**)

Table No. 5: Comparison of the cohort socio-demographic characteristics among unfollowed women and those followed

	Unfollowed cases n= 459		Followed cases n= 483		P
Variables	**Effective**	**Percentage (%)**	**Effective**	**Percentage (%)**	
Age range (mean± SD)	24,04± 4,66		25,78± 4,67		
< 20 years	73	15,9	27	5,59	**<0,001**
[20 years , 30 years[	320	69,72	81	16,77	
[30 years, 40 years]	64	13,94	367	75,98	
>40 years	02	0,46	08	1,66	
Provenance					
Urban	212	46,2	333	68,9	**<0,001**
Rural	191	41,6	140	29,0	
Suburban	56	12,2	10	2,1	
Sudy level of the woman giving birth					
Illiterate	21	4,6	01	0,2	
M'Cid or Koranic school	00	00	00	00	
Primary	214	40,7	83	17,2	**<0,001**
College	167	36,4	136	28,2	
High school	66	14,4	162	33,5	
Superior 1st and 2nd cycles	16	3,5	89	18,4	
Superior 3rd cycles	02	0,4	12	2,5	
Availability of medical coverage					
Yes	326	71,0	422	87,4	**<0,001**
No	133	29,0	61	12,6	

3.6 Comparison of the cohort medical characteristics among unfollowed women and those followed

The comparison of the cohort medical characteristics showed that 73.2% of the unfollowed women were secondaries. Whereas, followed women were primiparous in 79.3%. The average weight was almost identical for both groups. It was 74.49± 8.67 for the first group and 74.95± 7.39 for the second group. 54.7% of unfollowed women and 54.9% of followed women had a full-term birth. The overterm delivery accounted for 38.8% of the first group and 41.4% of the second group. Women with an uncomplicated delivery accounted for 85.6% of the unfollowed group and 92.1% of the followed group. The average number of hospital days was almost identical for both groups. It was 1.87± 0.38 for the first group and 1.87± 0.34 for the second group. Their newborns were eutrophic in 87.8% of the unfollowed women and 85.3% of the followed women. (**Table 6**)

Table No. 6: Comparison of the cohort medical characteristics among unfollowed women and those followed

	Unfollowed cases n= 459		**Followed cases n= 483**		**P**
Variables	**Effective**	**Percentage (%)**	**Effective**	**Percentage (%)**	
Parity					
Primipare	84	18,3	383	79,3	
2nd P	336	73,2	78	16,1	**0,01**
3rd P	28	6,1	15	3,1	
⩾4 P	11	2,3	07	1,4	
Women Weight (mean± SD)	74,49± 8,67		74,95± 7,39		
< 60kg	4	0,87	00	00	
[60 kg, 80kg [	182	39,65	145	30,02	**0,039**
[80 kg, 90 kg]	268	58,39	301	62,32	
>90 kg	5	1,09	37	7,66	
Pregnancy Term					
Premature delivery	30	6,5	18	3,7	
Term delivery	251	54,7	265	54,9	**0,207**
Term overrun	178	38,8	200	41,4	
Birth Process					
Uncomplicated	393	85,6	445	92,1	**0,001**
With complication	66	14,4	38	7,9	
Number of hospital days (mean± SD)	1,87± 0,38		1,87± 0,34		
1 day	67	14,6	64	13,3	
2 days	384	83,7	419	86,7	**0,866**
3 days	08	1,7	00	00	
Weight of newborns					
Hypotrophic	37	8,1	64	13,3	
Eutrophic	403	87,8	412	85,3	**0,001**
hypertrophic	19	4,1	07	1,4	

3.7 Comparison of postnatal complications recorded in this study between followed group vs. unfollowed group

The comparison of postnatal complications recorded between followed and unfollowed women showed that between hospital output and the 9th day of postpartum, early genital hemorrhage; endometritis; urinary tract infection; breast engorgement; and breast lymphangitis were significantly associated with unfollowed postpartum, with a P-value <0.001 for each condition. Also, this comparison revealed that the complications recorded among women between the 9th and 42nd day of postpartum, namely, return of haemorrhagic layers; urinary tract infection; mammary engorgement; mammary lymphangitis; and

postpartum depression are significantly associated with the under-use of postnatal follow-up, with a P-value <0.001 for each pathology. (**Table 7**)

Table No. 7: Comparison of postnatal complications recorded in this study between followed group vs. unfollowed group

	Unfollowed cases n= 459		Followed cases n= 483		P
Diagnosed postnatal complications	**Effective**	**Percentage (%)**	**Effective**	**Percentage (%)**	
Between hospital output and the 9th day of postpartum					
Early genital hemorrhage	64	13,9	16	3,3	**<0,001**
Endometritis	52	11,3	00	00	**<0,001**
Pelviperitonitis	02	0,4	00	00	**0,147**
Urinary tract infection	92	20,0	14	2,9	**<0,001**
Breast engorgement	110	24,0	19	3,9	**<0,001**
Breast lymphangitis	48	10,5	06	1,24	**<0,001**
Baby-blues	05	1,1	06	1,2	**0,827**
Between the 9th and 42nd day of postpartum					
Return of hemorrhagic layers	78	17,0	27	5,6	**<0,001**
Urinary tract infection	43	9,4	10	2,1	**<0,001**
Breast engorgement	30	6,5	02	0,4	**<0,001**
Breast Lymphangitis	16	3,5	00	00	**<0,001**
Acute mastitis	03	0,7	00	00	**0,075**
Postpartum depression	55	12,0	31	6,4	**0,003**
Postpartum psychosis	06	1,3	07	1,4	**0,852**

3.8 The associations between diagnosed complications and under-use of postnatal consultations

This analysis illustrated that between the hospital output and the 9th day of postpartum, there is an association between the occurrence of the following complications and under-use of postnatal consultations: early genital haemorrhage [RR=4.209, 95% CI [2.471-7, 171], <0.001]; urinary tract infection [RR=6.915, 95% CI [3.999-11.956], <0.001]; breast engorgement [RR=6.092, 95% CI [3.808-9.746], <0.001]; and breast lymphangitis [RR=8.418, 95% CI [3.638-19.481], <0.001]. In addition, it has shown that between the 9th and 42nd days of postpartum, there are dependencies between the occurrence of the following complications and the under-use of postnatal consultations: return of haemorrhagic layers [RR=3.040, 95% CI [2.000-4.620], <0.001]; urinary tract infection [RR=4.525, 95% CI [2.301-8.897], <0.001]; breast engorgement [RR=15,784, 95% CI [3,794-65,671], <0.001]; and postpartum depression [RR=1,867, 95% CI [1,225-2,845], 0.003]. (**Table 8**)

Table No. 8: The associations between diagnosed complications and under-use of postnatal consultations

Diagnosed complications	RR	IC (95%)	PX²
Between hospital output and the 9th day of postpartum			
Early genital hemorrhage	4,209	[2,471-7, 171]	<0,001
Endometritis	-------	-------	<0,001
Urinary tract infection	6,915	[3,999-11,956]	<0,001
Breast engorgement	6,092	[3,808-9,746]	<0,001
Breast lymphangitis	8,418	[3,638-19,481]	<0,001
Between the 9th and 42nd day of postpartum			
Return of hemorrhagic layers	3,040	[2,000-4,620]	<0,001
Urinary tract infection	4,525	[2,301-8,897]	<0,001
Breast engorgement	15,784	[3,794-65,671]	<0,001
Breast Lymphangitis	-----	-------	<0,001
Postpartum depression	1,867	[1,225-2,845]	0,003

DISCUSSION

During the 9 days of postpartum, the risk of early genital hemorrhage is greater among unfollowed than followed women. In fact, according to the results of this study, an unfollowed woman during the postpartum is 4.209 times more likely to have an early genital hemorrhage than followed women. The significance of this association was significant [PX² <0.001; 95% CI [2,471-7, 171]], confirming the findings of several studies, including the Depalle [13], Maria [14], and Reyal [15] studies. These authors found an association between the prevention of postpartum hemorrhage and the monitoring of women during postpartum. They consider that all women who have given birth should be vigilantly monitored during this period.

The risk of endometritis could not be verified because despite P < 0.001, cross-analysis of the data was not possible since the women followed in our study did not develop this complication. In the literature, there is mainly research evidence of an association between the incidence of this complication, the prenatal follow-up and delivery conditions [16] [17].

In our study, pelvic peritonitis (P=0.147) and baby blues (P=0.827) were not associated with postnatal follow-up. However, the Masmoudi et al study found an association between the use of postnatal services and the prevalence of the Baby-blues complication [18].

The risk of having a urinary tract infection is greater among unfollowed women. An unfollowed woman during the postpartum has a 6.915 times greater risk of urinary tract infection than a followed woman [PX² <0.001; 95% CI [3,999-11,956]]. Lajoso et al [19] and

Audouin [20] studies linked the prevention of urinary tract infections and their complications to the use of care.

The risk of breast engorgement is greater among unfollowed women. An unfollowed woman during the postnatal period is 6.092 times more likely to develop breast engorgement than a followed one [PX² <0.001; 95% CI [3,808-9,746]], endorsing the Gresh et al [21] study and the Karaçam et al [22] study which found that the use of postnatal visits can minimize the conflicting information that a woman receives about breastfeeding and avoid breast engorgement.

The risk of having breast lymphangitis is greater among unfollowed women. An unfollowed woman is 8.418 times more likely to have breast lymphangitis than a followed woman [PX² <0.001; 95% CI [3,638-19,481]], affirming the results of Cole's study [23]. This study found that women who did not receive early breastfeeding counseling developed more signs of fatigue and anger that aggravated breast engorgement to other breast complications, notably, breast lymphangitis.

During the period between the 9th and 42nd day of postpartum, the risk of return hemorrhagic layers is greater among women without postpartum care. An unfollowed woman is 3.040 times more likely to have a return hemorrhagic layer than a followed woman. [PX² <0.001; 95% CI [2,000-4,620]], corroborating the results of Sema's study [24] which found that postpartum hemorrhage can be prevented by promoting postpartum visits.

The risk of having a urinary tract infection between the 9th and 42nd day of postpartum is higher among unfollowed women. An unfollowed woman is 4.525 times more likely to have a urinary tract infection than a followed woman [PX² <0.001; 95% CI [2,301-8,897]], acknowledging the results of the Lajoso et al study [19], and the Audouin study [20].

The risk of breast engorgement, between the 9th and 42nd day of postpartum, is greater among unfollowed woman. During this postpartum period, the unfollowed woman is 15.784 times more likely to have breast engorgement than a followed woman [PX² <0.001; 95% CI [3,794-65,671]]. Evidence from the literature suggesting that breast engorgement is generally associated with a lack of education maternal about prevention of this complication, as well as a lack of early breastfeeding counseling [25] [26].

The risk of having breast lymphangitis between the 9th and 42nd day of postpartum could not be verified because, despite P < 0.001, cross-analysis of the data was not possible, as this complication is not recorded in the deliveries followed.

This study found no association between postpartum follow-up and acute mastitis (P=0.075). In contrast, Merz et al, in their work entitled Breast Infections, explained how a delay in the taking charge of a simple breast complication leads likely to the development of acute mastitis [27].

The risk of postpartum depression is greater among unfollowed women. An unfollowed woman is 1.867 times more likely to have postpartum depression than a followed delivery [PX² 0.003; 95% CI [1.225-2.845]], confirming the findings of several studies, including the Peraudeau study [28] and the Chabrol study [29]. These studies have explained that during a postnatal consultation, the health care provider can assess the physical condition of the women who have given birth and consequently implement comprehensive care including psycho-educational actions that can prevent the occurrence of postnatal depression.

CONCLUSION

This study showed significant associations between the under-use of postnatal consultations and the incidence of certain postnatal complications diagnosed among the respondents, attesting the need to promote postnatal consultations in order to participate in the reduction of maternal morbidity and mortality in Morocco.

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CONFLICTS OF INTEREST

None.

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