VOLUME - 12, ISSUE - 08, AUGUST - 2023 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Public Health

FACTORS FAVORING COMPLIANCE TO THE MINIMAL INTER PREGNANCY INTERVAL OF 24 MONTHS AFTER VAGINAL DELIVERY IN YAOUNDÉ

Fouelifack Ymele Florent*	Yaoundé Central Hospital. Higher Institute of Medical Technology - Nkolondom, Research, Education, and Health Development Group (GARES-Falaise), Dschang – Cameroon. *Corresponding Author
Tameh Theodore	Nkongsamba Regional Hospital. University of Bamenda.
Djukem Edwige	Higher Institute of Medical Technology - Nkolondom, Yaounde - Cameroon.
Anyimbi Mosman Ofeh	Maga District Hospital, Cameroon
Dongmo Fouelifa Loïc	Faculty of Health Sciences, University of Lomé. Army Health Services School of Lomé. Togo
Tebeu Pierre Marie	Director of the Inter-states Center for Public Health Training in Central Africa (CIESPAC), Brazzaville, – Congo.

ABSTRACT **Introduction.** The inter-pregnancy interval is the period between two consecutive full-term births. The World Health Organization recommends a minimum inter-pregnancy interval of 24 months between two live births in order to reduce materno-fetal and perinatal risks. In Cameroon, little is known of the factors favoring compliance to this interval. Our objective was to determine factors that promote compliance to the minimum inter-pregnancy of 24 months following vaginal delivery. **Methods.** We conducted a descriptive cross-sectional study at the Yaoundé Central Hospital from March 1, 2019 to June 31, 2019. We included every pregnant woman having at least one child who came to consult at the maternity. A consecutive sampling technique was used. The data were entered and analyzed using Epi Info version 7.2.2.6 software. Our results were expressed as frequency, mean, odds ratio (OR) with its 95% confidence interval. P was significant for any value strictly lower than 5%. **Results.** Of 300 participants, 213 (71%) kept the minimum inter-pregnancy of 24 months. The factors that independently favored this compliance were secondary [AOR (CI): 2.88(1.62-5.10); p<0.001] and higher education [AOR (CI): 11.91(6.09-23.28); p<0.001], civil servant status [AOR (CI): 4.92(3.13-7.74); p<0.001], modern contraceptive use [AOR (CI): 3.33(2.36-4.68); p<0.001], and having children with good nutritional status [AOR (CI):14.77(3.31-65.82); p<0.001]. **Conclusion.** Compliance to the minimum inter-pregnancy of 24 months was influenced by the mother's educational status, employment status, use of contraceptive methods, and good nutritional status of the preceding child. It would therefore be imperative to take this into account during behavior change communication.

KEYWORDS : Factors favoring, compliance, inter-pregnancy interval, woman, Cameroon

INTRODUCTION

The inter-pregnancy interval is the time between two successive full-term births [1].

Globally, and more so in developing countries (DCs), a decrease in mortality and fertility is a major issue for demographic policies. Family planning (FP), and particularly birth spacing, are often associated with the well-being of mother and child [1- 8, 11, 20, 21]. Furthermore, surveys carried out in Pakistan [12], Kenya [13], and other countries [14,15] have shown that, in developing countries, the relationship between short inter-pregnancy and high infant-child mortality persists even after variables such as the frequency of preterm births and the duration of breastfeeding were held constant. Women's access to FP and especially adequate birth spacing is considered a protective factor to their health and that of their children, the improvement of which would contribute to the achievement of the first four sustainable development goals. The World Health Organization (WHO) recommends that women wait at least 24 months after a live birth and at least 6 months after a miscarriage or elective abortion before conceiving, to reduce the risk of adverse perinatal outcomes in the next pregnancy [16].

In Cameroon, little data is available on the factors that promote compliance to the optimal inter-pregnancy interval. According to the latest Cameroon Demographic and Health Surveys [17], 25% of births occurred after a short inter-pregnancy interval (less than 24 months). Our general objective was to determine the factors favoring compliance to the minimum inter-pregnancy interval of 24 months after delivery. Specifically, to determine the proportion of women who kept the minimum inter-pregnancy birth interval following vaginal births, to describe their socio-demographic and obstetric profile, and to identify the factors favoring compliance to this interval.

MATERIALS AND METHOD

Study design, duration, period, and site

This was a descriptive cross-sectional study carried out over a period of 8 months, from November 23, 2018 to June 20, 2019, at the Yaoundé Central Hospital (YCH). The maternity of the YCH is a reference center in the Centre Region of Cameroon, conducting about 350 deliveries monthly (*a high attendance*), which allowed us to easily attain the minimum sample size.

Sampling

The sampling was consecutive. Our population consisted of pregnant women having at least one child and/or women with at least two consecutive children who came for consultation during the study period. Those who gave their informed consent to the study were included. All women who decided to withdraw in the course of the study were excluded. The minimum sample size was estimated using:
Lorenz's equation: $n = (z)^2 p (1 - p) / d^2$, where n = sample size, z = level of confidence according to the normal distribution (for a confidence interval of 95%, z = 1.96), d = acceptable margin of error = 5%, and p = proportion that keeps the minimum inter-pregnancy interval of 24 months in Cameroon = 25%, according to DHS 2018 [17]. After calculation, we

obtained 296. But we used a sample size of 300 participants.

Procedure

The participants were recruited from the antenatal care unit of the Gynecology and Obstetrics department of the YCH. During the first contact with the women, we explained the purpose of the study and its possible benefits on family welfare. Once the eligibility criteria were met, the women signed a written informed consent. The dependent variables studied were sociodemographic and obstetric. The independent variables were inter-pregnancy interval ≥24 months and <24 months. The pre-tested questionnaire was filled with information received through an interview, the antenatal care, the medical, and the delivery records.

Data analysis

All the data recorded on the questionnaires were entered and analyzed using Microsoft Word and Excel 2013, and EPI INFO 7.2.2.6 softwares respectively. Our results were expressed as frequency, mean, standard deviation, odds ratio (OR) with its 95% confidence interval. P was considered statistically significant for any value less than 0.05.

RESULTS

5.1. General

Of the 300 women interviewed, 213 (71%) kept the minimum inter-pregnancy interval of 24 months and 87 (29%) did not. The mean age of our sample was 32.52±6.97 years ranging between 18 and 54 years. To further our analysis, we divided our sample into 2 groups: one that kept the minimum inter-pregnancy interval of 24 months and the other that did not.

5.2. Factors favoring a inter-pregnancy interval ≥ 24 months

5.2.1. Distribution of the factors being studied

The distribution of the factors related to the inter-pregnancy interval is explored in table 1 below.

Table 1. Distribution of factors influencing compliance to the minimum inter-pregnancy interval.

Features	Frequency	Inter-pregnancy				P	OR (95% CI)
		≥24		<24			
	N=300	N=213	%	N=87	%		
Age						0,20	
18-27	74	45	60,81	29	33,33		
28-37	154	114	53,52	40	45,98		
38-47	65	51	23,94	14	16,09		
48-54	7	3	1,41	4	4,60		
Marital status						0,1	
Married	213	157	73,71	56	64,37		
Single	87	56	26,29	31	35,63		
Educational Status						<0,001	
Primary	59	25	11,74	34	39,08	0,004	2,75(0,85-4,64)
Secondary	115	73	34,27	42	48,28	0,000	2,64(1,82-3,46)
Higher	126	115	53,99	11	12,64	0,000	1,79(1,06-2,52)
Employment status						0,001	
Civil servant	80	74	34,74	6	6,90	<0,001	2,57(1,65-3,50)
Student	33	24	11,27	9	10,34	0,1	1,04(0,2-1,9)
Business owner	77	59	27,70	18	20,69	0,3	1,25(0,55-5,8)
House wife	19	12	5,63	7	8,05	0,24	0,6(0,4-1,6)
Others	91	44	20,66	47	54,02		
Monthly income (in FCFA)						<0,001	
<50000	157	102	47,89	55	63,22	0,06	2,05(0,98-4,31)
50000-100000	90	69	32,39	21	24,14	0,72	1,16(0,51-2,65)
≥100000	53	42	19,72	11	12,64	<0,001	15,8(14,4-16,09)
Number of children (class)						0,09	
1	65	39	18,31	26	29,89		
2-3	148	113	53,05	35	40,23		
4-5	65	45	21,13	20	22,99		
More than 5	22	16	7,51	6	6,90		
Modern contraceptive use						0,03	
Yes	223	166	77,93	57	65,52	0,036	1,85(1,07-3,21)
No	77	47	22,07	30	34,48		
Nutritional status of children						0,001	
Malnutrition	1	0	0,00	1	1,15		NA
Prematurity	15	4	1,88	11	12,64	0,07	2,03(0,86-3,2)
Good	284	209	98,12	75	86,21	0,001	7,6(2,36-24,8)
Past History						0,62	
High blood pressure	4	2	0,94	2	2,30		
Diabetes	6	4	1,88	2	2,30		
None	290	207	97,18	83	95,40		

Educational status (p<0.001), employment status (p=0.001), monthly income (p<0.001), use of modern contraceptives (p=0.03), and nutritional status of children (p=0.001), had a heterogeneous distribution, while age (p=0.20), marital status (p=0.10), number of children (p=0.09), and past history (p=0.62) had a homogeneous distribution with respect to compliance or not to the minimum inter-pregnancy interval.

5.2.3. Logistic regression

To get rid of every confounding factor and determine which factors were independently associated with compliance to the minimum inter-pregnancy interval, we performed a multivariate logistic regression using all the factors previously associated in the bivariate analysis (Table 2).

Table 2. Logistic regression

Features	Total	Inter-pregnancy (in months)				Crude		Adjusted	
		≥24		<24		OR (CI of 95%)	P	aOR (CI of 95%)	aP
	N=300	N=213	%	N=87	%				

Educational Status									
Primary	59	25	42,37	34	57,63	1			
Secondary	115	73	63,48	42	36,52	2,36(1,24-4,48)	0,007	4,25(1,98-9,11)	<0,001
Higher	126	115	91,27	11	8,73	14,21 (6,35-31, 82)	<0,001	11,71(4,87-28,13)	<0,001
Employment Status									
Civil servant	80	74	92,50	6	7,50	7,19(2,06-25, 09)	<0,001	1,92(1,46-2,50)	<0,001
Student	33	24	72,73	9	27,27	1,55(0,46-5,19)	0,47	0,53(0,2-1,46)	0,2
Business owner	77	59	76,62	18	23,38	1,91(0,65-5,58)	0,23	0,5(0,16-1,52)	0,22
Others	91	47	51,65	44	48,35	0,62(0,22-1,72)	0,36	0,9 (0,5-1,40)	0,60
Housewife	19	12	63,16	7	36,84	1			
Monthly income (in CFA francs)									
<50000	157	102	64,97	55	35,03	1			
50000-100000	90	69	76,67	21	23,33	1,77(0,98-3,2)	0,05		
≥100000	53	42	79,25	11	20,75	2,06(0,98-4,31)	0,05		
Use of Modern contraception									
Yes	223	166	74,44	57	25,56	1,85(1,07-3,21)	0,02	2,60 (1,06-6,38)	0,03
No	77	47	38,96	30	61,04	1			
Nutritional status of children									
Malnutrition	1	0		1					
Prematurity	15	4	26,67	11	73,33	1			
Good nutritional status	284	209	73,59	75	26,41	7,66(2,36-24, 80)	<0,001	14,77(3,31-65,82)	<0,001

The secondary (aOR= 4.25, CI=1.98-9.11, and p<0.001) and higher education status (aOR =11.71, CI=4.87-28.13, and p<0.001), the status of civil servant (aOR =1.92, CI=1.46-2.50, and p<0.001), the use of modern contraceptive methods (aOR=2.60, CI=1.06-6.38, and p=0.03), and good nutritional status (aOR=2.60, CI=1.06-6.38, and P=0.03) were factors that independently favored compliance to the minimum inter-pregnancy interval of 24 months.

DISCUSSION

1. General

Several authors found a mean age above 30 years just like in our study [18,19].

2. Factors favoring compliance to the minimum inter-pregnancy interval of 24-months

2.1. Distribution of factors influencing compliance to the minimum inter-pregnancy interval

Educational status (p<0.001), employment status (p=0.001), monthly income (p<0.001), use of modern contraceptives (p=0.03), and nutritional status of children (p=0.001) appeared to influence compliance to the minimum inter-pregnancy interval of 24 months (Table 1). Literacy would have a positive impact on the demand for family planning services. Regarding the use of modern contraceptive methods, urban women are better educated concerning the use of modern contraceptive methods than rural women [20-22].

2.2 Logistic regression

After logistic regression (Table 2), the secondary (aOR = 4.25, CI=1.98-9.11, and p<0.001) and higher education status (aOR=11.71, CI=4.87-28.13, and p<0.001), the status of civil servant (aOR=1.92, CI=1.46-2.50, and p<0.001), the use of modern contraceptive methods (aOR=2.60, CI=1.06-6.38, and p=0.03), and having a well-nourished child (aOR=2.60, CI=1.06-6.38, and P=0.03), independently favored compliance to the minimum inter-pregnancy interval.

Several authors found a predominance of housewives (contrary to civil servants in our case) [23-27]. Our results could be explained by the fact that these women are currently better educated on birth spacing methods in their workplace. In addition, most studies show that the use of modern contraception significantly favors the respect of the minimum inter-pregnancy interval [20-26,28].

Ethical considerations

Prior to recruitment, we obtained an ethical clearance, N° 1823 IERB-Udo/05/2019/T, from the Institutional Ethical Review Board for Human Health Research of the University of Douala. Authorization was obtained from the administration of the YCH. The questionnaires were anonymous and any participant who consented to participate in the study was free to withdraw at any time without that affecting her management.

Conflict of interest

The authors declare no conflict of interest.

Authors' contributions

Fouelifack Ymele Florent and Djukem Edwige designed the study, collected and analyzed the data. Fouedjio Jeanne Hortence and Fouelifa Dongmo Loic analyzed the data and wrote the manuscript. Tebeu Pierre Marie supervised the entire process from the design of the study to manuscript writing.

Acknowledgements

We are grateful to the YCH administration for granting us permission to conduct this study, the staff of the department of Gynecology and Obstetrics, and also the participants for facilitating the realization of this study.

CONCLUSION

A high level of education, civil servant status, and the use of modern contraceptive methods are factors that independently favor compliance to the minimum inter-pregnancy interval of 24 months among women. We suggest that policy makers, health and education personnel, and community leaders take intersectoral action to institute and/or intensify behavior change communication campaigns and promote community health.

REFERENCES

[1] Macro ORC. Central Statistical Agency: Ethiopia demographic and health survey 2005. ORC Macro Calverton Md USA 2006
[2] Herndn D, Reynaldo M, Robert K: Nutrition, lactation, and birth interval components in rural Guatemala. Am J Clin Nuir. 1982, 35: 1468-1476.

[3] Antoine P, Diouf PD. Indicators of child mortality and socioeconomic conditions in urban areas: initial results of a survey conducted in Pikine. 1989;
[4] Bongaarts J, Potter J, Trussel J. Does family planning reduce infant mortality? Popul Dev Rev. 1988;14(1):171-190.
[5] Callum C., Farid S. & Moussa M. Child loss and its impact on fertility >>, in Egypt: demographic responses to modernization, Hallouda Awad M., Farid Samir & Cochrane Susan H. 1988 , 239-278.
[6] Cantrelle P. and Leridon H. Breast Feeding, child Mortality and Fertility in a rural zone of Senegal, in Population Studies, vol. 25, no. 3, 1971, pp. 505-5.
[7] Cantrelle P., Leridon H. and Livenais P. Fécondité, allaitement et mortalit6 infantile. Diff6rences inter-ethniques dans une meme region: Saloum (S6negal), in Population, 35e annee, no 3, 1980, pp. 623-64.
[8] Boerma J.T. & Van Vianen H.A.W. Birth intervals, mortality and growth of children in rural area in Kenya >, in Journal of Biosocial Science, vol.16, no. 4, Oct. 1984, pp. 475- 486.
[9] CICRED (Committee for International Coordination of National research in Demogra- phy) Seminar on infant mortality in relation to the level of fertility, 6-12 may 1975, Bangkok (Thailand), CICRED, 1975, 317 p.
[10] Conde-Agudelo A et al. Effect of Interpregnancy interval on perinatal outcomes in Latin America. Obstetrics and gynecology, 2005, 106(2):359-66.
[11] Cloe MK et al. Identifying children with high mortality risk. National family health survey bulletin, 1999, 12:1-4.
[12] Mauskopf J. Reproductive response to child mortality: a maximum likelihood esti- mation model, in Journal of the American Statistical Association, vol 78, no 382, june 1983, pp. 238-248.
[13] Mensch Barbara S. - << The effect of child mortality on contraceptive use and fertility in Columbia, Costa Rica and Korea >>, in Population Studies, vol 39, no 2, Jul 1985, pp 309-327.
[14] Smith GC, Pell UP, Dobbie R. Interpregnancy interval and risk of pre-term birth and neonatal death: a retrospective cohort study. British medical journal, 2003, 327(7410):313-9.
[15] Rutstein S. Effects of birth internal on mortality and health: multivariate cross country analysis, MACRO International, Presentation at USAID, july2000. In: Setty-venugopal V, Upadhyay UD. Birth spacing three to fine saves lives. Baltimore, Johns Hopkins Bloomberg School of Public Health, Population Information Program, 2002 (Population reports, series L, No.13).
[16] World Health Organization. Recommendation for spacing after a live birth. Report of a WHO Technical Consultation on Birth Spacing Geneva, Switzerland 13-15 June 2005. 2007. Available at: file:///C:/Users/user/Downloads/WHO_RHR_07.1_eng.pdf. Accessed August 15, 2022
[17] National Institute of Statistics (INS) and ICF. 2020. Cameroon Demographic and Health Survey 2018. Yaoundé, Cameroon. The DHS Program ICF Rockville, Maryland, USA. February, 2020
[18] Kodjogbe N. Enquête démographique sur la santé au Bénin 2 ème édition, 2003.
[19] Zalha Sani M. Les obstacles à l'utilisation des services de planification familiale à Ouagadougou au Burkina Faso, Thèse de Médecine, Bamako 2004, n°4-M-25.
[20] Anoh A, 2001 - Emergence of family planning in Côte d'Ivoire. Doctoral thesis in demography, University of Paris X-Nanterre, Department of Sociology, Doctoral School of Sociology and Demography of Contemporary Societies, Paris, 441 p.
[21] Evina A., 2004 - Les déterminants de la pratique contraceptive au Cameroun: Analyse des données de l'Enquête Démographique et de Santé de 1998 (EDSC-II.
[22] Guillaume A and Desgrées du Loû A, 2002 - Birth control among women in Abidjan, Côte d'Ivoire: contraception, abortion or both? International Perspectives on Family Planning, special issue: 4-11.
[23] Institut National de la Statistique et de la Démographie (INSD), Macro I. Enquête Démographique et de Santé (EDS-IV) et à Indicateurs Multiples (MICS) EDSBF-MICS IV 2010. Rapport Préliminaire. Ouagadougou, Burkina Faso: Ministry of Economy and Finance; August 2011. Report No.
[24] Ivankovich M. Examining the influence of socio-demographic variables on the use of contraception after abortion in the United States Using the 2002 national survey of family growth. Centers for Disease Control. 2002.
[25] John Bongaarts, F.Westoff C. The potential role of contraception in reducing abortion. Studies in Family Planning. 2000;31(3):193-202.
[26] Megan L. Kavanaugh, Elizabeth E. Carlin, Jones RK. Patients' attitudes and experiences related to receiving contraception during abortion care. Elsevier. 2011;84:585-93. Epub 14 March 2011. Elsevier Inc
[27] Diabaté Diallo, Simiga Sy, M. TraORé, al. Knowledge, attitude and practices of family planning in rural areas. Méd Afr noire. 1997;44:317-19.
[28] Allison P.D., (1999). "Logistic Regression using the SAS System: Theory and Applications," Cary, N.C: SAS Institute Inc.