

ORIGINAL PAPER

PSYCHOMETRIC PROPERTIES OF THE CZECH VERSION OF THE TOOL – SCREENING FOR EARLY EATING DISORDER SIGNS (SEEDS-CZ)

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Abstract

Aim: The objective was to determine the psychometric properties of the Czech version of the evaluation tool “Screen for early eating disorder signs” (SEEDS-CZ). **Design:** Validation study. **Methods:** The group of respondents consisted of young women aged 15–21 (mean = 17.7). From the total of 230 subjects, 106 had type 1 diabetes and 124 were without disease. Psychometric analysis was implemented with regard to factor analysis and reliability. With respect to reliability, the internal consistency was determined by the Cronbach alpha coefficient. In order to verify the domains of the SEEDS-CZ questionnaire, exploration factor analysis with promax rotation and confirmation factor analysis were used. Convergence validity was assessed by correlation with independent testing of the same or similar areas. **Results:** On the basis of the exploratory factor analysis, three factors arose in the Czech version. Factor 1 (Body Image) was saturated by seven items, Factor 2 (Feelings) was saturated by seven items, and Factor 3 (Quality of life) was saturated by five items. Contrary to the original version, item 5 was assigned to Factor 1. The correlation between factors was strong. Correlations with the Diabetes Eating Problem Survey – Revised version, the Eating Attitude Test-26, and the Rosenberg scale were significant. The Cronbach alpha coefficient was 0.89 for the tool as a whole. **Conclusion:** The SEEDS-CZ evaluation tool is conceptually consistent with the original version of the SEEDS. From the psychometric point of view, it is suitable for use, particularly with diabetics.

Keywords: factor analysis, screening tool, SEEDS-CZ, reliability, validity.

Introduction

Modern understanding of eating disorders perceives these diseases to lie on a continuous spectrum from anorexia nervosa, through bulimia nervosa, to various forms of overeating (psychogenic, nocturnal) and obesity (Uhlíková, 2019). Worldwide, the lifetime prevalence of anorexia is estimated to be 0.21% – 3.7%, bulimia 0.81% – 4.2%, and other eating disorders – 2.22%, with increased prevalence in women (Le et al., 2017). According to some authors, adolescent diabetics are at higher risk of developing eating disorders, impaired eating behavior, and reduced quality of life compared to adolescent girls without diabetes (Goebel-Fabbri et al., 2011; Young et al., 2013). During young adulthood, there is a significant decrease in glycemic control, an increased prevalence of depressive symptoms (Cherubini et al., 2018), and higher levels of anxiety and eating disorders (Merwin et al., 2015; Young et al., 2013). Since individuals with type 1 diabetes mellitus (DM1) usually undergo check-ups by an endocrinologist or diabetologist several times a year,

there is regular opportunity for screening for problematic diet, weight loss, subjective perception of body shape, and early intervention to control disease progression. Questionnaires are available worldwide to identify people with eating disorders. However, the assessment tools used to capture the risks of eating disorders in the non-diabetic population [e.g., the Eating Disorders Examination Questionnaire (EDE-Q)], and the Eating Disorders Inventory-3 (EDI-3) are not sufficiently sensitive when used in diabetics.

A panel of experts found that 50% of items in the EDE-Q, and 6.6% in the EDI-3 may be highly affected by DM1 (Powers et al., 2013). In the Czech cultural environment, there is no available tool to detect this risk in adolescents and young adults with diabetes.

Based on a literature review (Sikorová & Valiašková, 2019), a Czech version of the assessment tool developed by Powers et al. (2016) – the Screen for Early Eating Disorder Signs (SEEDS) questionnaire (adapted with the consent of the author) – was chosen to determine psychometric properties.

According to Powers et al. (2016), the SEEDS assessment tool is suitable for screening for risk of eating disorders, especially for the diabetic

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population from 12 years of age. Powers et al. (2016) created an effective screening tool, one advantage of which is how quickly it can be completed (two–five minutes), it is also easy to administer and can be used in adolescents from 12 years of age with increased risk of developing eating disorders. The development of the tool was transparently documented from the very beginning, with the creation of focus groups, which compiled a preliminary summary for analysis by an expert panel. Individual interviews also contributed to the development of the evaluation tool. The questionnaire focuses on feelings and subjective perception of the subject's own body. It does not include items related to behavior. The authors subsequently verified the assessment tool on 279 individuals with diabetes. Factor analysis has shown a three-factor structure. The questionnaire is freely available on the Researchers at Park Nicollet's International Diabetes Center and Melrose Center website, together with information on the use of the questionnaire, and an explanation of the purpose of use.

Aim

The objective was to determine the psychometric properties of the Czech version of the “Screen for early eating disorder signs” (SEEDS-CZ) evaluation tool.

Methods

Design

The paper is in the form of a validation study.

Sample

The group of respondents consisted of young women aged 15–21. From the total of 230, 106 had type DM1 (46%), and 124 were without disease (54%), the average age was 17.8 years ($SD = 2.03$) in subjects with DM1, and 17.5 years ($SD = 1.62$) in subjects without diabetes ($p = 0.1667$). The selection of the sample was intentional. Selection criteria were the absence of other chronic diseases (except diabetes mellitus), and the age category 15–21 years.

Data collection

Data collection was performed with the use of the Screen for Early Eating Disorder Signs questionnaire, Czech version (SEEDS-CZ, Sikorová & Valiašková, 2020). This tool was used with the consent of the author, Margaret Powers, and was translated into Czech. The translation of the tool respected the principles of good practice for the translation and cultural adaptation of evaluation tools published by Wild et al. (2005). The questionnaire was translated

into Czech by two independent translators. Another independent translator created the first Czech translation from these two independently performed translations, which was then translated back into English by a native speaker. Subsequently, the reverse translation into English was compared with the text of the English original in order to determine differences in content and meaning. The differences found were then corrected by a translator and two professionals. The evaluation tool contains 20 items with a selection of responses on a Likert scale (1–7). The resulting scores range from 20–140 – in the Body Image domain: 6–42, and in the Feelings and Quality of Life domains: 7–49. The resulting score enables identification of degree of risk of eating disorder: zero – low (≤ 68), medium (69–84), and high (≥ 85).

In order to compare convergent validity, the domains and the overall results of the SEEDS-CZ evaluation tool were correlated with independent tests for the same or similar areas. The correlation was performed with the Diabetes Eating Problems Survey – Revised version (DEPS-R), the Eating Attitude Test Questionnaire (EAT-26), and the Rosenberg Self Esteem Scale.

The DEPS-R is a 16-item diabetes-specific self-evaluation questionnaire focused on assessing the level of disturbed diet. According to Markowitz et al. (2010), the authors of the tool, the questionnaire requires up to ten minutes to complete. It does not include sub-scales. Occurrence of the surveyed phenomena over the previous month is evaluated. A Likert scale is used (0 – never; 5 – always). The higher the score, the higher the risk of disordered eating behavior. An overall score ≥ 20 indicates risk of disordered eating behavior. The questionnaire was used with the consent of the authors.

The EAT-26 questionnaire is used for evaluation of eating attitudes. It was created by Garner et al. (1982). The original version, consisting of 40 items was subsequently shortened to 26 items describing eating attitudes or behavior. Introduced in the Czech Republic by Papežová (2010), the questionnaire is one of the most frequently used evaluation tools for assessment of eating disorders. The questionnaire shows the degree of disturbance in eating attitudes and eating behavior, and in the relationship of the patient to his/her own body. It consists of 26 questions, forming three sub-scales: dietary behavior, bulimia and food preoccupation, and oral control. For questions 1–25, respondents select how often they engage in the relevant behaviors on a frequency scale (Always, Usually, Often, Sometimes, Rarely, and Never), with a greater frequency reflected by a higher

score (while for question 26 the scoring system is reversed). A score ≥ 20 points is considered a risk score with regard to eating disorders.

The Rosenberg Self-Esteem Scale (Rosenberg, 1965), a subjective ten-item scale measuring overall self-esteem, is used to assess levels of self-esteem. The overall level of self-esteem is expressed by a total score. Respondents express the degree of agreement with individual items on a four-point scale (from 0 – “I strongly agree”, to 3 – “I strongly disagree”). The overall score can range from 0–30. A score in the range of 15–24 is evaluated as normal self-esteem, below 15 points as low self-esteem, and above 25 points as above-average self-esteem. The Czech version was introduced by Blatný (1994).

Data collection was performed at specialist outpatient clinics of Ostrava University Hospital, and at secondary schools and special training colleges in the Moravian-Silesian region, in the period July–December 2019.

The questionnaire was distributed to all individuals meeting the selection criteria upon arrival at the selected specialist outpatient clinic, during office hours. Three hundred questionnaires were distributed, with a return rate of 79%. Six incomplete questionnaires were excluded.

Data analysis

Psychometric analysis of the SEEDS-CZ was performed in the form of factor analysis with reliability evaluation. With regard to the number of SEEDS-CZ items, the sample size was sufficiently large (the number of respondents was eleven times greater than the number of items). In general, the extracted factors obtained by exploratory factor analysis can be considered explicit, reliable, and relevant if the ratio of the number of respondents to the number of variables in the analyzed scale (subject ratio) is at least 5:1 – i.e., the number of respondents is at least five times larger than the number of variables /scale items (Gurková et al., 2012). Regarding reliability, the internal consistency of the tool was determined by calculating the Cronbach's alpha coefficient. The values can range between 0–1, with generally acceptable values of the coefficient ranging between 0.7–0.95 (Tavakol & Dennick, 2011). The normality of data was evaluated and the symmetry of distribution was tested (skewness and kurtosis). Exploratory factor analysis with promax rotation and confirmatory factor analysis were used to determine the domains in the SEEDS-CZ questionnaire. The following parameters were calculated: chi-square (χ^2), number of degrees of freedom (df), their ratio (χ^2/df), RMSEA index (Root Mean Square Error of Approximation), TLI (Tucker-

Lewis index) and BIC (Bayesian information criterion). Correlation analysis between factors was performed using Pearson's correlation coefficient. The suitability of the data for factor analysis was evaluated according to the Kaiser-Meyer-Olkin measure (KMO). This value can range between 0–1. The higher the value, the more suitable the data are. The minimal limit value is 0.6, with values above 0.8 indicating very suitable data (Thompson, 2005). Bartlett's Test of Sphericity was also performed (the results of analysis should be significant). Furthermore, the number of factors was determined. The number of factors that emerged was determined by eigenvalue for every other factor. The eigenvalue was set to 1 as a standard (acceptance of as many factors as the number of factors which achieved a value 1 or more). The Stata v. 14 and JASP (Version 0.11.1) programs were used for statistical processing of the data.

Results

Factor analysis

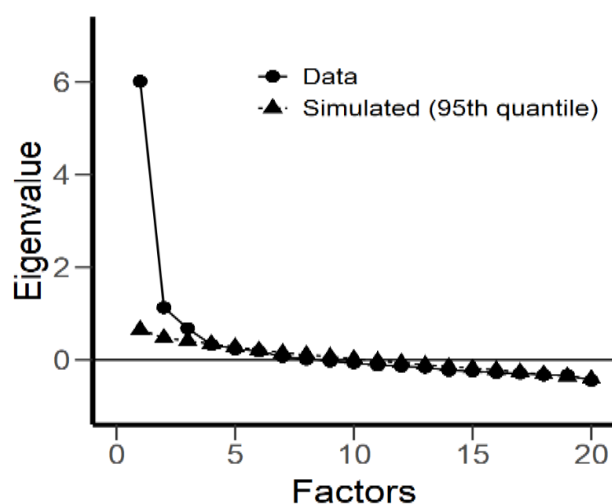
In the first stage, the normality of the data was evaluated, and the symmetry of the distribution was tested using the Skewness and kurtosis test for normality. The value of the total score showed a normal distribution of data ($p = 0.282$), and the values indicated no signs of deviation.

In addition, the suitability of data for factor analysis was tested. The KMO value exceeded the minimal value of 0.6, indicating very good results, and Bartlett's Test of Sphericity was significant (0.882; $p < 0.001$); thus the data were suitable for use of exploratory factor analysis. Based on the exploratory factor analysis during the promax rotation, a three-factor model with three components with an eigenvalue above 1 was indicated. Items were assigned to factors based on the highest factor loadings. The criterion for maintaining the items was loading of the rotated factor ≥ 0.3 per single factor, communality ≥ 0.3 per item. No twice saturated items were determined. Factor 1 (Body Image) was saturated by seven items, Factor 2 (Feelings) was saturated by seven items, and Factor 3 (Quality of Life) was saturated by five items. Item 20 was not explicitly included in the factors. Item 5 was assigned to Factor 1, in contrast to the original version of the questionnaire (Table 1). Assessment of the scree plot, displaying intrinsic values, confirmed the suitability of the three factors (Figure 1).

In order to verify the three-factor model of the SEEDS-CZ questionnaire (after item reduction), confirmation factor analysis was performed. The most basic condition for its use is the need for each

Table 1 Communalities after factor extraction

| Item number | Item title | Factor 1 | Factor 2 | Factor 3 | Uniqueness |
|-------------|--|----------|----------|----------|------------|
| 1. | How do you usually feel? | 0.244 | 0.302 | 0.113 | 0.659 |
| 2. | How would your friends describe you? | -0.056 | 0.455 | 0.126 | 0.748 |
| 3. | How often do you compare how you look to those around you? | 0.691 | 0.125 | -0.234 | 0.536 |
| 4. | How well do you fit in with your friends? | -0.081 | 0.083 | 0.604 | 0.622 |
| 5. | How often do you feel in control of your life? | 0.434 | 0.038 | 0.256 | 0.589 |
| 6. | How satisfied are you with how you look? | 0.482 | 0.055 | 0.179 | 0.590 |
| 7. | How satisfying is your life? | 0.095 | 0.220 | 0.477 | 0.508 |
| 8. | How well do you handle your feelings? | -0.051 | 0.800 | -0.201 | 0.562 |
| 9. | How would your family members describe your mood most of the time? | 0.019 | 0.540 | 0.170 | 0.550 |
| 10. | How often do you feel your life is valuable? | 0.111 | 0.213 | 0.380 | 0.621 |
| 11. | How well do you manage your stress? | 0.043 | 0.732 | -0.169 | 0.547 |
| 12. | How often do you think about your body shape and size? | 0.606 | 0.063 | -0.097 | 0.635 |
| 13. | How do you describe your mood? | 0.099 | 0.271 | 0.369 | 0.580 |
| 14. | How satisfied are you with your body shape? | 0.827 | -0.147 | -0.019 | 0.484 |
| 15. | How satisfied are you with your body size? | 0.852 | -0.179 | -0.038 | 0.489 |
| 16. | How do you describe your moods? (different characteristics of the answer than item 13) | -0.138 | 0.928 | -0.134 | 0.419 |
| 17. | How much do you think you matter to your family? | -0.088 | -0.238 | 0.776 | 0.602 |
| 18. | How do you feel when others around you talk about body shape and size? | 0.663 | -0.018 | -0.065 | 0.618 |
| 19. | How much do you think you matter to your friends? | -0.109 | -0.165 | 0.740 | 0.622 |
| 20. | How often do you think you meet the expectations your family has for you? | 0.162 | 0.189 | 0.226 | 0.751 |

Promax rotation method**Figure 1** Scree plot

factor in the model to be measured by at least three indicators. In the case of the model tested here, this condition was met. The model contained three factors and each was measured by at least three items. The χ^2 and fit indices were used to assess the suitability of the model to the data. Values $\chi^2 = 167.186$; $df = 117$; $p = 0.002$; $\chi^2/df = 1.429$; $RMSEA = 0.046$ (90% CI = 0.027–0.057); $TLI = 0.944$ and $BIC = 469.069$ indicated that model was acceptable according to the tested criteria.

Keeping the original item 20, the model achieved the parameters $\chi^2 = 191.056$; $df = 133$; $p < 0.001$; $\chi^2/df = 1.436$; $RMSEA = 0.047$ (90% CI = 0.029–0.057); $TLI = 0.939$ a $BIC = 532.208$.

Correlation analysis

Correlation between the factors achieved values of 0.59 to 0.79 ($p < 0.001$). The strongest correlation was between Factor 1 (Body Image) and Factor 2 (Feelings) (Table 2). Correlation analysis between items ranged from 0.57–0.65 for Factor 1 (Body Image), 0.51–0.65 for Factor 2 (Feelings), and 0.50–0.67 for Factor 3 (Quality of Life).

Table 2 Correlation analysis between factors

| | Factor 1 | Factor 2 | Factor 3 |
|-----------------|----------|----------|----------|
| Factor 1 | 1.000 | | |
| Factor 2 | 0.791 | 1.000 | |
| Factor 3 | 0.589 | 0.665 | 1.000 |

Pearson correlation coefficient; $p < 0.001$

Construct validity

In order to evaluate convergence validity, the evaluation tool domains and the overall results of the SEEDS-CZ were correlated with independent tests of the same or similar areas. The correlation was performed with the DEPS-R, for girls with DM1, and the Rosenberg Self-Esteem Scale (RSES). Both

evaluation tools indicated significant relation to the SEEDS-CZ (Table 3). For girls without DM1, the SEEDS-CZ evaluation tool and its domains were correlated with the Eating Attitude Test-26 questionnaire. The Pearson correlation coefficient showed a significant medium to low correlation. No significant correlation with the Rosenberg Self-Esteem test was indicated (Table 4).

Reliability

The internal consistency measured by the Cronbach's alpha coefficient was good for the SEEDS-CZ screening tool as a whole ($\alpha = 0.89$), with the values of the coefficient ranging from 0.77 to 0.82 for individual domains. The Body Image domain achieved the highest alpha coefficient ($\alpha = 0.82$) and the lowest coefficient was achieved in the Quality of Life domain ($\alpha = 0.77$). In the Feelings domain, the Cronbach alpha was $\alpha = 0.81$.

Table 3 Correlation between SEEDS-CZ, DEPS-R and Rosenberg scale (girls with DM1)

| | DEPS-R | Rosenberg scale | SEEDS-CZ | Body image | Feelings |
|------------------------------|---------|-----------------|----------|------------|----------|
| DEPS-R-CZ | 1 | | | | |
| Rosenberg test | 0.0623 | 1 | | | |
| SEEDS-CZ | 0.7818* | -0.1972* | 1 | | |
| body image | 0.7324* | -0.2404* | 0.8670* | 1 | |
| feelings | 0.6368* | -0.1481 | 0.8741* | 0.6932* | 1 |
| mental health, relationships | 0.6610* | -0.0918 | 0.8007* | 0.5389* | 0.5668* |

Pearson correlation coefficient; * $p < 0.05$; SEEDS-CZ – Screen of Early Eating Disorder Signs; DEPS-R – Diabetes Eating Problem Survey – revised version

Table 4 Correlation between SEEDS-CZ, EAT-26 and Rosenberg scale (girls without DM1)

| | EAT-26 | Rosenberg scale | SEEDS-CZ | Body image | Feelings |
|------------------------------|---------|-----------------|----------|------------|----------|
| EAT-26 | 1 | | | | |
| Rosenberg test | 0.0618 | 1 | | | |
| SEEDS-CZ | 0.1977* | -0.0446 | 1 | | |
| body image | 0.3435* | -0.1703 | 0.7345* | 1 | |
| feelings | 0.1802* | -0.0525 | 0.8367* | 0.4645* | 1 |
| mental health, relationships | 0.0301 | -0.1007 | 0.7796* | 0.3318* | 0.5044* |

Pearson correlation coefficient; * $p < 0.05$; SEEDS-CZ – Screen of Early Eating Disorder Signs; EAT-26 – Eating Attitude Test

Discussion

Prevention of eating disorders in at-risk diabetics and their subsequent education are an essential part of diabetic care. Recommended procedures of the International Society for Paediatric and Adolescent Diabetes (Delamater et al., 2018) suggest the use of screening for eating disorders. A suitable option for capturing this risk and warning signs indicating eating disorders is the screening of disturbed eating attitudes and disturbed eating behavior. However, early examination of eating disorders and body image in diabetics is not commonly performed in practice (Hanlan et al., 2013; Wisting et al., 2019; Young et al., 2013). This may be due to the lack of specific evaluation tools. For clinical practice, it is useful to choose screening tools that are shorter than tools suitable for research purposes. According to its authors (Powers et al., 2016), the latest SEEDS questionnaire shows excellent psychometric properties. So far, it has been verified in only one study in adolescents from 12 years of age and in young adult women (average age 19.2 years). We, therefore, set ourselves the goal of determining the psychometric properties of this tool in the Czech cultural environment.

In our study, psychometric analysis of the SEEDS-CZ was conducted with regard to factor analysis and reliability. Exploratory factor analysis is used primarily to identify correlations between the measured variables and their reduction to a lower number of indirectly measured latent variables, known as factors. Factors bring together items that are strongly correlated. On the other hand, ideally, factors should be uncorrelated. The affiliation of a particular item to a given factor is determined by the size of the factor loading. It ranges from -1 (strong negative relationship), through zero (the item does not belong to the specific factor), to +1 (the item explains the specific factor) (Hendl, 2015). According to Škaloudová (2010), it is appropriate to use exploratory factor analysis for a preliminary assessment of the factor structure, to establish hypotheses about the number and nature of factors, and to then verify them using confirmatory factor analysis. The minimum value of factor loading should be 0.3. In our study, three factors of the evaluation tool SEEDS-CZ were identified with their own values above 1, as in the original version (Powers et al., 2016). However, one item was not clearly assigned to the factors – i.e., the item: “How

often do you think you meet the expectations your family has for you?" from the Quality of Life domain. This item showed a higher degree of variability that did not fit the identified factors. Therefore, a model with this item excluded was designed for further testing. In the study by Powers et al. (2016) this item was also one of those with the lowest factor loading. In contrast to the study by Powers et al. (2016), one item: *"How often do you feel in control of your life?"* was assigned to the Body Image domain. After item exclusion, the correlation analysis achieved stronger correlations between factors than when using the Powers et al. (2016) model. The final model includes 19 items, divided into three factors, Factor 1 (Body Image), which includes seven items focused on subjective evaluation of the subject's own physical appearance and body weight, Factor 2 (Feelings), which focuses on the subject's perception of his/her own mood and stress management in seven items, and Factor 3 (Quality of Life), which monitors satisfaction with life and relationship to the immediate social environment (five items).

A confirmatory factor analysis was performed to verify the three-factor model of the SEEDS-CZ questionnaire. In this analysis, the items that were saturated were assigned to these three factors. Confirmatory factor analysis, as opposed to exploratory factor analysis, does not look for relationships between variables, but tests a predetermined hypothesis, evaluates the validity of a pre-estimated structure of relationships between variables, or determines whether the measured data can be explained by the proposed theoretical model. There are several methods which can be used for verification of the factor structure. However, the process of this analysis always finishes with a statistical test of the hypothesis about the suitability of the chosen factor structure. Specifically, it is a test of the conformity of the original correlation matrix with the correlation matrix derived on the basis of the assumption that the manifest variables are a linear combination of specified factors (Škaloudová, 2010). In our analysis, the values χ^2/df , RMSEA, TLI and BIC were evaluated. Values $\chi^2/df \leq 3$ and RMSEA $\leq 0,08$ were considered acceptable (Schermelleh-Engel et al., 2003). The TLI index should be higher than 0.95 and the BIC should be as low as possible so that the model displays better conformity with the data. (Kass & Raftery, 1995). Although we did not achieve a one percent level of significance at the value of the test criterion $\chi^2 = 167.186$, even after modifying the model (moving the item, one excluded), based on fit indices (close conformity of the model with RMSEA data, sufficient TLI and

BIC values), the presented factor structure model can be considered acceptable. With regard to these parameters, this model was more suitable than the original model of Powers et al. (2016).

Comparison of convergent validity showed a high dependence with the DEPS-R test (especially the Body Image domain) and a weak but significant negative dependence with the Rosenberg self-esteem scale, indicating that as self-confidence decreases, the risk of eating disorders increases (also most significantly in the Body Image domain). Similar results were obtained in the study by Powers et al. (2016). The increased risk of eating disorders with declining self-confidence (using the same assessment tools) was confirmed in a study by Mora et al. (2017), and, in diabetic women, by Hrachovinová (2002). A stronger correlation between the SEEDS-CZ domains and similar tools in women with DM1 indicates a more effective use in this population compared to the non-diabetic population. The reliability of Cronbach's alpha was excellent, which also indicates the good internal consistency of the instrument. The lowest coefficient found was for the Quality of Life domain, as well as for the English version of the tool.

Limitations of the study were the size of the sample, which was relatively small, and the fact that the selection of individuals for research was carried out in only one region.

For use in practice, it is necessary to verify the SEEDS-CZ tool by research and to determine a new resulting cut-off score. According to the authors of the original version, it is appropriate to set these cut off criteria for low, medium, and high risk according to the average value (mean) in individual domains, in size ≤ 1 SD; > 1 to ≥ 2 SD and > 2 SD more than the average of the total SEEDS-CZ score for low-risk, medium, and high-risk assessment.

Conclusion

In our study, the SEEDS-CZ screening tool was proven to have good psychometric properties overall. The three- factor model of the Czech version is conceptually consistent with the original version (Powers et al., 2016). With regard to its psychometric properties, the SEEDS-CZ questionnaire is a suitable screening tool for use in the Czech cultural environment to determine eating disorder risks, particularly in diabetics.

Ethical aspects and conflict of interest

The research meets the basic ethical principles respecting research on human subjects. It was

approved by the Ethics Committee of the University of Ostrava Faculty of Medicine, and by the Ethics Committee of Ostrava University Hospital. The use of the evaluation tools was agreed by the authors of the questionnaires. The authors declare that they are not aware of any conflict of interest in connection with the submitted paper.

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Participation of co-authors

Concept and design (LS), data analysis and interpretation (LS, TV), draft manuscript (LS), critical revision of the manuscript (LS, TV), completion of articles (LS).

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