ACTA 30 YEARS 1988 - 2018

Original Article

# External causes of mortality in pregnant and puerperal women

## Causas externas de mortalidade em mulheres grávidas e puérperas

## Causas externas de mortalidad en mujeres embarazadas y puérperas

Suelayne Gonçalves do Nascimento[1]
Ricarlly Soares da Silva[2]
Larissa de Moraes Cavalcante[1]
Aline Priscila Rego de Carvalho[1]
Cristine Vieira do Bonfim[3,4]

**Keywords**
External causes; Pregnant women; Violence against women; Maternal mortality; Vital statistics; Postpartum period

**Descritores**
Causas externas; Gestantes; Violência contra a mulher; Mortalidade materna; Estatísticas vitais; Período pós-parto

**Descriptores**
External causes; Mujeres embarazadas; Violencia contra la mujer; Mortalidad materna; Estadísticas vitals; Periodo Posparto

**Submitted**
February 20, 2018

**Accepted**
May 3, 2018

**Abstract**
**Objective:** To describe deaths due to accidents, suicides and homicide among pregnant or puerperal women.
**Methods:** This was a retrospective study on 169 deaths (108 of pregnant women and 61 of puerperal women) in the state of Pernambuco, Brazil, covering the years 2006 and 2014, for which the data source was the Mortality Information System (SIM).
**Results:** Homicides were the main type of violence for pregnant women (34.9%) and puerperal women (23.1%). The deaths occurred in the age group of 20-49 years (n = 122; 72,2%), among women of nonwhite race/color (n = 141; 83,4%) and with no companion (n = 129; 76,3%).
**Conclusion:** Investigating deaths due to external causes during the pregnancy-puerperal period provides information that is useful for implementation of violence prevention strategies.

**Resumo**
**Objetivo:** Descrever as mortes por acidentes, suicídios e homicídios entre gestantes e puérperas.
**Métodos:** Estudo retrospectivo de 169 óbitos (108 de gestantes e 61 puérperas) no estado de Pernambuco entre os anos de 2006 e 2014 com uso da fonte de dados do Sistema de Informações sobre Mortalidade (SIM).
**Resultados:** Homicídios foram o principal tipo de violência em gestantes (34,9%) e puérperas (23,1%). Os óbitos ocorreram na faixa etária de 20 a 49 anos (n = 122; 72,2%), em mulheres de raça/cor não branca (n = 141; 83,4%) e sem companheiro (n = 129; 76,3%).
**Conclusão:** A investigação dos óbitos por causas externas durante o período gravídico-puerperal fornece informações úteis para a implementação de estratégias de prevenção da violência.

**Resumen**
**Objetivo:** Describir las muertes por accidentes, suicidios y homicidios entre mujeres embarazadas o puérperas.
**Métodos:** Se trata de un estudio retrospectivo sobre 169 defunciones (108 de mujeres embarazadas y 61 de puérperas) en el estado de Pernambuco, Brasil, para los años 2006 y 2014, cuya fuente de datos fue el Sistema de Información sobre Mortalidad (SIM).
**Resultados:** Los homicidios fueron el principal tipo de violencia para con las mujeres embarazadas (34,9%) y las puérperas (23,1%). Las muertes sucedieron en el grupo de edad de 20 a 49 años (n = 122; 72,2%), entre mujeres de raza/color no blancas (n = 141; 83,4%) y sin pareja estable (n = 129; 76,3%).
**Conclusión:** La investigación de las muertes por causas externas durante el período embarazo-puerperal proporciona información útil para la implementación de estrategias de prevención de la violencia.

**Corresponding author**
Cristine Vieira do Bonfim
http://orcid.org/0000-0002-4495-9673
E-mail: cristine.bonfim@uol.com.br

**DOI**
http://dx.doi.org/10.1590/1982-0194201800026



**How to cite:**
Nascimento SG, Silva RS, Cavalcante LM, Carvalho AP, Bonfim CV. External causes of mortality in pregnant and puerperal women. Acta Paul Enferm. 2018;31(2):181-6.

[1]Hospital e Maternidade Petronila Campos, São Lourenço da Mata, PE, Brazil.
[2]Secretaria de Saúde do Estado de Pernambuco, Recife, PE, Brazil.
[3]Fundação Joaquim Nabuco, Recife, PE, Brazil.
[4]Universidade Federal de Pernambuco, Recife, PE, Brazil.
Conflicts to interest: none to declare

## Introduction

Maternal death is considered to be an important indicator of the quality of care provided for women's health and of the social realities of a country.[1] It has close links with sociocultural and biological determinants, especially in relation to gender inequalities.[2]

The World Health Organization (WHO) defines maternal death as the death of a woman during pregnancy or within a period of 42 days after the end of the pregnancy, regardless of the duration or location of the pregnancy, due to any cause relating to or aggravated by measures taken towards the woman, except for accidental or incidental causes.[3] Another definition, from the Maternal Mortality Study Group, define pregnancy-related death as the death of a woman, due to any cause, during pregnancy or even up to a year after the pregnancy.[4]

These definitions enable identification of maternal deaths, based only on their causes, as direct or indirect.[3] Direct deaths are those due to complications relating to pregnancy and delivery and after childbirth. These comprise interventions, omissions or incorrect treatment; or chains of events resulting from any one of the items above.[5] Indirect deaths are related to preexisting diseases or to diseases that developed during the pregnancy, but not due to direct obstetric causes, although they may have been aggravated by the physiological effects of the pregnancy.[6]

Therefore, it is evident that all deaths due to external causes during the pregnancy-puerperal period are excluded from construction of the maternal mortality indicator, i.e. deaths are classified only as deaths caused by external injuries, without any reference to pregnancy or puerperium.[7] These deaths include injuries caused by car accidents, drowning, poisoning or falls, and also violence such as aggression, homicides, suicides and sexual abuse.[8]

To comprehend and gain knowledge of the determinants of violence and accidents, and the extent of these events, it is necessary to perform systematic data analysis on morbidity and mortality due to external causes.[9] However, due to the complexity of ascertaining the exact nature of accidents and violent events, their classification always involves a degree of imprecision.[10]

For this reason, the relationship between maternal death and external causes is unknown and rarely investigated through maternal death surveillance systems in Brazil. This worsens the level of underreporting, since these causes are rated as non-obstetric and are therefore automatically eliminated from construction of the official maternal mortality indicator.[7]

Inclusion of these deaths in official data will make it possible to characterize and ascertain the relevance and trends among these deaths and will provide information for developing strategies and guidance for public policies with the objective of reducing and preventing these injuries. This study aimed to describe deaths due to external causes (accidents, suicides and homicides) among pregnant women or puerperal women in the state of Pernambuco (Brazil), during the period from 2006 to 2014.

## Methods

This was a retrospective study conducted in the state of Pernambuco, covering the years 2006 and 2014, for which the data source was the Mortality Information System (SIM). The study population was composed of pregnant or puerperal women who died due to external causes (accidents, suicides and homicides).

To classify causes of death, we used chapter XX of the 10th Revision of the International Classification of Diseases (ICD),[11] which lists external causes, divided according to the circumstances of these deaths: transport accidents (V01-V99), suicides (X60-X84) and homicides (X85-Y09). Out of the total number of deaths that occurred during the years 2006 to 2014 (n = 207); 39 deaths related to other external causes were excluded from the analysis (Exposure to inanimate mechanical forces (W20-W49) - 1; Accidentall drowning and submersion (W65-784) – 4; Exposure to electric current, radiation and extreme ambient air temperature and

pressure - (W85-W99) – 6; Accidental exposure to other and unspecified factors (X58-X59) – 2; Event of undetermined intent (Y10-Y34) – 22; Falls (W00-W19) – 3; Other land transport accidents (V80-V89) – 1).

The following variables were analyzed: age group, race/color: white (white and yellow) or nonwhite: (black and brown), marital situation: with no companion (single, widowed or legally separated) or with companion (married or consensual partnership), location of the occurrence (home, healthcare establishments or public environment), provision of medical care and necropsy. The variables of occupation and education level were not analyzed due to the lack of information records: n = 63 (37.3%) and n = 54 (31.9%), respectively.

For the descriptive analysis on the data, we used the EpiInfo software, version 7. Descriptive statistics with frequency distribution were used.

The project was approved by the Research Ethics Committee of the Instituto de Medicina Integral Professor Fernando Figueira (CAEE: 46848515.9.0000.5201).

## Results

169 deaths were studied, among which 108 (63.9%) were in the pregnant women group and 61 (36,1%) in the puerperal women group. Table 1 shows that the highest percentages of deaths were due to homicides, both during pregnancy n = 59 (34,9%) and puerperium n = 39 (23,1%).

**Table 1.** External causes for death among pregnant and puerperal women

| Year | Pregnant women | | | Puerperal women | | |
|---|---|---|---|---|---|---|
| | Accidents | Suicides | Homicides | Accidents | Suicides | Homicides |
| | n(%) | n(%) | n(%) | n(%) | n(%) | n(%) |
| 2006 | 3(14.3) | 5(23.8) | 6(28.6) | - | - | 7(33.3) |
| 2007 | 3(12.0) | 1(4.0) | 11(44.0) | 1(4.0) | 3(12.0) | 6(24.0) |
| 2008 | 7(28.0) | 3(12.0) | 8(32.0) | - | 1(4.0) | 6(24.0) |
| 2009 | 3(15.8) | - | 7(36.8) | 4(21.1) | 1(5.3) | 4(21.1) |
| 2010 | 6(24.0) | - | 7(28.0) | 3(12.0) | 2(8.0) | 7(28.0) |
| 2011 | 3(30.0) | - | 6(60.0) | - | - | 1(10.0) |
| 2012 | 4(21.1) | 1(5.3) | 4(21.1) | 4(21.1) | 1(5.3) | 5(26.3) |
| 2013 | 5(62.5) | - | - | - | 1(12,5) | 2(25.0) |
| 2014 | 3(17.6) | 2(11.8) | 10(58.8) | 1(5.9) | - | 1(5.9) |
| Total | 37(21.9) | 12(7.1) | 59(34.9) | 13(7.7) | 9(5.3) | 39(23.1) |

Table 2 shows that most deaths occurred in the age group of 20-49 years (n = 122; 72.2%), among women of nonwhite race/color (n = 141; 83.4%) and with no companion (n = 129; 76.3%). Regarding the location of the occurrence, deaths due to accidents were most frequent in public environments, accounting for 21 deaths (12.4%) among pregnant women and 7 (4.1%) among puerperal women. Deaths due to suicides occurred mostly in healthcare establishments during pregnancy (n = 6; 3.6%) and in healthcare establishments during the puerperium (n = 4; 2.4%). Deaths due to homicides were predominantly in public environments (n = 24; 14.2%) and at home (n = 18; 10.7%) for pregnant women and puerperal women, respectively.

**Table 2.** Socio-demographic data, location and characteristics of the death of pregnant and puerperal women

| Variables | Type of death | | | | | |
|---|---|---|---|---|---|---|
| | Accidental | | Suicide | | Homicide | |
| | Pregnant (n = 37) n(%) | Puerperal (n = 13) n(%) | Pregnant (n = 12) n(%) | Puerperal (n = 9) n(%) | Pregnant (n = 59) n(%) | Puerperal (n = 39) n(%) |
| Age group | | | | | | |
| 10-19 years | 9(5.3) | 3(1.8) | 4(2.4) | 3(1.8) | 21(12.4) | 7(4.1) |
| 20-49 years | 28(16.6) | 10(5.9) | 8(4.7) | 6(3.6) | 38(22.5) | 32(18.9) |
| Race/color[a] | | | | | | |
| White | 7(4.1) | 2(1.2) | 1(0.6) | 1(0.6) | 7(4.1) | 4(2.4) |
| Nonwhite | 29(17.2) | 11(6.5) | 11(6.5) | 8(4.7) | 49(29.0) | 33(19.5) |
| Marital status[b] | | | | | | |
| Married or widowed | 6(3.6) | 5(3.0) | 3(1.8) | 3(1.8) | 10(5.9) | 7(4.1) |
| Single or divorced | 27(16.0) | 14(8.3) | 9(5.3) | 3(1.8) | 46(27.2) | 30(17.8) |
| Location of the occurrence | | | | | | |
| Healthcare establishments | 13(7.7) | 5(3.0) | 6(3.6) | 4(2.4) | 10(5.9) | 3(1.8) |
| Home | - | - | 5(3.0) | 4(2.4) | 17(10.1) | 18(10.7) |
| Public environment | 21(12.4) | 7(4.1) | - | 1(0.6) - | 24(14.2) | 15(8.9) |
| Others | 3(1.8) | 1(0.6) | 1(0.6) | | 8(4.7) | 3(1.8) |
| Medical care in the period[c] | | | | | | |
| Yes | 13(7.7) | 5(3.0) | 4(2.4) | 4(2.4) | 8(4.7) | 3(1.8) |
| No | 20(11.8) | 4(2.4) | 4(2.4) | 4(2.4) | 39(23.1) | 32(18.9) |
| Necropsy[d] | | | | | | |
| Yes | 30(17.8) | 7(4.1) | 9(5.3) | 7(4.1) | 50(29.6) | 28(16.6) |
| No | 5(3.0) | 3(1.8) | 1(0.6) | 1(0.6) | 5(3.0) | 10(5.9) |

No information: a(n=6; 3.6%); b(n=6; 3.6%); c(n=17; 10.2% and n = 12; 7.2%); d(n = 9; 5.4% and 4; 2.4%)

Among the 169 deaths analyzed, 103 women (60.9%) did not receive medical care at the time of death, especially in the case of homicides, for which the numbers were 39 (23.1%) for pregnant women

and 32 (18.9%) for puerperal women. In relation to 131 deaths (77.5%), a necropsy was performed, among which for homicides during pregnancy, there were n = 50 (29.6%) (Table 2).

Table 3 presents the main underlying causes for death within the chapter of external causes. It was found that the greatest proportions of death for the pregnant and puerperal groups were due to the following causes: occupant of vehicle in traffic accident (n=42; 84.0%), Injury due to gunshot wounds (n=55; 56.1%) and Injury caused by cutting, penetrating or blunt object (n=32; 32.7%). For pregnant women, traffic accidents (n = 32; 64.0%) and gunshot wounds (n = 33; 33.7%) were the main causes of deaths. For puerperal women, the main cause of deaths was gunshot wounds (n = 22; 22.4%) and Injury caused by cutting, penetrating or blunt object (n = 11; 11.2%) (Table 3).

**Table 3.** Description of underlying causes of death among pregnant and puerperal women

| Causes | Pregnant woman n(%) | Puerperal woman n(%) | Total n(%) |
|---|---|---|---|
| Accidents | | | |
| Occupant of vehicle or motorcycle injured in a traffic accident (V23-89) | 32(64.0) | 10(20.0) | 42(84.0) |
| Pedestrian injured in a traffic accident (V09) | 5(10.0) | 3(6.0) | 8(16.0) |
| Suicides | | | |
| Self-intoxication through exposure to drugs or pesticides (X61-68) | 8(38.1) | 4(19.0) | 12(57.1) |
| Self-inflicted injuries through drowning or hanging (X70-71) | 4(19.0) | 2(9.5) | 6(28.6) |
| Deliberated self-inflicted injuries (X60-84) | 0(0.0) | 3(14.3) | 3(14.3) |
| Homicides(a) | | | |
| Injury due to gunshot wounds (X95) | 33(33.7) | 22(22.4) | 55(56.1) |
| Injury caused by cutting, penetrating or blunt object (X99-Y00) | 21(21.4) | 11(11.2) | 32(32.7) |
| Agressions (X85-Y09) | 5(5.1) | 6(6.1) | 11(11.2) |

## Discussion

This study results have shown homicide as the main violent death cause among pregnant and puerperal women. Suicide was the most frequent among pregnant women. Before the early 90's, there was little research on homicide or suicide during and after pregnancies,[12] but nowadays there's substantial evidence that homicide and suicide are common death causes associated to pregnancy.[13,14] The number of homicides and suicides reported in the literature allow the formulation of hypotheses over the prevalence and etiology of death associated with pregnancy, so it is quite appropriate to emphasize the importance of these deaths in order to preserve the health, safety and well-being of women and children.[12]

Research conducted in Colombia also identified that over half of the deaths due to violent causes and accidents involved pregnant women.[10] Therefore, including episodes of violence as part of the routine investigations in healthcare services, especially during the prenatal period, might favor early identification of cases of violence, thus decreasing the number of deaths due to external causes.[15]

The results from the present study show that deaths due to external causes were most prevalent among women in the age group between 20 and 49 years, of nonwhite race/color and with no companion. Socio-demographic factors may have contributed towards the greater occurrence of deaths in this population group. These findings are in accordance with those found in other studies.[12,16,17] A study realized in Recife (PE) with women victim of homicide have identified that 75% of these women were from 20 to 49 years old, and most of them were brown/black and single.[16] A research conducted in 37 states of the USA on homicide and suicide associated to pregnancy, observed that the homicides were more frequent with young black women, whilst suicides were more common among old white women.[13] A research developed to exam if being pregnant or post-partum was associated to an extreme risk of homicide among women in Illinois (USA), identified as the victims profile women from 20 to 29 years old who were black and single. Pregnant and puerperal women with age from 10 to 29 had twice the risk of homicide in comparison to the non-pregnant or puerperal women (relative risk of 2,20 [IC 95% 1,70-2,85]).[17]

Public environments were the main location of occurrences of accidental and violent events. This result draws attention to the violence involved in these events, which does not allow the possibility of survival of the victim. A study that aimed to identify the number of homicides due to gunshots in a state capital in northeastern Brazil found that among the female victims of gunshot injuries that occurred in

public environments, only a small proportion survived the aggression. One third of the women who initially survived subsequently died in hospital.[18]

Necropsy was not performed in the cases of all deaths due to external causes among pregnant and puerperal women. This procedure is indicated for improving the accuracy of information on causes of natural and violent deaths.[7] A study that described the incompleteness of death registries in the SIM due to external causes in the state of Pernambuco, indicated a high incompleteness of the variable necropsy.[7] The Medical Legal Institute (IML) is the Official Body that performs necropsies in cases of deaths due to external causes, aiming to elucidate the causes that originated the event. For any resulting death and/or suspicion of an external cause, the filling of the Declaration of Death (DO) must be performed by an IML coroner or expert after body necropsy, or by a designated expert, if the locality does not have an IML building.[19,20] The state of Pernambuco has three IMLs with professionals trained to receive the bodies and perform the necropsy. Therefore, the high proportion of incompleteness of the necropsy variable leaves doubts about possible negligence in the filling of the variable in the DO by the professionals of IML, or part of the deaths due to external causes have not been referred to IML.[7]

Among the causes of death, traffic accidents stood out among the accidental causes of external deaths. In developed countries, this type of accident is responsible for up to 80% of cases of injury during pregnancy.[20] When traffic accidents occur during pregnancy, they are usually associated with increased risk of obstetric complications, such as premature rupture of membranes, placental abruption, premature birth, abortion, uterine rupture and fetal and/or maternal death.[21]

Accidents caused by motorcycles were also responsible for a large proportion of the deaths among pregnant and puerperal women. A similar study conducted in Nigeria found that over 83% of hospitalizations due to automotive vehicle accidents during pregnancy involved a motorcycle.[22]

To decrease the numbers of cases of accidents and consequently the mortality rate, greater investment is required to maintain traffic safety, with more efficient inspection and surveillance combined with educational campaigns that sensitize drivers towards respecting traffic laws.[23]

Among deaths due to suicide, the main method used was self-intoxication through exposure to drugs and pesticides, which was a finding consistent with what has been described in the literature.[24] Historically, pregnancy has been considered to be a factor that prevents suicide.[25] However, several authors have stated that thoughts of death and suicidal behavior tend to increase during pregnancy.[26-28]

Unplanned pregnancy and violence perpetrated by intimate partners are the most common causes of suicide attempts, because they tend to significantly increase the symptoms of depression.[24,29] In this regard, the family, healthcare services, religious groups and the community, among other groups, are an indispensable part of the support network and can contribute towards decreasing the risk of suicide.[25]

In analyzing deaths due to homicide, gunshot wounds were the main cause of death during the puerperal period. Homicide is an important, but often unreported, cause of maternal mortality.[30] In a study conducted in Brazil, almost 70% of deaths among women of fertile age were caused by guns.[16] These deaths are also associated, in most cases, with violence perpetrated by intimate partners and often include situations of sexual violence.[31] A review of the overall prevalence of intimate partner homicides has shown that in the USA about 45% of homicides against women were committed by intimate partner. In the United Kingdom this proportion is 54% and in South Africa 50%.[13]

## Conclusion

The results from the present study show that mortality occurred mostly among women from 20 to 49 years old, generally nonwhite and with no companion. Homicide was the main cause of violence against pregnant and puerperal women. Suicide was more prevalent amongst puerperal women and accidents were more prevalent among pregnant women. Therefore, investigating deaths due to external causes during the pregnancy-puerperal period provides useful information that complements violence prevention strategies for this population group.

## Collaborations

Nascimento SG and Bonfim CV contributed to the study conception, data analysis and interpretation, writing of the manuscript, critical review of its intellectual content and final approval of the version to be published. Silva RS, Cavalcante LM and Carvalho APR contributed to data analysis and interpretation, writing of the manuscript and final approval of the version to be published.

## References


1. Lamba A, Agarwal S, Dutta AK. A cross sectional study to assess the pattern of maternal mortality in a tertiary level government hospital of a city in north India. Int J Reprod Contracept Obstet Gynecol. 2016;5(1):220–3.
2. Bazile J, Rigodon J, Berman L, Boulanger VM, Maistrellis E, Kausiwa P et al. Intergenerational impacts of maternal mortality: qualitative findings from rural Malawi. Reprod Health. 2015 May;12(S1 Suppl 1):S1.
3. World Health Organization (WHO). Trends in maternal mortality: 1990 to 2013. Geneva: WHO; 2014.
4. Centers for Disease Control and Prevention (CDC). Pregnancy Mortality Surveillance System. Georgia: CDC; 2016.
5. Montgomery AL, Ram U, Kumar R, Jha P; Million Death Study Collaborators. Maternal mortality in India: causes and healthcare service use based on a nationally representative survey. PLoS One. 2014; 9(1):e83331.
6. Thornton C, Schmied V, Dennis CL, Barnett B, Dahlen HG. Maternal deaths in NSW (2000-2006) from nonmedical causes (suicide and trauma) in the first year following birth. BioMed Res Int. 2013;2013:623743.
7. Alves MM, Alves SV, Antunes MB, Santos DL. External causes and maternal mortality: proposal for classification. Rev Saude Publica. 2013;47(2):283–91.
8. Neves AC, Mascarenhas MD, Silva MM, Malta DC. Perfil das vítimas de violências e acidentes atendidas em serviços de urgência e emergência do Sistema Único de Saúde em capitais brasileiras – 2011. Epidemiol Serv Saude. 2013;22(4):587–96.
9. de Melo CM, Bevilacqua PD, Barletto M. Produção da informação sobre mortalidade por causas externas: sentidos e significados no preenchimento da declaração de óbito. Ciênc Saude Colet. 2013;18(5):1225–34.
10. Salazar E, Buitrago C, Molina F, Alzate CA. Tendencia de la mortalidad por causas externas en mujeres gestantes puérperas y su relación con factores socioeconómicos en Colombia, 1998-2010. Rev Panam Salud Publica. 2015;37(4-5):225–31.
11. Organização Mundial da Saúde (OMS). Classificação Estatística Internacional de Doenças e Problemas Relacionados à Saúde – CID-10. 10 ed. São Paulo: EDUSP; 2000.
12. Shadigian E, Bauer ST. Pregnancy-associated death: a qualitative systematic review of homicide and suicide. Obstet Gynecol Surv. 2005;60(3):183–90.
13. Stöckl H, Devries K, Rotstein A, Abrahams N, Campbell J, Watts C, et al. The global prevalence of intimate partner homicide: a systematic review. Lancet. 2013;382(9895):859–65.
14. Wallace ME, Hoyert D, Williams C, Mendola P. Pregnancy-associated homicide and suicide in 37 US states with enhanced pregnancy surveillance. Am J Obstet Gynecol. 2016;215(3):364.e1–10.
15. Sgobero JK, Monteschio LV, Zurita RC, Oliveira RR, Mathias TA. Violência física por parceiro íntimo na gestação: prevalência e alguns fatores associados. Aquichan. 2015;15(3):339–50.
16. Silva MA, Cabral Filho JE, Amorim MM, Falbo Neto GH. Mulheres vítimas de homicídio em Recife, Pernambuco, Brasil, 2009/2010: um estudo descritivo. Cad Saude Publica. 2013;29(2):391–6.
17. Koch AR, Rosenberg D, Geller SE; Illinois Department of Public Health Maternal Mortality Review Committee Working Group. Higher risk of homicide among pregnant and postpartum females aged 10-29 years in Illinois, 2002-201. Obstet Gynecol. 2016;128(3):440–6.
18. Trindade RF, Costa FA, Silva PP, Caminiti GB, Santos CB. Mapa dos homicídios por arma de fogo: perfil das vítimas e das agressões. Rev Esc Enferm USP. 2015;49(5):748–55.
19. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Análise de Situação de Saúde. Manual para preenchimento da declaração de óbito. Brasília (DF): Ministério da Saúde; 2011. [Série A - Normas e Manuais Técnicos].
20. Vivian-Taylor J, Roberts CL, Chen JS, Ford JB. Motor vehicle accidents during pregnancy: a population-based study. BJOG. 2012;119(4):499–503.
21. Woldeyes WS, Amenu D, Segni H. Uterine rupture in pregnancy following fall from a motorcycle: a horrid accident in pregnancy. Case Report Obstet Gynecol. 2015; Article ID 715180.
22. Njoku OI, Joannes UO, Christian MC, Azubike OK. Trauma during pregnancy in a Nigerian setting: patterns of presentation and pregnancy outcome. Int J Crit Illn Inj Sci. 2013;3(4):269–73.
23. Dirlik M, Bostancıoğlu BÇ, Elbek T, Korkmaz B, Çallak Kallem F, Gün B. Features of the traffic accidents happened in the province of Aydın between 2005 and 2011. Ulus Travma Acil Cerrahi Derg. 2014;20(5):353–8.
24. Mojibian M, Mirhoseini H, Asadpour M, Pourrashidi Boshrabadi A, Hosseinpoor S, Rezahosseini O, et al. Frequency of Suicidal Thoughts and Attempt in Pregnant Women Referred to Four Hospitals of Yazd City, Iran in 2011. J Sci Technol. 2014;4(1):31–8.
25. Builes-Correa MV, Anderson-Gómez MT, Ramírez-Zapata A, Arbeláez BE. Suicidio en mujeres gestantes: vivencias y redes de apoyo para las familias que les sobreviven. Rev Fac Nac Salud Pública. 2014;32(3):332–9.
26. Zangeneh M, Veisi F, Ebrahimi B. Frequency of attempted suicide methods and the fetal outcomes in pregnant women in Kermanshah. J Womens Health Care. 2014;3(4):164.
27. Phillips MR. Pregnancy and suicide: towards a coherent narrative. Lancet Psychiatry. 2014;1(3):168–70.
28. Okada MM, Hoga LA, Borges AL, Albuquerque RS, Belli MA. Domestic violence against pregnant women. Acta Paul Enferm. 2015;28(3):270–4.
29. Mahenge B, Likindikoki S, Stöckl H, Mbwambo J. Intimate partner violence during pregnancy and associated mental health symptoms among pregnant women in Tanzania: a cross-sectional study. BJOG. 2013 ;120(8):940–6.
30. McFarlane J, Campbell JC, Sharps P, Watson K. Abuse during pregnancy and femicide: urgent implications for women's health. Obstet Gynecol. 2002;100(1):27–36.
31. Osnaya-Moreno H, Zaragoza Salas TA, Escoto Gomez JA, Mondragon Chimal MA, Torres Castaneda ML, Jimenez Flores M. Gunshot wound to the pregnant uterus: case report. Rev Bras Ginecol Obstet. 2013. 2013;35(9):.427-31.