

# Psychological Effects of Bed Bug Attacks (*Cimex lectularius* L.)

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## ABSTRACT

**BACKGROUND:** In some individuals, psychological sequelae resulting from bed bug biting events include nightmares, flashbacks, hypervigilance (to keep the bugs away), insomnia, anxiety, avoidance behaviors, and personal dysfunction. These symptoms are suggestive of posttraumatic stress disorder (PTSD).

**METHODS:** We used a previously published PTSD checklist to analyze online blogs and other Internet sites where bed bug postings occur to assess postings for evidence of emotional trauma.

**RESULTS:** One hundred thirty-five postings were read and analyzed, and 110 (81%) of those postings reported psychological effects from bed bug infestations. Scoring with the PTSD checklist revealed a range of 0-52 (mean 13.25; SD 9.38); one met the criteria ( $\geq 50$ ) considered positive for PTSD.

**CONCLUSIONS:** Based upon our survey of online postings concerning such effects, an as-yet-to-be-determined proportion of individuals who experience bed bug bites develop moderate-to-severe negative emotional symptoms after infestations. These individuals should be identified in the course of their interactions with health professionals so that appropriate mental health care may be provided.

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**KEYWORDS:** Bed bugs; Bite reactions; Health effects; PTSD

An international outbreak of bed bug infestations of homes and temporary lodging sites has occurred over the last decade.<sup>1-3</sup> Infestation by bed bugs may produce psychological distress with nightmares, flashbacks of the infestation, hypervigilance (to keep the bugs away), insomnia, anxiety, avoidance behaviors, and personal dysfunction. Posttraumatic stress disorder (PTSD) occurs after many types of physical or emotional trauma, including combat, assaults, environmental disaster, motor vehicle accidents, physical injuries, and life-threatening illnesses and hospitalization in intensive care units.<sup>4</sup> Individuals with PTSD usually display a triad of symptoms: flashbacks of the event by intrusive memories and nightmares; startle responses and hypervigilance; and protec-

tive reactions such as avoidance of stimuli associated with the trauma.<sup>5</sup>

In our practice, bed bug bites associated with infestations of private and public places often have been associated with psychological effects in some individuals. At least one individual nationwide has claimed PTSD after a bed bug infestation.<sup>6</sup> It is not a surprise that awakening from sleep with severe itching associated with the visible presence of numerous bed bugs on the skin and bed coverings may cause panic, a sense of isolation, embarrassment, and insomnia. On the basis of our published<sup>7-9</sup> and clinical experience, as well as the findings to follow, we conclude that bed bug attacks cause moderate-to-severe psychological effects and PTSD in certain susceptible individuals.

**Funding:** None.

**Conflict of Interest:** None.

**Authorship:** Both authors had full access to the data and a direct role in the writing and preparation of the manuscript.

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## METHODS

In order to generate preliminary data on this issue, we used a previously published PTSD checklist of symptoms based on the *Diagnostic and Statistical Manual of Mental Disorders*, 4<sup>th</sup> edition (DSM-IV) criteria<sup>4,10</sup> to survey online

blogs and other Internet sites where bed bug postings occur. These sites, [Bedbugger.com](http://Bedbugger.com), [Bed bug resource.com](http://Bedbugresource.com), and [Insectgeeks.com](http://Insectgeeks.com), were visited daily for 1 month between May 15 and June 15 and postings were scored using the checklist.<sup>11-13</sup> Scores  $\geq 50$  were suggestive of PTSD.<sup>4</sup>

One hundred thirty-five postings were found, read, and scored. Eighty-one percent (n = 110) of postings reported a variety of moderate-to-severe psychological and emotional effects after bed bug bites (Figure). Six postings detailed intense and repeated cleanings of homes or offices, near-constant changing of clothes, and repetitive body inspections. Five postings reported persistent avoidance of people, activities, and places that might lead to transmission of insects or arouse recollections of the original encounter, and 5 postings detailed suicidal thoughts or attempts. One posting recounted violent nightmares resulting from the infestation. Using the recommended scoring rubric for the PTSD checklist,<sup>4</sup> the range of scores was from 0-52 with a mean of 13.25 and SD of 9.38. One posting met checklist criteria for PTSD.

## DISCUSSION

Although this study was limited by a database obtained from spontaneous reporting of bed bug bites, the findings are remarkable in that over 80% of reports included one or more symptom associated with PTSD. Intuitively, the likelihood of fulfilling DSM-IV criteria for PTSD would have been increased had we been able to conduct prospective interactions with those affected. However, this review of

self reports and our personal experience suggests that PTSD may develop in susceptible individuals.

Although we have reported that there is little evidence to support bed bug transmission of disease agents such as human immunodeficiency virus or hepatitis viruses,<sup>9</sup> previous publications suggesting possible infection<sup>14,15</sup> have been a major concern to patients in our practice seeking medical care for bites from these insects. The level of concern expressed by these patients meets the DSM-IV Criterion A for an “actual or threatened death or serious physical injury.” Further, the “actual physical threat” requirement for PTSD diagnosis has been broadened to allow many different types of traumatic stressors as PTSD qualifying events.<sup>16</sup> Lastly, diagnostic criteria require the absence of symptoms of avoidance, numbing, and increased arousal *before* the traumatic event—information not available to us.

## CLINICAL SIGNIFICANCE

- Bed bug infestations are on the rise worldwide.
- Bed bug attacks may produce a variety of negative emotional and psychological effects.
- In some individuals, psychological sequelae resulting from bed bug biting events include nightmares, flashbacks, hypervigilance (to keep the bugs away), insomnia, anxiety, avoidance behaviors, and personal dysfunction.
- These symptoms are suggestive of post-traumatic stress disorder (PTSD).

## CONCLUSIONS

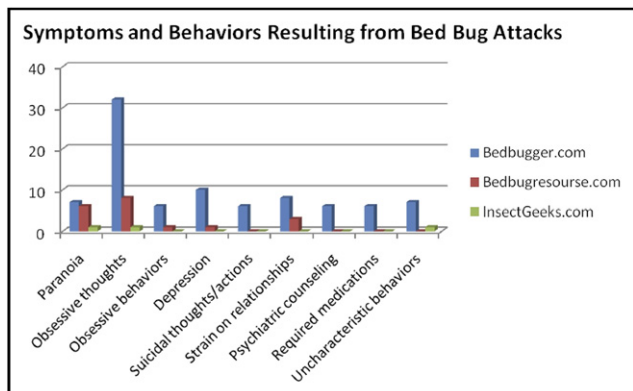
Bed bug infestations and associated bites produce a variety of emotional and psychological reactions, some of which may meet criteria for PTSD, although further research is needed to determine to what extent PTSD may occur after attacks by bed bugs. Our findings suggest that all individuals who experience bites should be queried for symptoms of emotional trauma and be offered psychological counseling where indicated. More accurate and available public health information on the biology, ecology, and health effects of these insects could decrease the level of anxiety associated with bed bug bites.

## ACKNOWLEDGMENTS

Breanna Lyle helped locate Internet postings describing bed bug bite experiences. Leigh Baldwin Wright helped in the preparation of this manuscript. This article has been approved for publication by the Mississippi Agriculture and Forest Experiment Station, Mississippi State University (No. J-12045).

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**Figure** Distribution of symptoms in 135 Internet reports describing effects from bed bug attacks.

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