



## Kazakh version of the beck depression inventory: Validation study in female cancer patients

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### ABSTRACT

This study aimed to evaluate the validity of the Beck Depression Inventory (BDI-II) as a screening tool for depression among Kazakh-speaking female cancer patients. A cross-sectional study design with random sampling was used to collect and analyze data from 115 female cancer patients. Means, sensitivity, specificity, and positive and negative predictive values were calculated. An analysis of receiver operating characteristic (ROC) curves was conducted to determine the optimal cut-off score for the BDI-II in this population as a screening tool for depression. Test-retest reliability and internal consistency were also tested. Results showed that using a BDI-II cut score of 15 retained high sensitivity (82.7%), increased specificity (75.0%), and improved positive (86.1%) and negative predictive values (69.8%) of the BDI-II compared to a cut score of 14. Kazakh BDI-II indicated excellent consistency (Cronbach's alpha of 0.86) and reliability (intra-class correlation coefficient (ICC) of 0.92 (95% CI [0.89–0.94])). The use of this valid screening tool can facilitate the diagnosis of depression in female cancer patients.

### 1. Background

Cancer is one of the most serious public health problems in the world, and Kazakhstan [1,2]. As a result of a cancer diagnosis, cancer patients are likely to suffer from acute and severe pressures that could lead to depression [3,4]. Depression, also known as major depressive disorder, is characterized by low mood, trouble making decisions and thinking, loss of energy and pleasure, disinterest in joyful activities, sleep and appetite disturbances, psychomotor disturbances, and suicidal thoughts [5,6]. Studies have demonstrated that depression in cancer patients adversely affects the quality of life, treatment adherence, and survival rate, and increases the cost of treatment [7–9]. It is more likely that female cancer patients will suffer from depression as they are more susceptible to it [10]. Studies on breast, cervical, and ovarian cancer patients showed that those patients had a high prevalence of depression and anxiety disorders [11–14]. Nevertheless, depression is often neglected, and the majority of cancer patients do not receive adequate treatment [15].

Among the challenges that oncologists and other physicians face is the timely identification of depression among cancer patients, and its appropriate treatment following the diagnosis [16]. Detecting depression in cancer patients may be facilitated by screening

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self-report psychological instruments, such as Beck Depression Inventory (BDI-II) [17,18]. BDI-II is one of the most widely used depression questionnaires, and it may be an effective tool for screening for depression and its severity in female cancer patients [17, 19]. This self-administered survey contains four statements, arranged in increasing severity, about a particular symptom or characteristic attitude of depression [20,21]. The BDI has been found to discriminate between different severities of depression, to be sensitive to changes associated with clinical trials and other types of interventions, and to predict outcomes [22]. According to the validation studies, cognitive-affective factors and somatic factors form the two-factor structure of the questionnaire [23]. The BDI-II has not only been translated into Portuguese [24], Chinese [25], Italian [26], Turkish [27], and Korean [28], but also has been validated in a variety of samples, including cancer patients [29–31]. In studies examining the validity of the BDI-II in oncology populations, the total score of the BDI-II was found to have good to excellent sensitivity and specificity, but the cut-off scores for the diagnosis of depressive disorders ranged from 13 to 16 depending on the study population [31–33]. The authors of this study have not found the Kazakh version of the BDI-II or any previous studies that evaluated the psychometric properties of the BDI-II screening tool in Kazakh and validated it. There is a great need for assessing the psychometric properties and validating international instruments for use by Kazakh and Russian-speaking people in Kazakhstan, as well as cancer patients in particular [34].

This study aimed to evaluate the validity of the BDI-II as a screening tool for depression among Kazakh-speaking female cancer patients.

## 2. Methods

### 2.1. Ethical approval and informed consent

In accordance with the Declaration of Helsinki and its revisions, this study followed the principles of confidentiality, anonymity, and informed consent. The Local Ethics Committee of the Kazakh Medical University of Continuing Education approved this study protocol (study ID: 06-2020; date: February 16th, 2020). All participants were given a full explanation of the study's purpose and scope and signed an informed consent form.

### 2.2. Sample and design

This cross-sectional study was conducted at the Kazakh Institute of Oncology and Radiology between January 2021 and April 2022. A simple random sampling technique was used to invite female cancer patients to participate in this study. Inclusion criteria: female adults with a histologically confirmed diagnosis of breast, cervical, colon, ovarian, or lung cancer; stage I to IV disease according to the TNM classification of malignant tumors; written and spoken Kazakh language proficiency; ability to provide informed consent. Exclusion criteria: participants who refused to join; current psychiatric or neurological disorder; referral to palliative care.

### 2.3. Procedures

There were two phases to the process: translation and cross-cultural adaptation of BDI-II, and assessment of measurement properties. These phases were carried out according to international recommendations [35]. Five stages of the translation and cross-cultural adaptation process were involved: translation into the Kazakh language, synthesis of the translation, back translation, a

**Table 1**  
Characteristics of study participants (N = 115).

Variable	N (%)
Age (years, mean $\pm$ SD)	58.5 $\pm$ 5.2
Marital status	66 (57.4)
Married	19 (16.5)
Divorced	6 (5.2)
Single	24 (20.9)
Widowed	
Occupation	30 (26.1)
Employed	57 (49.6)
Retired	11 (9.5)
Self-employed	17 (14.8)
Unemployed	
Education	45 (39.1)
High-school	26 (22.6)
Technical or equivalent	44 (38.3)
University degree	
Cancer type	52 (45.2)
Breast cancer	29 (25.2)
Cervical cancer	10 (8.7)
Colon cancer	9 (7.8)
Lung cancer	15 (13.0)
Ovarian cancer	

consensus of the expert committee, and pretest of the prefinal draft. Two native Kazakh speakers translated the instrument: one is a health professional with cancer experience, and the other is not in the health field. The translation outcomes were discussed between the translators and authors, and a draft was produced. BDI-II has been translated back into English by two native speakers, neither of whom had prior knowledge of the original version. To establish consensus, a committee of experts reviewed a report prepared by the researcher's team detailing the differences between the translations, reverse translations, and original versions. Translators and authors discussed the translation outcomes, and a second draft was produced. The committee's decisions were aimed at ensuring semantic, idiomatic, experimental, and conceptual equality between versions. Tables 1–3 contain the original, translated, and back-translated versions of the questionnaire. Twenty Kazakh speakers were tested on the prefinal version to see if they had any difficulties understanding the items. A final version of the Kazakh BDI-II was developed after a consensus of 85.7% was reached. Study participants completed this version of the questionnaire.

According to the guidelines on translation and validation, the sample size should be between four and ten participants per item for the self-administered instrument. The final analysis included data on 115 patients out of 226 approached patients. Fig. 1 presents the research framework.

#### 2.4. Questionnaires and data collection

Following the collection of sociodemographic data and clinical characteristics, the Kazakh BDI-II was applied twice within 14 days for self-reported measurement properties. To ensure comparability between the two tests and avoid memory bias, a specific time interval was implemented. The BDI-II questionnaire comprises 21 self-report items with various response options, which assess a range of depression symptoms. Participants are required to select the statement that best reflects their attitude for each item. The BDI-II scores range from 0 to 63 and are categorized as follows: 0–13 indicating no depression, 14–19 indicating mild depression, 20–28 indicating moderate depression, and 29–63 indicating severe depression.

After completing the BDI-II questionnaire on Day, 1 patients were asked to complete the Hamilton Depression Rating Scale (HDRS). The HDRS was utilized as a gold standard by the physician to clinically diagnose depressive disorders, with the physician being unaware of the questionnaire results. Widely recognized as one of the most commonly used evaluation scales for depression [36], the HDRS holds a significant place in the clinical protocols for diagnosing and treating depression with and without psychotic symptoms in Kazakhstan [37,38]. The HDRS employs a 17-item scale, with scores ranging from 0 to 52. Scores within the range of 0–7 are considered normal, while scores of 8–16 suggest mild depression, 17–23 indicate moderate depression, and scores exceeding 24 indicate severe depression [36].

#### 2.5. Statistical analysis

Means, sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), diagnostic likelihood ratio positive (DLR+), and diagnostic likelihood ratio negative (DLR-) values were calculated. To determine the optimal cut-off score for the BDI-II as a screening tool for depression in this population, an analysis of receiver operating characteristic (ROC) curves was conducted. Test-retest reliability, which examines the consistency of participant responses on two separate occasions, was assessed using the intraclass correlation coefficient (ICC). For our ICC analysis, values below 0.5 were considered poor, between 0.5 and 0.75 were moderate, between 0.75 and 0.9 were good, and values above 0.9 were excellent [39]. The internal consistency of the subscales was evaluated using Cronbach's alpha. Acceptable values ranged from 0.70 to 0.95, with a recommended maximum alpha value of 0.90 [40]. IBM SPSS for Windows (version 21.0, SPSS INC., Chicago, IL, USA) was used to analyze the data.

### 3. Results

#### 3.1. Study sample

The present validation study included 115 patients with breast (45%), cervical (25%), colon (9%), ovarian (13%), and lung (8%) cancer. The mean age of the patients was 58.5 years (SD = 5.2). The majority of the patients had a high school diploma (39%) or a university degree (38%). Patients' mean BDI-II scores were 18.8 (SD = 8.4) for the first test and 18.8 (SD = 8.0) for the retest. The socio-demographic characteristics of the patients are presented in Table 1.

**Table 2**  
Criterion validity coefficients of the Beck Depression Inventory.

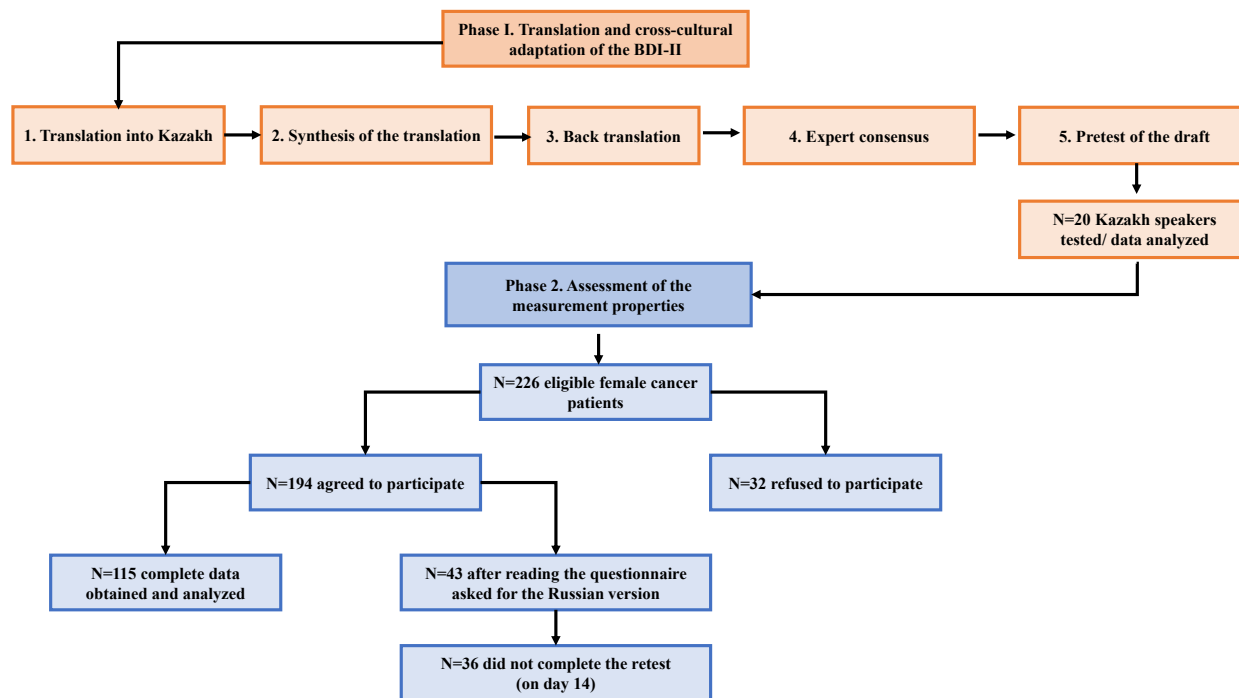
	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	DLR+	DLR-
BDI-II (cut score 14)	84.0	65.0	81.8	68.4	2.4	0.2
BDI-II (cut score 15)	82.7	75.0	86.1	69.8	3.3	0.2

BDI-II – Beck Depression Inventory; DLR+ - diagnostic likelihood ratio positive; DLR- - diagnostic likelihood ratio negative; NPV – negative predictive value; PPV – positive predictive value.

**Table 3**  
Kazakh BDI-II scores.

	Test 1		Test 2	
	Mean (SD)	Minimum-Maximum	Mean (SD)	Minimum-Maximum
Breast cancer n = 52	20.4 (9.5)	2–42	19.3 (8.6)	0–36
Cervical cancer n = 29	17.6 (8.1)	3–29	18.4 (8.2)	3–35
Colon cancer n = 10	16.8 (6.7)	8–26	17.0 (6.3)	9–26
Lung cancer n = 9	11.9 (6.0)	4–23	12.1 (6.4)	4–23
Ovarian cancer n = 15	21.6 (6.0)	9–28	22.7 (4.0)	16–29

BDI-II – Beck Depression Inventory; SD – standard deviation.



**Fig. 1.** Research framework.

### 3.2. Validation of the Kazakh BDI-II in female cancer patients

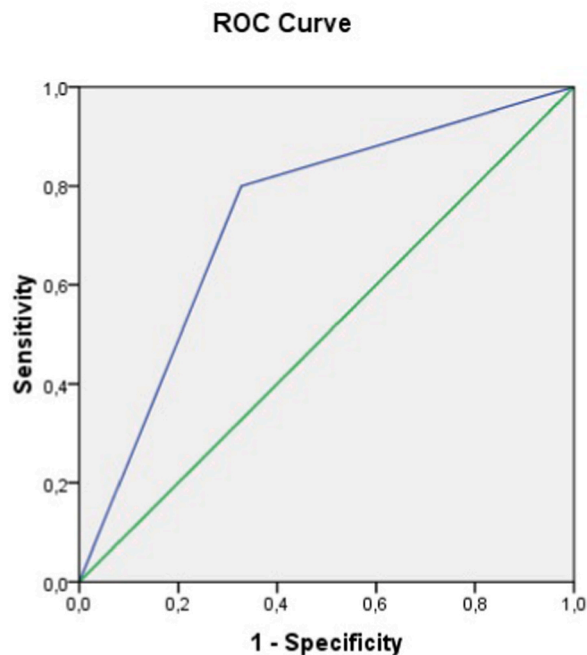
75 out of 115 patients (65.2%) were diagnosed with depression using HDRS. In the ROC analysis of the BDI-II, the area under the curve (AUC) was 0.74 with a standard error of 0.1 (Fig. 2). According to the traditional cut score of 14, the BDI-II showed 84.0% sensitivity and 65.0% specificity. Positive and negative predictive values were 81.8% and 68.4%, respectively. Using a higher BDI-II cut score of 15 also retained high sensitivity (82.7%), while increasing specificity to 75.0%. The positive and negative predictive values also improved to 86.1% and 69.8%, respectively (Table 2).

The internal consistency of the total scale of the Kazakh BDI-II indicated excellent consistency, as shown by Cronbach's alpha of 0.86. Test-retest reliability analysis showed excellent reliability with an ICC of 0.92 (95% CI [0.89–0.94]). Table 3 summarizes BDI-II values by patient groups.

## 4. Discussion

### 4.1. Psychometric properties of the Kazakh BDI-II

According to our study, the BDI-II proves to be an effective screening tool for identifying depression in female patients with various types of cancer. With a cut-off point of 15, it exhibits a remarkably high sensitivity of 91.9% and a strong specificity of 82.9%. Moreover, the Kazakh version of the BDI-II has demonstrated excellent test-retest reliability and outstanding internal consistency. 43 respondents preferred the Russian version over the Kazakh BDI-II in our study, and 36 respondents did not complete the re-test. Consideration must be given to country-specific factors. In Kazakhstan, all official forms and surveys are bilingual, and people are used to seeing both the Russian and Kazakh versions on the same form. Moreover, in Almaty city, where this study was conducted,



**Fig. 2.** Receiver operating characteristics analysis of the Beck Depression Inventory Abbreviations: ROC – receiver operating characteristics.

Russian is still more common in the healthcare setting. Thus, during the translation and adaptation phase of the questionnaire, the expert committee decided to include the Russian translation of some questions. For example, the item 'sadness' was translated into 'mun' which could be back-translated as 'grief'. By adding the Russian versions, the questionnaire became more familiar to respondents. Using a bilingual BDI-II form may be beneficial in Kazakhstan.

In contrast to previous studies on the psychometric properties of the Beck Depression Inventory (BDI) in cancer patients, the findings of this study show some variations. Warmenhoven et al., in a sample of 46 advanced cancer patients, reported a good sensitivity of 90% and acceptable specificity of 69% using a cut score of 16 for the BDI. They also observed a high sensitivity of 90% but low specificity of 64% with a standard cut score of 14 [31]. However, in the current study, a larger sample size was utilized, and the Hamilton Depression Rating Scale (HDRS) was employed as the gold standard for assessment. These differences in sample size and choice of gold standard contribute to the divergent results between the studies.

Several studies that have evaluated the validity and reliability of the BDI-II in different languages and countries have shown excellent internal consistency and test-retest reliability in both outpatient and inpatient settings [41–43]. The BDI-II showed good psychometric properties in cancer patients, compared to those without cancer [44]. There was no effect on screening accuracy when somatic items of the questionnaire were excluded [44]. Those findings support its use as a clinical tool for diagnostic purposes.

#### 4.2. Study limitations

Kazakhstan has a limited amount of research on depression among cancer patients, which may hinder the development of evidence-based interventions. In our previous study on depression symptom prevalence among newly diagnosed breast cancer patients, we found alarmingly high rates of depression [45]. Present study findings contribute to the diagnosis and screening of depression in female cancer patients. This is the first study to validate the Kazakh BDI-II among female cancer patients, to our knowledge.

The present validation study has several limitations. We included only patients with breast, cervical, colon, ovarian, and lung cancers. It is therefore not possible to generalize findings on the prevalence of depression to other female cancer patients. Second, we did not examine the construct validity of the BDI-II, instead focusing on its ability to discriminate between patients with depression and those without. A future study should provide additional evidence of the construct validity of the Kazakh BDI-II. Third, since the BDI-II is a self-report measure, social desirability bias may be present, as discussed in other studies [42]. To ensure a correct interpretation of the scores, future studies should investigate the robustness of the Kazakh BDI-II against the social desirability of outcomes.

#### 4.3. Clinical implications

The high prevalence of depression among participants in this study (65.2%) underscores the need for an appropriate screening tool to enable physicians to assess their patients' psychological conditions and treat them as necessary.

#### 4.4. Conclusion

With a cut score of 15, the Kazakh BDI-II is an adequate tool for screening for depression in female cancer patients. It has high sensitivity and good specificity. The proper diagnosis and management of depression among female cancer patients in Kazakhstan remain a challenge. The use of this valid screening tool can facilitate the diagnosis of depression in female cancer patients.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.heliyon.2023.e18146>.

#### References

- [1] R.L. Siegel, K.D. Miller, H.E. Fuchs, A. Jemal, Cancer statistics, 2022, *Ca - Cancer J. Clin.* 72 (2022) 7–33.
- [2] A. Zhylkaidarova, D. Kaidarova, K. Batyrbekov, O. Shatkovskaya, D. Begimbetova, Trends of colorectal cancer prevalence in Kazakhstan related to screening, *Clin Endosc* 54 (2021) 32.
- [3] K.M. Brintzenhofe-Szoc, T.T. Levin, Y. Li, D.W. Kissane, J.R. Zabora, Mixed anxiety/depression symptoms in a large cancer cohort: prevalence by cancer type, *Psychosomatics* 50 (2009) 383–391.
- [4] Y.-H. Wang, J.-Q. Li, J.-F. Shi, J.-Y. Que, J.-J. Liu, J.M. Lappin, J. Leung, A. V Ravindran, W.-Q. Chen, Y.-L. Qiao, Depression and anxiety in relation to cancer incidence and mortality: a systematic review and meta-analysis of cohort studies, *Mol. Psychiatr.* 25 (2020) 1487–1499.
- [5] K.P.S. Kumar, S. Srivastava, S. Paswan, A.S. Dutta, Depression-symptoms, causes, medications and therapies, *Pharma Innov.* 1 (2012) 37.
- [6] C. Otte, S.M. Gold, B.W. Penninx, C.M. Pariante, A. Etkin, M. Fava, D.C. Mohr, A.F. Schatzberg, Major depressive disorder, *Nat. Rev. Dis. Prim.* 2 (2016), 16065, <https://doi.org/10.1038/nrdp.2016.65>.
- [7] H.R. Smith, Depression in cancer patients: pathogenesis, implications and treatment, *Oncol. Lett.* 9 (2015) 1509–1514.
- [8] P. Theofilou, H. Panagiotaki, A literature review to investigate the link between psychosocial characteristics and treatment adherence in cancer patients, *Onco Rev.* 6 (2012).
- [9] A. Pitman, S. Suleman, N. Hyde, A. Hodgkiss, Depression and anxiety in patients with cancer, *Bmj* (2018) 361.
- [10] D. Riedl, G. Schüßler, Factors associated with and risk factors for depression in cancer patients – a systematic literature review, *Transl Oncol* 16 (2022), 101328.
- [11] I. Karibayeva, B. Turdaliyeva, N.Z. Zainal, F. Bagiyarova, D. Kussainova, Prevalence of anxiety symptoms in women newly diagnosed with breast cancer in Kazakhstan and its associated factors, *Asian Pac. J. Cancer Prev. APJCP* (2022) 24.
- [12] C.A. Logue, J. Pugh, P. Foden, R.D. Mahmood, R.D. Morgan, C. Mitchell, J. Hasan, A.R. Clamp, G.C. Jayson, Psychosexual morbidity in women with ovarian cancer: evaluation by germline BRCA gene mutational status, *Sex. Med.* 10 (2022), 100465.
- [13] H. Okati-Aliabad, A. Ansari-Moghadam, M. Mohammadi, S. Kargar, F. Shahraki-Sanavi, The prevalence of anxiety and depression and its association with coping strategies, supportive care needs, and social support among women with breast cancer, *Support. Care Cancer* 30 (2022) 703–710, <https://doi.org/10.1007/s00520-021-06477-2>.
- [14] E.W. Areklett, E. Fagereng, K. Bruheim, S. Andersson, K. Lindemann, Self-reported cognitive impairment in cervical cancer survivors: a cross-sectional study, *Psycho Oncol.* 31 (2022) 298–305.
- [15] J. Walker, C.H. Hansen, P. Martin, S. Symeonides, R. Ramessur, G. Murray, M. Sharpe, Prevalence, associations, and adequacy of treatment of major depression in patients with cancer: a cross-sectional analysis of routinely collected clinical data, *Lancet Psychiatr.* 1 (2014) 343–350.
- [16] M. Lloyd-Williams, Difficulties in diagnosing and treating depression in the terminally ill cancer patient, *Postgrad. Med.* 76 (2000) 555–558.
- [17] A.M.H. Kriebber, L.M. Buffart, G. Kleijn, I.C. Riepma, R. De Bree, C.R. Leemans, A. Becker, J. Brug, A. Van Straten, P. Cuijpers, Prevalence of depression in cancer patients: a meta-analysis of diagnostic interviews and self-report instruments, *Psycho Oncol.* 23 (2014) 121–130.
- [18] G. Jackson-Koku, Beck depression inventory, *Occup Med (Chic Ill)* 66 (2016) 174–175, <https://doi.org/10.1093/ocmed/kqv087>.
- [19] I. Karibayeva, B. Turdaliyeva, N.Z. Zainal, F. Bagiyarova, The Prevalence of Depression Symptoms Among Advanced Breast Cancer Patients: A Systematic Review and Meta-Analysis, 55, *Archives of the Balkan Medical Union*, 2020, <https://doi.org/10.31688/ABMU.2020.55.4.12>.
- [20] A.T. Beck, R.A. Steer, M.G. Carbin, Psychometric properties of the Beck depression inventory: twenty-five years of evaluation, *Clin. Psychol. Rev.* 8 (1988) 77–100.
- [21] P. Richter, J. Werner, A. Heerlein, A. Kraus, H. Sauer, On the validity of the Beck depression inventory, *Psychopathology* 31 (1998) 160–168.
- [22] R.A. Steer, A.T. Beck, J.H. Riskind, G. Brown, Differentiation of depressive disorders from generalized anxiety by the Beck Depression Inventory, *J. Clin. Psychol.* 42 (1986) 475–478.
- [23] R.C. Campos, B. Gonçalves, The Portuguese version of the Beck depression inventory-II (BDI-II), *Eur. J. Psychol. Assess.* (2011).
- [24] M.H. Gomes-Oliveira, C. Gorenstein, F. Lotufo Neto, L.H. Andrade, Y.P. Wang, Validation of the Brazilian Portuguese version of the Beck depression inventory-II in a community sample, *Brazilian Journal of Psychiatry* 34 (2012) 389–394.
- [25] Z. Wang, C.-M. Yuan, J. Huang, Z.-Z. Li, J. Chen, H.-Y. Zhang, Y.-R. Fang, Z.-P. Xiao, Reliability and validity of the Chinese version of Beck Depression Inventory-II among depression patients, *Chin. Ment. Health J.* (2011).
- [26] C. Sica, M. Ghisi, The Italian Versions of the Beck Anxiety Inventory and the Beck Depression Inventory-II: Psychometric Properties and Discriminant Power, 2007.
- [27] E.G. Kapci, R. Uslu, H. Turkcapar, A. Karaoglan, Beck Depression Inventory II: evaluation of the psychometric properties and cut-off points in a Turkish adult population, *Depress. Anxiety* 25 (2008). E104–E110.
- [28] E.-H. Lee, S.-J. Lee, S.-T. Hwang, S.-H. Hong, J.-H. Kim, Reliability and validity of the Beck depression inventory-II among Korean adolescents, *Psychiatry Investig* 14 (2017) 30.
- [29] A. Bener, R. Alslaiman, L.G. Doodson, H.R. El Ayoubi, Comparison of reliability and validity of the breast cancer depression anxiety stress scales (DASS-21) with the Beck depression inventory-(BDI-II) and hospital anxiety and depression scale (HADS), *Int. J. Behav. Res. Psychol.* 4 (2016) 197–203.
- [30] K. Mystakidou, E. Tsilika, E. Parpa, V. Smyrniotis, A. Galanos, L. Vlahos, Beck Depression Inventory: exploring its psychometric properties in a palliative care population of advanced cancer patients, *Eur. J. Cancer Care* 16 (2007) 244–250.
- [31] F. Warmenhoven, E. van Rijswijk, Y. Engels, C. Kan, J. Prins, C. Van Weel, K. Vissers, The Beck Depression Inventory (BDI-II) and a single screening question as screening tools for depressive disorder in Dutch advanced cancer patients, *Support. Care Cancer* 20 (2012) 319–324.

- [32] D.R. Hopko, J.L. Bell, M.E.A. Armento, S.M.C. Robertson, M.K. Hunt, N.J. Wolf, C. Mullane, The phenomenology and screening of clinical depression in cancer patients, *J. Psychosoc. Oncol.* 26 (2008) 31–51.
- [33] M.R. Katz, N. Kopek, J. Waldron, G.M. Devins, G. Tomlinson, Screening for depression in head and neck cancer, *Psycho Oncol.: Journal of the Psychological, Social and Behavioral Dimensions of Cancer* 13 (2004) 269–280.
- [34] Y. Ignatyev, M. Assimov, M.C. Aichberger, S. Ivens, J. Mir, D. Dochsharov, A. Ströhle, A. Heinz, A.P. Mundt, Psychometric properties of a Russian version of the general health questionnaire-28, *Psychopathology* 45 (2012) 252–258.
- [35] D.E. Beaton, C. Bombardier, F. Guillemin, M.B. Ferraz, Guidelines for the process of cross-cultural adaptation of self-report measures, *Spine* 25 (2000) 3186–3191, <https://doi.org/10.1097/00007632-200012150-00014>.
- [36] M. Zimmerman, J.H. Martinez, D. Young, I. Chelminski, K. Dalrymple, Severity classification on the Hamilton depression rating scale, *J. Affect. Disord.* 150 (2013) 384–388.
- [37] K. Altynbekov, E. Zhusupova, N. Logacheva, G. Smagulova, The Clinical Protocol of the Ministry of Health of the Republic of Kazakhstan for Diagnosing and Treating Depression with Psychotic Symptoms, 2017. Nur-Sultan.
- [38] K. Altynbekov, E. Zhusupova, N. Logacheva, G. Smagulova, The Clinical Protocol of the Ministry of Health of the Republic of Kazakhstan for Diagnosing and Treating Depression without Psychotic Symptoms, 2017. Nur-Sultan.
- [39] T.K. Koo, M.Y. Li, A guideline of selecting and reporting intraclass correlation coefficients for reliability research, *J. Chiropr Med* 15 (2016) 155–163.
- [40] M. Tavakol, R. Dennick, Making sense of Cronbach's alpha, *Int. J. Med. Educ.* 2 (2011) 53–55, <https://doi.org/10.5116/ijme.4dfb.8dfd>.
- [41] D.L. Segal, F.L. Coolidge, B.S. Cahill, A.A. O'Riley, Psychometric properties of the Beck Depression Inventory—II (BDI-II) among community-dwelling older adults, *Behav. Modif.* 32 (2008) 3–20.
- [42] Z.E. García-Batista, K. Guerra-Peña, A. Cano-Vindel, S.X. Herrera-Martínez, L.A. Medrano, Validity and reliability of the Beck depression inventory (BDI-II) in general and hospital population of Dominican republic, *PLoS One* 13 (2018), e0199750.
- [43] D. Canel-Çınarbaş, Y. Cui, E. Lauridsen, Cross-cultural validation of the Beck depression inventory—II across US and Turkish samples, *Meas. Eval. Counsel. Dev.* 44 (2011) 77–91.
- [44] S. Almeida, M. Camacho, J.B. Barahona-Corrêa, J. Oliveira, R. Lemos, D.R. da Silva, J.A. da Silva, T.M. Baptista, J. Grácio, A.J. Oliveira-Maia, Criterion and construct validity of the Beck Depression Inventory (BDI-II) to measure depression in patients with cancer: the contribution of somatic items, *Int. J. Clin. Health Psychol.* 23 (2023), 100350.
- [45] B. Turdaliyeva, I. Karibayeva, F. Bagiyarova, N.Z. Zainal, D. Kussainova, Prevalence and associated factors of depression symptoms in women newly diagnosed with breast cancer in Kazakhstan, *Asian Pac. J. Cancer Prev. APJCP* 23 (2022).