REVISTA DA ESCOLA DE ENFERMAGEM DA USP

JOURNAL OF SCHOOL OF NURSING · UNIVERSITY OF SÃO PAULO

ORIGINAL ARTICLE

Maternal near-miss in labor and delivery in the light of technologies in health*

Near miss materno no trabalho de parto e parto à luz das tecnologias em saúde
Near miss materno en el trabajo de parto y parto a la luz de las tecnologías sanitarias

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* Extracted from the dissrtation: "*Near miss* materno: entre mulheres no período de trabalho de parto e parto", Universidade Estadual de Londrina, 2017.

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ABSTRACT

Objective: To know maternal near-miss situations during labor and delivery according to technologies in health. **Method:** A quantitative study conducted with puerperal women in a public institution in which the maternity department is a reference for high risk care. Data collection was performed from October 2016 to August 2017, and data were processed in SPSS 20.0. Technologies in health were used for discussing the results. **Results:** Participation of 319 puerperal women. Primiparous women (p=0.027), previous diagnosis of hypertension (p=0.0001), preeclampsia (p=0.0001) and urinary tract infection (p=0.002) were items with statistical significance for the maternal near-miss outcome in labor and delivery. The hard technology associated with the outcome was transportation for hospitalization (p=0.035). Among the light-hard technologies, the following were associated: characteristics of amniotic fluid (p=0.05), vital signs check (p=0.0001), and initiation of the partograph for cesarean section (p=0.026). Among the light technologies, user satisfaction was relevant (p=0.007). **Conclusion:** Health technologies can be used for structuring the assistance in order to prevent maternal near-miss.

DESCRIPTORS

Near Miss, Healthcare; Pregnancy, High-Risk; Parturition; Obstetric Nursing; Technology.

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INTRODUCTION

The theme of patient safety deserves attention from health professionals at all levels of care, which includes women's care at the time of labor and delivery in order to reduce maternal morbidity and mortality in this process[1].

In 2000, the United Nations (UN) held a conference to establish proposals for the Millennium Development Goals, which should be achieved by 2015, including a significant reduction in maternal mortality[2].

A new UN meeting was held in 2015, when goals for sustainable development were set. The third of these objectives was "to ensure a healthy life and promote wellbeing for all". One of its goals included reducing maternal mortality with the proposal not to exceed the rate of 70 women per 100,000 live births by 2030[3].

Based on the above, in Brazil, many protocols that qualified women's care focused on managing aggravation and providing guidelines for the increase of women's safety in the pregnancy-puerperal cycle were implemented. The current maternal mortality rate in Brazil is 26 women per 100,000 live births, which is well below that proposed in the sustainable development goals[4].

Therefore, the need for continuous investment in protocols and evidence-based updates in order to further reduce this rate, since even with tools for the safe outcome of pregnancy, there are still women experiencing severe morbidity events or maternal near-miss (MNM)[5-6].

In 2011, the World Health Organization (WHO) defined MNM as the situation in which women experience severe, life-threatening morbidities, and established criteria to identify them in order that necessary interventions are performed, thereby ensuring these women's wellbeing. The near-miss can occur during pregnancy, labor, delivery and puerperal period, and up to 42 days postpartum[7].

Women's care based on health technologies is one of the proposed points for achieving safer care. In this sense, by considering the triad of hard, light-hard and light technologies in health, it is interesting that the management of near-miss is intrinsically linked to the flexibility of using such tools[8].

In the present study, the aim is to know maternal near-miss situations during labor and delivery assistance according to technologies in health.

METHOD

TYPE OF STUDY

This is a quantitative, cross-sectional and analytical study that is a prospective cohort on high-risk pregnancy. It was developed in the maternity of a public institution that provides assistance to obstetric intercurrences and high complexity deliveries. Service is provided exclusively by the Brazilian Unified Health System (Portuguese acronym: SUS) in a municipality in the southern region of the country.

DATA COLLECTION

Women diagnosed with high-risk pregnancy according to the Ministry of Health protocol[6], with at least one MNM criterion according to WHO[7] and able to understand and give their consent for participation in the study were included. The objective of the study was clarified to all participants and they were asked to sign the Informed Consent (IC) form. The sample calculation was based on the annual report of deliveries at the institution of the year prior to the study. The following were considered: sample error of 5%, confidence level of 95%, and a universe of 1,045 births on year 2015. The sample consisted of 319 women[9].

A pilot study was conducted for adjustment of the instrument. Data collection was performed subsequently in the period from October 2016 to August 2017. Data were obtained by means of transcription of the medical chart, prenatal card, interview with all puerperal women, and description of the institutional structure of care. In order to guarantee the complete coverage of data, at the end of each case, the form was checked, as well as the medical charts and prenatal cards, and the re-interview by telephone in situations of hospital discharge was performed.

The form was structured to provide access to socioeconomic, demographic and obstetric data according to the health technologies proposed by Merhy[10], in which they are presented as facilitators for the diagnosis of the healthcare process. Technologies are the following: hard technology (HT) is directly linked to the material and physical structure of the institution; light-hard technology (LHT) refers to the scientific knowledge that bases the care performed, and is obtained through indicators of care at admission, obstetric practices in labor, delivery management and near-miss criteria; and the light technology (LT) is directed to the interpersonal relationship established between health professionals and users through dialogue and empathy, and is obtained through the indicator of users' level of satisfaction.

ANALYSIS AND PROCESSING OF DATA

Data were processed in the Statistical Package for the Social Sciences (SPSS) software, version 20.0, and analyzed by means of the chi-square test for searching possible associations ($p \leq 0.05$). The following dependent variables were used: 'maternal near-miss outcome in labor and delivery (MNMOLD)' and 'user satisfaction in relation to care' (obtained through women's reports of their expectations met in relation to guidelines and the interpersonal relationship with the health team).

ETHICAL ASPECTS

In compliance with determinations of Resolution 466/12 of the National Health Council, the study was approved by the Research Ethics Committee in Research Involving Human Beings of the Universidade Estadual de Londrina (CEP/UEL) under number 1.757.596.

RESULTS

This study included 319 women, most of whom (70.5%) were between 20 and 35 years of age, 18.5% were aged 36 years or over, and 11% were adolescents. The race was predominantly white (57.8%), the majority (86.8%) had

a partner, a little more than half (56.0%) had completed secondary education, 48.6% of families received more than three minimum wages. In the obstetric profile, there was statistical significance between the number of children and the maternal near-miss outcome in labor and delivery (MNMOLD) (p=0.027). Primiparous women had a higher incidence of MNMOLD (40.5%) (Table 1).

The analysis of the moment of MNM occurrence in the studied population demonstrated that 55.6% went through this situation during pregnancy, 19.5% during labor and delivery, and 25.4% from pregnancy until delivery.

Table 2 shows a statistically significant association between previous hypertension (p=0.0001), preeclampsia (p=0.0001), urinary tract infection (p=0.002), and MNMOLD.

According to the hard and light-hard technologies with regard to structure, the institution has the following: a pre-delivery room with two beds; two wards with shared rooms with nine beds; an inpatient ward with six beds for the hospitalization of pregnant women at risk; a delivery room with a gynecological table and a specific place inside the delivery room for the first care to the newborn; another setting for daily care of newborns in shared accommodation, and one

for nursing care; two shared bathrooms for all hospitalized women. The service also has the necessary supplies and materials for assistance to women at high-risk.

Regarding assistance during admission for labor, there was a significant statistical difference between the transport for hospitalization (p=0.035), vital signs check (p=0.0001) and the characteristics of amniotic fluid (p=0.05) and MNMOLD. Among women who sought hospitalization, 57.6% used private transportation, 55.2% of women did not have their vital signs checked, and 69.0% had no records of the amniotic fluid characteristic (Table 3).

In obstetric practices during labor, the initiation of partograph for cesarean section (54.3%) was associated with MNMOLD (p = 0.026). There was no association between labor management and MNMOLD. However, 32.9% of women were hospitalized with dilation of less than 4 cm, 34.2% without effective uterine dynamics, 65.8% had no induction of labor, and in 60.2% the outcome of pregnancy was the cesarean section. As for obstetric routines, there was no orientation for bathing for relaxation (86.5%), use of active ball or birthing chair (90.8%), companion at delivery (58.2%) and massage for pain relief (98.1%) (Table 3).

Table 1 – Distribution of women according to socioeconomic, demographic, obstetric characterization, and maternal near-miss outcome in labor and delivery – Londrina, PR, Brazil, 2017.

Variables	Maternal near-miss outcome in labor and delivery						P value*
	Yes		No		Total		
	n	%	n	%	n	%	
Age range (years)							
14-19	23	11.0	12	11.0	35	11.0	0.693
20-35	150	71.4	75	68.8	225	70.5	
36 and older	37	17.6	22	20.2	59	18.5	
Maternal race							
White	11	56.6	65	60.2	181	57.8	0.550
Black	89	43.4	43	39.8	132	42.2	
Marital status							
With partner	17	85.2	98	89.9	277	86.8	0.296
No partner	31	14.8	11	10.1	42	13.2	
Education al level							
Primary school	61	29.2	30	27.5	91	28.6	0.538
Secondary school	11	56.6	60	55.0	178	56.0	
Higher education	30	14.4	19	17.4	49	15.4	
Family income (MW)**							
≤1	30	14.3	19	17.4	49	15.4	
1 to 2	75	35.7	40	36.7	115	36.1	0.648
≥ 3	105	50.0	50	45.0	155	48.6	
Number of children							
Primiparous	85	40.5	37	33.9	122	38.2	0.027
Secundiparous	75	35.7	30	27.5	105	32.9	
Multiparous	50	23.8	42	38.5	92	28.8	
Interval between births							
< 2 years	24	61.5	15	38.5	39	18.8	0.395
≥ 2 years	116	68.6	53	31.4	169	81.2	

*Chi-square test (p<0.05); **Minimum wage in 2017: R$ 937.00.

Table 2 – Distribution of women according to presence of near-miss criteria prior to hospitalization for delivery and maternal near-miss outcome from pregnancy until delivery – Londrina, PR, Brazil, 2017.

Presence of near-miss criteria prior to hospitalization for delivery	Yes		No		Total		P value*
	n	%	n	%	n	%	
Hypertension							
Yes	117	92.1	10	7.9	127	39.8	0.0001
No	93	48.4	99	51.6	192	60.2	
Heart disease							
Yes	8	57.1	6	42.9	14	4.4	0.567
No	202	66.2	103	33.8	305	95.6	
Preeclampsia							
Yes	48	92.3	4	7.7	52	16.3	0.0001
No	162	60.7	105	39.3	267	83.7	
Urinary tract infection							
Yes	16	43.2	21	56.8	37	11.6	0.002
No	194	68.8	88	31.2	282	88.4	
Mental disorder							
Yes	11	64.7	6	35.3	17	5.3	0.920
No	199	65.9	103	34.1	302	94.7	
Coagulation disorder							
Yes	15	75.0	5	25.0	20	6.3	0.373
No	195	65.2	104	34.8	299	93.7	

*Chi-square test (p<0.05).

Table 3 – Distribution of women according to hard and light-hard technologies offered during hospitalization care, obstetric practices in labor, delivery management, and near-miss outcome in labor and delivery – Londrina, PR, Brazil, 2017.

Variables	Yes		No		Total		P value*
	n	%	n	%	n	%	
Transportation for hospitalization							
Ambulance	89	42.4	33	10.3	122	38.2	0.035
Private transportation	121	57.6	76	69.7	197	61.8	
Checking of vital signs at admission							
Yes	94	44.8	20	18.3	114	35.7	0.0001
No	116	55.2	89	81.6	205	64.2	
Dilation at admission							
< 4 cm	69	32.9	36	33.0	105	32.9	0.166
≥ 4 cm	49	23.3	37	33.9	86	26.9	
No record	92	43.8	36	33.0	128	40.1	
Uterine dynamics at admission							
Present	89	42.4	53	48.6	142	44.5	0.561
Absent	75	35.7	34	31.2	109	34.2	
No record	46	21.9	22	20.2	68	21.3	
Characteristic of amniotic fluid							
Clear	61	29.0	31	28.4	92	28.8	0.050
Meconium	4	1.9	8	7.3	12	3.8	
No record	145	69.0	70	64.2	215	67.4	
Oxytocin induction of labor							
Yes	75	35.7	34	31.2	109	34.2	0.420
No	135	64.3	75	68.8	210	65.8	
Relaxation bath in labor							
Yes	15	7.1	6	5.5	21	6.6	0.691
No	13	6.2	9	8.3	22	6.9	
No record	182	86.7	94	86.2	276	86.5	
Ball or birthing chair in labor							
Yes	4	2.0	4	4.1	8	2.7	0.390
No	12	6.1	7	7.1	19	6.5	
No record	180	91.8	87	29.6	267	90.8	

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Variables	Maternal near-miss outcome in labor and delivery						P value*
	Yes		No		Total		
	n	%	n	%	n	%	
Use of massage in labor							
Yes	3	1.4	3	2.8	6	1.9	0.449
No record	207	98.6	106	97.2	313	98.1	
Pre-birth companion							
Yes	114	60.6	54	51.9	168	57.5	0.174
No	74	39.4	50	48.1	124	42.5	
Partograph							
Up to 3 hours	32	15.2	28	25.7	60	18.8	0.026
More than 3 hours	26	12.4	15	13.8	41	12.9	
No record	38	18.1	20	18.3	58	18.2	
Initiation for cesarean section**	114	54.3	46	42.2	160	50.2	
Companion during labor							
Yes	76	39.0	45	46.4	121	41.6	0.226
No	119	61.0	52	53.6	171	58.6	
Place of delivery							
Bedroom	6	2.9	7	6.4	13	4.1	0.131
Delivery room	68	32.4	38	34.9	106	33.2	
Surgical center	136	64.8	64	58.7	200	62.7	
Type of birth							
Natural	81	38.6	46	14.4	127	39.8	0.530
Cesarean section	129	61.4	63	57.8	192	60.2	

*Chi-square test (p<0.05); ** Partograph initiated only to record the motive for cesarean section.

Among the light technologies, there was statistical significance in relation to receiving the desired orientations (p=0.013); information about the companion (p=0.022); kind treatment by the team (p=0.0001); information on clinical status (p=0.005); explanation of procedure performed (p=0.007); good relationship with the team (p=0.005); freedom to clarify questions (p=0.007); presentation of the team (p=0.026) and satisfaction with care. It was found that 44.5% did not receive the guidelines they wanted; 38.9% were not informed about the right of having a companion, but 54.6% were treated with kindness; 86.9% had information about their clinical condition; 85.9% received explanations about the procedures performed; 95.1% reported a good relationship with the team; 96.1% felt free to clarify questions; and 94.3% stated that the team presented themselves (Table 4).

Table 4 – Distribution of women according to light technologies offered and satisfaction with the service – Londrina, PR, Brazil, 2017.

Variables	Satisfaction with service						P value*
	Yes		No		Total		
	n	%	n	%	n	%	
Guidance before delivery							
Yes	177	62,5	21	58,3	198	62,1	0,624
No	106	37,5	15	41,7	121	37,9	
Desired orientation received							
Yes	157	55,5	12	33,3	169	53,0	0,013
No	126	44,5	24	66,7	150	47,0	
Information about companion							
Hospitalization	108	38,2	11	30,6	119	37,3	0,022
Pre-labor	43	15,2	8	22,2	51	16,0	
Delivery	9	3,2	2	5,6	11	3,4	
Puerperal period	13	4,6	6	16,7	19	6,0	
Not informed	110	38,9	9	25,0	119	37,3	
Kind treatment by the team							
Yes	270	84,6	28	77,8	298	93,4	0,0001
No	12	4,2	8	93,4	20	6,3	
No opinion	1	0,4	0	0,0	1	0,3	
Information on clinical picture							
Yes	246	86,9	24	66,7	270	84,6	0,005
No	37	13,1	12	33,3	49	15,4	

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Variables	Satisfaction with service						P value*
	Yes		No		Total		
	n	%	n	%	n	%	
Explanation of procedure performed							
Yes	243	85,9	24	66,7	267	83,7	0,007
No	40	14,1	12	33,3	52	16,3	
Good relationship with the team							
Yes	269	95,1	29	80,6	298	93,4	0,005
No	14	4,9	7	19,4	21	6,6	
Freedom to clarify doubts							
Yes	272	96,1	30	83,3	302	94,7	0,007
No	11	3,9	6	16,7	17	5,3	
Introduction of the team							
Yes	267	94,3	30	83,3	297	93,1	0,026
No	16	5,7	6	16,7	22	6,9	

*Chi-square test ($p < 0.05$).

DISCUSSION

Women at extremes of age, that is, adolescents and those over 35 years of age, are classified as intermediate risk in care protocols for pregnant women[5]. For a long time, pregnancy in adolescence was understood as a risk factor for young women's health and characterized as a public health problem. However, this paradigm is being broken currently, because this group's exposure to social risk is known to be much greater than exposure to biological risk[11]. The escape from the reality in which they live, and the fact that the social representation of being a mother gives them a specific and respected identity before society, are social determinants for maintaining the incidence of pregnancy in this age group[12]. This reality was confirmed in this study, because there was no significant number of MNMOLD occurrence among adolescents.

Considering that women currently take longer to decide for a first pregnancy because of their daily lives, or even because of the search for social and financial stability, many of them have become pregnant after 35 years of age[13]. In the present study, the number of women who had MNMOLD after that age was not significant. Most studied women who had MNMOLD events were young adults of childbearing age.

In relation to the pregnancy-puerperal cycle, the predisposition to some specific condition may be related to primiparous women[14]. In this study, the proportion of MNMOLD in primiparous women was significant, similar to a study conducted in the state of Pernambuco in a reference maternity for high risk, in which 93.2% of primiparous women were at gestational risk[15].

Although this study was focused on labor and delivery, the occurrence of near-miss during pregnancy reinforces the importance of quality prenatal care, accurate follow-up, and early identification of any type of change or presence of morbidity for intervention in a timely manner. The morbidities identified in this study were not different from those identified as determinants of high rates of national maternal mortality.

The epidemiological profile of these deaths constructed by the Health Surveillance Secretariat presents hypertension as the leading cause of maternal mortality with 20% of cases, and puerperal infections with 7%, the third cause of maternal death in Brazil[16].

In the design and implementation of LHT, the necessary subsidies for programming effective actions for the prevention of near-miss can be found, since they propose the knowledge of professionals as an essential factor for quality care. In this sense, the findings of the present study question to what extent the inadequate use of specific knowledge about the mentioned diseases, or the lack of care due to lack of such knowledge could be determining the occurrence of MNM.

In pregnancy, there are several presentations of hypertension known, namely: previously hypertensive pregnant women; pregnant women who develop hypertension after 20 weeks, and may evolve to preeclampsia, eclampsia or HELLP syndrome (hemolysis, elevated liver enzymes, low platelet count), which increases the likelihood of MNMOLD[17-18]. Urinary tract infection is another pathology present in the periods of pregnancy and giving birth of innumerable women, and which can progress to chorioamnionitis, puerperal infection or even sepsis. Again, the importance of the professional having skills that correspond to the light and hard technologies in health is emphasized in order to manage the presented pictures properly[19].

In the same way that pre-delivery care is important, the moment of hospitalization is also significant, since from anamnesis and its record the best conduct will be chosen and demonstrated the LHT during assistance[5]. However, this moment is not always registered in the medical record. In the present study, lack of information on vital signs and characteristics of the amniotic fluid was identified. Vital signs provide important information about the initial state of women at high-risk[20]. The analysis of the amniotic fluid offers information on fetal status, as well as indications of risk for infection in parturient women that may extend to the puerperal period. Therefore, this information provides an adequate management of MNM cases[21].

In this study, 32.9% of hospitalized women showed no signs of labor, which are dilation greater than four

centimeters and presence of uterine dynamics, a conduct considered appropriate since these are women at high obstetric risk[22]. Most women in this study had a cesarean section as a resolution of gestation. Even though these are high rates, the indications were considered pertinent given the high-risk diagnosis involved, and demonstrated the adequate use of LHTs. Since 1996, the WHO has recommended that institutions have a maximum of 15% cesarean deliveries among the total deliveries[23]. However, a current publication recommended that institutions adopt the Robson's classification or classification of the 10 groups, which proposes groups with specific obstetric characteristics. Thus, each institution has its cesarean section rate according to the characteristics of women attended, which affirms the effectiveness in indicating the surgery[24].

Humanized care is a proposal of the Ministry of Health for the assistance offered by the SUS and directly associated to light technologies, and women in situations of MNM should not be excluded from this service. In addition to professionals' awareness, one of the ways to humanize the moment of childbirth depends on the structure of the institution, which must offer: access to hot water, Swiss ball, complementary therapies for pain relief, and good interpersonal interaction of the team with the woman by involving the maintenance of a calm, comfortable and private environment, which shows the joint use of the triad of technologies in health[22-25]. Again, in this study, obstetric routines were not properly registered in medical records.

In relation to HT (hard technologies), the structure of the institution under analysis provides the means to perform examinations, ensure access to the intensive care unit if necessary, and also access to the operating room and the neonatal intensive care unit. Professionals have access to all necessary materials and supplies, which is extremely important for the care of MNM cases. However, the structure where the maternity is located has limitations, for example: toilets that are often used by extended periods of time during labor are insufficient; warm water is a non-pharmacological help for pain relief, but access to the shower is restricted[26]; and wide and airy corridors for walks of parturient women are not available, even though walking favors the progression of labor[27].

Women's mean of transportation to the institution is also considered a HT. In this study, most women sought hospitalization by their own means, that is, private vehicles, and these women were the highest cases of MNMOLD. Parturient women are entitled the right of safe transportation through the Mobile Emergency Care System (Portuguese acronym: SAMU) for the referral hospital. This means of transport can meet any type of demand presented by parturient women along the way, and ensure their physiological stability[28].

Day-to-day practice and the automatism of the caring process can harm the interpersonal relationship between professionals and users and favor the non-establishment of light technologies in the work environment. In this study, despite the limited resolution of women's specific demands during their hospitalization, their satisfaction was evident. This can be explained by the fact that for users, it is often more important to be treated with humanity than to have their pathologies or demands resolved[29-30].

CONCLUSION

In this study, the presence of arterial hypertension, pre-eclampsia and urinary tract infection prior to admission to labor have determined the occurrence of maternal near-miss in labor and delivery due to hypertensive crisis, HELLP syndrome and puerperal infection, respectively. In this sense, it could be deduced that light-hard and hard technologies were not enough for the prevention of negative outcomes in the care offered to these women after hospitalization. However, these technologies were adequately implemented, and the determinants of near-miss cases in labor and delivery were the insufficient follow-up of maternal conditions during pregnancy and their hospitalization in a critical clinical picture. This diagnosis emphasizes the need for prenatal adjustment of women classified as high risk, which should include efficient clinical follow-up, use of light technologies for women's empowerment on their diagnosis and self-care, as well as effective conditions of access to the referral institution for the adequate delivery and minimization of risks.

The limitation of the study is the lack of information in medical records on women's care, which indicates the need for a review in the procedure of records of care, as this is an important health information system and essential for the analysis of the quality of care and, consequently, of patient safety.

Technologies in health can be a reference for structuring the care for high-risk labor and delivery, and have the aim of preventing maternal near-miss at these moments.

RESUMO

Objetivo: Conhecer situações de *near miss* materno durante a assistência ao trabalho de parto e parto, de acordo com as tecnologias em saúde. **Método:** Estudo quantitativo, realizado em uma instituição pública, cuja maternidade é referência para alto risco, com puérperas. A coleta de dados foi realizada no período de outubro de 2016 a agosto de 2017, e os dados foram processados no SPSS 20.0. Para a discussão dos resultados, foram utilizadas as tecnologias em saúde. **Resultados:** Participaram 319 puérperas. Primípara (*p*=0,027), diagnóstico prévio de hipertensão (*p*=0,0001), pré-eclâmpsia (*p*=0,0001) e infecção do trato urinário (*p*=0,002) foram itens que apresentaram significância estatística para o desfecho de *near miss* materno no trabalho de parto e parto. A tecnologia dura que se associou com o desfecho foi o transporte para internação (*p*=0,035); entre as leve-duras, associaram-se as características do líquido amniótico (*p*=0,05), verificação dos sinais vitais (*p*=0,0001) e abertura do partograma para cesariana (*p*=0,026); e entre as leves, a satisfação da usuária foi relevante (*p*=0,007) **Conclusão:** Acredita-se que as tecnologias em saúde podem ser utilizadas para a estruturação da assistência para a prevenção do *near miss* materno.

DESCRITORES

Near Miss; Gravidez de Alto Risco; Parto; Enfermagem Obstétrica; Tecnologia.

RESUMEN

Objetivo: Conocer situaciones de *near miss* materno durante la asistencia al trabajo de parto y parto, según las tecnologías sanitarias. **Método:** Estudio cuantitativo, llevado a cabo en un centro público, cuya maternidad es referencia para alto riesgo, con puérperas. La recolección de datos se realizó en el período de octubre de 2016 a agosto de 2017, y los datos fueron procesados en el SPSS 20.0. Para la discusión de los resultados, fueron utilizadas las tecnologías sanitarias. **Resultados:** Participaron 319 puérperas. Primípara (*p*=0,027), diagnóstico previo de hipertensión (*p*=0,0001), pre eclampsia (*p*=0,0001) e infección del tracto urinario (*p*=0,002) fueron puntos que presentaron significación estadística para el resultado de *near miss* materno en el trabajo de parto y parto. La tecnología dura que se asoció con el resultado fue el traslado a estancia hospitalaria (*p*=0,035); entre las ligera-duras, se asociaron las características del líquido amniótico (*p*=0,05), verificación de las señales vitales (*p*=0,0001) y apertura del partograma para cesárea *(p*=0,026); y, entre las ligeras, la satisfacción de la usuaria fue relevante (*p*=0,007). **Conclusión:** Se cree que las tecnologías sanitarias pueden utilizarse para la estructuración de la asistencia a fin de prevenir el *near miss* materno.

DESCRIPTORES

Near Miss Salud; Embarazo de Alto Riesgo; Parto; Enfermería Obstétrica; Tecnología.

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