Psychological well-being and self-esteem in Slovak adolescents

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Chapter 3

Psychometric evaluation of the General Health Questionnaire-12 and Rosenberg Self-esteem Scale in Hungarian and Slovak early adolescents

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Abstract

The reliability and factor structure of the General Health Questionnaire-12 (GHQ-12) and the Rosenberg Self-Esteem scale (RSE) were evaluated in samples of Hungarian and Slovak early adolescents. The principal component analyses support the two-factor solution for GHQ-12 with subscales "depression/anxiety" and "social dysfunction". Similarly, the RSE appears to be an instrument with a two-factor structure with subscales "negative self-esteem" and "positive self-esteem" in both samples. Reliability analyses of GHQ-12 and RSE total scales show satisfactory results, although the reliability figures of some components are lower. The factor structure of RSE component "negative self-esteem" is less clear. Researchers need to be aware of the potential problems surrounding the negative item wording and make every effort to ensure that negatively-worded items are carefully constructed and easily interpreted by the population of early adolescents.

Keywords: General Health Questionnaire-12, Rosenberg Self-Esteem scale, psychometrics, early adolescents

Introduction

Recent studies show increasing interest in the mental health of early adolescents (Bolognini et al., 1996; Eccles, 1999; Oksoo & Kyeha, 2001; Sweeting & West, 2003). There are several reasons why attention to the mental health of early adolescents appears to be so important. Firstly, in the period of early adolescence several specific physical and social changes occur which have an impact on psychological development. This period has been described as an especially stressful phase of development (Benjet & Hernandes-Guzman, 2001; Mahon et al., 2003). Secondly, the latest studies demonstrate the important roles of some psychological factors, particularly stress, anxiety and depressive mood on adolescents' health risk behaviour (Callas et al., 2004; Weiss et al., 2005). If mental health as fundamental to all forms of health is a positive attribute, then mental health promotion is a strong reason for healthy and valuable adolescents' development (Weare, 1996). The project reported in this study was carried out in Hungary and Slovakia in 1999 as a part of the international comparative intervention project "Promoting Mental and Emotional Health in the European Network of Health Promoting Schools (ENHPS)" (Weare, 1996). The ENHPS study concentrated on developing and implementing strategies of health promotion focussing on specific aspects of early adolescents' mental health, such as psychological well-being and self-esteem. These aspects were measured using two world-wide used instruments: the General Health Questionnaire–12 (psychological well-being) and the Rosenberg Self-esteem Scale (self-esteem).

General Health Questionnaire

The General Health Questionnaire (GHQ) was developed in England as a self-administered screening instrument to identify psychological distress for use in general population surveys, or among general medical outpatients. It was designed to cover four identifiable elements of distress: depression, anxiety, social impairment and hypochondria. The questionnaire was originally created as a 60-item instrument. Shortened versions (30, 28, 20 and 12 items) were developments from the original. The 12-item version of GHQ is the most widely-used screening instrument for common mental disorders (Werneke et al., 2000; Aalto-Setala et al., 2002). The GHQ questions ask whether the respondent has recently experienced a particular symptom (like abnormal feelings or thoughts) or type of behaviour (McDowell & Newell, 1996). The four-point response scale of the questionnaire may be scored in two ways. Firstly, it can be treated as a multiple-response scale or "Likert score" (0, 1, 2, 3). The alternative is to treat it as a bimodal response scale (0, 0, 1, 1). The GHQ-12 summary score ranging from 0 to 12 with cut-off point 2/3 for "cases" indicating a level of psychological distress of potential clinical significance is used (Goldberg

& Williams, 1988). The GHQ manual notes that it is not appropriate for use with children but that it has been used with adolescents (Goldberg & Williams, 1988). The scale has been used in a number of countries and languages for different age groups. In 1988 Goldberg and Williams reported that this instrument had been translated into about 38 languages, and so far over 50 validity studies have been published. The scale is widely used in the USA, Australia and Western Europe (Goldberg & Williams, 1988; Werneke et al., 2000), it is occasionally used in Asian countries (Montazeri et al., 2003; Gao et al., 2004) and there are also several publications which refer to the utilisation of the GHQ in Central and Eastern Europe, particularly in Hungary, Belarus, Croatia, Poland and also Slovakia (Radovanovic et al., 1983; Kulenovic et al., 1995; Nagyova et al., 2000; Geckova et al., 2001). Although the GHQ is often used as a screening instrument there are still questions regarding its dimensionality. Previous studies describe substantial factor variance on scales between the centres being evaluated. Factor analyses on GHQ-12 have yielded two- and three-factor solutions according to different settings, including translations into different languages (Goldberg & Williams, 1988; Werneke et al., 2000).

Rosenberg Self-esteem Scale

The concept of self-esteem is essential for knowing how individuals perceive, value and regard the self, in order to interpret their behaviour. The RSE is one of the most popular and well-utilised measures of self-esteem. Originally the scale was developed to measure adolescents' global feelings of self-worth or self-acceptance, and is generally considered as the standard against which other measures of self-esteem are compared (Blascovich & Tomaka, 1991). The benefit of this scale is that it is short, easy and quick to administer. The scale is an attempt to achieve a one-dimensional measure of global self-esteem. Ten items are included, divided into 5 positive and 5 negative statements, and they are usually scored using a four-point response ranging from strongly disagree to strongly agree. In spite of the popularity of this scale, studies focussing on psychometrics are rather scarce and besides, existing studies do not give us satisfactory answers for the factor structure of the RSE. Some studies accept the scale as a one-dimensional 10-item instrument; others report a two-dimensional solution (Kaplan & Pokorny, 1969; Blascovich & Tomaka, 1991; Marsh, 1996; French & Tait, 2004). Studies from Slovakia and Czech republic are using this instrument as a two or three-dimensional scale (Blatny & Osecka, 1994; Osecka & Blatny, 1997; Fickova, 1999).

The main aim of the present study is to evaluate selected psychometric aspects of the GHQ-12 and RSE in Hungarian and Slovak early adolescents with regard to their factor structure.

Method

Procedure and sample

The study was carried out as part of the international comparative project "Promoting Mental and Emotional Health in the ENHPS" (Weare, 1996). Two countries in Central Europe, Hungary and Slovakia, participated in this research. Data were collected in September 1999 in Slovakia and in September 2000 in Hungary. The Slovak sample consisted of 519 pupils (50.9% boys, 49.1% girls), mean age 11.5 years (range 10 - 14 years). The Hungarian sample consisted of 431 pupils (52.7% boys, 47.3% girls), mean age 11.5 years (range 10 - 14 years). The Slovak children came from 8 elementary schools located in the city of Kosice. The Hungarian children came from 10 elementary schools, 4 schools situated in the city of Miskolc and 6 schools in the city of Debrecen. The schools were selected at random and all were elementary state schools. Respondents completed the questionnaires at school, in their classrooms and under the guidance of the field workers. The response rate was 88.8% in the Slovak sample and 92.5% in the Hungarian sample.

Measures

Psychological well-being was measured using the 12-item version of the General Health Questionnaire (GHQ-12) (Goldberg, 1972). The items focus on various aspects of respondents' psychological disposition, for example problems with sleep (Have you recently lost much sleep over worry?), strain (Have you recently felt constantly under strain?), happiness (Have you recently been feeling reasonably happy, all things considered?) or stress (Have you recently been feeling unhappy or depressed?). The questions compare how the respondents' present state differs from their usual state. For the scoring, a four-point Likert scale (0,1,2,3) was used with sum score ranging from 0 to 36. Higher score indicates lower psychological well-being.

Self-esteem was assessed using the Rosenberg Self-Esteem scale (RSE) (Rosenberg, 1965). The items ask what respondents think about themselves, e.g. "At times I think I am no good at all.", "I feel that I am a person of value, at least on an equal plane with others.", "I take a positive attitude towards myself.". The 10 items on the scale include 5 positive and 5 negative statements. Each item has a four response options (1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree). The sum score for self-esteem varies from 10 to 40. Higher sum score indicates higher self-esteem.

The adaptation of the instruments to Slovak conditions was carried out via the following procedure. Firstly, two Slovak native speakers with mastery of the English language translated the instruments from English

into Slovak. Then the instruments were re-translated from Slovak back into English, this time by a native English speaker with mastery of the Slovak language. The discrepancies between the different versions of the instruments were discussed.

Statistical analyses

To analyse the data correlations, reliability analyses, item analysis and Principal Component Analysis (PCA) available in SPSS 10.1 were used.

Results

Principal Component Analysis

Principal Component Analysis (PCA) with varimax rotation was used to examine the factor structure of the Hungarian and Slovak versions of the GHQ-12 and RSE.

GHQ-12

Table 3.1 presents loadings (item-component correlations) of the GHQ-12 in the Hungarian and Slovak samples. In the Hungarian version of the GHQ-12 two significant factors with eigenvalues above 1 accounted for 41.4% of the total variance. Items 1, 3, 4, 7, 8 and 12 loaded on component 1. Items 2, 5, 6, 9, 10 and 11 loaded on component 2. The components can be labelled as follows: component 1 = depression/anxiety, component 2 = social dysfunction. The PCA in the Slovak version of the GHQ-12 yielded a three-factor solution accounting for 47.1% of the variance explained. In the Slovak sample the three-factor structure was less clear (not presented in the table). Items 2, 5, 6, 9 and 10 loaded with ≥0.5 on component 2, items 7 and 12 on component 1 and items 1, 4 and 8 on component 3. Item 3 was suspect with loadings ≥0.35 on components 2 and 3. Similarly, item 11 was suspect with loadings ≥0.4 on components 1 and 2. The forced two-factor solution with varimax rotation was therefore carried out in the Slovak sample. The two-factor solution accounted for 38.4% of the variance explained and the factor structure was identical with the results of the Hungarian version.

Table 3.1 Principal component analysis of the GHQ-12 in the Hungarian and Slovak samples

		Hungary (n=431)		Slovakia (n=519)	
No. of item	**GHQ-12**	Component 1	Component 2	Component 1	Component 2
1	Concentrate	.27	**.41**	.25	**.43**
3	Play useful part	.07	**.41**	.15	**.51**
4	Making decisions	-.01	**.72**	-.10	**.50**
7	Enjoy activities	.19	**.60**	.17	**.46**
8	Face up problems	.12	**.69**	.03	**.70**
12	Feeling happy	.39	**.49**	.15	**.56**
2	Lost sleep	**.57**	-.02	**.67**	-.01
5	Under strain	**.68**	.22	**.71**	.08
6	Overcome difficulties	**.68**	.15	**.70**	.09
9	Feeling unhappy	**.74**	.14	**.72**	.10
10	Lost self-confidence	**.56**	.29	**.62**	.23
11	Feeling worthless	**.67**	.16	**.51**	.27

Component 1 = depression/anxiety
Component 2 = social dysfunction

RSE

In the Hungarian version of the RSE two significant factors accounted for 44.9% of the total variance. Table 3.2 presents loadings of the RSE items in this sample. Items 1, 3, 4, 7 and 10 loaded on component 1. Items 2, 5, 6, 8 and 9 loaded on component 2, although item 9 is suspect with high loading also on component 1. Component 1 can be denoted as "positive self-esteem" and component 2 as "negative self-esteem". In the Slovak version of the RSE PCA yielded a three-factor solution accounting for 50.8% of the variance explained. The factor structure was less clear however, with items 8 and 10 loading on component 3 (not labelled). In order to obtain a clearer factor structure, the forced two-factor solution with varimax rotation was carried out in the Slovak sample. The two-factor solution accounted for 40.7% of the variance explained and the factor structure was identical with the Hungarian version of the RSE.

Table 3.2 Principal component analysis of the RSE in the Hungarian and Slovak samples

		Hungary (n=431)		Slovakia (n=519)	
No. of item	**RSE**	Component 1	Component 2	Component 1	Component 2
2	No good at all	.15	**.70**	.03	**.62**
5	Not proud	.23	**.57**	-.01	**.62**
6	Feel useless	.16	**.70**	.28	**.71**
8	Lack of respect	-.05	**.62**	-.41	**.32**
9	Feel a failure	**.60**	.40	.24	**.68**
1	Satisfied with self	**.57**	.29	**.58**	.21
3	Have a good quality	**.65**	-.21	**.60**	-.02
4	Equal to others	**.65**	.15	**.51**	.26
7	Feel valuable	**.69**	.24	**.61**	.20
10	Positive attitude	**.56**	.07	**.68**	.04

Component 1 = positive self-esteem

Component 2 = negative self-esteem

Reliability and item analysis

To test the reliability the internal consistency and item analysis of the questionnaires was measured using Cronbach's alpha and mean inter-item correlations (Table 3.3). Cronbach's alpha for the GHQ-12 total scale was 0.79 and 0.73 for the Hungarian and Slovak versions, respectively. Cronbach's alpha for the subscale "depression/anxiety" (component 1) appeared to be 0.76 in the Hungarian and 0.75 in the Slovak sample. Cronbach's alpha for the subscale "social dysfunction" (component 2) was 0.62 in the Hungarian and 0.53 in the Slovak sample.

Cronbach's alpha for the RSE total scale was 0.75 and 0.65 for the Hungarian and Slovak versions, respectively. Cronbach's alpha for the subscale "negative self-esteem" (component 1) appeared to be 0.66 in the Hungarian and 0.62 in the Slovak sample. Cronbach's alpha for the subscale "positive self-esteem" (component 2) was 0.65 in the Hungarian and 0.55 in the Slovak sample.

The mean inter-item correlations, which can be regarded as an indicator of homogeneity of the scales, were also computed (Table 3.3). The highest mean i-i correlation was found for GHQ-12 component 1 "depression/anxiety" (0.34) in both samples, and the lowest for the RSE total scale in the Slovak sample (0.16).

Table 3.3 Reliability figures; mean inter-item correlations of the GHQ-12 and RSE scales and subscales in the Hungarian and Slovak samples

	Hungary (n=431)			Slovakia (n=519)		
	Compo-nent 1	Compo-nent 2	Total scale	Compo-nent 1	Compo-nent 2	Total scale
GHQ-12						
Cronbach's α	.76	.62	.79	.75	.53	.73
i-i correlation	.34	.21	.23	.34	.16	.19
RSE						
Cronbach's α	.66	.65	.75	.62	.55	.65
i-i correlation	.28	.27	.23	.25	.20	.16

GHQ-12: Component 1 = depression/anxiety, Component 2 = social dysfunction
RSE: Component 1 = negative self-esteem, Component 2 = positive self-esteem
i-i correlation = mean inter-item correlation

The result of item analysis show that in GHQ-12 items 3 "play useful part" and 4 "making decisions" are the items least consistent with the rest of the scale (Table 3.4). When considering the RSE items 8 "lack of respect", 3 "have a good quality", 5 "not proud" and 10 "positive attitude" appear to be least consistent with the rest of the scale in Hungarian and Slovak sample alike (Table 3.5).

Table 3.4 Item analysis of the GHQ-12 in the Hungarian and Slovak samples

		Corrected Item-Total Correlation		Alpha if Item Deleted	
No. of item		Hungary	Slovakia	Hungary	Slovakia
1	Concentrate	.35	.32	.78	.73
3	Play useful part	.22	.28	.79	.73
4	Making decisions	.31	.12	.78	.75
7	Enjoy activities	.39	.28	.78	.73
8	Face up problems	.39	.29	.78	.73
12	Feeling happy	.49	.31	.77	.73
2	Lost sleep	.34	.41	.78	.72
5	Under strain	.55	.48	.76	.71
6	Overcome difficulties	.51	.49	.77	.71
9	Feeling unhappy	.56	.50	.76	.70
10	Lost self-confidence	.49	.49	.77	.71
11	Feeling worthless	.50	.43	.77	.72

Table 3.5 Item analysis of the RSE in the Hungarian and Slovak samples

		Corrected Item-Total Correlation		Alpha if Item Deleted	
No. of item	RSE	Hungary	Slovakia	Hungary	Slovakia
2	No good at all	.44	.30	.72	.62
5	Not proud	.41	.30	.72	.63
6	Feel useless	.43	.53	.72	.57
8	Lack of respect	.26	-.04	.74	.69
9	Feel a failure	.55	.47	.70	.58
1	Satisfied with self	.46	.37	.71	.61
3	Have a good quality	.23	.24	.74	.64
4	Equal to others	.42	.36	.72	.61
7	Feel valuable	.52	.36	.71	.62
10	Positive attitude	.33	.29	.73	.63

Discussion

The purpose of this study was to evaluate the reliability and factor structure of the Hungarian and Slovak versions of GHQ-12 and RSE.

Factor structure of scales

The results of our study are in line with previous findings, describing substantial factor variance between the centres evaluated. Factor analyses on both scales have yielded unidimensional, two- and three-factor solutions according to different settings, including translations into different languages (Goldberg & Williams, 1988; Blascovich & Tomaka, 1991; Werneke et al. 2000; French and Tait, 2004). As for our results, in the Hungarian version of the GHQ-12 two factors were identified, which can be labelled as "depression/anxiety" and "social dysfunction". Similarly, two factors were found in an Italian study among young males (Politi et al., 1994), in an Australian study (Martin, 1999), in 10 centres of a WHO study (Werneke et al., 2000) or in Iranian young people study (Montazeri et al., 2003, Gao et al., 2004). In the Slovak version of the GHQ-12, after rotation three components were shown, but the pattern was less clear than in the Hungarian sample. Items 1, 3, 4 and 8 (concentrate, play useful part, making decisions, face up problems) loaded on component 1 (= social dysfunction). Items 2, 5, 6, 9, 10 and 11 (lost sleep, under strain, overcome difficulties, feeling unhappy, lost self-confident, feeling worthless) always loaded together, which present component 2 (= depression/anxiety).

Items 7 and 12 (enjoy activities, feeling happy) loaded on component 3 (not labelled). Also the findings of French and Tait (2004) with Australian adults and Gao et al. (2004) are in line with this three-factor solution. In the above-mentioned WHO study the three-factor solution was identified in 5 centres: Athens, Ibadan, Rio de Janiero, Shanghai and Verona (Werneke et al. 2000). In the WHO study these three factors were reported to cover domains of anxiety and depression, social dysfunction and loss of confidence. The factor structure of the Slovak version of GHQ-12 differed from that of the above-mentioned studies reporting three-factor solutions, and thus a forced two-factor solution was carried out. This additional procedure contributed significantly to clarity regarding the factor structure of the Slovak version of GHQ-12, since it appeared to be identical with the factor structure of the Hungarian version of this instrument.

Similarly, the results of this study in both versions of RSE support the possibility of using the scale as a two-factor instrument. Items 2, 5, 6, 8 and 9 (no good at all, not proud, feel useless, lack of respect, feel a failure) in the Hungarian and also in the Slovak version of RSE loaded on component 2 (= negative self-esteem). Component 1 (= positive self-esteem) included item 1, 3, 4, 7 and 10 (satisfied with self, have a good quality, equal to others, feel valuable, positive attitude). These results are in accord with the findings of several previous studies (Kaplan & Pokorny, 1969; Blascovich & Tomaka, 1991). However, there are also studies questioning the bidimensional solution. According to Schmitt and Stuls (1985) the bidimensional factor structure is an artifact of carelessness in the subjects' responses. They assume that subjects may have carelessly agreed with the statements in the RSE (scores on the negatively worded items are reversed in the analysis so that the disagreement is eventually considered to indicate self-esteem, whereas agreement with positively worded items will be considered to reflect good self-esteem). Shanahi et al. (1990) attempted to minimise the effect of possibly careless responding by eliminating parts of data considered to be contaminated by this bias using a criterion; however, the omission of potentially careless responses had little effect on the factor structure. Also the results of item analysis in our study are in line with these outcomes since among items least consistent with the rest of the scale positively as well as negatively worded items can be found. In addition, Marsh (1996) carried out confirmatory factor analysis on a large sample (20,000+) of adolescents and his results provided support for a two-factor solution rather than the hypothesised unidimensional construct.

Reliability

The reliability figures for the total scales are acceptable, with Cronbach's alphas > 0.70. The only exception is the Slovak version of RSE, which is

somewhat lower (0.65). With regard to the subscales, Cronbach's alphas of subscales for both scales are acceptable (above 0.60). However, the reliability of component 1 in the Slovak versions of both scales is quite low (0.53 for "social dysfunction" GHQ-12 subscale and 0.55 for "positive self-esteem" RSE subscale).

The mean inter-item correlations provide further support for two-dimensional solutions of PCA. In general, the mean inter-item correlations for the total scales are lower than for subscales, indicating the presence of more dimensions within the scales. As already suggested by Cronbach's alpha figures, the internal consistency of subscales 1 in the Slovak versions of both scales are lower and therefore require further inspection.

Age appropriateness

The GHQ was designed as an adult measure, but a recent review identified 82 studies where it had been frequently used also with adolescents (Tait et al., 2002). With regard to RSE, it was originally designed for adolescents (Rosenberg, 1965). The results of this study show that both scales may be used with early adolescents, even if some caution is needed when attempting to explain unique factors associated with the reversed items. The results of this study in (particular lower Cronbach's alpha figures and lower mean inter-item correlations for subscales 1 in both scales) are in line with previous studies showing that children and adolescents are susceptible to negative item biases, for example they may lack the linguistic skills necessary to give appropriate responses to negative questions, either when they are negatively worded or when they express a negative self-concept (Marsh, 1996).

Conclusion

The study findings showed that the psychometric properties of the Hungarian and also the Slovak versions of the GHQ-12 and the RSE are acceptable, and these instruments may be used for measuring aspects of mental health in early adolescents. Nevertheless, given the problems associated with negatively-worded items in the scales, researchers need to be aware of the potential problems surrounding the negative item wording and make every effort to ensure that negatively-worded items are carefully constructed and easily interpreted by the population of interest.

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