INTRODUCTION

Among the variety of issues that might impair quality of life (QoL) in cancer patients, a particularly important concern is cancer-related cognitive impairments (CRCI) (Ahles & Root, 2018; Joly, Rigal, Noal, & Giffard, 2011; Tannock, Ahles, Ganz, & van Dam, 2004). In a study among cancer patients approaching a psycho-social counselling office, more than 40% reported distressing impairments regarding...
memory or concentration (Lehmann-Lau et al., 2019). Even if such impairments may be small in size, they considerably worsen the QoL of a cancer survivor (Anderson-Hanley, Sherman, Riggs, Agocha, & Compas, 2003; Asher, 2011; Joly et al., 2011), including problems with reintegration into the social community or return to work (Ahlès & Root, 2018; Asher & Myers, 2015).

Cancer-related cognitive impairments may include deficits in attention, concentration and working memory (Stewart, Bielajew, Collins, Parkinson, & Tomiak, 2006; Tannock et al., 2004). Suggested mechanisms responsible for CRCI include psychological and social stress, the treatment of the cancer, comorbidities such as hypothyroidism, anaemia or liver disease, as well as hormonal changes or nutritional deficiencies (Ahlès & Root, 2018; Asher, 2011; Asher & Myers, 2015; Buchbinder et al., 2018; Joly et al., 2011; Schagen et al., 2014; Stewart et al., 2006; Tannock et al., 2004; Wu et al., 2018).

Given the practical relevance of CRCI, the National Comprehensive Cancer Network (NCCN) suggests to screen cancer survivors for cognitive impairments via self-report in order to develop and improve adequate intervention strategies (Asher & Myers, 2015). Even though several tests on neuropsychological functioning exist, such instruments do not determine the subjective level of impairment experienced by the patient, but measure objective outcomes such as the time to complete a task or the quality of the fulfillment of the task (Asher & Myers, 2015; Cimprich, So, Ronis, & Trask, 2005; Cimprich, Visovatti, & Ronis, 2011; Tannock et al., 2004).

However, the application of such objective assessment methods may be problematic for use in cancer patients, as this population may suffer from cognitive deterioration that cannot be detected by objective neurocognitive tests. More importantly, objectively measured CRCI seems to be qualitatively different from subjectively reported CRCI: Many studies demonstrate that objective and subjective measures of CRCI do not correlate with each other (Cimprich et al., 2005; Hutchinson, Hosking, Kichenadasse, Mattiske, & Wilson, 2012; Mehnert et al., 2007). Thus, objective and subjective CRCI have to be measured separately to ensure a comprehensive assessment of the patients’ impairments and needs. To date, however, only few assessment instruments on the subjective level of CRCI exist (Asher & Myers, 2015; Cimprich, Visovatti, & Ronis, 2011). Few self-report assessment tools for cognitive functioning are available in German: The Attention Deficits Questionnaire (ADQ) was developed for neurological patients and was published in two versions, one as self-report version and one as a third-party assessment tool (Volz-Sidiropoulou et al., 2007). Another test, the Questionnaire of Cognitive Disturbance with Mental Disorders, is measuring the level of cognitive disturbance and was developed for patients with mental disorders (Beblo et al., 2010). However, items of the ADQ were not able to differentiate between patients with small neurocognitive impairments (Volz-Sidiropoulou et al., 2007), which may be particularly relevant when assessing cancer patients. Furthermore, both tests are relatively long which complicates their application in clinical care.

In need of a comprehensive self-report tool for assessing CRCI, Cimprich et al. (2011) developed the Attentional Function Index (AFI). This instrument, originally released in English language, assesses the perceived level of specific cognitive functioning domains, that is directed attention, working memory and higher-level executive functions in daily life activities impaired by life-threatening and chronic illnesses such as cancer (Cimprich et al., 2011). The development of the AFI was accomplished in collaboration of several experts including researchers and theorists in cognitive psychology, neurobehavior and cognitive neuroscience (Cimprich et al., 2011). The English original version of the test has already been applied in various oncological groups including breast and lung cancer patients (Cimprich et al., 2011), but also pregnant women (Stark, 2006). It could also be shown that the AFI did not correlate with objective measurements of CRCI and thus reflects a different important construct of QoL (Cimprich, 1992; Cimprich et al., 2005).

The exploratory factor analysis of the 13-item questionnaire revealed three factors named effective action, attentional lapses and interpersonal effectiveness (Cimprich et al., 2011). Testing for convergent and divergent validity, significance and direction of the correlations of the AFI score with theory-based criteria such as levels of concentration, cognitive failure, confusion and mental fatigue supported the hypothesis of good construct validity (Cimprich et al., 2011). Furthermore, internal consistency was found to be satisfactory. As an important covariate, age was found to be associated with the scores of the AFI (Cimprich et al., 2011).

In order to provide a comprehensive and short self-report instrument for assessing subjective CRCI in German-speaking cancer survivors, we translated the AFI into German and tested its psychometric properties using a sample of 1,312 survivors of haematological malignancies, a population which is at high risk for developing neuropsychological impairments (Harder et al., 2002; Scheiβel, Valentine, O’Brien, & Meyers, 2004; Scherwath et al., 2013). We aimed to explore (a) the factorial structure of the German translation, (b) the internal consistency among the total score and each of its subscales, (c) the construct validity and (d) the associations of the AFI sum score with medical and socio-demographic variables. As a secondary aim, we compared our results with the English original version. Our results are supposed to enable researchers and clinicians in German-speaking countries to use this instrument for assessing an important component of QoL in cancer survivors.

## METHODS

### 2.1 Study design and recruitment

This test validation is part of a cross-sectional study among haematological cancer survivors. Participants were recruited between October 2014 and August 2017. Patients were eligible if they had been diagnosed with a malignant neoplasm of lymphoid, hematopoietic and related tissue (ICD-10: C81-C96), having a minimum age of 18 years at time of diagnosis and a maximum age of 85 at time of
assessment, sufficient knowledge of the German language to fill in the questionnaire as well as cognitive ability to provide written informed consent for study participation.

Participants were gathered from two main sources. One part of the sample was recruited from the cancer registries of the city of Leipzig and the Federal State of Schleswig-Holstein respectively (response rate: 46%). Thereby, eligible patients were contacted via mail and reminded in case they did not respond. The other part of participants was approached through social media, patient congresses, established doctors and self-help groups. Further details can be found in the study protocol (Esser, Kuba, Götze, & Mehnert, 2017). The study was approved by the Ethics Committee of the Medical Faculty of the University of Leipzig (approval number: 292–15-24082015).

### 2.2 | Attentional Function Index

The Attentional Function Index was developed and validated in a sample of 172 breast cancer patients (Cimprich, 1992; Cimprich et al., 2011). The instrument has 13 items in total. The first nine items are positively formulated (e.g., following through on your plans), whereas the last four items are negatively worded (e.g., forgetting to do important things) and thus have to be inverted before any statistical analyses. A visual analogue scale serves as response format. Each item can be answered with a mark on a 100 mm horizontal line ranging from "not at all" (0 mm) to "extremely well" and "a great deal" (100 mm) for positively and negatively formulated items respectively. The distance from 0 mm to the mark made by the patient defines the respective score for each question. The total score is calculated as the mean across the 13 item scores. A higher score indicates a higher, that is better level of perceived cognitive function.

### 2.3 | Translation process of the AFI

The steps of the translation process of the AFI were guided by current state of the art (Bracken & Barona, 2016; World Health Organization). Forward translation from English into German was done by one of the co-authors whose native language is German. A German psychologist who graduated in the UK used this translated version for a blind-backward translation into English. Two German native speakers subsequently compared both English versions and discussed any necessary changes for the German translation. Nevertheless, only minor adjustments were necessary in the final German version, which can be found in the Appendix 1.

### 2.4 | Validation instruments

Cognitive functioning and QoL were assessed with the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), a validated and well-established measurement used across cancer sites (Jocham, Dassen, Widdershoven, & Halfens, 2009). It consists of 30 items which form a total of 15 subscales. For our study, we used a two-item scale assessing cognitive functioning (Cronbach’s $\alpha = .80$), rated on a four-point Likert scale ranging from "not at all" to "very much," and a two-item scale measuring global QoL (Cronbach’s $\alpha = .93$), rated on a seven-point Likert scale ranging from "very poor" to "excellent" (Esser et al., 2017; Fayers et al., 2001; Jocham et al., 2009). All outcomes are transformed to a scale ranging from 0 to 100, with higher scores indicating higher cognitive functioning and QoL respectively (Fayers et al., 2001).

**Fatigue** was assessed with the Brief Fatigue Inventory (BFI) (Cronbach’s $\alpha = .95$) (Radbuch et al., 2003), in which patients report on their level of fatigue and its impact on different domains of the patient’s life. The items can be scored on an eleven-point Likert scale ranging from "no fatigue"/"does not interfere" to "as bad as you can imagine"/"completely interferes." The BFI total score is calculated as the mean across all items, with higher values indicating higher levels of fatigue.

Depression was assessed with a module of the Patients Health Questionnaire (PHQ-9) (Cronbach’s $\alpha = .85$) (Kroenke, Spitzer, & Williams, 2001), a nine-item instrument assessing the frequency of DSM-IV criteria of depression on a four-point Likert scale, ranging from "not at all" to "almost every day." The sum score can be used as an indicator for the severity of depressive symptomatology (Hinz et al., 2016), with higher values indicating higher levels of depressive symptomatology.

**Comorbidity** was assessed with a slightly adapted version of a comorbidity assessment instrument (Cronbach’s $\alpha = .82$) (Bayliss, Ellis, & Steiner, 2005). Altogether, 24 comorbidities were assessed. In the adaptation process, similar comorbidities were summarised (e.g., “congestive heart failure” and “coronary heart disease” were summed up to “heart disease”) and comorbidities which are typical for haematological cancers and their treatments (e.g., anaemia) were added. Details of the adaptation can be found elsewhere (Esser et al., 2017).

### 2.5 | Statistical methods

We first provided descriptive statistics on socio-demographic and medical variables. Responder analyses could be conducted for patients recruited from the cancer registry via Mann–Whitney $U$ tests (continuous variables) and chi-squared tests (categorical variables).

Since multivariate outliers are known to bias results of factor analyses (Finch, 2012) as well as measures of internal consistency (Liu & Zumbo, 2007), we identified such cases via Mahalanobis distance above the critical value of the chi-square distribution ($p < .001$) and excluded them for all analyses.

Principal component factor analysis (PCA) with varimax rotation was used to explore the factor structure of the German AFI. This procedure was chosen to enable comparability with the English validation study, which applied the same method. Kaiser-Meyer-Olkin and Bartlett’s test were applied to determine sampling adequacy.
Kaiser’s criterion was used to extract the number of factors. Factor loadings with $r \geq .4$ were considered meaningful. To check the stability of our findings, we reanalysed the factorial structure among two subsamples (patients from the cancer registries vs. patients from other sources) and with another type of factor analysis (principal axis factoring, PAF) among the total sample and both subsamples. In doing so, we ran a total of six exploratory factor analyses.

The internal consistency was computed via Cronbach’s $\alpha$ for the total scale and each of the subscales. We also investigated the corrected item-scale and item-total correlations in order to test whether the single item reflects the respective scales and the overall test result, that is whether the items would correlate with the respective scale and the overall test with an $r > .3$ (Field, 2013; Park & Kim, 2012).

Construct validity was assessed via correlation analyses (Pearson’s $r$). Thereby, the AFI sum score was correlated with various variables to investigate convergent (i.e., positive correlations) and divergent validity (i.e., negative correlations). Based on theory and empirical findings, we hypothesised that the AFI correlates positively with cognitive functioning of the EORTC questionnaire and global QoL (Cimprich et al., 2011; Tannock et al., 2004) and negatively with fatigue and depressive symptomatology (Cimprich et al., 2011; Janelins et al., 2017; Mehnert et al., 2007).

The relationship of patient characteristics with the AFI was determined by univariate regression analyses. In line with the English validation study (Cimprich et al., 2011), we investigated associations with age, education and presence of any comorbidities. Additionally, we tested the relationship with gender given that the validation study (Cimprich et al., 2011), we investigated associations with fatigue and depressive symptomatology (Cimprich et al., 2011; Janelsins et al., 2017; Mehnert et al., 2007).

Practical relevance of significant findings was determined by effect sizes using the recommendations of Cohen (1992). Data were analysed using IBM SPSS Statistics 24 for Windows (IBM). The significance level was set at $\alpha < .05$. Missing data were deleted listwise.

### RESULTS

The total number of participants was 1,312, of which 937 (71%) and 375 (29%) were recruited from the cancer registries and other sources respectively. A total of 152 participants provided incomplete data on the AFI and thus were not included in the analyses. Another 49 patients were identified as multivariate outliers and subsequently excluded, which resulted in a final study sample of 1,111 patients. Detailed sample characteristics are shown in Table 1.

According to the size of the respective factor loadings, a three-factor model could be revealed. In detail, seven items were assigned to the first factor “effective action,” three items to the second factor “attentional lapses” and three items to the third factor “interpersonal effectiveness.” Both the number of factors and respective items on these factors were identical with the results of the English validation study. Nevertheless, four items loaded above the minimum loading of $r = .4$ on several factors and three items could not be clearly assigned to only one factor, that is getting easily annoyed or irritated, remembering to do all the things you started out to do and keeping your mind on what others are saying (for detailed factor loadings see Table 2). The total variance explained by the factors was 71.2%. Concerning stability of our findings, we reanalysed the structure across different subsets (cancer registry vs. other sources) and statistical analyses (PCA vs. PFA); in summary, the structure was kept for all re-calculations. As an exception, the item getting easily annoyed or irritated loaded slightly higher on factor 2 than on factor 3 among patients from the cancer registries for both PC and PF analyses (data not shown).

Reliability of the total score was high, with $\alpha = .91$ (Tavakol & Dennick, 2011). Alphas for each subscale are presented in Table 3. Additionally, corrected item-scale and item-total correlations $r$ were found to be $\geq .46$ for all items. In detail, corrected item-scale correlations ranged between .71–.81 (items on factor 1), .73–.81 (items on

### TABLE 1

| Demographic and medical sample characteristics (if not else noted: raw values, valid percentages in brackets) |
|---------------------------------------------------------------|
| **Age (M, SD)**                                               | **Total sample** (N = 1,111) |
| **Gender**                                                   |                              |
| Female                                                       | 497 (44.7)                   |
| Male                                                         | 615 (55.3)                   |
| **Education**                                               |                              |
| ≤10 years                                                    | 616 (56.2)                   |
| >10 years                                                    | 481 (43.3)                   |
| **Years after first hemato-oncologic diagnosis (M, SD)**     | 9.2 (5.2)                    |
| **Diagnosis**                                               |                              |
| Lymphoma<sup>a</sup>                                        | 472 (43.3)                   |
| Acute leukaemia<sup>b</sup>                                 | 161 (14.8)                   |
| Chronic leukaemia<sup>c</sup>                               | 158 (14.5)                   |
| Multiple myeloma                                            | 140 (12.8)                   |
| Others<sup>d</sup>                                          | 159 (14.6)                   |
| **Therapy**                                                 |                              |
| Chemotherapy                                                | 905 (81.7)                   |
| Radiotherapy                                                | 418 (37.6)                   |
| Antibody therapy                                            | 236 (21.3)                   |
| Autologous SCT                                              | 196 (17.7)                   |
| Allogeneic SCT                                              | 165 (15.0)                   |
| Surgery                                                     | 149 (13.4)                   |
| **Any comorbidities**                                       | 1,038 (94.3)                 |

Abbreviation: SCT, stem cell transplantation.
<sup>a</sup>Hodgkin Lymphoma, Non-Hodgkin Lymphoma.
<sup>b</sup>ALL, acute lymphoid leukaemia; AML, acute myeloid leukaemia AML.
<sup>c</sup>CLL, chronic lymphoid leukaemia; CML, chronic myeloid leukaemia.
<sup>d</sup>Osteomyelofibrosis, myelodysplastic syndrome, severe aplastic anaemia, hairy cell leukaemia.
TABLE 2  Factor loadings using principal component analysis with varimax rotation

| Item                                                                 | Factor 1: Effective action | Factor 2: Attentional lapses | Factor 3: Interpersonal effectiveness |
|---------------------------------------------------------------------|----------------------------|-------------------------------|-------------------------------------|
| Getting started on activities you intend to do                      | 0.84                       | 0.13                          | 0.32                                |
| Following through on your plans                                     | 0.85                       | 0.15                          | 0.14                                |
| Doing things that take time and effort                              | 0.81                       | 0.09                          | 0.17                                |
| Making your mind up about things                                    | 0.72                       | 0.21                          | 0.21                                |
| Keeping your mind on what you are doing                             | 0.69                       | 0.43                          | 0.27                                |
| Remembering to do all the things you started out to do              | 0.60                       | 0.51                          | 0.25                                |
| Keeping your mind on what others are saying                         | 0.52                       | 0.47                          | 0.43                                |
| How often you make mistakes on what you are doing                   | 0.18                       | 0.88                          | 0.13                                |
| Forgetting to do important things                                   | 0.18                       | 0.86                          | 0.11                                |
| How hard you find it to concentrate on details                      | 0.21                       | 0.83                          | 0.12                                |
| Being patient with others                                          | 0.25                       | 0.13                          | 0.83                                |
| Keeping self from saying or doing things                            | 0.20                       | 0.08                          | 0.79                                |
| Getting easily annoyed or irritated                                 | 0.13                       | 0.49                          | 0.55                                |

Note: The assignment of items to their respective factor is indicated with bold font.

As hypothesised, we found significant positive correlations of the AFI sum score with cognitive functioning ($r = .64, p \leq .01$) and global QoL ($r = .44, p \leq .01$) as well as significant negative correlations of the AFI sum score with levels of fatigue ($r = -.60, p \leq .01$) and depressive symptomatology ($r = -.65, p \leq .01$). The sizes of correlations could be interpreted as medium to large (Cohen, 1992).

Univariate regression analyses showed positive significant relationships of the AFI sum score with age ($\beta = .12, p < .001$), presence of one or more comorbidities ($\beta = -.07, p = .02$) and gender (being male) ($\beta = .07, p = .01$). However, these effects were small according to Cohen, with explained variances of $\leq 1.5$% (Cohen, 1992). The relationship between the AFI and education level was not significant ($\beta = -.01, p = .70$).

4 | DISCUSSION

4.1 | Main findings

This article investigated the psychometric properties of the German translation of the AFI among a sample of haematological cancer survivors. A three-factorial structure could be revealed and measures of reliability and construct validity indicated good psychometric properties. Results largely corresponded with the English original version.

4.2 | Comparison with previous results

Despite the translation into German and the differences between the validation samples, our findings were very similar to those of the English validation study (Cimprich et al., 2011). In detail, the

TABLE 3  Descriptive statistics and internal consistency for the three subscales and the total score

| Scale                                | M (SD)  | Reliability * |
|--------------------------------------|---------|---------------|
| Factor 1: effective action (7 items) | 72.92 (18.21) | .911          |
| Factor 2: attentional lapses (3 items) | 66.68 (23.71) | .880          |
| Factor 3: interpersonal effectiveness (3 items) | 68.55 (19.63) | .698          |
| Total score                          | 70.49 (16.48) | .911          |

*Cronbach’s α.
three-factor structure and their respective items were identical to the English validation study (Cimprich et al., 2011). The fact that the item getting easily annoyed or irritated loaded high on factors 2 and 3 is also in line with the English validation study (Cimprich et al., 2011). A reason for the low factor discrimination of this item between the two factors attentional lapses and interpersonal effectiveness could be that it does not clearly refer to interpersonal relationships and thus may also be interpreted as an item assessing negative emotional responses to the attentional lapses. We also could replicate the finding that the items remembering to do all the things you started out to do and keeping your mind on what others are saying loaded high on more than one factor (Cimprich et al., 2011). As these two items were conceptually associated with factor 1 (Cimprich et al., 2011), they were kept to this subscale, which was also statistically indicated since these two items loaded highest on this factor.

Internal consistency was satisfactory for the total score and each of the subscales and largely in line with the English validation study (Cimprich et al., 2011), indicating high consistency of the measure. The corrected item-scale and item-total correlations were relatively high, suggesting that the items are well reflecting the results of their scales and the total score. These correlations also indicate sufficient ability of the test to discriminate between high and low scores of perceived attentional function (Field, 2013; Park & Kim, 2012).

Also in line with Cimprich et al. (2011), construct validity was verified by showing positive relationships of the AFI score with self-rated cognitive impairment and QoL as well as negative correlations of the AFI score with mental fatigue and depression.

View studies exist on CRCI in older cancer populations (Loh et al., 2016). We found that older participants rated their attentional function better than younger patients did, which indicates that younger patients perceive their CRCI as more severe than older patients do. An explanation might be that older respondents do not have such a high expectation of effective functioning in daily life anymore; in contrast, younger patients are still involved in many challenges in all-day life and thus may already detect small changes in attentional functioning (Cimprich et al., 2011; Janelinsins et al., 2017). Although the English validation study also described this association between age and the AFI (Cimprich et al., 2011), it is to note that an earlier study among breast cancer patients did not find such a correlation (Cimprich, 1992). These contradictory results could imply that age does not have a strong effect on the subjective level of CRCI, an assumption which would be statistically supported by the small effect size for this association in our study.

We also showed that male participants reported less cognitive impairment on the AFI than female individuals. This effect could not be shown in the English original version given that this sample consisted of female breast cancer patients (Cimprich et al., 2011). Nevertheless, our finding corresponds with previous literature implying that female cancer survivors generally report higher levels of psychological/emotional distress than male cancer survivors (Lehmann-Laue et al., 2019; Zebrack, Yi, Petersen, & Ganz, 2008). Therefore, this finding additionally supports the construct validity of the AFI.

We could also show that higher comorbidity is associated with higher subjective level of attentional functioning. In the English validation study, no significant associations could be shown (p = .98) (Cimprich et al., 2011). This discrepancy may be due to the fact that the English validation study used a different battery of chronic illness (e.g., hypertension, heart disease and diabetes) (Cimprich et al., 2011). Another reason may be the large sample size in our study, which could have resulted in significant findings without practical relevance. In fact, effects of covariates on the AFI score were only small in size and therefore have to be interpreted with caution.

Also in line with the English original version, our study showed no significant associations between education level and the AFI (Cimprich et al., 2011).

4.3 | Strengths and limitations

The current study has several strengths: first, it benefits from a relatively large sample size increasing the generalisability and replicability of the factor structure (Costello & Osborne, 2005) and the preciseness of the reliability and validity measures (Blau, Kernéis, & Porcher, 2008) of the German version of the AFI. Second, we could show the robustness of our factorial structure via replication of the analyses across subgroups and different analyses. Third, the variety of sources of recruitment may have enhanced the representativeness of the population, and thereby increased the generalisability of the results. Another advantage is that we kept to the methodological strategy of the English validation study as close as possible, which enabled us to compare our findings with the original version.

However, the study also has limitations: first, the cross-sectional design does not provide data on which conclusions about causal relationships of the AFI with any of the tested outcomes and covariates could be drawn. Another limitation is that most medical data, particularly among those patients who were not recruited from the cancer registries, are based on self-report and thus have limited validity.

4.4 | Practical implication and future research

The German AFI translation showed adequate psychometric properties and thus can be reasonably applied to screen for subjective level of CRCI. In addition to measurements that assess cognitive function objectively (Cimprich et al., 2011; Tannock et al., 2004), this questionnaire might provide important information on how the patients themselves rate their CRCI and thus to determine whether this issue may negatively affect the QoL of the patients. In doing so, the AFI score can be used to monitor the subjective level of attentional functioning throughout the illness and treatment trajectory in order to detect perceived deficits and to intervene as early as possible to maintain or improve QoL (Mehnert et al., 2007). Given the strong associations between the AFI with
psychological distress and fatigue, low subjective levels of attentional function of patients may also guide screening for a variety of other outcomes of QoL.

Our sample differed from the English original version in gender and cultural background and other important patient characteristics that may have affected the self-perception of individuals (Allen et al., 1998; Ito & Hofmann, 2014; Stone et al., 2014). Together with the unknown effect of the translation process, we applied exploratory factor analyses to explore the factorial structure of the items. In future studies, confirmatory factor analysis should confirm our factor structure for the German AFI. Nevertheless, the stability of the factors across the two studies and within our study (across the different subsamples) suggests that the structure is relatively robust. In order to test the sensitivity of the AFI to assess intra-individual change, the instrument should be applied in longitudinal studies.

5 | CONCLUSION

The German translation of the AFI is a valid and reliable instrument to measure the subjective level of CRCI and thus may be reasonably used in German-speaking oncological populations. Psychometric findings should be confirmed and expanded in future studies.

ACKNOWLEDGEMENT

We thank all survivors who participated and Philipp Göbel for helping us to collect the data.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest. The funding source was not involved at any stage of the research process.

ETHICAL APPROVAL

The study was approved by the Ethics Committee of the Medical Faculty of the University of Leipzig (approval number: 292–15-24082015).

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How to cite this article: Baumann E, Kuba K, Götze H, Mehnert-Theuerkauf A, Esser P. Initial validation of the German version of the Attentional Function Index in a sample of haematological cancer survivors. Eur J Cancer Care. 2020;00:e13226. https://doi.org/10.1111/ecc.13226
APPENDIX 1

FIGURE 1  German version of the Attentional Function Index (AFI)

| Appendix: German version of the Attentional Function Index (AFI) |
|---|
| Im Moment: Wie gut funktionieren Sie Ihrem Gefühl nach in den unten aufgeführten Bereichen? Markieren Sie entlang der Linien jeweils diejenige Stelle, die am besten beschreibt, wie Sie zurzeit im jeweiligen Bereich zurechtkommen. |
| 1. Ich nehme Aktivitäten, die ich mir vorgenommen habe (Arbeit, Freizeit), in Angriff. | überhaupt nicht | äußerst gut |
| 2. Ich führte Aktivitäten, die ich begonnen habe, zu Ende. | überhaupt nicht | äußerst gut |
| 3. Ich tue Dinge, von denen ich weiß, dass sie Zeit und Aufwand mit sich bringen. | überhaupt nicht | äußerst gut |
| 4. Ich kann Entscheidungen treffen. | überhaupt nicht | äußerst gut |
| 5. Ich kann mich auf das konzentrieren, was ich gerade mache. | überhaupt nicht | äußerst gut |
| 6. Ich kann all die Dinge im Kopf behalten, die ich angefangen habe. | überhaupt nicht | äußerst gut |
| 7. Ich kann mich auf das konzentrieren, was andere mir erzählen. | überhaupt nicht | äußerst gut |
| 8. Ich kann mich zurückhalten, etwas zu sagen oder zu tun, was ich nicht sagen oder tun will. | überhaupt nicht | äußerst gut |
| 9. Ich habe mit Anderen Geduld. | überhaupt nicht | äußerst gut |
| Im Moment: Wie würden Sie sich in den folgenden Bereichen einschätzen? |
| 10. Ich finde es schwer, mich auf Details zu konzentrieren. | überhaupt nicht | erheblich |
| 11. Bei der Ausführung von Tätigkeiten unterlaufen mir Fehler. | überhaupt nicht | erheblich |
| 12. Ich vergesse, wichtige Dinge zu erledigen. | überhaupt nicht | erheblich |
| 13. Ich bin schnell gereizt oder verärgert. | überhaupt nicht | erheblich |