

# Associations of Suicide Seasonality with Rural-Urban Residence and Mental Disorders in Ilam, Iran

Dear Editor,

Suicide is one of the ten leading causes of death in Western countries and the second leading cause in people aged 15-19 years. In recent decades, annual suicide attempts reportedly ranged from 2.6 to 1,100 per 100,000 people, while the rate of lifetime prevalence ranges from 750 to 5,930 per 100,000 worldwide.<sup>1</sup> Studies regarding suicide in Iran showed that most attempts originated in urban areas, and a recent systematic review focusing on seasonal variation indicated that most suicides were committed in the spring and summer seasons.<sup>2</sup>

The two leading models describing the effect of seasons on suicide are the bioclimatic and socio-demographic models. The bioclimatic model analyzes the ways in which climate-related and environmental factors (e.g. heat) influence the springtime peak in suicide rates, likely as a result of increased excitability in the nervous system. The socio-demographic model proposes that the spring peak is a consequence of increased occupational and public activity.<sup>3</sup> Utilizing a set of representative and fresh data, the present study aims at examining the seasonality of suicide. As the second objective, we also explored differences in seasonality between rural and urban areas, mental disorders, and genders.

The data of suicide attempts were extracted from the systematic registration suicide data system (SRSD) provided by Ilam University of Medical Sciences, Ilam, Iran. Data on attempted suicide have been collected systematically since 2010. We identified 546 suicide deaths and 6,272 attempted suicides from 1 January 2010 to 31 December 2014. The data included all suicide attempts by the residence of Ilam aged 6 years and older, who were admitted to medical centers in Ilam during the period of the present study. In the systematic registration suicide data system (SRSD), suicide attempts were determined by analyzing physicians' statements and hospital admission records. This was in addition to daily suicide counts according to a structured schedule that involved nine items, namely age, sex, marital status, educational level, job status, partners' job status and educational level, region of residence, race, and other demographic information. Data concerning mental disorders, addiction, methods of suicide attempt, and outcome were collected from individual outpatient visits on a monthly basis. Two methods, Chi-square, Edwards' T, were used independently to analyze the seasonality. Seasonal effect ("peak/trough seasons" and "deaths/suicide attempts") was explored by ratio statistics; the null hypothesis assumes that completed suicides in each method group are evenly distributed over a year.

Our findings showed that the number of suicide attempts in rural and urban areas fluctuated by season. The number was highest in spring/autumn for both genders, and for rural areas the highest was in spring/summer for both genders. The overall distribution of suicides by residence (males  $\chi^2=44.5$ ,  $P\leq 0.001$ , females  $\chi^2=115.3$ ,  $P\leq 0.001$ ) differed significantly between seasons for both genders. Suicide data during 2010 to 2014 revealed that suicide following mental disorders showed statistically significant seasonality with a peak in the springtime, regardless of other factors such as gender and age. Excluding suicides due to mental disorders, the seasonality remained statistically significant for all other types of suicide, but the peak month shifted to autumn in 2010, 2011, and 2012.

Data regarding suicide attempts by month indicated that the spring time peak occurred in May and the autumn peak took place in September, whereas the peak months for completed suicides were January, March, and October. In general, suicides peaked in springtime and early summer, and platitude in the autumn and winter months. Several studies indicated that the patterns of springtime and autumn peaks were more common in Western countries. Both rural and urban areas showed seasonal variation in suicide attempts, although a greater seasonal effect was observed in urban areas. Basing his research on the sociological model, Durkheim illustrated a difference between rural and urban areas, demonstrating that variables affecting suicide were more prevalent in rural areas.<sup>4</sup> We investigated the presence of mental disorders in terms of seasonal variation in suicide, and our results indicated a higher frequency in springtime deaths. Several studies have examined the interplay between psychiatric disorders and seasonal change on suicidal inclination. For instance, Doganay et al.<sup>5</sup> found that attempts by individuals who suffered from depression and suicidal tendencies generally peaked in spring and summer months. This is in agreement with our findings.

Suicide in Ilam illustrates a significant seasonality for both rural and urban areas, which is greater in urban areas. Significant seasonality in suicide was observed in attempters with mental disorders, for which our findings showed two peaks in spring and autumn.

## Acknowledgment

We would like to thank the Vice Chancellor of Research and Technology of Ilam University of Medical Sciences for financial support.

**Conflict of Interest:** None declared.

Please cite this article as: Veisani Y, Delpisheh A, Sayehmiri K, Moradi G, Hassanzadeh J. Associations of Suicide Seasonality with Rural-Urban Residence and Mental Disorders in Ilam, Iran. *Iran J Med Sci* 2016;41(5):462-462.

Yousef Veisani<sup>1</sup>, MS; Ali Delpisheh<sup>2</sup>, PhD; Kourosh Sayehmiri<sup>3</sup>, PhD; Ghobad Moradi<sup>4</sup>, MD, PhD; Jafar Hassanzadeh<sup>5</sup>, PhD

<sup>1</sup>Psychosocial Injuries Research Center, Ilam University of Medical Sciences, Ilam, Iran;

<sup>2</sup>Department of Clinical Epidemiology, Ilam University of Medical Sciences, Ilam, Iran;

<sup>3</sup>Department of Social Medicine, Ilam University of Medical sciences, Ilam, Iran;

<sup>4</sup>Social Determinants of Health Research Center, Kurdistan University of Medical Sciences, Sanandaj, Iran;

<sup>5</sup>Research Center for Health Sciences, Department of Epidemiology, School of Health, Shiraz University of Medical Sciences, Shiraz, Iran

### Correspondence:

Ali Delpisheh, PhD;

Department of Clinical Epidemiology, Ilam University of Medical Sciences, P.O. Box 69315-138, Ilam, Iran

**Tel/Fax:** +98 84 32240404

**Email:** alidelpisheh@yahoo.com

Received: 04 November 2015

Revised: 09 February 2016

Accepted: 06 March 2016

## References

1. Kessler RC, Berglund P, Borges G, Nock M, Wang PS. Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990-1992 to 2001-2003. *JAMA*. 2005;293:2487-95. doi: 10.1001/jama.293.20.2487. PubMed PMID: 15914749.
2. Page LA, Hajat S, Kovats RS. Relationship between daily suicide counts and temperature in England and Wales. *Br J Psychiatry*. 2007;191:106-12. doi: 10.1192/bjp.bp.106.031948. PubMed PMID: 17666493.
3. Zhang J, Ma J, Jia C, Sun J, Guo X, Xu A, et al. Economic growth and suicide rate changes: a case in China from 1982 to 2005. *Eur Psychiatry*. 2010;25:159-63. doi: 10.1016/j.eurpsy.2009.07.013. PubMed PMID: 19926256.
4. Simkin S, Hawton K, Yip PS, Yam CH. Seasonality in suicide: a study of farming suicides in England and Wales. *Crisis*. 2003;24:93-7. doi: 10.1027//0227-5910.24.3.93. PubMed PMID: 14518641.
5. Doganay Z, Sunter AT, Guz H, Ozkan A, Altintop L, Kati C, et al. Climatic and diurnal variation in suicide attempts in the ED. *Am J Emerg Med*. 2003;21:271-5. doi: 10.1016/S0735-6757(03)00039-1. PubMed PMID: 12898481.