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Factors Associated with Closely Spaced Pregnancies at the Departmental Hospital Centre of Zou-Collines (Benin) in 2022

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Abstract

Introduction: Birth spacing to prevent closely-spaced pregnancies, which are a source of maternal and neonatal morbidity and mortality, is not always respected by our women, as recommended by the World Health Organization (WHO). The objective was to study the factors associated with closely-spaced pregnancies among women followed at the Departmental Hospital Center du Zou et du Colline (DHC/Z-C) in 2022. **Study Method:** This was a descriptive, analytical cross-sectional study with prospective data collection from 20 May to 30 June 2022. **Results:** At the end of the study, 83 of the 117 women surveyed had close pregnancies, a frequency of 70.94%. They had an average age of 27.0 ± 6.3 years and were of Fon ethnicity and related in 91.57% of cases. The majority were married (96.60%). The factors significantly associated with these closely spaced pregnancies were age between 25 and 30 years, household occupation, age at first birth, age at marriage, women's perception of contraceptive method (CM), women's knowledge of the existence of a center providing family planning services and non-use of MC. **Conclusion:** Close pregnancies are still very common in the commune of Abomey. It is therefore important to increase the use of contraceptive methods in this part of the country.

Keywords

Close Pregnancy, Associated Factors, DHC/Z-C

1. Introduction

Close pregnancies, occurring within 18 months after a previous childbirth, pose significant challenges to maternal and child health globally, including in Benin. They are associated with heightened risks of obstetric complications.

Numerous studies have consistently indicated that women with very short pregnancy intervals face increased risks, including prematurity, neonatal mortality, and intrauterine growth retardation [1] [2]. However, these studies lack specificity on whether the association is attributable to obstetric history or demographic factors. Women with very short pregnancy intervals are predisposed to perinatal death, experiencing higher rates of prematurity and intrauterine growth retardation [3]. The third trimester sees an increase in irregular bleeding, anemia, and postpartum infections due to maternal deficiencies in iron and folates [4] [5]. Generally, based on existing literature data, women with closely spaced pregnancies are often disadvantaged, being younger, less qualified, and less educated [1] [2].

By exploring the factors contributing to close pregnancies at Zou-Collines Departmental Hospital in 2022, this study aims to address the identified brevity and integrate relevant perspectives from previous research.

2. Materials and Methods

This was a descriptive cross-sectional study, with prospective data collection from May 20th to June 30th, 2022. The study population comprised all pregnant or postpartum women admitted to the service during the study period. The sampling was non-probabilistic and exhaustive. Data were collected through interviews with pregnant and postpartum women, using a structured paper-based questionnaire containing our variables. The dependent variable in this study was closely spaced pregnancy, measured by the time difference (less than 24 months) between two deliveries or the previous delivery and the current pregnancy. The collected data were entered into EPIDATA 3.1 software and analyzed using Epi-Info 7. Qualitative variables were described in percentages with their confidence intervals, and quantitative variables were presented as means with their standard deviations. Fisher's exact test and Pearson's chi-squared test were used, as appropriate, to assess the significance of the results. Any result was considered significant for a p-value less than 0.05. Anonymity and confidentiality of the collected information were ensured. Informed consent was obtained from the participants, and a consent form was administered before distributing the questionnaire. The investigator remained non-judgmental about the participants' opinions. Throughout the study, the rights of the participants were respected in accordance with Article 6 of the Code of Ethics and Deontology for Health Research in the Republic of Benin [6]. The study received approval from the health research ethics committee.

3. Results

At the end of our study, 83 out of 117 surveyed women had experienced closely

spaced pregnancies, representing a frequency of 70.94%.

The average age of participants with closely spaced pregnancies was 27.0 ± 6.3 years, ranging from 17 to 42 years. Most of them were between 20 and 25 years old. Figure 1 shows the distribution of women according to age groups.

3.1. Residence, Occupation, and Education Level

Among women with closely spaced pregnancies, the Fon ethnic group and related ethnicities accounted for 91.57% of the cases; 71.08% lived in rural areas, and 69.88% were homemakers. Additionally, 46.99% of them had a primary education level. Table 1 presents the distribution based on ethnicity, residence, occupation, and education level of the women.

3.2. Religion, Marital Status, and Household Type

The majority religion among women with closely spaced pregnancies was

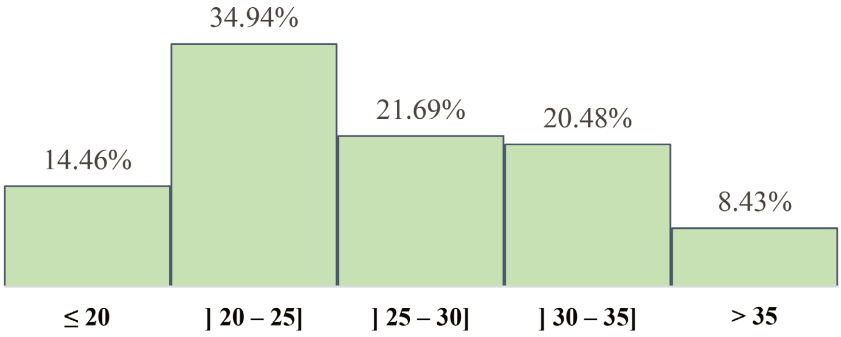

Figure 1. Distribution of women with closely spaced pregnancies by age groups.

Table 1. Distribution of participants by ethnicity, residence, occupation, and education level of women.

	Study population n (%)	Participants with close pregnancies n (%)
Profession		
Homemaker	74 (63.5)	58 (69.88)
Trader	22 (18.80)	14 (16.87)
Civil servant	8 (6.84)	4 (4.82)
Aetisan	6 (5.13)	3 (3.61)
Student	6 (5.13)	3 (3.61)
Others	1 (0.85)	1 (1.20)
Education level		
None	31(26.05)	25 (30.12)
Primary	52 (43.70)	39 (46.99)
Secondary	27 (22.69)	17 (20.48)
University	9 (7.69)	2(2.41)

Christianity, accounting for 50.60% of the cases. They were married in 96.39% of the cases and lived in a monogamous household in 77.11% of the cases. Table 2 illustrates the distribution based on religion, marital status, and household type.

3.3. Obstetric History of Women

The average gravidity (number of pregnancies) of the participants was 4 ± 2, ranging from 2 to 9 pregnancies. As for the average parity (number of children born), it was 3 ± 2, with a range of 1 to 8 children. The average number of living children was 2 ± 1 child, and the participants had between 0 and 7 living children. Table 3 shows the distribution of women based on their obstetric history.

3.4. Spouse's Occupation

In the case of women who had closely spaced pregnancies, 36.1% of their spouses were artisans. Table 4 presents the distribution based on the spouse's occupation.

3.5. Age at Marriage, Age at First Birth, and Desired Number of Children

The average age at marriage for women with closely spaced pregnancies was 18.16 ± 2.1 years, ranging from 13 to 29 years. On average, they had their first child at the age of 19 ± 2.4 years, with a range of 19 to 31 years. They desired to have an average of 6 ± 2 children, with a range of 3 to 12 children. Husband's Attitude towards Contraceptive Methods (CM), Availability of Family Planning (FP) Services, Pregnancy Desire, Information on CM, and CM Use Regarding

Table 2. Distribution of participants by religion, marital status, and household type.

	Study population n (%)	Participants with close pregnancies n (%)
Religion		
Christian	60 (51.28)	42 (50.60)
Muslim	50 (42.74)	38 (45.78)
Traditional	7 (5.98)	3 (3.61)
Marital status		
Married	113 (96.58)	80 (96.39)
Single	1 (0.85)	1 (1.20)
Divorced	3 (2.56)	2 (2.41)
Type of household		
Monogamy	92 (78.63)	64 (77.11)
Polygamy	25 (21.37)	19 (22.89)

Table 3. Distribution of women according to obstetric history.

	Study population n (%)	Participants with close pregnancies n (%)
Gestite		
Grand multigravida	17 (14.53)	14 (16.87)
Multigravida	16 (13.68)	11 (13.25)
Paucigravida	47 (40.17)	32 (38.55)
Primigravida	37 (31.62)	26 (31.32)
Parity		
Grand multipara	8 (6.83)	4 (4.82)
Multipara	32 (27.35)	8 (9.64)
Paucipara	12 (10.26)	29 (34.94)
Primipara	65(55.56)	42 (50.60)

Table 4. Distribution of women according to spouse's occupation.

Profession du conjoint	Study population n (%)	Participants with close pregnancies n (%)
Artisan	37 (31.6)	30 (36.1)
Faemer	24 (20.5)	17 (20.5)
Trader	18 (15.4)	15 (18.1)
Retailer	17 (14.5)	11 (13.3)
Civil servant	11 (9.4)	7 (8.4)
Student	6 (5.1)	2 (2.4)
Driver	4 (3.4)	1 (1.2)

the use of contraceptive methods, 43.37% of the spouses of women who had closely spaced pregnancies were against their use, and 36.14% were indifferent. Only 24.10% of women with closely spaced pregnancies were aware of the availability of FP services at the center. Additionally, 77.1% were not using any contraceptive methods. Table 5 presents this data.

3.6. Relationship between Age and Closely Spaced Pregnancies

Table 6 shows a significant association between women with closely spaced pregnancies and age.

3.7. Relationship between Age at Marriage, Age at First Birth, and Closely Spaced Pregnancies

There was a significant association between age at marriage, age at first birth, and closely spaced pregnancies. Table 7 shows this association.

Table 5. Distribution of Women according to Husband's Attitude towards CM, Availability of FP Services, Pregnancy Desire, Information on CM, and CM Use.

	Study population n (%)	Participants with close pregnancies n (%)
Attitude du mari vis-à-vis des MC		
Against	46 (39.32)	36 (43.37)
Favorable	30 (25.64)	17 (20.48)
Indifferent	41 (35.04)	30 (36.14)
Availability of family planning (FP)		
No	78 (66.67)	63 (75.9O)
Yes	39 (33.33)	20 (24.10)
Desire for pregnancy		
Yes	60 (50.43)	45 (54.22)
No	57 (49.57)	38 (45.78)
Informations about FP		
No	67(57.26)	51(61.45)
Yes	50(42.74)	32 (38.55)
Usage of FP		
No	84 (71.8)	64 (77.1)
Yes	33 (28.2)	19 (22.9)

Table 6. Associations between age and closely spaced pregnancies.

Age	Close pregnancy				RP	$IC_{95\%}$	p value
	Yes		No				
	N	%	n	%			
≤20	12	85.71	2	14.29	1		
]20 - 25]	29	76.32	9	23.68	1.12	[0.85 - 1.50]	0.785
]25 - 30]	18	50.00	18	50.00	1.71	[1.16 - 2.50]	0.021
]30 - 35]	17	80.95	4	19.05	1.05	[0.78 - 1.42]	0.352
>35	7	71.43	2	28.57	1.20	[0.71 - 2.01]	0.714

3.8. Relationship between Women's Perceptions of Contraceptive Methods and Closely Spaced Pregnancies

There was a significant inverse association between women's perceptions of contraceptive methods and closely spaced pregnancies. This inverse association in favor of a protective effect suggests that women with a positive perception of contraceptive methods had a lower risk of having a closely spaced pregnancy. Table 8 presents this association.

Table 7. Association between age at marriage, age at first birth, and closely spaced pregnancies.

	Close pregnancy				RP	IC95%	p value
	Yes		No				
	n	%	n	%			
Mother's age at marriage							
≤20	79	79.80	20	20.20	3.3	[1.43 - 8.01]	0.000
>20	4	23.53	13	76.47			
Mother's age at first birth							
≤20	66	89.19	8	10.81	2.2	[1.51 - 3.20]	0.000
>20	17	40.48	25	59.52			

Table 8. Association between women's perceptions of contraceptive methods and closely spaced pregnancies.

	Close pregnancy				RP	IC95%	p value
	Yes		No				
	n	%	n	%			
Perception of CM							
Against religion	12	63.16	7	38.84	0.86	[0.51 - 2.01]	0.375
Factor of disorder	20	86.96	3	13.04	1.28	[1.03 - 1.58]	0.065
Birth spacing	30	61.22	19	38.78	0.77	[0.60 - 0.99]	0.030

Table 9. Association between household type, occupation, and closely spaced pregnancies.

	Close pregnancy				RP	IC95%	p value
	Yes		No				
	n	%	n	%			
Profession							
Homemaker	58	79.45	15	20.55	1.36	[1.03 - 1.80]	0.012
Others	25	30.12	18	54.54			

3.9. Relationship between Household Type, Occupation, and Closely Spaced Pregnancies

There was an association between occupation and closely spaced pregnancies. Table 9 shows these results.

3.10. Relationship between Husband's Attitude towards CM, Availability of FP Service, Desired Number of Children, and Closely Spaced Pregnancies

There was a significant association between women's awareness of the existence

of a center providing FP services and closely spaced pregnancies (See Table 10).

3.11. Multivariate Analyses

The multivariate analyses revealed associations between age, age at marriage, woman's occupation, availability of contraceptive methods service, contraceptive methods use, and closely spaced pregnancies. This distribution is presented in Table 11.

4. Discussion

Our study allowed us to establish a socio-demographic profile of women with closely spaced pregnancies at the CHD-Zou/Colline.

This study revealed that women with closely spaced pregnancies accounted for 70.94% (83/117) of the surveyed population. This proportion is relatively high compared to those obtained in various studies conducted in other countries worldwide, where the optimal interval between two pregnancies, as recommended by the WHO (at least 24 months between two pregnancies), is not considered in the operational definition of their dependent variables, which is the intergenic space.

Indeed, the frequency of closely spaced pregnancies in our study is much higher than that found by Hajian-Tilaki *et al.* in Babol, northern Iran, in 2009 [6], Racheed *et al.* in Saudi Arabia in 2007 [7], and Salif *et al.* in Mali in 2006 [8], where the frequencies were 3.8%, 25%, and 21%, respectively. Similarly, the proportion found by Thoma *et al.* in 2014 [9] was 29% among American mothers

Table 10. Association between husband's attitude towards CM, Availability of FP service, desired number of children, and closely spaced pregnancies.

	Close pregnancy						
	Yes		No		RP	$IC_{95\%}$	p value
	n	%	n	%			
Family planning center available							
No	63	81.82	14	18.18			
Yes	20	51.28	19	48.72	0.6	[0.45 - 0.86]	0.007

Table 11. Factors associated with closely spaced pregnancies.

	Close pregnancy		P values
	ORa	IC 95%	
Age]25 - 30]	1.8	[1.26 - 2.60]	0.031
Age at marriage ≤ 20	3.1	[1.38 - 6.01]	0.022
Occupation: Homemaker	1.5	[1.19 - 1.91]	0.032
Availability of contraceptive methods	0.6	[0.49 - 0.87]	0.017
Usage of contraceptive methods	0.8	[0.64 - 0.97]	0.049

with two pregnancies in less than 18 months.

These differences in proportions could be explained by the various frameworks and methodologies adopted by different authors. Additionally, the interval chosen for closely spaced pregnancies is not uniformly defined in all studies. Furthermore, the studies available on the subject [6] [7] [8] [10] [11] [12] were mainly cohort studies, predominantly conducted in foreign populations. These studies considered all possible durations between two pregnancies and divided them into intervals. They then searched for the rates of pathologies for each interval to determine the appropriate or ideal interval for closely spaced pregnancies in each of their populations. Thus, the populations considered in these studies may have better living standards compared to our sample, which may justify these observed differences.

Our study allowed us to establish a socio-demographic profile of women with closed spaced pregnancies at the CHD-Zou/Colline.

Moreover, the majority of these women were married, representing 96.39% of the cases in our sample. This rate is close to that obtained by Koroma [13], which was 98%. However, the proportion found in our study is higher compared to that found by Vaillant in 2012 [14] at Nantes University Hospital, where 41% of these women were married. On the other hand, the study by Dedecker *et al.* [10] conducted in a university hospital in France showed that these women were mainly single in 58% of the cases. This difference can be explained by the existing sociodemographic variations between the populations studied in each research.

In the context of our research, the high prevalence of closely spaced pregnancies among married women underscores the importance of sociodemographic factors in this phenomenon. The notable variations in marital status across different studies, such as those with Koroma [13], Vaillant [14], and Dedecker *et al.* [10], highlight the need for a comprehensive examination of social factors in the context of interpregnancy intervals. These observations reinforce the idea that marital status may play a significant role in understanding the dynamics of closely spaced pregnancies.

Regarding closely spaced pregnancies at CHD-Zou/Colline, we identified six significant factors associated with closely spaced pregnancies.

1) Homemaker Occupation

In our study, the homemaker status was associated with closely spaced pregnancies ($p = 0.012$), accounting for 69.88% of cases. This pertains to a social group without a remunerative activity. This result aligns with those found by Koroma [13] and Dedecker *et al.* [10], who observed rates of 60% and 62%, respectively. However, a French retrospective case-control study conducted by Vandenbroucke in 2013 [11] showed that 34% of women had no occupation in the closely spaced pregnancy group. This difference could be explained not only by the methodology used by the authors but also by other reasons and the context of their work. Indeed, the homemaker status can contribute to closely spaced pregnancies by creating an environment where women may have less in-

fluence on pregnancy planning due to the absence of a remunerative professional activity. This may be linked to socio-economic factors such as limited financial resources or financial dependence, making access to contraceptive methods challenging and influencing the timing of pregnancies. Moreover, the absence of professional occupation can lead to greater availability of leisure time, prompting women to engage more frequently in intimate activities during these periods of rest. This dynamic could potentially contribute to an increase in closely spaced pregnancies.

These results underscore the importance of considering social and economic contexts in understanding the determinants of closely spaced pregnancies.

2) Women's Positive Perception of Contraceptive Methods (CM)

In our study, women with a positive perception of contraceptive methods had a lower risk of having a closely spaced pregnancy in 61.22% of the cases. Specifically, they had 0.77 times less chance of having a closely spaced pregnancy. The proportion obtained in our study is slightly higher than that obtained by Koroma [13] in Mali in 2015, where 55% of women had a good understanding of CM in the closely spaced pregnancy group. In this sense, Koroma [13] explained that when the concept of contraception is poorly understood by women or when they have a negative perception of CM, they are more likely to have closely spaced pregnancies.

3) Women's Knowledge of the Existence of a Center with Family Planning (FP) Services

Women who were aware of the existence of a family planning center were at a lower risk of having closely spaced pregnancies in 51.28% of the cases. These results confirm the findings of Téfouet *et al.* [15] in Cameroon in 2019, stating the importance of women's knowledge and attendance at family planning services to minimize closely spaced pregnancies. Similarly, authors such as Couturier [16] and Moreira [17] explained in their studies that MC coverage in an area could limit closely spaced pregnancies.

4) Woman's Age

In our study, the woman's age was associated with closely spaced pregnancies ($p=0.021$). Specifically, women aged between 25 and 30 years were 1.71 times more likely to have closely spaced pregnancies. This complex relationship between maternal age and closely spaced pregnancies could be influenced by various factors, including emotional maturity, family planning choices, and other socio-cultural considerations. For instance, in certain cultures, younger women may be more inclined to have closely spaced pregnancies due to social norms or family pressures. On the other hand, older women may face different challenges related to conception, which can also contribute to closely spaced pregnancies. Thus, our apparent finding of the impact of age on closely spaced pregnancies emphasizes the importance of exploring these dynamics more deeply for a more holistic understanding of the determinants of these pregnancies.

5) Age at First Birth

In our sample, women who had their first child before the age of 20 were more at risk of having closely spaced pregnancies. This result is different from that found by Vandenbroucke [11] in 2013. In this study, the maternal age at first birth was 30 years for women with closely spaced pregnancies. This difference observed in the results could be explained by the fact that our women marry very early and start motherhood very young. A study conducted in Africa in 2012 [18] showed that 19% of women under 18 years old had already given birth to a child, making pregnancies more early, numerous, and less spaced.

6) Non-Use of Contraceptive Methods (CM)

At the end of our study, 77.1% of women with closely spaced pregnancies did not use any contraceptive method. This rate is higher than that found by Koroma [13], which was 70%. The high rate of non-use of CM in our study could be explained by the fact that most partners are against contraception, accounting for 43.37%. This result is in line with the conclusions of Koroma [13], which stated that husbands also play a role in women's non-adherence to FP principles.

5. Conclusion

In summary, our study provides valuable insights into the prevalence and factors associated with closely spaced pregnancies in the CHD-Zou/Colline hospital. The high proportion of closely spaced pregnancies highlights the need for targeted interventions to address this issue and improve maternal and child health outcomes. Further research and collaboration between healthcare providers and communities are essential to promote family planning and ensure healthier pregnancy spacing for women and children [19].

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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