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Heat wave and the risk of intimate partner violence

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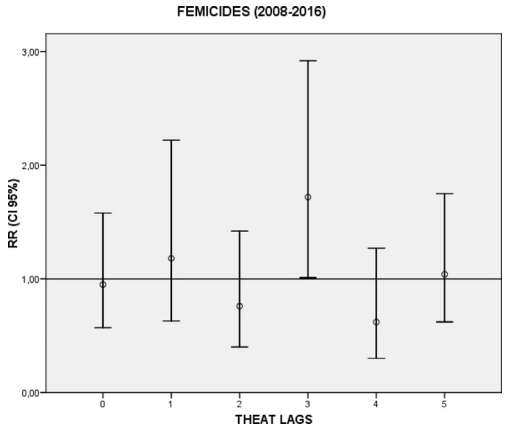
HIGHLIGHTS

- The risk of intimate partner femicides increases three days after the heat wave.
- The risk of police reports increases one day after the heat wave.
- The risk of help line calls increases five days after the heat wave.
- Heat waves are associated with an increase in intimate partner violence.

GRAPHICAL ABSTRACT



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ABSTRACT

Background: A high number of women report experiencing intimate partner violence (IPV). It is of utmost importance to identify possible factors that precipitate IPV and incorporate them into police protocols for evaluating IPV risk. Scientific evidence shows that environmental temperature is associated with a risk of violent behavior.
Objectives: To analyze the effect and impact of heat waves on the risk of IPV.
Methods: Ecological, longitudinal time series study. The dependent variables are: intimate partner femicides (IPF), reports of IPV and 016 IPV telephone help line calls in the Community of Madrid from 05/01 to 09/30 in the years 2008–2016. The principal independent variable is the daily maximum temperature in Celsius (Tmax) above the heat wave threshold of 34 °C. A binomial negative regression was used for calls and reports and a Poisson regression was used for IPF. The attributable risk among those exposed (AR%) and the number of attributable cases was calculated for each variable.
Results: The risk of IPF increased three days after the heat wave, [RR(IC95%):1.40(1.00–1.97)], police reports of IPV increased one day after [RR (IC95%):1.02(1.00–1.03) and help line calls increased five days after [RR(IC95%):1.01(1.00–1.03)]. The AR% was 28.8% (IC95%: 0.3%–49.2%) for IPF, 1.7% (IC95%:0.3%–3.1%) for police reports and 1.43% (IC95:0.1%;2.8%) for help line calls.

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Conclusions: Our results suggest that heat waves are associated with an increase in IPV. The effect of an increase in IPV is delayed in time, with differences according to the violence indicators analyzed.

1. Introduction

According to the last World Report on Homicide of the United Nations, 43,600 women were killed by their intimate partners or family members in 2012 (UNODC, 2013). In the European Union (EU) it is estimated that 22% of the women that have or have had a partner have experienced physical and/or sexual violence, and 43% have experienced psychological violence by a current or past intimate partner (FRA, 2014). In Spain, according the last Macrosurvey on Gender Violence 2015, the 13,% of the women had suffered everlife physical and/or sexual intimate partner violence (IPV) (Delegación de Gobierno para la Violencia de Género, 2015, Macroencuesta).

Despite the fact that only 30% of the European women (FRA, 2014) and the 26.8 of the Spanish women (Delegación de Gobierno para la Violencia de Género, 2015, Macroencuesta) exposed to this type of violence file a police report against their aggressor (FRA, 2014), in Spain in 2017 there were 125,769 reports of intimate partner violence (IPV) (including 20,044 in the Community of Madrid). Also in 2017, 49 women were killed by their partners, only 11 (22.4%) of whom had filed a police report against their aggressor (Ministerio de Sanidad Servicios Sociales e igualdad, 2015; http://estadisticasviolenciagenero.msssi.gob.es/). These figures, which are repeated year after year in different European countries (FRA, 2014; García-Moreno et al., 2006) highlight the need for social innovation to address this grave social problem.

While the roots of IPV are clearly linked to gender inequalities, in recent decades, there has been intense research to identify factors that increase a woman's risk of experiencing IPV (Abramsky et al., 2011; López-Ossorio et al., 2017; Sanz-Barbero et al., 2018) and, in the most extreme terms, of being killed by her partner (Beyer et al., 2013; Sanz-Barbero et al., 2016; Stöckl et al., 2013). These factors, as pointed out by Heise's Integral Ecological Model (Heise, 1998), interact on different levels ranging from individual characteristics - age, birthplace, socioeconomic position, etc. - to other social and structural circumstances such as gender inequality and women's political participation (Bond et al., 2010; Gressard et al., 2015; Palma-Solis et al., 2008; Sanz-Barbero et al., 2015).

Given the high number of women who report IPV and request support, it is of vital importance to open new lines of inquiry that permit continued advances in the identification of possible precipitating factors of IPV and their incorporation in police protocols to evaluate the risk of recurrence (López-Ossorio et al., 2016). One of these areas is related to exploring the relationship between IPV and environmental variables more deeply, given its growing presence in research on interpersonal and collective violence (Levy et al., 2017; Michel et al., 2016; Schinasi and Hamra, 2017).

Although it would seem that a behavior as socially rooted as IPV could never be brought about by variables of an environmental nature, scientific evidence shows that exposure to environmental temperature is associated with the risk of violent behavior (Schinasi and Hamra, 2017). In particular, sexual aggression (McLean, 2007), assaults and robberies (Lemon et al., 2017; Michel et al., 2016; Schinasi and Hamra, 2017) have been associated with temperature, although there is controversy over whether this association is linear or curvilinear (Bushman et al., 2005). In the case of IPV, an association has been identified between temperature and an increase in police reports of IPV (Rotton and Cohn, 2001; Auliciems and DiBartolo, 1995; Cohn, 1993), in emergency telephone calls (Rotton and Cohn, 2001; Lebeau, 1994), and in requests for access to domestic violence shelters (Michael and Zumpe, 1986).

The objective of this study is to analyze the effect of daily maximum temperatures during heat waves on the risk of intimate partner femicides (IPF), police reports and calls to the 016 telephone help line in the Community of Madrid, and to estimate the number of cases attributable to this type of violent behavior produced during heat waves.

2. Methods

2.1. Study design

The study is an ecological longitudinal time series study.

2.2. Description of the variables

The dependent variables analyzed include IPFs, IPV police reports and calls to the 016 telephone help line in the Community of Madrid, during the period from May 1st to September 30th in the years 2008–2016. The data sources of the dependent variables include:

- Information about the number of daily calls to the IPV telephone help line in the Community of Madrid during the study period was provided by the Government Delegation for Gender Violence (Ministry of Health, Social Services and Equality).
- The daily number of IPV reports filed before the Gender Violence Courts and the number of IPFs that occurred in the Community of Madrid were provided by the Integral Monitoring System for Cases of Gender Violence (VioGen) of the Ministry of the Interior during the study period mentioned above.

The variable used to account for the impact of heat on the dependent variables was daily maximum temperature (Tmax). This information was provided by the State Meteorological Agency. According the Ministry of Health, Social Services and Equality's protocol (Díaz et al., 2015; Ministerio de Sanidad, Servicios Sociales e Igualdad, 2017), a heat wave occurs when the daily Tmax surpasses the threshold of 34 °C in the Observatory in Madrid. Therefore, the principal independent variable is constituted by T_{heat} values defined as:

$$T_{heat} = 0 \text{ s i } T_{max} < 34\ ^{\circ}C$$

$$T_{heat} = T_{max} - 34 \text{ si } T_{max} > 34\ ^{\circ}C$$

Based on the values of T_{heat}, and with the objective of analyzing whether the effect of high temperatures on the dependent variables could have a lag of one to five days, the variables were calculated with time lags T_{heat1}, T_{heat2}, T_{heat3}, T_{heat4} y T_{heat5}, respectively. The choice of lags of up to 5 days is based on how high temperatures(heatwaves) affect health indicators such as morbi-mortality at a biological level (Díaz et al., 2002) and the impact in mental illnesses such as neurodegenerative (Linares et al., 2016). In both cases the delays chosen are up to 5. On the other hand, the papers of Katerndahl et al. (Katerndahl et al., 2010), indicate that the delay between stress reactions and alcohol abuse with femicides are usually delayed up to 3 days.

2.3. Statistical analyses

Given that in the case of the variables “IPV police reports” and “calls to the 016 IPV telephone help line” there is overdispersion - greater