Perfil epidemiológico de bajo peso al nacer, departamento de Córdoba, Colombia, 2020-2021

Epidemiological profile of low birth weight, department of Córdoba, Colombia, 2020-2021

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Abstract

Introduction: Low birth weight (<2500 g) is one of the most important indicators to monitor progress in maternal, perinatal and child health. **Materials and methods:** Descriptive, analytical- correlational study with a quantitative approach. 1410 cases of newborns with low birth weight, reported in the Public Health Epidemiological Surveillance System (SIVIGILA) of the Department of Health Development, in the department of Córdoba, Colombia, were analyzed. For the analysis, the R statistical package and frequency tables were used. **Results:** 35% of the mothers were between the ages of 17-21 and 55% of them reside in municipal capitals. 92% had various trades as their occupation, 82% belong to stratum 1, 2% integrate the migrant population and 66% have a secondary educational level. On the other hand, 47% of the children reached 37 weeks of gestation and 94% of them were classified as low birth weight. **Discussion:** These results agree with those of other authors who determined that socioeconomic factors influence low birth weight. **Conclusions:** The sociodemographic characteristics of the mother are determining factors for low birth weight. **Keywords:** Health profile; Pregnancy; Infant, Low Birth Weight.

INTRODUCTION

The World Health Organization (WHO) defines the concept of low birth weight (LBW) as a birth weight of less than 2500 g[1]. This is one of the most important indicators for monitoring progress in maternal, perinatal and child health, as it reflects the reproductive capacity of the mother and allows the survival and development of the newborn to be predicted. Low birth weight babies are much smaller than normal weight babies, since their characteristics include thinness, little adipose tissue and their body is disproportionate to the size of their head, in the case of a neonate.

Low birth weight remains a major public health problem worldwide and is associated with a number of short- and long-term consequences. It is estimated that about 15 to 20% of children born each year, worldwide, have low birth weight. This equates to 20 million newborns per year, 96% of whom are in developing countries; Therefore, this problem is associated with the conditions of poverty in a country, as well as with the conditions of pregnant mothers with inadequate intakes, hygienic conditions that lead to infections, and high pregnancy rates in the adolescent population[1].

The global incidence varies between 8-20%, depending on the level of development of the countries. It is estimated that approximately 85% of all newborn deaths are correlated with low birth weight. The

most affected region is South Asia with 22-25% incidence, and the least affected region is the Western Pacific with 5-6%. India accounts for about 40% of all low birth weight births worldwide and, because babies are not weighed at birth in developing countries, an estimated 58% of these cases are not recorded worldwide[2].

In the Latin American and Caribbean region, the proportion of low birth weight infants is 9 per cent. Currently, a high proportion of newborns are not birth-heavy and these account for about 10%; so the WHO sees this as a problem even in high-income countries, where a lower figure would be expected[1].

The Pan American Health Organization 3 states that 72.7% of newborn deaths in Latin American countries are associated with LBW[3].

According to research by the National Institute of Health, "when analyzing data from some South American countries, Venezuela has the highest percentage of low birth weight newborns (10.6%) and Colombia ranks second with 9%. It is estimated that in the last decade, births with low birth weight have increased from 70 to 90 per 1000 live births"[4].

Similarly, in Colombia, 17,687 cases of LBW were reported in 2016[5], which increased to 18,486 cases in 2017, with a variation of 3.7% compared to the previous year[6]. For the year 2018, there was an 8.3% increase in notifications with 19,439 cases reported 7 and, for 2019, there were 19,436 cases. However, the behavioral trend of this event increased by 9.6% between 2016 and 2019[8].

In 2020, 18,477 cases of newborns with LBW were reported, representing a ratio of 2.9 cases per 100 live births[9]. This increased to 20,590 cases reported in 2021, representing a ratio of 3.3 cases per 100 live births 10. For its part, within the Ten-Year Public Health Plan (2022-2031), the goal is to keep the proportion of Low Birth Weight less than 9%[11].

On the other hand, in the department of Córdoba, between 2016 and 2017, this proportion remained at 2.4 per 100 live births, with a median weight of 2350; and increased to 2.7 per 100 live births for the period between 2018 and 2019. Likewise, there was a slight decrease in 2020, with 622 cases reported, which represented a rate of 2.5 per 100 live births, but increased to 788 cases reported in 2021; that is, a rate of 3.2 cases per 100 live births 10. Therefore, it is established to maintain the percentage of children with low birth weight at 3.1%[12].

Therefore, this study is theoretically supported by the self-care deficit declared by Dorothea Orem, which is established as a way of describing the relationship between the individual's capacities to act

and the demands made for self-care, which contributes to identifying the requirements of self-care[13]; as well as the interventions required, the need for self-care and the methods of help that women require at this stage, in order to enhance their capacity for self-care and avoid low birth weight.

In connection with the above, the objective is to analyze the epidemiological profile of LBW in the department of Córdoba, Colombia, in order to support and fill the knowledge gaps in this regard, to allow a first approach to the reality of this phenomenon at the departmental level by providing information with sufficient scientific validity, and that allows the monitoring and evaluation of public policies that impact the well-being of women in the future. women in the reproductive stage and in newborns. For this, the analysis presented is taken as a basis and the standardization of nursing care for this event is proposed. Therefore, the research group poses the following research question: What is the epidemiological profile of low birth weight in the department of Córdoba, Colombia, in the period 2020-2021?

METHODOLOGY

This study was classified as descriptive, analytical-correlational, and quantitative. The study population consisted of 1410 cases of low birth weight, which were reported in the Public Health Epidemiological Surveillance System (SIVIGILA) of the Ministry of Health Development of the department of Córdoba, Colombia; however, the sample calculation was not carried out since we worked with the total population.

The analyzed data were extracted from the SIVIGILA software version 4.0, the information was filtered and organized in an Excel file, version for Windows 2010; The analysis was performed in the statistical package R, a univariate analysis was performed where absolute frequencies and percentages were calculated for the qualitative variables of the mother and those of the newborn. In addition, a bivariate analysis of qualitative variables, such as the sociodemographic characteristics of the mother and the classification of low birth weight, was also studied, and the relationships (using an independence test known as the uncertainty coefficient) between sociodemographic characteristics and low birth weight were also studied. For all tests, a statistical significance of $p<0.05$ values was considered.

The study is ethically based on Resolution 8430 of 1993 of the Ministry of Health and Social Protection 14, and was classified as 'without ethical risk' due to the fact that no modification is made to the variables of interest defined in this study. The information obtained was handled with confidentiality and will not be used for any purpose other than the objectives of this research. Likewise, this study is based on Law 1581 of 2012 15, which protects the protection of personal data by not having any link that allows the transfer of information to third parties. Likewise, this study was submitted to the research committee of the Faculty of Health Sciences of the University of Sinú Elías Bechara Zainum.

RESULTS

The study population consisted of 1410 cases of LBW. According to the analysis of the sociodemographic characteristics of the mother, it is observed that the predominant age group is 17 to 21 years old with 35.11% (495), followed by the group from 22 to 26 years old with 27.09% (382); the age range between 27 and 31 years represents 16.10% (227), while the age range between 32 and 36 years represents 8.51% (120). and the 12-16 age group with 8.23% (116). In contrast, the groups with the lowest frequency were those aged 37 to 41 years (3.83%), those aged 42 to 46 (1.06%) (15), and those aged 47 or over (0.07% (1), Table 1.

Regarding the area of origin, 55.4% (776) belong to the municipal seat, 25.04% (353) belong to the population center and 19.93% (281) to the dispersed rural area. Table 1.

In relation to employment, the occupation predominated with various trades or others with 92.34% (1302), dependent workers with 2.20% (31) and independent workers with 0.35% (5). Table 1.

Another of the sociodemographic conditions studied was ethnicity, where 97.94% (1381) belong to other groups; 1.63 per cent (23) belong to the indigenous population, 0.21 per cent (3) to the Roma Roma people; while 0.14% (2) are of the black-mulatto ethnic group and 0.07% (1) of the Raizal ethnic group of the Archipelago of San Andrés, Providencia and Santa Catalina.Table 1.

According to socioeconomic status, stratum 1 predominated with 82.06% (1157), followed by 12.62% (178) for stratum 2, 0.64% (9) for stratum 3 and 0.28% (4) for stratum 4. Table 1.

In terms of population groups, 2.06% (29) belong to the migrant population, 0.21% (3) belong to the displaced population with the same number for the ICBF population; the disabled population, community mothers and victims of violence share the same number with 0.14% (2) each; and, finally,

0.07% (1) belong to indigenous groups, sharing the same number with the demobilized population and the psychiatric population. Table 1.

According to educational level, 66.17% (933) attended basic secondary education, followed by 20.35% (287) with primary education, 11.84% (167) with technical or higher education and 1.49% (21) with no level of schooling. Table 1.

Table 1. ***Sociodemographic characteristics of the mother***

AGE	FREQUENCY	PERCENTAGE
12-16	116	8,23
17-21	495	35,11
22-26	382	27,09
27-31	227	16,10
32-36	120	8,51
37-41	54	3,83
42-46	15	1,06
47-51	1	0,07
AREA		
Municipal seat	776	55,04
Population center	353	25,04
Dispersed Rural	281	19,93
OCCUPATION		
Not applicable	70	4,96
Miscellaneous or other trades	1302	92,34

No data		2	0,14
Dependent Workers		31	2,20
Employed		5	0,35
ETHNICITY			
Indigenous		23	1,63
Black mulatto		2	0,14
Other		1381	97,94
Raizal		1	0,07
Gypsy Rom		3	0,21
STRATUM			
1		1157	82,06
2		178	12,62
3		9	0,64
4		4	0,28
6		9	0,64
No data		53	3,76
POPULATION GROUPS			
GROUP WITH DISABILITIES	Disabled	2	0,14
	Non-Disabled	1408	99,86
DISPLACED GROUP	Displaced	3	0,21
	I don't scroll	1407	99,79

MIGRANT GROUP	Migrant	29	2,06
	Non-Migrant	1381	97,94
INDIGENOUS GROUP	Non-indigenous	1409	99,93
	Indigenous	1	0,07
POPULATION GROUP ICBF	No	1407	99,79
	ICBF Population	3	0,21
COMMUNITY MOTHER GROUP	Community Mother	2	0,14
	Non-Community Mother	1408	99,86
DEMOBILIZED GROUP	Demobilized	1	0,07
	No	1409	99,93
PSYCHIATRIC GROUP	Non-psychiatric	1409	99,93
	Psychiatric	1	0,07
GROUP VICTIMS OF VIOLENCE	Non-victim of violence	1408	99,86
	Victim of violence	2	0,14
EDUCATIONAL LEVEL			
None		21	1,49
Primary		287	20,35
High school		933	66,17
No data		2	0,14
Senior Technician		167	11,84

Source: Authors.

Regarding the characteristics of the newborn, 47.80% (674) had 37 weeks of gestation, 32.84% (463) had 38 weeks, 13.40% (189) had 39 weeks, 4.47% (63) had 40 weeks of gestation, 0.92% (13) had 41 weeks, 0.28% (4) had 42 weeks of gestation and those who reached 43, 44 and 45 weeks gestation was 0.07% (1) for each week. In addition, 99.43% (1402) of the newborns were low birth weight and 0.50% (7) had very low birth weight, considering low birth weight to be newborns with a weight equal to or less than 2499 grams and very low birth weight to newborns with a weight equal to or less than 1499 grams[3]. Table 2.

Table 2. ***Characteristics of the newborn***

GESTATION WEEK	FREQUENCY	PERCENTAGE
37	674	47,80
38	463	32,84
39	189	13,40
40	63	4,47
41	13	0,92
42	4	0,28
43	1	0,07
44	1	0,07
45	1	0,07
No data	1	0,07
WEIGHT CLASSIFICATION		
Low birth weight	1402	99,43
Very low birth weight	7	0,50
No data	1	0,07

Source: Authors.

To correlate the mother's sociodemographic characteristics with the weight classification, the uncertainty coefficient was used and, according to the recorded data, the 'P. Value' of the uncertainty coefficient test was obtained for each of the variables under study, with a significance level of 5% and a confidence level of 95%. The contrasted variables, such as sociodemographic variables (mother's age and educational level) and weight classification, have a P. Value less than 0.05; therefore, the hypothesis of independence is rejected, which means that the age of the mother and her educational level influences the presentation of LBW. Table 3.

Table 3. ***Statistical Association Between Mother's Sociodemographic Characteristics and Weight Classification***

CHARACTERISTICS OF THE MOTHER		WEIGHT CLASSIFICATION
		P. Value
MOTHER'S AGE		0,014
OCCUPATION		0,273
ETHNIC GROUP		0,988
STRATUM		0,933
POPULATION GROUPS	Disabled	0,880
	Displaced	0,853
	Migrant	0,564
	Destitute	0,915
	ICBF	0,853
	Community Mother	0,880
	Demobilized	0,915
	Psychiatric	0,915
	Victim of violence	0,880
EDUCATIONAL LEVEL		0,0039

Source: Authors.

DISCUSSION

Low birth weight is a public health problem because it can increase the risk of neonatal death by up to 14 times, as well as stunted growth and development, and in adulthood, it increases the possibility of suffering from chronic diseases such as diabetes, hypertension, among others. This event is associated with the conditions of poverty in a country, with the conditions of pregnant mothers with deficient intakes, with sanitary conditions that lead to contracting infections, and with high rates of pregnancies in the adolescent population[1].

In this context, the sociodemographic characteristics of the mothers were studied, including the stratum, the result of which was 82.06% (1157) for stratum 1 and 12.62% (178) for stratum 2. This is similar to the results obtained by Morillo and Rojas 16, where the majority of mothers, with 76%, belonged to stratum 1 and 13% to stratum 2.

Similarly, the mother's educational level was studied, with 66.17% (933) predominating secondary education. This result is similar to the results obtained by Morillo and Rojas[16] in the city of Pasto, Colombia, where the highest level of schooling for mothers, at 50%, was basic secondary education.

According to the medical literature and studies carried out in Latin American countries, the mother's age, socioeconomic status, and educational level have an important implication as determinants of the health of families and their children[17].

Although newborns were classified according to birth weight, where 99.43% (1402) of the newborns were low birth weight and 0.50% (7) had very low birth weight; After conducting an exhaustive review of the characteristics of the newborn, there was no evidence of studies at the global level or in Latin America, at the national or departmental level, that would allow these results to be compared.

In this sense, and after rejecting the hypothesis of independence, which allows us to relate the influence of the socioeconomic characteristics of the mothers with the LBW, although there is little literature to compare these results, some research allowed us to guide the respective analysis.

However, in the bivariate analysis carried out by Agudelo, Maldonado, Plazas, Gutiérrez, Gómez and Diaz[17], they found a statistically significant association between low birth weight and the mother's educational level (p 0.013), and this is related to the results of this research (with a p value of 0.056). whereas it is associated with the low probability of access to jobs with better pay and better working conditions that allow them to overcome their children's health problems; likewise, it could also be

associated with little or no knowledge of the rights and duties in health, on the part of the mother and her environment, which can prevent the pregnant woman from accessing health services due to the lack of knowledge of the benefits that the General Social Security Health System provides during the preconception stage. prenatal care and newborn care.

On the other hand, we found no studies demonstrating the statistical association between low birth weight and maternal age; However, the medical literature identifies the moment in the life course of adolescence and youth as a predisposing factor, associated with biopsychosocial conditions; among them, singleness, low schooling, economic dependence on parents, inopportuneness to enter prenatal care and, added to this, the biological conditions of growth and maturation that lead to the development of pathologies per trimester of gestation. including the need for obstetric interventions.

It should be noted that the variables of occupation, stratum, ethnicity and population groups did not have statistically significant values for low birth weight.

It is important to consider that low birth weight is an indicator of malnutrition and the health status of the mother, as a consequence of multiple and complex interactions between maternal, fetal and intrauterine factors[3]. Equally important is the timely identification of these children, so that the territorial, departmental, district, municipal, EAPB and UPGD entities can monitor and control these minors and, in this way, programs aimed at the maternal-perinatal route, early childhood, among others, can be strengthened.

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ETHICAL CONSIDERATIONS

The study is ethically based on resolution 8430 of 1993 of the Ministry of Health and Social Protection, and was classified as 'without ethical risk' due to the fact that no modification is made to the variables of interest defined in this study. The information obtained was handled with confidentiality and will not be used for any purpose other than the objectives of this research. Likewise, this study is based on Law 1581 of 2012, which protects the protection of personal data as there is no link that allows the

transfer of information to third parties. Likewise, this study was submitted to the research committee and ethics committee of the Faculty of Health Sciences of the University of Sinú Elías Bechara Zainum.

CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

CONCLUSIONS

When sociodemographically characterizing the mothers, it was evident that the highest percentage of the cases were at the time of the life course of the youth and that they came from the municipal capital; as well as that most of them are dedicated to various trades, belong to socioeconomic stratum 1 and have up to the educational level of secondary school.

In relation to the characteristics of the newborn, it was observed that the cases studied met the clinical criteria for case definition, as the product was at 37 weeks of gestation and weighed less than or equal to 2499 grams.

Regarding the correlation of the mother's sociodemographic characteristics with the newborn's weight classification, it was determined that the mother's age and educational level influence the occurrence of this event.

Finally, this research reaffirms the postulates declared by Dorothea Orem, on the importance of self-care from the preconception and gestation phase, which thus contributes to identifying the requirements of self-care, the interventions required, the need for self-care and the methods of help that women require, with special emphasis on the training and development of self-care of women and their families.

References

1. World Health Organization (WHO). Global Nutrition Targets 2025: A policy document on low birth weight. Geneva, Switzerland; 2017. Available in: https://www.who.int/es/publications/i/item/WHO-NMH-NHD-14.5

2. Ramírez J. Factors related to low birth weight in a high-complexity hospital. *Interdiscip J Epidemiol Public Health*. 2019 ; 2(2):7. https://doi.org/10.18041/2665-427X/ijeph.2.5195

3. National Health Service. Public Health Surveillance Protocol - Low Term Birth Weight. 2020; (3):15. Available in: https://www.ins.gov.co/buscador-eventos/Lineamientos/Pro_Bajo%20peso%20al%20nacer.pdf

4. National Institute of Health. Public Health Surveillance Protocol-Low Term Birth Weight. 2016; (3):27. Available in: http://saludpereira.gov.co/medios/PRO_Bajo_peso_al_nacer_a_termino2016.pdf

5. National Institute of Health. Report on Low Birth Weight at Term Event, Colombia, 2016. 2016; (2):24. Available in: https://www.ins.gov.co/buscador-eventos/Informesdeevento/Bajo%20peso%20al%20nacer%202016.pdf

6. National Institute of Health. Low Term Birth Weight Event Report, Colombia, 2017. 2017; (3):14. Available in: https://www.ins.gov.co/buscador-eventos/Informesdeevento/BAJO%20PESO%20AL%20NACER%20A%20T%C3%89RMINO%202017.pdf

7. National Institute of Health. Low Term Birth Weight Event Report, Colombia, 2018. 2018; (4):14. Available in: https://www.ins.gov.co/buscador-eventos/Informesdeevento/Bajo%20Peso%20al%20Nacer_2018.pdf

8. National Institute of Health. Low Term Birth Weight Event Report, Colombia, 2019. 2019; (4):14. Available in: https://www.ins.gov.co/buscador-eventos/Informesdeevento/BAJO%20PESO%20AL%20NACER_2019.pdf

9. National Institute of Health. Low Term Birth Weight Event Report, Colombia, 2020. 2020; (4):19. Available in: https://www.ins.gov.co/buscador-eventos/Informesdeevento/BAJO%20PESO%20AL%20NACER_2020.pdf

10. National Institute of Health. Low Term Birth Weight Event Report, Colombia, 2021. 2021; 31. Available in: https://www.ins.gov.co/buscador-eventos/Informesdeevento/BAJO%20PESO%20AL%20NACER%20A%20TERMINO%20INFORME%202021.pdf

11. Ten-Year Public Health Plan 2022-2031. Resolution No. 1035. 2022 Jun 14. Available in: https://www.minsalud.gov.co/Normatividad_Nuevo/Resoluci%C3%B3n%20No.%201035%20de%202022.pdf

12. Departmental Development Plan 2020-2023. Ordinance No. 0009. 2020 Jun 12. Available in: https://drive.google.com/file/d/1jpLXs3_j0X7fetMDAZW_Ju1Vc1zR-Q5C/view

13. Naranjo Hernández Y, Concepción Pacheco JA, Rodríguez Larreynaga M. The Self-Care Deficit Theory: Dorothea Elizabeth Orem. *Gac Méd Espirit*. 2017; 19(3):89-100. Available in: http://scielo.sld.cu/scielo.php?script=sci_abstract&pid=S1608-89212017000300009&lng=es&nrm=iso&tlng=es

14. Scientific, Technical and Administrative Standards for Health Research. Resolution No. 8430. 1993 Oct 4. Available in: https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/DE/DIJ/RESOLUCION-8430-DE-1993.PDF

15. General Provisions for the Protection of Personal Data. Statutory Law No. 1581. 2012 Oct 17. Available in: https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=49981

16. Morillo-Rosero HH, Rojas-Botero ML. Low birth weight and household food insecurity in Pasto, Colombia. *Univ Health*. 2019; 21(2):166-75. https://doi.org/10.22267/rus.192102.151.

17. Agudelo Pérez SI, Maldonado Calderón MJ, Plazas Vargas M, Gutierrez Soto I, Gomez AM, Díaz Quijano D. Relationship between sociodemographic factors and low birth weight in a university clinic in Cundinamarca, Colombia. *Rev Científica Salud Uninorte*. 2017; 33(2). https://doi.org/10.14482/sun.33.2.10534