

# Risk for Depression and Anxiety in Long-Term Survivors of Hematologic Cancer

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**Objective:** An increasing number of hematologic cancer patients outlive 10 years past diagnosis. Nevertheless, few studies investigated psychological strain in this patient group beyond 5 years after diagnosis. We conducted a registry-based investigation of risk for depression and anxiety among long-term hematologic cancer survivors up to 26 years after diagnosis compared to the general population. **Methods:** In this cross-sectional postal survey, cancer survivors were recruited through 2 regional cancer registries in Germany. Depression (Patient Health Questionnaire-9) and anxiety (Generalized Anxiety Disorder-7) were assessed. Survivor data were compared to age- and gender-matched comparison groups (CG) randomly drawn from large representative samples ( $N > 5,000$ ). **Results:** Out of 2,001 eligible patients, 46% participated ( $n = 922$ ). Survivors were significantly more likely than the CG to report elevated depressive (relative risk [RR] = 3.1; 95% confidence interval [CI]: 2.2–4.3) and anxious symptomatology (RR = 1.7; 95% CI: 1.2–2.3). Depression scores remained high even in the survivor Group 12–26 years after diagnosis. RR for anxiety decreased to values comparable to the CG. Younger and middle-aged survivors ( $\leq 65$  years) were at highest relative and absolute risk to be psychologically impaired. **Conclusion:** This study shows that depression rather than anxiety is a prominent problem in long-term survivors of hematologic cancer. The results stress the importance of monitoring patients even years after diagnosing and supplying psychosocial support to patients in need.

**Keywords:** long-term cancer survivors, depression, anxiety, Patient Health Questionnaire, hematological malignancies

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Hematologic malignancies are tumors in the blood-forming tissue, such as bone marrow or cells of the immune system, and can be categorized into leukemia, lymphoma, and multiple myeloma (Robert Koch Institute, 2016). Depending on diagnosis and stage, treatment includes all types of oncological therapies such as chemotherapy or radiation; in many cases, highly toxic combinations and interventions including stem cell transplantation are necessary in this patient group (Bailer & Grulke, 2016). Course and prognosis are highly heterogeneous. For example, Hodgkin-Lymphoma is an acute illness with good treatment options, whereas leukemia and multiple myeloma can take chronic forms (Robert Koch In-

stitute, 2016). Recent developments like improved survival rates due to early detection and treatment as well as incidence rates that have doubled during the last 40 years have led to an increasing number of long-term survivors (Robert Koch Institute, 2016): In Germany, approximately 75% of Hodgkin lymphoma patients, 45% of non-Hodgkin lymphoma patients and 36% of leukemia patients outlive 10 years after diagnosis (Robert Koch Institute & Association of Population-based Cancer Registries in Germany, 2015). Irrespective of state of remission, a cancer survivor has been defined as anyone living with a diagnosis of cancer, whereas long-term survivors are those 5 years and more after diagnosis

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